October 16, 2017

Washington State Department of Ecology
Northwest Regional Office
3190 160th Ave SE
Bellevue, WA 98008-5452

Attn: Robin Harrover

Transmitted via email to: *rhar461@ecy.wa.gov*

Re: Status Report No. 60, July through September 2017 Activity Period
Boeing Auburn Facility
WAD 041337130, RCRA Corrective Action Agreed Order No. 01HWTRNR-3345
Auburn, Washington
Project No.0025164.140.501

Dear Ms. Harrover:

The Resource Conservation and Recovery Act (RCRA) Corrective Action Agreed Order (Auburn Agreed Order) became effective on August 14, 2002. As required under Section VI.13 of the Auburn Agreed Order, The Boeing Company (Boeing) is providing Status Report No. 60, which covers the 3-month activity period of July through September 2017.

References

1. July 3, 2017. Newforma File Transfer: AGW105 Photos/Video. From Jennifer Wynkoop, Landau Associates (LAI) to Neal Hines and Robin Harrover, Washington State Department of Ecology (Ecology).
2. July 5, 2017. Email: Boeing Auburn Remediation Update. From Jennifer Wynkoop, LAI, to Jenna Leonard, City of Auburn.
3. July 5, 2017. Ecology Listserv. Ecology's Response to Comments Coming Soon.
4. July 14, 2017. Letter: Status Report No. 59, April Through June 2017 Activity Period, Boeing Auburn Facility, WAD 041337130, RCRA Corrective Action Agreed Order No. 01HWTRNR-3345. From Jennifer Wynkoop, LAI, to Robin Harrover, Ecology.
5. July 20, 2017. Project discussion with City of Auburn. Attended by Representatives of Boeing, LAI, and City of Auburn.
6. July 28, 2017. Letter from Neal Hines, Ecology, to Current Resident, City of Algona (Letter for indoor air testing to three homes in City of Algona). Ecology letters to residents in Algona about vapor intrusion sampling.
7. July 31, 2017. Draft Letter: 2017 Feasibility Study (FS) Field Activities Data Submittal and Recommendations, Boeing Auburn Facility, Auburn, Washington. From Sarah Fees and Jennifer Wynkoop, LAI, to Robin Harrover and Neal Hines, Ecology.

8. August 2, 2017. Ecology Listserv. Bioremediation (feeding the "microbes") cleanup pilot study update.
9. August 2, 2017. Letter: Request for Variance, Continuous Multi-channel Tubing (CMT) Monitoring Well, Boeing Auburn Facility, Auburn, Washington. From Jennifer Wynkoop, LAI, to Noel Philip, Ecology.
10. August 2, 2017. Conference Call: FS field work results and Cleanup Technologies discussion. Agenda and Table of Cleanup Technologies provided by Ecology before meeting.
11. August 3, 2017. Site Walk Attended by Jennifer Wynkoop, LAI, Carl Bach and Jim Swortz, Boeing, Robin Harrover and Neal Hines, Ecology.
12. August 4, 2017. Letter from Neal Hines, Ecology, to Current Resident, City of Algona (Neighbor Letter regarding vapor intrusion testing).
13. August 9, 2017. Letter: 2017 Feasibility Study Field Activities Data Submittal and Recommendations, Boeing Auburn Facility, Auburn, Washington. From Sarah Fees and Jennifer Wynkoop, LAI, to Robin Harrover and Neal Hines, Ecology.
14. August 16, 2017. Email: Ecology conditional approval for 2017 Feasibility Study Field Activities, Data Submittal and Recommendation. From Robin Harrover, Ecology, to Carl Bach, Boeing.
15. August 16, 2017. Email: CMT Variance. From Noel Philip, Ecology, to Jennifer Wynkoop, LAI. Attachment: Draft Variance Letter (Approval for CMT variance).
16. August 16, 2017. Letter: Ecology comment regarding the Passive Diffusion Sampling Comparison – December 2016; prepared for the Boeing Company by Landau Associates; April 18, 2017; FS #2018; CS #5019; EPA WAD041337130.
17. August 17, 2017. Ecology Listserv: August 17 – September 26, Learn More About Results of the Boeing Auburn Groundwater Studies, Algona City Hall.
18. August 18, 2017. Email: Ecology request for replacement of Well AGW105(I). From Robin Harrover, Ecology, to Carl Bach, Boeing.
19. August 22, 2017. Mill Creek Site Visit. Attended by Jennifer Wynkoop and Sarah Fees, LAI, Robin Harrover and Neal Hines, Ecology, Carl Bach, Boeing, and Maggie, City of Auburn.
20. August 24, 2017. Technical Memorandum: Laboratory Transition – Evaluation of Laboratory Split Samples, Boeing Auburn Facility, Auburn, Washington. From Jennifer Wynkoop, LAI, to Robin Harrover and Neal Hines, Ecology.
21. August 25, 2017. Email: RE: Auburn Laboratory Transition. From Neal Hines, Ecology, to Jennifer Wynkoop, LAI, and Robin Harrover, Ecology.
22. August 25, 2017. File Transfer: Photos of Site Walks – Boeing property and Mill Creek – Boeing-Auburn Site Wide Corrective Action. From Sarah Fees, LAI, to Robin Harrover and Neal Hines, Ecology.
23. August 25, 2017. Email: EIM Submission Email – Study ID FS2018 – The Boeing Company, Auburn Fabrication Division Plan. From Erica Fot, Ecology, to Beth Roberts, LAI.
24. September 1, 2017. Letter: Ecology's Responses to Comments received on the Draft Remedial Investigation Report, Boeing Auburn Facility, Auburn, Washington by Landau Associates Inc. for the Boeing Company, dated February 9, 2017; FS #2018; CS #5049; EPA WAD041337130. From Neal Hines, Ecology, to Representatives of City of Algona, City of Auburn, Boeing, LAI,

and Futurewise. (Attachments: Responsiveness Summary – Ecology's response to questions and official comments received during the comment period.)

25. September 1, 2017. Ecology Listserv: Ecology response to comments about the Remedial Investigation.
26. September 1, 2017. Email: Cyanide Sampling at Boeing Auburn. From Sarah Fees, LAI, to Neal Hines, Ecology. (Attachment: APEX Washington State accreditation approval for total cyanide method D7511-09.)
27. September 12, 2017. Letter: Ecology approval of the Draft Remedial Investigation Report, Boeing Auburn Facility, Landau Associates Inc. for the Boeing Co; February 9, 2017; FS #2018; CS #5049; EPA ID: WAD041337130. From Robin Harrover, Ecology, to Carl Bach, Boeing.
28. September 14, 2017. Letter: 2017 Feasibility Study Field Activities Data Submittal – Building 17-06, Boeing Auburn Facility, Auburn, Washington. From Sarah Fees and Jennifer Wynkoop, LAI, to Robin Harrover and Neal Hines, Ecology.
29. September 19, 2017. Ecology Listerv: Ecology at City of Algona Council Meeting, September 26.
30. September 21, 2017. Letter: Groundwater Monitoring Results: June 2017, WP Glimcher Wells, Auburn, Washington. From Jennifer Wynkoop, LAI to Christian Faltenberger, WP Glimcher.
31. September 22, 2017. Email: Follow-up request from yesterday's Tech Call. From Robin Harrover, Ecology, to Carl Bach, Boeing.
32. September 22, 2017. LAI Report: Algona Pilot Test Report, Boeing Auburn Facility, Auburn, Washington.
33. September 26, 2017. Letter: Groundwater Monitoring Results: June 2017, Auburn School District Warehouse Property Wells, Auburn, Washington. From Jennifer Wynkoop, LAI, to Cindi Blansfield, Assistant Superintendent of Business and Operations, Auburn School District.
34. September 26, 2017. Letter: Groundwater Monitoring Results: March, May, and June 2017, City of Algona Wells, Algona, Washington. From Jennifer Wynkoop, LAI, to David Hill, Mayor, City of Algona.
35. September 26, 2017. Letter: Groundwater Monitoring Results: May and June 2017, City of Auburn Wells, Auburn, Washington. From Jennifer Wynkoop, LAI, to Chris Thorn, Water Quality Program Coordinator, City of Auburn.
36. September 26, 2017. Letter: Groundwater Monitoring Results: June 2017, Sentry Wells, Auburn, Washington. From Jennifer Wynkoop, LAI, to Jim Morgan, Public Works Manager, City of Pacific.
37. September 26, 2017. Letter: Groundwater Monitoring Results: May 2017, Coastal Farm and Ranch Well, Auburn, Washington. From Jennifer Wynkoop, LAI, to Byron Baule, Operations Manager, Coastal Farm and Ranch.
38. September 26, 2017. Letter: Groundwater Monitoring Results: March and May 2017, 840 Industry Drive North Well, Algona, Washington. From Jennifer Wynkoop, LAI, to Ben Brodsky, Senior Development and Construction Manager, DCT Industries (DCTI).

39. September 26, 2017. Letter: Groundwater Monitoring Results: June 2017, Boeing Wells on Fana Auburn 234 LLC property, Auburn, Washington. From Jennifer Wynkoop, LAI, to John Powers, Fana Group of Companies.
40. September 26, 2017. Letter: Groundwater Monitoring Results: June 2017, Boeing Wells on Fana Auburn LLC Property, Auburn, Washington. From Jennifer Wynkoop, LAI, to John Powers, Fana Group of Companies.
41. September 26, 2017. Letter: Groundwater Monitoring Results: March and June 2017, Primus Wells, Algona, Washington. From Jennifer Wynkoop, LAI, to Peter Wazlawek, Primus International, Inc. (Primus).
42. September 26, 2017. Letter: Groundwater Monitoring Results: May and June 2017, Boeing Wells along the Interurban Trail, Auburn and Algona, Washington. From Jennifer Wynkoop, LAI, to Kurt Krebs, Puget Sound Energy (PSE).
43. September 26, 2017. Letter: Groundwater Monitoring Results: June 2017, Washington State Department of Transportation Well, Auburn, Washington. From Jennifer Wynkoop, LAI, to Amir Ahmadi, Regional Materials Engineer, Washington State Department of Transportation (WSDOT).
44. September 27, 2017. Letter: Groundwater Monitoring Results: June 2017, U.S. General Services Administration Wells, Auburn, Washington. From Jennifer Wynkoop, LAI, to Bradley Keifer, Building Management Specialist, US General Services Administration (GSA).
45. September 28, 2017. Email: Cyanide Sampling. From Jennifer Wynkoop, LAI, to Neal Hines, Ecology.

Work Conducted

General Site-wide Corrective Action Activities

On July 14, 2017, LAI submitted Status Report No. 59 regarding second quarter 2017 activities to Ecology and other stakeholders[1] for their records (Reference #4).

As part of various offsite monitoring well access agreement and right-of-way (ROW) permits, Boeing provides semi-annual groundwater data submittals. First quarter groundwater sampling was conducted in March 2017 and second quarter groundwater sampling was conducted in May and June 2017. The following semi-annual groundwater data submittals were distributed during the third quarter 2017:

- Data for AGW237(D), AGW238(I), and AGW239(S) located on the Auburn School District warehouse property from the second quarter 2017 sampling events to the Auburn School District (Reference #33)

[1] A list of stakeholders that receive copies of the quarterly status reports are listed at the end of this document. Ecology also forwards quarterly status reports via email to representative of the cities of Algona, Auburn, and Pacific, and Washington State Department of Health.

- Data for 35 wells located on City of Algona ROW from the first and second quarter 2017 sampling events to the City of Algona (Reference #34)
- Data for 32 wells located on City of Auburn ROW and City of Auburn property from the second quarter 2017 sampling events to the City of Auburn (Reference #35)
- Sentry well data from the second quarter 2017 sampling event to the City of Pacific (Reference #36)
- AGW236(S) data from the second quarter 2017 sampling event to Coastal Farm and Ranch (Reference #37)
- AGW276(M) data from the first and second quarter 2017 sampling events to DCTI (Reference #38)
- AGW179(I) and AGW180(D) data from the second quarter 2017 sampling event to Fana Auburn 234 LLC (Reference #39)
- AGW177(I) and AGW178(D) data from the second quarter 2017 sampling event to Fana Auburn LLC (Reference #40)
- Data for AGW256(I), AGW257(S), and AGW258(S) from the second quarter 2017 sampling event to GSA (Reference #44)
- Data for 12 wells from the first and second quarter 2017 sampling events to Primus (Reference #41)
- Data for 16 wells located on the Interurban Trail from the second quarter 2017 sampling event to PSE (Reference #42)
- Data for 17 wells located on The Outlet Collection property from the second quarter 2017 sampling event to WP Glimcher (Reference #30)
- Data for APP-057 from the second quarter 2017 sampling event to WSDOT (Reference #43).

Ecology project managers, Robin Harrover and Neal Hines, continued to attend regularly scheduled monthly conference calls with Boeing, LAI, and the City of Algona's environmental consultant, ICF International (ICF). The primary purpose of these calls is to discuss technical aspects of the project scope and schedule, data results, and public outreach. Boeing and Ecology communication personnel also attend these calls.

During the third quarter 2017, Ecology completed two site visits with Boeing. On August 3, 2017, Ecology visited the Boeing property for a tour of Building 17-07 and Building 17-06 (Reference #11). This visit was to better understand the FS investigation areas in Buildings 17-06 and 17-07 and at AOC A-01. On August 22, 2017, Ecology, Boeing, and the City of Auburn toured Mill Creek (Reference #19). This visit was completed to select locations for the permanent pore water monitoring stations proposed in the FS work plan. Boeing sent the photos taken during the site walks to Ecology on August 25, 2017 (Reference #22). In addition to these site visits, Ecology also observed the groundwater sampling activities on Boeing property for cyanide analysis conducted on September 7, 2017. The cyanide analysis sampling is discussed further in the Feasibility Study Investigation section.

Groundwater and Surface Water Sampling

Boeing converted the remaining set of monitoring wells planned for passive diffusion bag (PDB) sampling from low-flow to PDB sampling in December 2016. Boeing provided a letter summarizing the comparison of results from PDB sampling to low-flow sampling for the wells converted in December 2016. This letter also summarized follow-up comparison results from a number of wells converted to PDB sampling in June 2016 and recommendations for wells that were not suitable for PDB sampling. These recommendations were implemented during the Phase VII (i.e., seven) June annual groundwater sampling event. Ecology provided comments on the December 2016 PDB letter on August 16, 2017 (Reference #16). One well (AGW126) will be reevaluated for PDB use after the December 2017 semi-annual groundwater sampling event. Results of this analysis will be presented in the fourth quarter 2017 status report.

The June annual groundwater sampling activities also included collection of split samples for analysis in preparation for the transition from Eurofins Lancaster Laboratories (LLI) to TestAmerica Laboratories, Inc. (TA) as Boeing's primary laboratory for the Boeing Auburn project. A summary of the work was provided to Ecology on August 24, 2017 (Reference #20). Ecology provided approval of the laboratory transition on August 25, 2017, noting that the laboratory results from TA were not statistically different from those from LLI (Reference #21).

Phase VII (i.e., seven) quarterly groundwater sampling took place from September 5 through September 7, 2017. The quarterly groundwater sampling data are provided in Attachment 1. The current monitoring well network is shown on Figure 1-1. A sampling matrix for the September 2017 quarterly sampling event is presented in Table 1-1. A complete summary of analytical results is presented in Table 1-2. Detected compounds are summarized in Table 1-3.

Surface water sampling activities include annual (dry season) sampling at eight locations. One of the locations was a new sampling location proposed in the FS work plan. The exact location of this new sample was determined during a site walk with Ecology, Boeing, and the City of Auburn on August 22, 2017 (Reference #19). Dry season surface water sampling event occurred on September 15, 2017. In addition to regular dry season sampling locations, a total organic carbon (TOC) sample was collected at SW-CD13. This sample was collected in response to an Ecology comment on the Algona Enhanced Natural Attenuation Pilot test; the results are discussed below. The dry season surface water sampling data are provided in Attachment 1. The regular dry season surface water sampling locations are shown on Figure 1-1. In addition, one-time TOC surface water sampling location SW-CD13 is shown on Figure 2-1. A complete summary of surface water analytical results is presented in Table 1-4.

Algona Enhanced Natural Attenuation Pilot Test

The enhanced natural attenuation pilot test injection began on August 18, 2015 and was completed on September 4, 2015. Approximately 80,000 gallons of electron donor solution was injected into the shallow water-bearing zone. Boeing is performing quarterly post-injection sampling to monitor the

effectiveness of the pilot test injection. Boeing submitted a draft Algona Pilot Test report summarizing the first year of pilot test results to Ecology in March 2017. Ecology provided comments on the report in June 2017. This report was finalized and submitted to Ecology on September 22, 2017 (Reference #32).

The September 2017 quarterly sampling event was the eighth quarterly sampling event following injection activities. A summary of results from the pilot test monitoring wells is provided in Attachment 2. The pilot test injection and monitoring well locations are presented on Figure 2-1. Pilot test data are summarized in Table 2-1.

Indications of post-injection enhanced bioremediation have been observed at nine wells consisting of three regularly monitored injection wells (IW34, IW36, and IW37) and six downgradient monitoring wells (AGW240-5, AGW244, AGW269, AGW270, AGW271, and AGW275). The primary indications of enhanced bioremediation consist of post-injection increases in total organic carbon (TOC) above baseline (<10 milligrams per liter [mg/L]), evidence of more reduced aquifer redox conditions, and changes in concentrations of trichloroethene (TCE), breakdown products, and/or end product. TOC concentrations continued to decrease from post-injection maximums but remained above baseline at the injection wells and at three downgradient, monitoring wells (AGW244, AGW270 and AGW271). TOC at the injection wells ranged from 9.2 mg/L to 59 mg/L. TOC at the three downgradient wells ranged from 9.3 mg/L to 18 mg/L. TOC concentrations at the other downgradient monitoring wells (AGW240-5, AGW269, and AGW275) have returned to baseline concentrations following earlier post-injection increases; however, highly reducing aquifer conditions and ethene/ethane production have continued to be observed at all three locations.

Secondary effects of enhanced bioremediation have been observed at other wells post-injection. These secondary effects consist of increased methane concentrations and shifts in the concentrations of TCE, breakdown products, and/or end products without increases in TOC concentrations. These secondary indicators were observed at three downgradient monitoring wells AGW240-1, AGW273, and AGW274.

Changes in vinyl chloride concentrations and detections of end products ethene and/or ethane have been observed at all 12 wells discussed above, with primary indications and secondary effects of enhanced bioremediation listed above, except volatile organic compounds have not been detected at AGW244. Ethene and ethane, which indicate complete reductive dechlorination, were only detected at 3 of these 12 wells (AGW240-1, AGW240-5, and AGW274) during baseline sampling, and have now been detected at 11 out of the 12 wells (the exception being AGW244, which does not have detections of VOCs).

In addition to the regular pilot test groundwater monitoring, a surface water sample was collected for TOC analysis from the Chicago Avenue ditch (SW-CD13) during the September dry season surface

water sampling. The TOC concentration from the September sampling was 7.5 mg/L[2]. When this location was sampled before the pilot test injection during the Algona natural attenuation assessment (December 2014), the TOC concentration was 9.1 mg/L. There is no evidence that increased TOC concentrations in groundwater are currently affecting TOC concentrations in the Chicago Avenue ditch.

Remedial Investigation Report

The draft remedial investigation (RI) report for public comment was submitted to Ecology on February 21, 2017. The RI public comment period began on March 8, 2017 and was completed on May 8, 2017. Ecology compiled responses to public comments in a responsiveness summary and provided the summary to Boeing and other stakeholders on September 1, 2017 (Reference #24). Ecology approved the Draft RI report on September 12, 2017 (Reference #27). Boeing is finalizing the report and will send out the final document in October 2017.

Feasibility Study Investigation

The FS work plan was submitted to Ecology on May 22. Ecology agreed to provide approval of portions of the work plan as needed to complete field activities in a timely manner. Boeing expects to receive full approval and finalize the work plan in the fourth quarter 2017.

FS field work investigation activities began in June 2017. Initial investigation activities in June consisted of sub-slab soil gas sampling in Building 17-07, soil gas sampling at former Building 17-03, and soil and groundwater sampling at AOC A-01. A draft data submittal summarizing initial results and providing recommendations for additional work was provided to Ecology on July 31, 2017 (Reference #7). The draft data submittal was discussed with Ecology during a conference call discussing results and FS cleanup technologies on August 2, 2017 (Reference #10). The data submittal was finalized and provided to Ecology on August 9, 2017 (Reference #13). Ecology provided approval of the additional FS field work at AOC A-01, former Building 17-03 and Building 17-07 on August 16, 2017 (Reference #14).

Third quarter, follow up field activities for former Building 17-03 source investigation included soil and groundwater sampling from borings drilled with a direct-push/auger combination rig. Drilling activities took place between August 28 to September 1 and September 8 and 11, 2017. Third quarter 2017, follow up field activities for the AOC A-01 petroleum hydrocarbon investigation included additional soil and groundwater sampling from borings drilled using a direct-push rig. Drilling activities took place on August 31, 2017. In addition, one groundwater monitoring well (AGW015) at AOC A-01 was sampled for petroleum hydrocarbons. This sampling was completed on September 7, 2017. Third quarter follow up field activities in Building 17-07 included installation of a CMT well. The monitoring well drilling and installation of the CMT well (AGW278) in Building 17-07 occurred from August 18 to

[2] TOC was detected at a concentration of 8.5 mg/L in the field duplicate sample.

20, 2017. In preparation for CMT drilling activities, Boeing submitted a variance request to Ecology on August 2, 2017 (Reference #9). Ecology provided a draft approval of the variance on August 16, 2017 (Reference #15). Results from these additional investigations will be submitted to Ecology in the fourth quarter 2017.

Third quarter FS fieldwork investigation activities also included soil and groundwater sampling for AOC A-13 in Building 17-06. Soil and groundwater samples were collected from borings completed using sonic drilling. Concrete coring took place on August 10 and 11 and drilling took place on August 12 and 13, 2017. One shallow monitoring well (AGW277) was installed. Data for this work was submitted to Ecology along with recommendations for additional work on September 14, 2017 (Reference #28). Ecology provided initial comments on the data submittal on September 22, 2017 (Reference #31). Boeing expects to receive Ecology approval and complete the additional work in the fourth quarter of 2017.

Well development of the newly installed wells (AGW277 and AGW278) was completed between August 30 and September 1, 2017. Surveying of the newly installed wells was completed on August 31, 2017. Monitoring well logs for AGW277 and AGW278 are included in Attachment 3. These wells were added to the groundwater monitoring well network (Figure 1-1) and were sampled during the quarterly groundwater sampling event in September 2017. The results of the initial sampling of these wells are provided in Attachment 1. Chloroform was detected in several channels of AGW278. Detections of chloroform are an indicator that drilling water is still present in the vicinity of the well. In accordance with the project sampling and analysis plan, wells that have initial groundwater samples with chloroform will be resampled after one month. Well AGW278 will be resampled in October 2017.

Additional FS work included follow-up cyanide sampling at AOC A-09. Based on the cyanide results from the June 2017 groundwater sampling event, Boeing and Ecology discussed additional evaluation of cyanide sampling and analysis methodology. Boeing and Ecology agreed to complete a preservative study by analyzing both preserved and unpreserved samples from two wells. Additionally, preserved samples included aliquots preserved to both pH 10 and to pH 12. Boeing and Ecology agreed that this preservative study would be completed by APEX laboratories, following their receipt of Washington State Accreditation for the analytical test method. Confirmation of accreditation was provided to Ecology on September 1, 2017 (Reference #26). The Groundwater sampling for the cyanide preservative study was conducted on September 7, 2017. Ecology attended the sampling event to observe the sampling and preservative methodologies. Results of the preservative study were discussed with Ecology on September 27, 2017 and Boeing recommended collection of additional groundwater samples for additional interference testing (Reference #45). The additional groundwater sampling is planned to occur in October 2017.

Data Management

In the third quarter 2016, Boeing submitted historical Boeing Auburn project data to Ecology's Environmental Information Management (EIM) database. Following the initial data submittal in 2016, Boeing and Ecology agreed on yearly submittals of data to the EIM database. On August 16, 2017, Boeing submitted required EIM data for the past year of data (August 2016 through the annual groundwater sampling event in June 2017). The data was successfully loaded to the EIM database and approval of the data submission was provided by Ecology's EIM coordinator on August 25, 2017 (Reference #23).

Communications

Ecology and Boeing are working together to ensure that all stakeholders are aware of the progress of investigation and cleanup activities at the Boeing Auburn site. The City of Algona continues to be notified of all fieldwork occurring in Algona. The City of Algona's consultant, ICF, continues to participate in project conference calls with Boeing and Ecology and continues to review Algona-related deliverables (e.g., work plans and reports). Ecology also provided an update to the Algona City Council on September 26, 2017.

Due to increased vinyl chloride concentrations detected in one well (AGW247-1) in Algona, Ecology offered additional indoor air testing to three residences adjacent to this well. Ecology sent letters to the residents of these three homes on July 8, 2017 (Reference #6). In addition, Ecology also sent letters to other Algona residents notifying them of the vinyl chloride concentration changes on August 4, 2017 (Reference #12).

The City of Auburn has had a transition of project contacts. Boeing provided an update email to the new City of Auburn contact on July 5, 2017 (Reference #2) and had a conference call to discuss the project status and upcoming work on July 20, 2017 (Reference #5). Boeing is continuing to work with the City of Auburn on an access agreement to install permanent pore water samplers in Mill Creek. Ecology also provided an update to the Auburn City Council on September 11, 2017.

Ecology posted several update notifications to their website regarding the following: Ecology's response to public comments for the RI report (Reference #3 and #25); updates on the Algona pilot test (Reference #8); informational displays at Algona's city hall (Reference #17); and a notification of Ecology speaking at the City of Algona council meeting (Reference #29).

Building 17-06 Ongoing Monitoring

Boeing is continuing to monitor petroleum hydrocarbons in well AGW128 in Building 17-06. The presence of petroleum hydrocarbons will also be monitored in the newly install well, AGW277. During the third quarter, free-phase product has continued to be detected in well AGW128 during regular well measurements. Free-phase product was not detected in well AGW277. Sorbent socks have been placed in well AGW128 to extract product and are replaced approximately monthly. If free-phase

product is detected in well AGW277, a sorbent sock will be installed at this location. Boeing will continue to replace the sorbent sock in well AGW128 and check for product in both wells regularly.

Occurrence of Problems

One of the wells along Perimeter Road (AGW105) was discovered damaged during annual groundwater sampling in June 2017 and as a result no samples were collected from the well. The PVC casing inside the monument was damaged and during a camera scope, the well was determined to have collapsed just below the surface. Boeing provided a summary of damage and a recommendation for the well to be decommissioned to Ecology in June 2017. Boeing provided Ecology with photos and video of the camera scope on July 3, 2017 (Reference #1). This well was decommissioned by over drilling on August 14, 2017. A well decommissioning record and decommissioning log is provided in Attachment 3. Ecology has requested that Boeing replace well AGW105 (Reference #18). Boeing anticipates replacing the well during the next planned FS drilling activities in December 2017.

In addition, the PVC riser at AGW074 was discovered damaged during annual groundwater sampling in June 2017. The well was repaired on August 14, 2017. AGW074 was resurveyed on August 31, 2017.

Projected Work for Next Reporting Period October through December 2017

Activities projected for the next reporting period pertain to the FS fieldwork, Algona pilot test, reporting, and ongoing monitoring of groundwater. Tasks during fourth quarter 2017 are expected to include:

- Prepare final copy of the Ecology approved RI report
- Finalize the FS work plan
- Providing Ecology with a data submittal of additional FS investigation results at AOC A-01 and former Building 17-03
- Completing FS investigation activities:
  - Soil and groundwater sampling at AOC A-13 (Building 17-06)
  - Additional cyanide sampling and analysis at AOC A-09
  - Pore water sampler installation and sampling at Mill Creek
- Submitting a site-wide natural attenuation assessment report
- Conducting the semi-annual groundwater sampling event in December 2017.

Other Significant Findings, Changes, and Contacts

None noted.

If you have any questions regarding this status report, or need any other information, please do not hesitate to contact Boeing or LAI.

LANDAU ASSOCIATES, INC.

Jennifer Wynkoop
Senior Associate Scientist

SEF/JWW/jrc
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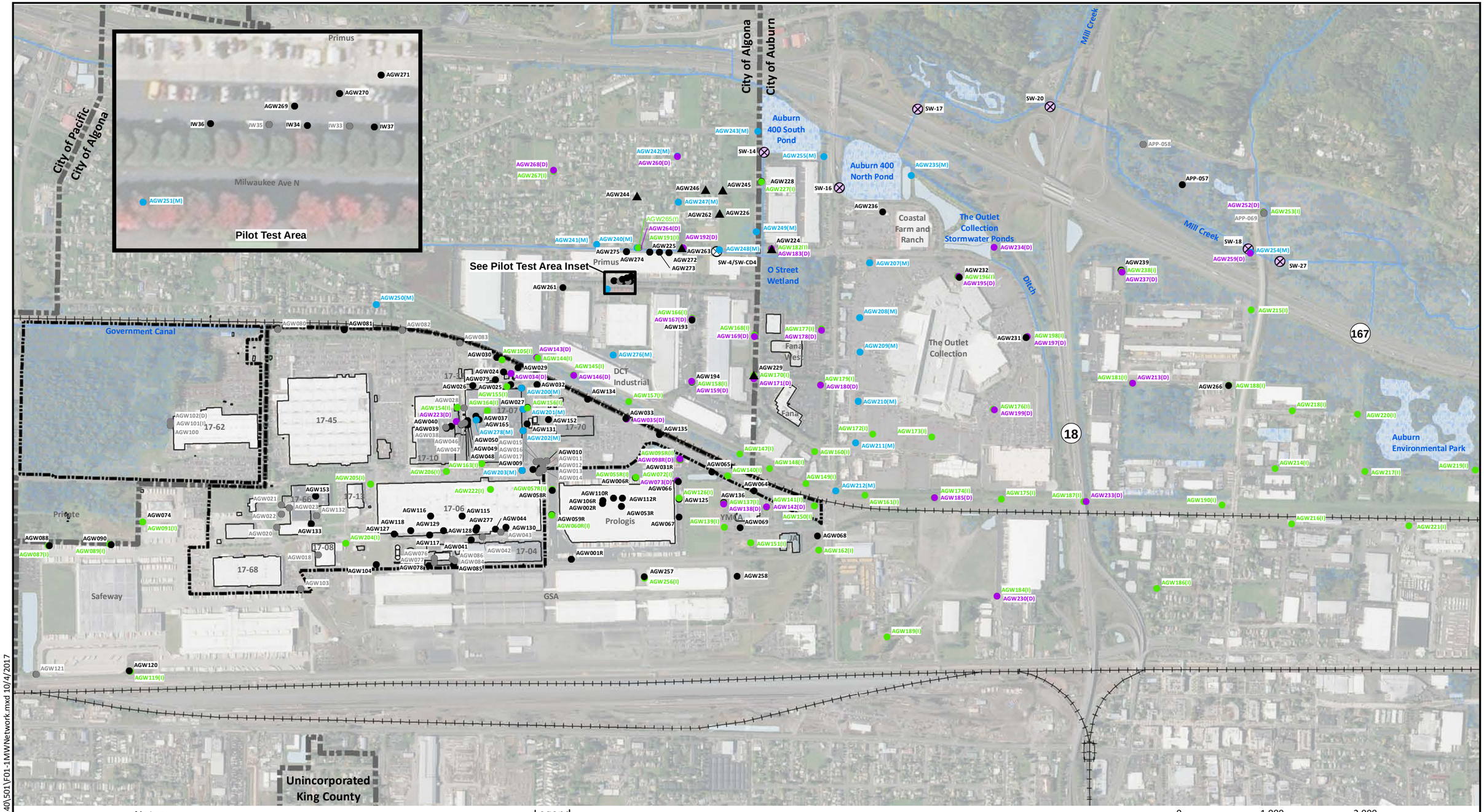
cc: Carl Bach, Boeing (email only)
Thomas MacMannis, Boeing (email only)
Kamara Sams, Boeing (email only)
James Swortz, Boeing
Kathryn Moxley, Boeing (email only)
Patrick McCabe, Boeing Realty (email only)
Christine Garrison, DCT Industrial (email only)
Steve Campbell, Prologis (email only)
Kim Lemon, Prologis (email only)
Neal Hines, Ecology (email only)
Jason Berry, YMCA Auburn (email only)

Attachments: Attachment 1: Groundwater Sampling Results
Attachment 2: Pilot Test Results
Attachment 3: Monitoring Well Logs

Attachment 1

Groundwater Sampling Results



Notes

1. Groundwater wells are identified by the AGW prefix. The designations behind the identifications indicate the zone. If there is no designation, the well is screened in the shallow zone. (I) = intermediate zone, (D) = deep zone, (M) = multi-level well; screens in multiple groundwater zones.
2. Well designations beginning with APP are installed and owned by WSDOT.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Legend

- Offsite Water Table Well
- Shallow Monitoring Well (2 to 30 ft BGS)
- (I) Intermediate Monitoring Well (40 to 60 ft BGS)
- (D) Deep Monitoring Well (80 to 100 ft BGS)
- (M) Multi-Level Well
- Wells Not Currently Sampled
- Annual Surface Water Sample Location
- Semiannual Surface Water Sampling Location
- Wetland Areas
- Water Bodies
- Waterways

N

0 1,000 2,000

Scale in Feet

Base Map Source: Geometrix 2003; Parcel Data Source: King County 2015; Aerial Photo Source: Esri World Imagery.

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LANDAU ASSOCIATES

Boeing Auburn Auburn, Washington	**Current Monitoring Well Network**	Figure 1-1

Table 1-1
3Q2017 Groundwater Sample Matrix
Boeing Auburn Facility
Auburn, Washington

Sample Location	Field Sample ID	Sample Date	Sample Type	Laboratory SDG	Laboratory Sample ID	Sulfate by EPA 300.0	TPH-D by NWTPH-Dx	MEE by RSK-175	TOC by SM 5310C	Low Level VOCs by SW-846 8260C
AGW191	AGW191-20170905	9/5/2017	PDN	580-71049-1	580-71049-9					X
AGW192	AGW192-20170905	9/5/2017	PDN	580-71049-1	580-71049-10					X
AGW225	AGW225-20170907	9/7/2017	N	580-71104-1	580-71104-3	X		X	X	X
AGW226	AGW226-20170905	9/5/2017	N	580-71049-1	580-71049-7	X		X	X	X
AGW240-1	AGW240-1-7-20170905	9/5/2017	N	580-71051-1	580-71051-2	X		X	X	X
AGW240-5	AGW240-5-28-20170905	9/5/2017	N	580-71051-1	580-71051-3	X		X	X	X
AGW244	AGW244-20170905	9/5/2017	N	580-71051-1	580-71051-4	X		X	X	X
AGW247-1	AGW247-1-6-20170906	9/6/2017	N	580-71057-1	580-71057-2	X		X	X	X
AGW247-5	AGW247-5-27-20170906	9/6/2017	N	580-71057-1	580-71057-3	X		X	X	X
AGW251-1	AGW251-1-8-20170906	9/6/2017	N	580-71057-1	580-71057-4	X		X	X	X
AGW251-2	AGW251-2-25-20170906	9/6/2017	N	580-71057-1	580-71057-5	X		X	X	X
AGW251-3	AGW251-3-40-20170906	9/6/2017	N	580-71057-1	580-71057-6	X		X	X	X
AGW262	AGW262-20170905	9/5/2017	PDN	580-71049-1	580-71049-8					X
AGW263	AGW263-20170907	9/7/2017	PDN	580-71104-1	580-71104-4					X
AGW269	AGW269-20170905	9/5/2017	N	580-71049-1	580-71049-5	X		X	X	X
AGW270	AGW270-20170907	9/7/2017	N	580-71104-1	580-71104-2	X		X	X	X
AGW271	AGW271-20170905	9/5/2017	N	580-71049-1	580-71049-4	X		X	X	X
AGW272	AGW272-20170905	9/5/2017	N	580-71049-1	580-71049-2	X		X	X	X
AGW273	AGW273-20170905	9/5/2017	N	580-71051-1	580-71051-5	X		X	X	X
AGW273	AGW900-20170905	9/5/2017	FD	580-71051-1	580-71051-6	X		X	X	X
AGW274	AGW274-20170905	9/5/2017	N	580-71049-1	580-71049-3	X		X	X	X
AGW275	AGW275-20170905	9/5/2017	N	580-71051-1	580-71051-7	X		X	X	X
AGW277	AGW277-20170906	9/6/2017	N	580-71056-1	580-71056-9		X			X
AGW277	AGW901-20170906	9/6/2017	FD	580-71056-1	580-71056-10		X			X
AGW278-1	AGW278-1-17-20170906	9/6/2017	N	580-71056-1	580-71056-3					X
AGW278-2	AGW278-2-25-20170906	9/6/2017	N	580-71056-1	580-71056-4					X

Table 1-1
3Q2017 Groundwater Sample Matrix
Boeing Auburn Facility
Auburn, Washington

Sample Location	Field Sample ID	Sample Date	Sample Type	Laboratory SDG	Laboratory Sample ID	Sulfate by EPA 300.0	TPH-D by NWTPH-Dx	MEE by RSK-175	TOC by SM 5310C	Low Level VOCs by SW-846 8260C
AGW278-3	AGW278-3-36-20170906	9/6/2017	N	580-71056-1	580-71056-5					X
AGW278-4	AGW278-4-45-20170906	9/6/2017	N	580-71056-1	580-71056-6					X
AGW278-5	AGW278-5-60-20170906	9/6/2017	N	580-71056-1	580-71056-7					X
AGW278-6	AGW278-6-80-20170906	9/6/2017	N	580-71056-1	580-71056-8					X
AGW278-7	AGW278-7-107-20170906	9/6/2017	N	580-71056-1	580-71056-2					X
IW34	IW34-20170905	9/5/2017	N	580-71049-1	580-71049-6	X		X	X	X
IW36	IW36-20170905	9/5/2017	N	580-71051-1	580-71051-8	X		X	X	X
IW37	IW37-20170905	9/5/2017	N	580-71051-1	580-71051-9	X		X	X	X

Abbreviations/Acronyms:

EPA = US Environmental Protection Agency
FD = field duplicate
ID = identification
MEE = methane, ethane, ethene
N = primary sample
PDN = passive diffusion primary sample
SDG = sample delivery group
SM = standard method
TOC = total organic compound
TPH-D = diesel-range total petroleum hydrocarbon
NWTPH-Dx = Northwest diesel-range total petroleum hydrocarbon extended
VOC = volatile organic compound

Table 1-2
3Q2017 Groundwater Analytical Results
Boeing Auburn Facility
Auburn, Washington

Sample Location:	AGW191	AGW192	AGW225	AGW226	AGW240-1	AGW240-5	AGW244	AGW247-1	AGW247-5	AGW251-1	AGW251-2	AGW251-3	AGW262	AGW263	AGW269
Zone:	Intermediate	Deep	Shallow	Shallow	Shallow-WT	Shallow	Shallow-WT	Shallow-WT	Shallow	Shallow-WT	Shallow	Intermediate	Shallow-WT	Shallow-WT	Shallow
Laboratory SDG:	580-71049-1	580-71049-1	580-71104-1	580-71049-1	580-71051-1	580-71051-1	580-71051-1	580-71057-1	580-71057-1	580-71057-1	580-71057-1	580-71057-1	580-71049-1	580-71104-1	580-71049-1
Sample Date:	9/5/2017	9/5/2017	9/7/2017	9/5/2017	9/5/2017	9/5/2017	9/5/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/5/2017	9/7/2017	9/5/2017
Sample Type:	PDN	PDN	N	N	N	N	N	N	N	N	N	N	PDN	PDN	N
Volatile Organic Compounds (µg/L; SW-846 8260C)															
Acetone	13 U	6.3 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	7.9 U	**23**	5.0 U
Benzene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Bromodichloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	0.50 UJ	0.50 UJ	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 U	0.50 UJ
Bromomethane	0.50 UJ	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 UJ
2-Butanone/MEK	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 UJ
Carbon Disulfide	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Tetrachloride	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	0.50 UJ	0.50 UJ	0.50 UJ	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 U	0.50 UJ
Chloroform	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Chloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dibromochloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.20**	**0.20**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
1,1-Dichloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	0.20 U	0.20 U	**4.3**	**3.6**	0.20 U	0.20 U	0.20 U	0.20 U	**1.1**	0.20 U	0.20 U	**1.0**	0.20 U	**5.1**	0.20 U
trans-1,2-Dichloroethene	0.20 U	0.20 U	**0.49**	**0.31**	0.20 U	0.20 U	0.20 U	**0.52**	**0.43**	0.20 U	0.20 U	0.20 U	0.20 U	**0.43**	0.20 U
1,2-Dichloropropane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,3-Dichloropropene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 UJ
4-Methyl-2-pentanone	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 UJ
Methylene Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Styrene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Toluene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.20**	0.20 U	0.20 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethene	0.20 U	0.20 U	**2.1**	**3.6**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**1.6**	0.20 U
Trichlorofluoromethane (CFC 11)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl Acetate	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	0.020 UJ	0.020 UJ	**0.33**	**0.36 J**	**0.068**	**0.062**	0.020 UJ	**6.5 J**	**2.7**	0.020 UJ	**1.6**	**6.6**	**0.26 J**	**0.54**	**1.0 J**
m-&p-Xylenes	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
General Chemistry (mg/L; EPA 300.0, SM 5310C)															
Sulfate	--	--	**5.0**	**7.4**	1.2 U	1.2 U	**5.4**	1.2 U	1.2 U	**28**	1.2 U	1.2 U	--	--	1.2 U
Total Organic Carbon	--	--	**4.2**	**2.6**	**7.9**	**5.9**	**9.3**	**9.8**	**5.9**	**11**	**9.0**	**7.6**	--	--	**8.5**
Dissolved Gasses (µg/L; RSK-175)															
Ethane	--	--	0.57 U	0.57 U	**5.6**	**4.5 J**	0.57 U	0.57 U	**1.7 J**	0.57 U	**1.7**	0.57 U	--	--	**2.3 J**
Ethene	--	--	0.40 U	0.40 U	0.40 U	0.80 UJ	0.40 U	0.40 U	0.40 UJ	0.40 U	**2.4**	**0.80 J**	--	--	0.80 UJ
Methane	--	--	**430**	**1,400**	**11,000**	**20,000 J**	**360**	**6,200**	**2,200 J**	**120**	**3,500**	**2,900**	--	--	**28,000 J**
Petroleum Hydrocarbons(mg/L; NWTPH-Dx)															
Diesel Range Organics (C12-C24)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oil Range Organics (C24-C40)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1-2
3Q2017 Groundwater Analytical Results
Boeing Auburn Facility
Auburn, Washington

Sample Location:	AGW270	AGW271	AGW272	AGW273	AGW273	AGW274	AGW275	AGW277	AGW277	AGW278-1	AGW278-2	AGW278-3	AGW278-4	AGW278-5	AGW278-6
Zone:	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow-WT	Shallow-WT	Shallow-WT	Shallow	Intermediate	Intermediate	Intermediate	Deep
Laboratory SDG:	580-71104-1	580-71049-1	580-71049-1	580-71051-1	580-71051-1	580-71049-1	580-71051-1	580-71056-1	580-71056-1	580-71056-1	580-71056-1	580-71056-1	580-71056-1	580-71056-1	580-71056-1
Sample Date:	9/7/2017	9/5/2017	9/5/2017	9/5/2017	9/5/2017	9/5/2017	9/5/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017
Sample Type:	N	N	N	N	FD	N	N	N	FD	N	N	N	N	N	N
Volatile Organic Compounds (µg/L; SW-846 8260C															
Acetone	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	R	R	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Bromodichloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bromomethane	0.50 U	0.50 UJ	0.50 UJ	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Butanone/MEK	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Carbon Disulfide	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Tetrachloride	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	0.50 U	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloroform	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.39**	0.20 U	**0.32**
Chloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Dibromochloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	**0.64 J**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
1,1-Dichloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	**0.34**	0.20 U	**3.5**	**1.6**	**1.6**	0.20 U	0.20 U	0.20 U	0.20 U	**1.4**	**0.98**	**7.8**	**0.89**	0.20 U	0.20 U
trans-1,2-Dichloroethene	**0.22**	0.20 U	**0.65**	**0.33**	**0.35**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.47**	0.20 U	0.20 U	0.20 U
1,2-Dichloropropane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,3-Dichloropropene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
4-Methyl-2-pentanone	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Methylene Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	**0.53 J**	0.50 U	0.50 U	0.50 U	0.50 U
Styrene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Toluene	**0.54**	**0.55**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.30**	**0.26**	0.20 U	0.20 U	0.20 U	0.20 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.55**	**0.72**	0.20 U	0.20 U	0.20 U	0.20 U
Trichlorofluoromethane (CFC 11)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl Acetate	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	**6.3**	**0.63 J**	**1.6 J**	**4.0**	**4.0**	**0.43 J**	**0.047**	0.020 UJ	0.020 UJ	**0.35 J**	0.020 UJ	**1.9 J**	**2.7 J**	0.020 UJ	0.020 UJ
m-&p-Xylenes	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
General Chemistry (mg/L; EPA 300.0, SM 5310C)															
Sulfate	1.2 U	1.2 U	**1.3**	1.2 U	1.2 U	1.2 U	1.2 U	--	--	--	--	--	--	--	--
Total Organic Carbon	**18**	**13**	**4.6**	**6.0**	**6.0**	**6.9**	**7.8**	--	--	--	--	--	--	--	--
Dissolved Gasses (µg/L; RSK-175)															
Ethane	1.7 U	1.7 UJ	0.57 U	0.57 UJ	**0.58 J**	**4.4**	**4.1 J**	--	--	--	--	--	--	--	--
Ethene	1.2 U	1.2 UJ	**0.60 J**	**0.95 J**	**0.97 J**	**0.79 J**	0.40 UJ	--	--	--	--	--	--	--	--
Methane	**30,000**	**33,000 J**	**680**	**1,300 J**	**1,500**	**5,300**	**9,500 J**	--	--	--	--	--	--	--	--
Petroleum Hydrocarbons(mg/L; NWTPH-Dx)															
Diesel Range Organics (C12-C24)	--	--	--	--	--	--	--	**0.45 J**	**1.2 J**	--	--	--	--	--	--
Oil Range Organics (C24-C40)	--	--	--	--	--	--	--	**0.98 J**	**1.8 J**	--	--	--	--	--	--

Table 1-2
3Q2017 Groundwater Analytical Results
Boeing Auburn Facility
Auburn, Washington

Sample Location:	AGW278-7	IW34	IW36	IW37
Zone:	Deep	Shallow	Shallow	Shallow
Laboratory SDG:	580-71056-1	580-71049-1	580-71051-1	580-71051-1
Sample Date:	9/6/2017	9/5/2017	9/5/2017	9/5/2017
Sample Type:	N	N	N	N
Volatile Organic Compounds (µg/L; SW-846 8260C				
Acetone	5.0 U	5.0 U	5.0 U	5.0 U
Benzene	0.20 U	0.20 U	0.20 U	0.20 U
Bromodichloromethane	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Bromomethane	0.50 U	0.50 UJ	0.50 U	0.50 U
2-Butanone/MEK	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Carbon Disulfide	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Tetrachloride	0.20 U	0.20 U	0.20 U	0.20 U
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chloroform	**0.51**	0.20 U	0.20 U	0.20 U
Chloromethane	0.50 U	0.50 U	0.50 U	0.50 U
Dibromochloromethane	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethane	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	0.20 U	0.20 U	0.20 U	0.20 U
1,1-Dichloroethene	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	0.20 U	**1.0**	**0.36**	**0.80**
trans-1,2-Dichloroethene	0.20 U	0.20 U	**0.23**	0.20 U
1,2-Dichloropropane	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,3-Dichloropropene	0.20 U	0.20 U	0.20 U	0.20 U
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U
2-Hexanone	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
4-Methyl-2-pentanone	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Methylene Chloride	0.50 U	0.50 U	0.50 U	0.50 U
Styrene	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	0.20 U	0.20 U	0.20 U	0.20 U
Tetrachloroethene	0.20 U	0.20 U	0.20 U	0.20 U
Toluene	0.20 U	**85 J**	0.20 U	**1.3**
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethene	0.20 U	0.20 U	0.20 U	0.20 U
Trichlorofluoromethane (CFC 11)	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl Acetate	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl Chloride	0.020 UJ	**2.0 J**	**5.0**	**1.3**
m-&p-Xylenes	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	0.50 U	0.50 U	0.50 U	0.50 U
General Chemistry (mg/L; EPA 300.0, SM 5310C)				
Sulfate	--	1.2 U	1.2 U	1.2 U
Total Organic Carbon	--	**37**	**9.2**	**59**
Dissolved Gasses (µg/L; RSK-175)				
Ethane	--	1.7 U	**1.7**	1.7 U
Ethene	--	1.2 U	0.40 U	1.2 U
Methane	--	**27,000**	**2,600**	**31,000**
Petroleum Hydrocarbons(mg/L; NWTPH-Dx)				
Diesel Range Organics (C12-C24)	--	--	--	--
Oil Range Organics (C24-C40)	--	--	--	--

Notes:

Bold text indicates detected analyte.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.

U = The compound was not detected at the reported concentration.

UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

Abbreviations/Acronyms:

EPA = US Environmental Protection Agency
FD = field duplicate
µg/L = micrograms per liter
mg/L = milligrams per liter
N = primary sample
NWTPH-Dx = Northwest diesel-rangetotal petroleum hydrocarbon extended
PDN = passive diffusion primary sample
SDG = sample delivery group
WT = water table

Table 1-3
3Q2017 Groundwater Detects
Boeing Auburn Facility
Auburn, Washington

Sample Location:	AGW191	AGW192	AGW225	AGW226	AGW240-1	AGW240-5	AGW244	AGW247-1	AGW247-5	AGW251-1	AGW251-2	AGW251-3	AGW262	AGW263
Zone:	Intermediate	Deep	Shallow	Shallow	Shallow-WT	Shallow	Shallow-WT	Shallow-WT	Shallow	Shallow-WT	Shallow	Intermediate	Shallow-WT	Shallow-WT
Laboratory SDG:	580-71049-1	580-71049-1	580-71104-1	580-71049-1	580-71051-1	580-71051-1	580-71051-1	580-71057-1	580-71057-1	580-71057-1	580-71057-1	580-71057-1	580-71049-1	580-71104-1
Sample Date:	9/5/2017	9/5/2017	9/7/2017	9/5/2017	9/5/2017	9/5/2017	9/5/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/5/2017	9/7/2017
Sample Type:	PDN	PDN	N	N	N	N	N	N	N	N	N	N	PDN	PDN
Volatile Organic Compounds (µg/L; SW-846 8260C)														
Acetone	13 U	6.3 U	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	7.9 U	**23**
Chloroform	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
1,1-Dichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.20**	**0.20**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	0.20 U	0.20 U	**4.3**	**3.6**	0.20 U	0.20 U	0.20 U	0.20 U	**1.1**	0.20 U	0.20 U	**1.0**	0.20 U	**5.1**
trans-1,2-Dichloroethene	0.20 U	0.20 U	**0.49**	**0.31**	0.20 U	0.20 U	0.20 U	**0.52**	**0.43**	0.20 U	0.20 U	0.20 U	0.20 U	**0.43**
Methylene Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.20**	0.20 U
Trichloroethene	0.20 U	0.20 U	**2.1**	**3.6**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**1.6**
Vinyl Chloride	0.020 UJ	0.020 UJ	**0.33**	**0.36 J**	**0.068**	**0.062**	0.020 UJ	**6.5 J**	**2.7**	0.020 UJ	**1.6**	**6.6**	**0.26 J**	**0.54**
General Chemistry (mg/L; EPA 300.0, SM 5310C)														
Sulfate	--	--	**5.0**	**7.4**	1.2 U	1.2 U	**5.4**	1.2 U	1.2 U	**28**	1.2 U	1.2 U	--	--
Total Organic Carbon	--	--	**4.2**	**2.6**	**7.9**	**5.9**	**9.3**	**9.8**	**5.9**	**11**	**9.0**	**7.6**	--	--
Dissolved Gasses (µg/L; RSK-175)														
Ethane	--	--	0.57 U	0.57 U	**5.6**	**4.5 J**	0.57 U	0.57 U	**1.7 J**	0.57 U	**1.7**	0.57 U	--	--
Ethene	--	--	0.40 U	0.40 U	0.40 U	0.80 UJ	0.40 U	0.40 U	0.40 UJ	0.40 U	**2.4**	**0.80 J**	--	--
Methane	--	--	**430**	**1,400**	**11,000**	**20,000 J**	**360**	**6,200**	**2,200 J**	**120**	**3,500**	**2,900**	--	--
Petroleum Hydrocarbons(mg/L; NWTPH-Dx)														
Diesel Range Organics (C12-C24)	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oil Range Organics (C24-C40)	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1-3
3Q2017 Groundwater Detects
Boeing Auburn Facility
Auburn, Washington

Sample Location:	AGW269	AGW270	AGW271	AGW272	AGW273	AGW273	AGW274	AGW275	AGW277	AGW277	AGW278-1	AGW278-2	AGW278-3	AGW278-4
Zone:	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow-WT	Shallow-WT	Shallow-WT	Shallow	Intermediate	Intermediate
Laboratory SDG:	580-71049-1	580-71104-1	580-71049-1	580-71049-1	580-71051-1	580-71051-1	580-71049-1	580-71051-1	580-71056-1	580-71056-1	580-71056-1	580-71056-1	580-71056-1	580-71056-1
Sample Date:	9/5/2017	9/7/2017	9/5/2017	9/5/2017	9/5/2017	9/5/2017	9/5/2017	9/5/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017	9/6/2017
Sample Type:	N	N	N	N	N	FD	N	N	N	FD	N	N	N	N
Volatile Organic Compounds (µg/L; SW-846 8260C														
Acetone	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	R	R	5.0 U	5.0 U	5.0 U	5.0 U
Chloroform	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.39**
1,1-Dichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	**0.64 J**	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	0.20 U	**0.34**	0.20 U	**3.5**	**1.6**	**1.6**	0.20 U	0.20 U	0.20 U	0.20 U	**1.4**	**0.98**	**7.8**	**0.89**
trans-1,2-Dichloroethene	0.20 U	**0.22**	0.20 U	**0.65**	**0.33**	**0.35**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.47**	0.20 U
Methylene Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	**0.53 J**	0.50 U	0.50 U
Toluene	0.20 U	**0.54**	**0.55**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.30**	**0.26**	0.20 U	0.20 U
Trichloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.55**	**0.72**	0.20 U	0.20 U
Vinyl Chloride	**1.0 J**	**6.3**	**0.63 J**	**1.6 J**	**4.0**	**4.0**	**0.43 J**	**0.047**	0.020 UJ	0.020 UJ	**0.35 J**	0.020 UJ	**1.9 J**	**2.7 J**
General Chemistry (mg/L; EPA 300.0, SM 5310C)														
Sulfate	1.2 U	1.2 U	1.2 U	**1.3**	1.2 U	1.2 U	1.2 U	1.2 U	--	--	--	--	--	--
Total Organic Carbon	**8.5**	**18**	**13**	**4.6**	**6.0**	**6.0**	**6.9**	**7.8**	--	--	--	--	--	--
Dissolved Gasses (µg/L; RSK-175)														
Ethane	**2.3 J**	1.7 U	1.7 UJ	0.57 U	0.57 UJ	**0.58 J**	**4.4**	**4.1 J**	--	--	--	--	--	--
Ethene	0.80 UJ	1.2 U	1.2 UJ	**0.60 J**	**0.95 J**	**0.97 J**	**0.79 J**	0.40 UJ	--	--	--	--	--	--
Methane	**28,000 J**	**30,000**	**33,000 J**	**680**	**1,300 J**	**1,500**	**5,300**	**9,500 J**	--	--	--	--	--	--
Petroleum Hydrocarbons(mg/L; NWTPH-Dx)														
Diesel Range Organics (C12-C24)	--	--	--	--	--	--	--	--	**0.45 J**	**1.2 J**	--	--	--	--
Oil Range Organics (C24-C40)	--	--	--	--	--	--	--	--	**0.98 J**	**1.8 J**	--	--	--	--

Table 1-3
3Q2017 Groundwater Detects
Boeing Auburn Facility
Auburn, Washington

Sample Location:	AGW278-5	AGW278-6	AGW278-7	IW34	IW36	IW37
Zone:	Intermediate	Deep	Deep	Shallow	Shallow	Shallow
Laboratory SDG:	580-71056-1	580-71056-1	580-71056-1	580-71049-1	580-71051-1	580-71051-1
Sample Date:	9/6/2017	9/6/2017	9/6/2017	9/5/2017	9/5/2017	9/5/2017
Sample Type:	N	N	N	N	N	N
Volatile Organic Compounds (µg/L; SW-846 8260C						
Acetone	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloroform	0.20 U	**0.32**	**0.51**	0.20 U	0.20 U	0.20 U
1,1-Dichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	0.20 U	0.20 U	0.20 U	**1.0**	**0.36**	**0.80**
trans-1,2-Dichloroethene	0.20 U	0.20 U	0.20 U	0.20 U	**0.23**	0.20 U
Methylene Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	0.20 U	0.20 U	0.20 U	**85 J**	0.20 U	**1.3**
Trichloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Vinyl Chloride	0.020 UJ	0.020 UJ	0.020 UJ	**2.0 J**	**5.0**	**1.3**
General Chemistry (mg/L; EPA 300.0, SM 5310C)						
Sulfate	--	--	--	1.2 U	1.2 U	1.2 U
Total Organic Carbon	--	--	--	**37**	**9.2**	**59**
Dissolved Gasses (µg/L; RSK-175)						
Ethane	--	--	--	1.7 U	**1.7**	1.7 U
Ethene	--	--	--	1.2 U	0.40 U	1.2 U
Methane	--	--	--	**27,000**	**2,600**	**31,000**
Petroleum Hydrocarbons(mg/L; NWTPH-Dx)						
Diesel Range Organics (C12-C24)	--	--	--	--	--	--
Oil Range Organics (C24-C40)	--	--	--	--	--	--

Notes:

Bold text indicates detected analyte.
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.
U = The compound was not detected at the reported concentration.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

Abbreviations/Acronyms:

EPA = US Environmental Protection Agency
FD = field duplicate
µg/L = micrograms per liter
mg/L = milligrams per liter
N = primary sample
NWTPH=Dx = Northwest diesel-range total petroleum hydrocarbon extended
PDN = passive diffusion primary sample
SDG = sample delivery group
WT = water table

Table 1-4
3Q2017 Surface Water Analytical Results
Boeing Auburn Facility
Auburn, Washington

Sample Location:	SW-14	SW-16	SW-17	SW-18	SW-18	SW-20	SW-27	SW-CD4	SW-CD13	SW-CD13
Laboratory SDG:	580-71326-1	580-71326-1	580-71326-1	580-71326-1	580-71326-1	580-71326-1	580-71326-1	580-71326-1	580-71326-1	580-71326-1
Sample Date:	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017	9/15/2017
Sample Type:	N	N	N	N	FD	N	N	N	N	FD
Volatile Organic Compounds (µg/L; SW-846 8260C)										
Acetone	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	--
Benzene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
Bromodichloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
Bromoform	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	--	--
Bromomethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
2-Butanone/MEK	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	--	--
Carbon Disulfide	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
Carbon Tetrachloride	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
Chlorobenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
Chloroethane	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ	--	--
Chloroform	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
Chloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
Dibromochloromethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
1,1-Dichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
1,2-Dichloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
1,1-Dichloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
cis-1,2-Dichloroethene	**0.53**	**1.1**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**1.2**	--	--
trans-1,2-Dichloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
1,2-Dichloropropane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
cis-1,3-Dichloropropene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
trans-1,3-Dichloropropene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
Ethylbenzene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
2-Hexanone	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	--	--
4-Methyl-2-pentanone	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	--	--
Methylene Chloride	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
Styrene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
1,1,2,2-Tetrachloroethane	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	0.20 UJ	--	--
Tetrachloroethene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
Toluene	0.20 U	**0.32**	**2.3**	**0.40**	**0.38**	**1.2**	**0.39**	**0.22**	--	--
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
1,1,1-Trichloroethane	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
1,1,2-Trichloroethane	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--
Trichloroethene	**0.76**	**0.31**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**1.7**	--	--
Trichlorofluoromethane (CFC 11)	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
Vinyl Acetate	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	--
Vinyl Chloride	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	--	--
m,p-Xylene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
o-Xylene	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--
General Chemistry (mg/L; SM 5310C)										
Total Organic Carbon	--	--	--	--	--	--	--	--	**7.5 J**	**8.5**

Notes:

Bold text indicates detected analyte.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The compound was not detected at the reported concentration.

UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.

Abbreviations/Acronyms:

FD = field duplicate

µg/L = micrograms per liter

mg/L = milligrams per liter

N = primary sample

SDG = sample delivery group

Attachment 2

Pilot Test Results

Legend

- One-Time Surface Water Sampling Location
- Offsite Water Table Well
- Shallow Monitoring Well
- Shallow Observation Well (not part of ongoing monitoring)
- Shallow Injection Well
- Shallow Injection Well (not part of ongoing monitoring)
- Waterways

Notes

1. SW-CD13 was sampled in September 2017 for total organic carbon analysis.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 120 240

Scale in Feet

Base map source: Geometrix 2003; Aerial Photo Source: Esri World Imagery; Parcel Data Source: King County GIS 2016

N

LANDAU ASSOCIATES

Boeing Auburn Auburn, Washington	**Pilot Test Well Locations**	Figure 2-1

G:\Projects\025\164\140\601\Quarterly Report\F2-1PilotTestWellLocations.mxd 10/12/2017

Table 2-1
Data Summary
Algona Bioremediation Pilot Test
Boeing Auburn Facility

Well	Aquifer Zone	Date	Elapsed Time from Injection (days)	Volatile Organic Compounds								Aquifer Redox Conditions							Donor Indicators	Volatile Organic Compounds	Molar Fraction				
				PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	tDCE (µg/L)	11DCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	DO (mg/L)	ORP (mV)	Iron II (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Methane (µg/L)	Aquifer Redox State	TOC (mg/L)	Total cVOC (nmol/L)	PCE	TCE	Total DCE	VC	Ethene+ Ethane
AGW225	WT	12/1/2014	-277	<0.2	2.3	5.7	0.6	<0.2	0.5	<1.0	<1.0	1.20	-76.8	2.6	4.8	<0.16	290	Fe/S	3.7	90	0.00	0.19	0.72	0.09	0.00
		8/14/2015	-21	<0.2	1.9	5.1	0.5	<0.2	0.49	<1.0	<1.0	1.39	213.3	6.4	4.1	<0.16	360	Fe/S	4.2	80	0.00	0.18	0.72	0.10	0.00
		12/8/2015	95	<0.2	2.1	4.8	0.5	<0.2	0.5	<1.0	<1.0	2.0	-54.7	4.0	4.2	<0.16	170	Fe/S	3.8	79	0.00	0.20	0.70	0.10	0.00
		3/2/2016	180	<0.2	1.9	4.6	0.4	<0.2	0.54	<1.0	<1.0	0.73	-14	2.5	3.3	<0.16	420	Fe/S	4.3	75	0.00	0.19	0.69	0.12	0.00
		6/23/2016	293	<0.2	2.3	4.4	0.5	<0.2	0.5	<1.0	<1.0	3.40	271	2.0	4.9	<0.10	330	Fe/S	3.6	76	0.00	0.23	0.66	0.11	0.00
		9/8/2016	370	<0.2	2.0	4.4	0.5	<0.2	0.46	<1.0	<1.0	0.48	-6.0	2.5	5.7	<0.10	340	Fe/S	4.3	73	0.00	0.21	0.69	0.10	0.00
		12/2/2016	455	<0.2	2.4	4.8	0.5	<0.2	0.44	<1.0	<1.0	0.96	4.5	5.0	4.7	--	280	Fe/S	3.4	80	0.00	0.23	0.68	0.09	0.00
		3/10/2017	553	<0.2	2.2	4.3	0.4	<0.2	0.6	<1.0	<1.0	0.26	71.5	2.0	3.4	--	320	Fe/S	4.9	75	0.00	0.22	0.65	0.13	0.00
		6/7/2017	642	<0.2	2.5	4.5	0.5	<0.2	0.40	<1.0	<1.0	0.53	62.6	2.0	4.9	--	280	Fe/S	3.8	77	0.00	0.25	0.67	0.08	0.00
		9/7/2017	734	<0.20	2.1	4.3	0.49	<0.20	0.33	<0.40	<0.57	0.46	-31.3	3.5	5.0	--	430	Fe/S	4.2	71	0.00	0.23	0.70	0.07	0.00
AGW226	WT	8/14/2015	-21	<0.2	4.1	3.1	0.3	<0.2	0.56	<1.0	<1.0	0.55	-12.2	2.0	8.0	<0.16	970	S/M	2.6	75	0.00	0.41	0.47	0.12	0.00
		12/2/2015	89	<0.2	0.5	1.8	<0.2	<0.2	0.4	<1.0	<1.0	7.29	-26.1	2.0	7.8	<0.16	1000	S/M	5.5	29	0.00	0.13	0.65	0.22	0.00
		3/3/2016	181	<0.2	3.6	3.1	0.3	<0.2	0.54	<1.0	<1.0	0.54	-28.45	2.5	6.5	<0.16	1300	S/M	2.4	71	0.00	0.39	0.49	0.12	0.00
		6/21/2016	291	<0.2	1	4.8	0.3	<0.2	0.7	<1.0	<1.0	0.44	177	2.0	7.4	<0.10	1200	S/M	2.7	71	0.00	0.11	0.74	0.16	0.00
		9/8/2016	370	<0.2	1.1	3.8	0.3	<0.2	0.90	<1.0	<1.0	0.70	82.5	0.0	17.6	<0.10	1100	S/M	4.2	65	0.00	0.13	0.65	0.22	0.00
		12/7/2016	460	<0.2	2.6	4.0	0.3	<0.2	0.73	<1.0	<1.0	1.67	45.1	3.0	7.6	--	920	S/M	2.4	76	0.00	0.26	0.58	0.15	0.00
		3/7/2017	550	<0.2	3.6	3.5	0.3	<0.2	0.60	<0.1	<0.1	0.48	-31.2	4.0	6.7	--	1000	S/M	2.5	76	0.00	0.36	0.51	0.13	0.00
		6/6/2017	641	<0.2	3.9	3.4	0.3	<0.2	0.5	<1.0	<1.0	0.46	75.9	3.0	7.5	--	970	S/M	2.3	76	0.00	0.39	0.50	0.11	0.00
		9/5/2017	732	<0.20	3.6	3.6	0.31	<0.20	0.36	<0.40	<0.57	0.68	-37.7	3.0	7.4	--	1400	S/M	2.6	73	0.00	0.37	0.55	0.08	0.00
AGW240-1	WT	12/1/2014	-277	<0.020	<0.2	<0.2	0.3	<0.2	0.3	<1.0	3.5	1.32	-169.5	2.7	<1.0	<0.16	3200	M	8.6	8	0.00	0.00	0.02	0.04	0.94
		8/14/2015	-21	<0.020	<0.2	<0.2	0.2	<0.2	0.049	<1.0	2.5	0.54	-67.3	1.8	<1.0	<0.16	2900	M	8.1	3	0.00	0.00	0.02	0.01	0.97
		12/7/2015	94	<0.020	<0.2	<0.2	<0.2	<0.2	0.3	<1.0	3.1	1.89	-83.3	2.5	<1.0	<0.16	2800	M	7.5	5	0.00	0.00	0.00	0.04	0.96
		3/3/2016	181	<0.2	<0.2	<0.2	<0.2	<0.2	1	<1.0	3.2	0.73	-13.23	5.0	<1.0	<0.16	2900	M	7.9	16	0.00	0.00	0.00	0.13	0.87
		6/15/2016	285	<0.2	<0.2	<0.2	<0.2	<0.2	0.11	<1.0	3.4	1.9	-42.5	1.5	<1.0	<0.10	5700	M	7.5	2	0.00	0.00	0.00	0.02	0.98
		9/8/2016	370	<0.2	<0.2	<0.2	<0.2	<0.2	0.091	<1.0	4.2	0.60	-45.4	4.5	<1.0	<0.10	8900	M	7.7	1	0.00	0.00	0.00	0.01	0.99
		11/30/2016	453	<0.2	<0.2	<0.2	<0.2	<0.2	0.13	<1.0	2.5	0.64	-22.4	7.0	<1.0	--	14000	M	7.3	2	0.00	0.00	0.00	0.02	0.98
		3/10/2017	553	<0.2	<0.2	<0.2	<0.2	<0.2	0.13	<1.0	6.2	0.50	83.4	1.5	<1.0	--	19000	M	8.9	2	0.00	0.00	0.00	0.01	0.99
		6/6/2017	641	<0.2	<0.2	<0.2	<0.2	<0.2	0.049	<1.0	1.1	12.31	15.9	2.0	<1.0	--	1200	M	7.1	1	0.00	0.00	0.00	0.02	0.98
		9/5/2017	732	<0.20	<0.20	<0.20	<0.20	<0.20	0.068	<0.40	5.6	0.58	-77.6	3.4	<1.2	--	11000	M	7.9	1	0.00	0.00	0.00	0.01	0.99
AGW240-5	SZ	12/1/2014	-277	<0.020	<0.2	4.9	0.7	<0.2	6.6	<1.0	1.0	0.51	-116.1	2.8	<1.0	<0.16	2200	M	6.6	163	0.00	0.00	0.29	0.54	0.17
		8/14/2015	-21	<0.020	<0.2	3.3	0.4	<0.2	5.6	1.2	<1.0	0.77	-41.7	2.8	<1.0	<0.16	2000	M	5.4	128	0.00	0.00	0.22	0.53	0.25
		12/7/2015	94	<0.020	<0.2	1.8	0.3	<0.2	4.3	1.3	1.3	0.81	-86.8	6.0	<1.0	<0.16	2200	M	6.5	90	0.00	0.00	0.12	0.38	0.50
		3/3/2016	181	<0.2	<0.2	1.7	0.3	<0.2	3.1	<1.0	<1.0	0.55	-19.15	6.0	<1.0	<0.16	1700	M	6.9	70	0.00	0.00	0.29	0.71	0.00
		6/15/2016	285	<0.2	<0.2	0.3	0.3	<0.2	2.5	2	2.3	0.33	-40.8	3.0	<1.0	<0.10	8100	M	20.2	46	0.00	0.00	0.03	0.21	0.76
		9/8/2016	370	<0.2	<0.2	<0.2	0.2	<0.2	0.20	<1.0	3.7	0.36	-48.8	4.0	<1.0	<0.10	31000	M	5.7	5	0.00	0.00	0.02	0.02	0.96
		11/30/2016	453	<0.2	<0.2	<0.2	0.2	<0.2	0.10	<1.0	3.7	0.51	-34.4	8.0	<1.0	--	28000	M	6.2	4	0.00	0.00	0.02	0.01	0.97
		3/10/2017	553	<0.2	<0.2	<0.2	<0.2	<0.2	0.066	<1.0	9.2	0.24	58.7	4.0	<1.0	--	22000	M	5.8	1	0.00	0.00	0.00	0.00	1.00
		6/6/2017	641	<0.2	<0.2	<0.2	<0.2	<0.2	0.074	<1.0	7.6	0.73	63.8	3.0	<1.0	--	9500	M	4.8	1	0.00	0.00	0.00	0.00	1.00
		9/5/2017	732	<0.20	<0.20	<0.20	<0.20	<0.20	0.062	<0.80	4.5	0.71	-54.7	2.4	<1.2	--	20000	M	5.9	1	0.00	0.00	0.00	0.01	0.99
AGW244	WT	12/1/2016	454	<0.2	<0.2	<0.2	<0.2	<0.2	<0.020	<1.0	<1.0	0.96	20.1	0.0	13.2	--	54	N	3.8	0	0.00	0.00	0.00	0.00	0.00
		3/10/2017	553	<0.2	<0.2	<0.2	<0.2	<0.2	<0.020	<1.0	<1.0	6.3	88	0.5	15.2	--	<3.0	Fe	5.4	0	0.00	0.00	0.00	0.00	0.00
		6/5/2017	640	<0.2	<0.2	<0.2	<0.2	<0.2	<0.020	<1.0	<1.0	0.62	41.2	2.0	3.8	--	4600	M	53.1	0	0.00	0.00	0.00	0.00	0.00
		9/5/2017	732	<0.20	<0.20	<0.20	<0.20	<0.20	<0.020	<0.40	<0.57	0.59	-28.8	3.8	5.4	--	360	Fe/S	9.3	0	0.00	0.00	0.00	0.00	0.00
AGW247-1	WT	12/2/2014	-276	<0.020	<0.2	0.8	<0.2	<0.2	0.17	<1.0	1.0	0.64	-76.1	2.5	6.3	<0.16	3600	S/M	57.4	11	0.00	0.00	0.19	0.06	0.75
		8/14/2015	-21	<0.020	<0.2	3.4	0.4	<0.2	2.5	<1.0	<1.0	0.49	-61.4	3.4	<1.0	<0.16	5200	M	9.6	79	0.00	0.00	0.49	0.51	0.00
		12/2/2015	89	<0.020	<0.2	1.5	0.3	<0.2	2.1	<1.0	<1.0	4.32	-101.2	5.5	1.1	<0.16	6900	M	13.2	52	0.00	0.00	0.36	0.64	0.00
		3/2/2016	180	<0.2	<0.2	0.9	0.4	<0.2	4	<1.0	<1.0	0.44	-32.23	6.0	<1.0	<0.16	7100	M	9.4	77	0.00	0.00	0.17	0.83	0.00
		6/15/2016	285	<0.2	<0.2	<0.2	0.5	<0.2	4.9	<1.0	<1.0	0.43	-49.5	2.5	<1.0	<0.10	6100	M	9.7	84	0.00	0.00	0.06	0.94	0.00
		9/8/2016	370	<0.2	<0.2	<0.2	0.4	<0.2	4.7	<1.0	<1.0	0.62	-48.6	2.5	1.3	<0.10	4200	M	11.1	79	0.00	0.00	0.05	0.95	0.00
		12/1/2016	454	<0.2	<0.2	<0.2	0.3	<0.2	4.0	<1.0	<1.0	0.74	-8.5	5.0	<1.0	--	4200	M	13.2	67	0.00	0.00	0.05	0.95	0.00
		3/7/2017	550	<0.2	<0.2	<0.2	0.4	<0.2	5.1	<1.0	<1.0	0.61	-47.3	4.5	<1.0	--	6500	M	10.2	86	0.00	0.00	0.05	0.95	0.00

Table 2-1
Data Summary
Algona Bioremediation Pilot Test
Boeing Auburn Facility

Well	Aquifer Zone	Date	Elapsed Time from Injection (days)	Volatile Organic Compounds								Aquifer Redox Conditions							Donor Indicators	Volatile Organic Compounds	Molar Fraction				
				PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	tDCE (µg/L)	11DCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	DO (mg/L)	ORP (mV)	Iron II (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Methane (µg/L)	Aquifer Redox State	TOC (mg/L)	Total cVOC (nmol/L)	PCE	TCE	Total DCE	VC	Ethene+ Ethane
		6/5/2017	640	<0.2	<0.2	<0.2	0.5	<0.2	4.8	<1.0	<1.0	0.79	0.9	2.0	<1.0	--	6700	M	9.2	82	0.00	0.00	0.06	0.94	0.00
		9/6/2017	733	<0.20	<0.20	<0.20	0.52	<0.20	6.5	<0.40	<0.57	0.52	-113.8	2.8	<1.2	--	6200	M	9.8	109	0.00	0.00	0.05	0.95	0.00
AGW247-5	SZ	12/2/2014	-276	<0.020	<0.2	6.6	0.7	<0.2	1.7	<1.0	1.7	0.22	-136	5.0	<1.0	<0.16	4000	M	21.3	103	0.00	0.00	0.47	0.17	0.36
		8/14/2015	-21	<0.020	<0.2	4.7	0.8	<0.2	3.0	<1.0	<1.0	0.54	-90.3	2.4	1.1	<0.16	3400	M	6.2	105	0.00	0.00	0.54	0.46	0.00
		12/2/2015	89	<0.020	<0.2	2.9	0.7	<0.2	4.0	<1.0	<1.0	4.76	-97.4	4.5	<1.0	<0.16	2100	M	6.7	101	0.00	0.00	0.37	0.63	0.00
		3/3/2016	181	<0.2	<0.2	2.2	0.7	<0.2	4.5	<1.0	<1.0	0.51	-63.1	6.5	<1.0	<0.16	2000	M	5.7	102	0.00	0.00	0.29	0.71	0.00
		6/15/2016	285	<0.2	<0.2	1.8	0.8	<0.2	4.4	<1.0	<1.0	0.34	-72.1	2.0	<1.0	<0.10	2300	M	5.4	97	0.00	0.00	0.28	0.72	0.00
		9/8/2016	370	<0.2	<0.2	1.3	0.6	<0.2	3.9	<1.0	<1.0	0.34	-77.9	3.5	1.6	<0.10	1300	M	6.7	82	0.00	0.00	0.24	0.76	0.00
		12/1/2016	454	<0.2	<0.2	1.6	0.7	<0.2	4.0	<1.0	<1.0	0.65	-69.2	4.0	<1.0	--	1400	M	5.7	88	0.00	0.00	0.27	0.73	0.00
		3/7/2017	550	<0.2	<0.2	0.7	0.5	<0.2	3.9	<1.0	1.5	0.59	-89.3	3.0	<1.0	--	1400	M	5.5	75	0.00	0.00	0.10	0.50	0.40
		6/5/2017	640	<0.2	<0.2	1.2	0.5	<0.2	2.6	<1.0	2.1	0.45	-13.1	2.0	<1.0	--	1600	M	5.4	59	0.00	0.00	0.14	0.32	0.54
		9/6/2017	733	<0.20	<0.20	1.1	0.43	<0.20	2.7	<0.40	1.7	0.51	-118.1	1.6	<1.2	--	2200	M	5.9	59	0.00	0.00	0.14	0.37	0.49
AGW251-1	WT	12/2/2014	-276	<0.020	<0.2	<0.2	<0.2	<0.2	1.8	2.2	5.8	0.83	-73.1	3.4	37.2	<0.16	16000	S/M	27.3	29	0.00	0.00	0.00	0.10	0.90
		8/14/2015	-21	<0.020	<0.2	<0.2	<0.2	<0.2	0.62	<1.0	<1.0	4.51	208.8	6.8	1.3	<0.16	140	Fe/S	16.9	10	0.00	0.00	0.00	1.00	0.00
		12/3/2015	90	<0.020	<0.2	<0.2	<0.2	<0.2	0.23	<1.0	<1.0	12.0	-60.5	1.0	280	<0.16	440	Fe/S	8.9	4	0.00	0.00	0.00	1.00	0.00
		3/3/2016	181	<0.2	<0.2	<0.2	<0.2	<0.2	0.15	<1.0	<1.0	0.85	41.55	1.0	117	<0.16	560	Fe/S	33.8	2	0.00	0.00	0.00	1.00	0.00
		6/20/2016	290	<0.2	<0.2	<0.2	<0.2	<0.2	1.1	<1.0	<1.0	0.83	124.4	2.0	20.7	<2.0	1800	S/M	11	18	0.00	0.00	0.00	1.00	0.00
		9/6/2016	368	<0.2	<0.2	<0.2	<0.2	<0.2	1.6	1.3	<1.0	2.19	-78.2	4.5	4.3	<0.10	1100	S/M	13.1	26	0.00	0.00	0.00	0.36	0.64
		12/2/2016	455	<0.2	<0.2	<0.2	<0.2	<0.2	0.037	<1.0	<1.0	1.71	27.9	1.0	281	--	59	Fe/S	11.5	1	0.00	0.00	0.00	1.00	0.00
		3/7/2017	550	<0.2	<0.2	<0.2	<0.2	<0.2	0.050	<1.0	<1.0	0.78	-27.7	2.0	203	--	130	Fe	23.3	1	0.00	0.00	0.00	1.00	0.00
		6/7/2017	642	<0.2	<0.2	<0.2	<0.2	<0.2	1.0	<1.0	<1.0	5.88	61.6	2.0	69.7	--	410	Fe/S	11.5	16	0.00	0.00	0.00	1.00	0.00
		9/6/2017	733	<0.20	<0.20	<0.20	<0.20	<0.20	<0.020	<0.40	<0.57	5.13	-48.2	1.6	28	--	120	Fe/S	11	0	0.00	0.00	0.00	0.00	0.00
AGW251-2	SZ	12/2/2014	-276	<0.020	<0.2	2.0	0.2	<0.2	4.7	3.2	5.9	0.49	-141.9	4.0	1.1	<0.16	8500	M	11.2	98	0.00	0.00	0.06	0.18	0.76
		8/14/2015	-21	<0.020	<0.2	<0.2	<0.2	<0.2	5.7	2.2	1.6	0.94	210.6	5.2	2.1	<0.16	4800	M	7.1	91	0.00	0.00	0.00	0.41	0.59
		12/3/2015	90	<0.020	<0.2	<0.2	<0.2	<0.2	3.9	1.8	1.1	13.38	-109.1	6.0	1.2	<0.16	3900	M	6.8	62	0.00	0.00	0.00	0.38	0.62
		3/3/2016	181	<0.2	<0.2	<0.2	<0.2	<0.2	4.9	1.9	1.1	0.56	-99.13	1.5	1.9	<0.16	2900	M	7.2	78	0.00	0.00	0.00	0.43	0.57
		6/20/2016	290	<0.2	<0.2	<0.2	<0.2	<0.2	2.7	2.7	1.1	0.56	48.8	2.0	<1.0	<2.0	3700	M	8.1	43	0.00	0.00	0.00	0.25	0.75
		9/8/2016	370	<0.2	<0.2	<0.2	<0.2	<0.2	1.8	2.6	1.3	0.73	-81.8	2.0	<1.0	<0.10	3300	M	8.1	29	0.00	0.00	0.00	0.17	0.83
		12/2/2016	455	<0.2	<0.2	<0.2	<0.2	<0.2	2.3	2.1	<1.0	1.09	-56.9	5.0	<1.0	--	2800	M	6.8	37	0.00	0.00	0.00	0.33	0.67
		3/7/2017	550	<0.2	<0.2	<0.2	<0.2	<0.2	3.2	1.9	1.4	0.69	-80	5.5	<1.0	--	2500	M	7.3	51	0.00	0.00	0.00	0.31	0.69
		6/7/2017	642	<0.2	<0.2	<0.2	<0.2	<0.2	2.3	2.3	2.6	0.54	17.0	2.0	<1.0	--	3200	M	8.6	37	0.00	0.00	0.00	0.18	0.82
		9/6/2017	733	<0.20	<0.20	<0.20	<0.20	<0.20	1.6	2.4	1.7	0.55	-116.5	2.2	<1.2	--	3500	M	9.0	26	0.00	0.00	0.00	0.15	0.85
AGW251-3	IZ	12/2/2014	-276	<0.020	<0.2	5.9	0.5	<0.2	4.3	<1.0	1.2	1.09	-112.2	3.1	<1.0	<0.16	2500	M	7.6	135	0.00	0.00	0.38	0.39	0.23
		8/14/2015	-21	<0.020	<0.2	3.0	0.2	<0.2	5.0	<1.0	<1.0	1.51	209.7	5.8	<1.0	<0.16	2200	M	6.3	113	0.00	0.00	0.29	0.71	0.00
		12/3/2015	90	<0.020	<0.2	3.0	<0.2	<0.2	5.0	<1.0	<1.0	10.63	-93.7	6.0	<1.0	<0.16	2100	M	6.1	111	0.00	0.00	0.28	0.72	0.00
		3/3/2016	181	<0.2	<0.2	1.2	<0.2	<0.2	7.8	<1.0	<1.0	0.59	-50.43	2.0	<1.0	<0.16	2600	M	7.3	137	0.00	0.00	0.09	0.91	0.00
		6/20/2016	290	<0.2	<0.2	1.2	<0.2	<0.2	6.1	<1.0	<1.0	0.45	78.3	2.0	<1.0	<2.0	2600	M	8.1	110	0.00	0.00	0.11	0.89	0.00
		9/8/2016	370	<0.2	<0.2	0.9	<0.2	<0.2	5.1	<1.0	<1.0	0.68	-38.6	3.5	<1.0	<0.10	2100	M	6.7	91	0.00	0.00	0.10	0.90	0.00
		12/2/2016	455	<0.2	<0.2	1.2	<0.2	<0.2	6.8	<1.0	<1.0	1.05	-21.2	5.0	<1.0	--	2000	M	6.1	121	0.00	0.00	0.10	0.90	0.00
		3/7/2017	550	<0.2	<0.2	0.7	<0.2	<0.2	8.4	<1.0	<1.0	0.75	-50.8	5.0	<1.0	--	2100	M	7.2	142	0.00	0.00	0.05	0.95	0.00
		6/7/2017	642	<0.2	<0.2	0.6	<0.2	<0.2	6.6	<1.0	1.9	0.45	32.7	1.5	<1.0	--	2900	M	8.8	112	0.00	0.00	0.04	0.60	0.36
		9/6/2017	733	<0.20	<0.20	1.0	<0.20	<0.20	6.6	0.80	<0.57	0.47	-85.8	2.0	<1.2	--	2900	M	7.6	116	0.00	0.00	0.07	0.73	0.20
AGW269	SZ	8/14/2015	-21	<0.020	<0.2	6.7	0.7	<0.2	3.2	<1.0	<1.0	0.52	-95.9	1.0	1.9	<0.16	1300	M	9.1	128	0.00	0.00	0.60	0.40	0.00
		12/7/2015	94	<0.020	0.2	7.4	1.2	<0.2	5.1	<1.0	1.7	0.36	-49.0	4.0	<1.0	<0.16	26000	M	122	172	0.00	0.01	0.39	0.36	0.25
		3/2/2016	180	<0.2	<0.2	6.5	1	<0.2	5.2	<1.0	2	0.27	-43.8	2.0	<1.0	<0.16	15000	M	8.5	161	0.00	0.00	0.34	0.37	0.29
		6/16/2016	286	<0.2	<0.2	1.9	0.6	<0.2	8.7	<1.0	<2.3	0.36	-28.1	2.0	<1.0	<0.10	24000	M	8.2	165	0.00	0.00	0.16	0.84	0.00
		9/7/2016	369	<0.2	<0.2	0.6	0.3	<0.2	6.4	1.3	<1.0	0.49	-21.7	4.0	<1.0	<0.10	29000	M	9.9	112	0.00	0.00	0.06	0.65	0.29
		11/29/2016	452	<0.2	<0.2	0.3	0.3	<0.2	4.9	1.1	5.9	0.67	-7.5	7.0	<1.0	--	35000	M	9.6	85	0.00	0.00	0.02	0.24	0.74
		3/6/2017	549	<0.2	<0.2	0.3	0.2	<0.2	5.4	<1.0	4.6	0.59	-39.9	2.0	<1.0	--	23000	M	8.9	92	0.00	0.00	0.02	0.35	0.63
		6/1/2017	636	<0.2	<0.2	< 0.2	0.2	<0.2	2.3	1.5	11	0.50	2.7	3.5	<1.0	--	18000	M	8.8	39	0.00	0.00	0.00	0.08	0.92
		9/5/2017	732	<0.20	<0.20	<0.20	<0.20	<0.20	1.0	<0.80	2.3	1.16	-44.9	3.0	<1.2	--	28000	M	8.5	16	0.00	0.00	0.00	0.17	0.83

Table 2-1
Data Summary
Algona Bioremediation Pilot Test
Boeing Auburn Facility

Well	Aquifer Zone	Date	Elapsed Time from Injection (days)	Volatile Organic Compounds								Aquifer Redox Conditions							Donor Indicators	Volatile Organic Compounds	Molar Fraction				
				PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	tDCE (µg/L)	11DCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	DO (mg/L)	ORP (mV)	Iron II (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Methane (µg/L)	Aquifer Redox State	TOC (mg/L)	Total cVOC (nmol/L)	PCE	TCE	Total DCE	VC	Ethene+ Ethane
AGW270	SZ	8/13/2015	-22	<0.020	<0.2	7.3	1.0	<0.2	2.2	<1.0	<1.0	1.58	199.4	5.8	<1.0	<0.16	750	M	7.2	121	0.00	0.00	0.71	0.29	0.00
		12/7/2015	94	<0.020	1.7	10	1.7	<0.2	1.3	1.5	2.0	0.30	-11.0	2.5	<1.0	<0.16	23000	M	682	154	0.00	0.05	0.44	0.08	0.44
		3/2/2016	180	<0.2	0.7	8.8	1	<0.2	1.7	<1.0	2.8	0.30	-38.6	6.5	<1.0	<0.16	22000	M	75.2	134	0.00	0.02	0.45	0.12	0.41
		6/16/2016	286	<0.2	0.3	6	0.8	<0.2	2	<1.0	<2.0	0.60	-52.4	2.0	<1.0	<0.10	25000	M	46.7	104	0.00	0.02	0.67	0.31	0.00
		9/7/2016	369	<0.2	<0.2	3.3	0.5	<0.2	2.9	1.0	<1.0	0.49	-47.9	3.0	1.1	<0.10	22000	M	39.1	86	0.00	0.00	0.32	0.38	0.29
		11/28/2016	451	<0.2	<0.2	2.2	0.4	<0.2	3.2	1.4	<1.0	0.47	-26.2	5.0	<1.0	--	30000	M	38.7	78	0.00	0.00	0.21	0.40	0.39
		3/6/2017	549	<0.2	<0.2	1.3	0.3	<0.2	6.4	1.1	<1.0	0.46	-49.1	2.5	<1.0	--	29000	M	29.6	119	0.00	0.00	0.10	0.65	0.25
		6/2/2017	637	<0.2	<0.2	0.6	0.3	<0.2	6.1	2.1	<1.0	0.68	1.6	4.0	<1.0	--	23000	M	20.3	107	0.00	0.00	0.05	0.54	0.41
		9/7/2017	734	<0.20	<0.20	0.34	0.22	<0.20	6.3	<1.2	<1.7	0.66	-55.8	3.5	<1.2	--	30000	M	18	107	0.00	0.00	0.05	0.95	0.00
AGW271	SZ	8/13/2015	-22	<0.020	<0.2	6.5	0.7	<0.2	4.6	<1.0	<1.0	1.32	204.0	6.2	<1.0	<0.16	2300	M	6.8	148	0.00	0.00	0.50	0.50	0.00
		12/7/2015	94	<0.020	1.2	15	1.8	<0.2	5.9	1.2	1.9	0.33	22.2	7.0	<1.0	<0.16	19000	M	971	277	0.00	0.02	0.45	0.25	0.28
		3/2/2016	180	<0.2	1.8	15	2.4	<0.2	2.8	1.5	3	0.37	25.8	6.0	<10.0	<0.16	28000	M	1080	238	0.00	0.04	0.46	0.11	0.39
		6/16/2016	286	<0.2	0.3	6.9	0.7	<0.2	2	<1.0	<2.6	0.58	-35.8	3.0	<1.0	<0.10	29000	M	48.6	113	0.00	0.02	0.70	0.28	0.00
		9/7/2016	369	<0.2	<0.2	4.4	0.5	<0.2	1.1	<1.0	<1.0	0.43	-39.5	2.5	<1.0	<0.10	28000	M	16.9	68	0.00	0.00	0.74	0.26	0.00
		11/29/2016	452	<0.2	<0.2	2.5	0.5	<0.2	3.9	<1.0	<1.0	0.72	-25.5	8.0	<1.0	--	36000	M	14.0	93	0.00	0.00	0.33	0.67	0.00
		3/7/2017	550	<0.2	<0.2	0.6	<0.2	<0.2	3.3	<1.0	6.3	0.76	-54.6	3.0	<1.0	--	34000	M	15.0	59	0.00	0.00	0.02	0.20	0.78
		6/2/2017	637	<0.2	<0.2	0.3	<0.2	<0.2	1.7	<1.0	<1.0	0.56	1.6	2.5	<1.0	--	30000	M	14.1	30	0.00	0.00	0.10	0.90	0.00
		9/5/2017	732	<0.20	<0.20	<0.20	<0.20	<0.20	0.63	<1.2	<1.7	1.96	-60.1	3.0	<1.2	--	33000	M	13	10	0.00	0.00	0.00	1.00	0.00
AGW272	SZ	8/13/2015	-22	<0.020	0.2	7.3	0.6	<0.2	0.66	<1.0	<1.0	0.49	-55.2	1.8	1.5	<0.16	400	Fe/S	5.4	94	0.00	0.02	0.87	0.11	0.00
		12/7/2015	94	<0.020	0.2	6.4	0.7	<0.2	1.8	<1.0	<1.0	1.36	-85.3	4.0	<1.0	<0.16	940	M	3.5	104	0.00	0.01	0.71	0.28	0.00
		3/2/2016	180	<0.2	0.3	5.4	0.5	<0.2	1.2	<1.0	<1.0	0.91	-71.43	1.0	1.1	<0.16	460	Fe/S	4.1	82	0.00	0.03	0.74	0.23	0.00
		6/17/2016	287	<0.2	0.3	4.9	0.6	<0.2	2	<1.0	<1.0	0.76	-29.8	2.5	1.4	<0.10	450	Fe/S	4.1	91	0.00	0.03	0.62	0.35	0.00
		9/7/2016	369	<0.2	0.3	3.9	0.6	<0.2	2.3	<1.0	<1.0	0.42	-37.5	3.0	1.6	<0.10	360	Fe/S	4.9	86	0.00	0.03	0.54	0.43	0.00
		11/28/2016	451	<0.2	0.4	6.0	0.7	<0.2	1.3	<1.0	<1.0	1.22	-19.0	5.0	<1.0	--	700	M	4.0	93	0.00	0.03	0.74	0.22	0.00
		3/6/2017	549	<0.2	0.4	5.5	0.6	<0.2	1.3	<1.0	<1.0	0.33	23.9	2.5	<1.0	--	500	M	4.3	87	0.00	0.04	0.73	0.24	0.00
		6/1/2017	636	<0.2	0.4	4.9	0.7	<0.2	1.4	<1.0	<1.0	0.89	0.2	2.0	1.7	--	440	Fe/S	4.3	83	0.00	0.04	0.69	0.27	0.00
		9/5/2017	732	<0.20	<0.20	3.5	0.65	<0.20	1.6	0.60	<0.57	3.19	-72.3	3.5	1.3	--	680	S/M	4.6	68	0.00	0.00	0.48	0.29	0.24
AGW273	SZ	8/13/2015	-22	<0.020	<0.2	6.3	0.7	<0.2	4.2	<1.0	<1.0	1.61	193.0	4.6	<1.0	<0.16	880	M	6.1	139	0.00	0.00	0.52	0.48	0.00
		12/7/2015	94	<0.020	<0.2	3.4	0.6	<0.2	6.0	<1.0	<1.0	1.52	-99.3	6.0	<1.0	<0.16	1500	M	6.0	137	0.00	0.00	0.30	0.70	0.00
		3/2/2016	180	<0.2	<0.2	3.5	0.5	<0.2	3.9	<1.0	<1.0	0.51	-54.3	1.2	<1.0	<0.16	1300	M	6.1	104	0.00	0.00	0.40	0.60	0.00
		6/17/2016	287	<0.2	<0.2	2.9	5	<0.2	3.9	<1.0	<1.0	0.71	24.1	2.0	<1.0	<0.10	1300	M	5.5	144	0.00	0.00	0.57	0.43	0.00
		9/7/2016	369	<0.2	<0.2	2.6	0.5	<0.2	4.2	<1.0	<1.0	0.77	-30.9	4.0	<1.0	<0.10	900	M	6.7	99	0.00	0.00	0.32	0.68	0.00
		11/29/2016	452	<0.2	<0.2	2.4	0.5	<0.2	4.8	1.3	1.2	1.33	-26.6	6.0	<1.0	--	3600	M	6.4	107	0.00	0.00	0.16	0.40	0.45
		3/6/2017	549	<0.2	<0.2	2.6	0.4	<0.2	5	<1.0	<1.0	0.21	-10.9	4.5	<1.0	--	1200	M	6.4	111	0.00	0.00	0.28	0.72	0.00
		6/1/2017	636	<0.2	<0.2	2.5	0.5	<0.2	3.9	<1.0	<1.0	0.61	2.2	3.0	<1.0	--	1200	M	6.0	93	0.00	0.00	0.33	0.67	0.00
		9/5/2017	732	<0.20	<0.20	1.6	0.33	<0.20	4.0	0.95	<0.57	0.72	-64.9	2.2	<1.2	--	1300	M	6.0	84	0.00	0.00	0.17	0.54	0.29
AGW274	SZ	8/13/2015	-22	<0.020	<0.2	<0.2	<0.2	<0.2	4.0	2.3	<1.0	0.54	-36.6	3.6	<1.0	<0.16	1900	M	7.5	64	0.00	0.00	0.00	0.44	0.56
		12/7/2015	94	<0.020	<0.2	<0.2	<0.2	<0.2	1.9	1.3	2.2	2.07	-95.0	4.0	<1.0	<0.16	2700	M	8.1	30	0.00	0.00	0.00	0.20	0.80
		3/2/2016	180	<0.2	<0.2	2	0.4	<0.2	5.5	<1.0	<1.0	0.43	-48.9	2.0	<1.0	<0.16	920	M	7	113	0.00	0.00	0.22	0.78	0.00
		6/17/2016	287	<0.2	<0.2	0.6	0.3	<0.2	4.6	1.5	<1.0	0.47	-5.1	2.0	<1.0	<0.10	920	M	5.8	83	0.00	0.00	0.07	0.54	0.39
		9/8/2016	370	<0.2	<0.2	<0.2	<0.2	<0.2	1.1	1.6	3.6	1.05	-33.1	2.8	<1.0	<0.10	9600	M	7	18	0.00	0.00	0.00	0.09	0.91
		11/29/2016	452	<0.2	<0.2	<0.2	<0.2	<0.2	0.7	1.6	4.6	0.83	-23.7	5.5	<1.0	--	13000	M	8.2	11	0.00	0.00	0.00	0.05	0.95
		3/6/2017	549	<0.2	<0.2	0.6	<0.2	<0.2	4.4	1.1	1.0	0.25	-27.3	1.5	<1.0	--	1500	M	7.6	77	0.00	0.00	0.04	0.47	0.49
		6/1/2017	636	<0.2	<0.2	1.9	0.4	<0.2	4.5	<1.0	<1.0	0.58	6.1	2.0	<1.0	--	700	M	6.7	96	0.00	0.00	0.25	0.75	0.00
		9/5/2017	732	<0.20	<0.20	<0.20	<0.20	<0.20	0.43	0.79	4.4	2.22	-55.9	4.3	<1.2	--	5300	M	6.9	7	0.00	0.00	0.00	0.04	0.96
AGW275	SZ	8/13/2015	-22	<0.020	<0.2	2.3	0.3	<0.2	7.7	<1.0	<1.0	0.64	-47.6	3.0	1.0	<0.16	2000	M	7.6	150	0.00	0.00	0.18	0.82	0.00
		12/7/2015	94	<0.020	<0.2	2.5	0.3	<0.2	7.7	<1.0	<1.0	1.02	-100.3	4.5	<1.0	<0.16	2100	M	6.9	152	0.00	0.00	0.19	0.81	0.00
		3/2/2016	180	<0.2	<0.2	0.6	<0.2	<0.2	7.7	2.2	1.6	0.35	-48.5	2.2	<1.0	<0.16	14000	M	79.7	129	0.00	0.00	0.02	0.47	0.50
		6/17/2016	287	<0.2	<0.2	<0.2	<0.2	<0.2	0.16	2.8	4.5	0.44	0.07	3.5	<1.0	<0.10	26000	M	7.9	3	0.00	0.00	0.00	0.01	0.99
		9/8/2016	370	<0.2	<0.2	<0.2	<0.2	<0.2	0.061	<1.0	5.8	0.46	-45.3	2.0	<1.0	<0.10	16000	M	8.3	1	0.00	0.00	0.00	0.01	0.99
		11/29/2016	452	<0.2	<0.2	<0.2	0.2	<0.2	0.055	<1.0	6.5	0.60	-30.4	7.0	<1.0	--	16000	M	4.1	3	0.00	0.00	0.01	0.00	0.99
		3/6/2017	549	<0.2	<0.2	<0.2	<0.2	<0.2	0.057	<1.0	5.1	0.20	-44.9	2.0	<1.0	--	14000	M	8.5	1	0.00	0.00	0.00	0.01	0.99

Table 2-1
Data Summary
Algona Bioremediation Pilot Test
Boeing Auburn Facility

Well	Aquifer Zone	Date	Elapsed Time from Injection (days)	Volatile Organic Compounds								Aquifer Redox Conditions							Donor Indicators	Volatile Organic Compounds	Molar Fraction				
				PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	tDCE (µg/L)	11DCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	DO (mg/L)	ORP (mV)	Iron II (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Methane (µg/L)	Aquifer Redox State	TOC (mg/L)	Total cVOC (nmol/L)	PCE	TCE	Total DCE	VC	Ethene+ Ethane
		6/1/2017	636	<0.2	<0.2	<0.2	<0.2	<0.2	0.053	<1.0	9.6	0.52	0.3	1.0	1.0	<1.0	--	17000	M	8.1	1	0.00	0.00	0.00	0.00	1.00
		9/5/2017	732	<0.20	<0.20	<0.20	<0.20	<0.20	0.047	<0.40	4.1	0.67	-58.5	1.8	<1.2	--	9500	M	7.8	1	0.00	0.00	0.00	0.01	0.99
IW33	SZ	8/13/2015	-22	<0.020	<0.2	6.6	0.8	<0.2	3.0	<1.0	<1.0	1.86	-17.1	2.6	<1.0	<0.16	940	M	7.4	124	0.00	0.00	0.61	0.39	0.00
		11/28/2016	451	--	--	--	--	--	--	--	--	9.27	38.3	--	--	--	--	--	205	--	--	--	--	--	--
IW34	SZ	8/17/2015	-18	<0.020	0.2	7.6	0.8	<0.2	4.9	<1.0	<1.0	0.57	-60.2	4.0	<1.0	<0.16	1900	M	6.9	167	0.00	0.01	0.52	0.47	0.00
		12/7/2015	94	<0.10	1.6	8.5	1.2	<0.2	1.1	2.9	1.7	1.79	-24.7	9.5	22.5	<0.16	7900	S/M	6010	130	0.00	0.04	0.35	0.06	0.55
		3/2/2016	180	<0.2	5.3	16	2.5	<0.2	1.1	3	2.7	0.39	44.1	7.0	<10.0	<0.16	15000	M	6450	249	0.00	0.09	0.43	0.04	0.44
		6/16/2016	286	<0.2	5.4	16	2.2	<0.2	0.9	3.8	2.2	1.07	116	3.0	1.9	0.16	23000	M	3840	243	0.00	0.09	0.42	0.03	0.46
		9/7/2016	369	<0.2	1.9	7.4	0.8	<0.2	0.34	1.5	<1.0	0.46	-85.3	6.0	1.1	0.14	17000	M	377	104	0.00	0.09	0.54	0.03	0.34
		11/28/2016	451	<2.0	<2.0	6.1	<2.0	<2.0	0.31	<1.0	<1.0	0.50	-69.7	7.0	<1.0	--	24000	M	259	68	0.00	0.00	0.93	0.07	0.00
		3/6/2017	549	<0.040 (a)	0.16 (a)	3.6	<2.0	<0.040 (a)	1.2	1.1	<1.0	0.89	-38.9	4.5	<1.0	--	24000	M	88	58	0.00	0.01	0.38	0.20	0.41
		6/1/2017	636	<0.2	<0.2	1.7	0.4	<0.2	2.2	2.4	< 1.0	0.53	28.3	1.0	<1.0	--	30000	M	36.6	58	0.00	0.01	0.15	0.25	0.60
		9/5/2017	732	<0.20	<0.20	1.0	<0.20	<0.20	2.0	<1.2	<1.7	1.26	-16.3	4.5	<1.2	--	27000	M	37	42	0.00	0.00	0.24	0.76	0.00
IW35	SZ	8/17/2015	-18	<0.020	<0.2	3.3	0.5	<0.2	3.7	<1.0	<1.0	0.77	-22.8	2.0	1.0	<0.16	1800	M	7.2	98	0.00	0.00	0.40	0.60	0.00
		11/28/2016	451	--	--	--	--	--	--	--	--	0.76	0.7	--	--	--	--	--	16.3	--	--	--	--	--	--
IW36	SZ	8/17/2015	-18	<0.020	0.2	3.3	0.7	<0.2	6.0	<1.0	<1.0	0.58	-29.5	2.8	<1.0	<0.16	1700	M	7.6	139	0.00	0.01	0.30	0.69	0.00
		12/7/2015	94	<0.020	<1.0	1.6	<1.0	<1.0	3.8	<1.0	1.4	1.77	-100.2	6.0	<1.0	<0.16	17000	M	63.7	77	0.00	0.00	0.13	0.49	0.38
		3/2/2016	180	<0.2	<0.2	1.5	0.4	<0.2	5.7	<1.0	2	0.32	-47.58	1.5	<1.0	<0.16	14000	M	17.9	111	0.00	0.00	0.11	0.51	0.38
		6/16/2016	286	<0.2	<0.2	1.5	0.4	<0.2	4.5	<1.0	1.9	0.36	-7.85	1.0	<1.0	<0.10	11000	M	11.4	92	0.00	0.00	0.13	0.47	0.41
		9/7/2016	369	<0.2	<0.2	1.7	0.4	<0.2	4.3	<1.0	1.8	0.35	-27.8	4.5	<1.0	<0.10	6600	M	11.2	90	0.00	0.00	0.14	0.46	0.40
		11/28/2016	451	<0.2	<0.2	1.7	0.4	<0.2	4.8	<1.0	1.2	0.87	-8.2	6.0	<1.0	--	2900	M	10.1	98	0.00	0.00	0.16	0.56	0.29
		3/6/2017	549	<0.2	<0.2	1.3	0.4	<0.2	6.1	<1.0	<1.0	0.71	-38.9	1.5	<1.0	--	2500	M	10.8	115	0.00	0.00	0.15	0.85	0.00
		6/1/2017	636	<0.2	<0.2	1.3	0.4	<0.2	5.5	<1.0	2.0	0.36	5.9	1.5	<1.0	--	2800	M	10.3	106	0.00	0.00	0.10	0.51	0.39
		9/5/2017	732	<0.20	<0.20	0.36	0.23	<0.20	5.0	<0.40	1.7	0.69	-54.3	2.4	<1.2	--	2600	M	9.2	86	0.00	0.00	0.04	0.56	0.40
IW37	SZ	8/13/2015	-22	<0.020	<0.2	5.3	0.5	<0.2	4.9	<1.0	<1.0	0.56	-45.0	2.0	<1.0	<0.16	1800	M	6.6	138	0.00	0.00	0.43	0.57	0.00
		12/7/2015	94	0.16	1.3	13	2.0	<0.2	1.5	5.8	3.1	1.40	-24.2	9.0	6.6	<0.16	3800	M	4780	190	0.00	0.02	0.31	0.05	0.62
		3/2/2016	180	<0.2	0.8	7.7	1.0	<0.2	1.2	1.8	2.2	0.47	35.1	5.0	<10.0	<0.16	23000	M	2480	115	0.00	0.02	0.36	0.08	0.54
		6/17/2016	287	<0.2	0.3	6	0.3	<0.2	0.4	<1.0	1.6	0.91	-81.5	2.5	<1.0	<0.10	20000	M	1130	74	0.00	0.02	0.51	0.05	0.42
		9/7/2016	369	<0.2	<0.2	2.7	<0.2	<0.2	0.14	<1.0	<1.0	0.91	-123.4	5.0	1.3	<0.10	17000	M	337	30	0.00	0.00	0.93	0.07	0.00
		11/28/2016	451	<0.2	<0.2	2.7	<0.2	<0.2	0.062	<1.0	<1.0	0.67	-106.8	7.0	<1.0	--	25000	M	356	29	0.00	0.00	0.97	0.03	0.00
		3/7/2017	550	<0.2	<0.2	2.5	<0.2	<0.2	0.17	<1.0	<1.0	0.74	-104.3	2.0	<1.0	--	27000	M	180	29	0.00	0.00	0.90	0.10	0.00
		6/1/2017	636	<0.2	<0.2	1.8	<0.2	<0.2	0.38	2.6	< 1.0	0.66	-49.3	4.5	<1.0	--	31000	M	87.6	25	0.00	0.00	0.16	0.05	0.79
		9/5/2017	732	<0.20	<0.20	0.80	<0.20	<0.20	1.3	<1.2	<1.7	0.88	-71.9	3.0	<1.2	--	31000	M	59	29	0.00	0.00	0.28	0.72	0.00

Notes:

Blue shading indicates the compound with highest molar fraction per event

Total DCE is the sum of cDCE, tDCE, and 11DCE

Acetylene was monitored from August 2015 through December 2016. There were no detections of this constituent; therefore, sampling was discontinued and it has been removed from this table.

Electron donor injection performed August 18 through September 4, 2015

(a) Results presented are from analysis by Method 8260C SIM. Samples were reanalyzed by Method 8260C SIM in order to meet data quality objectives due to elevated reporting limits (2.0 µg/L) in the Method 8260C run.

Abbreviations/Acronyms:

-- = not applicable/not analyzed
11DCE = 1,1-dichloroethene
cDCE = cis-1,2-dichlorethene
Conc = concentration
cVOC = chlorinated volatile organic compounds
DO = dissolved oxygen
Fe = Iron-reducing
IZ = Intermediate Zone
M = Methanogenic
µg/L = micrograms per liter
µmol/L = micromoles per liter
mg/L = micrograms per liter
mV = millivolt
ORP = oxygen-reduction potential
PCE = tetrachloroethene
S = Sulfate-reducing
SZ = Shallow Zone
tDCE = trans-1,2-dichloroethene
TCE = trichloroethene
VC = vinyl chloride
WT = Water Table Zone

Attachment 3

Monitoring Well Logs

Please print, sign and return by mail to Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE44696

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *(select one)*

☐ Construction

☒ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* R 66263

Type of Well *(select one)*

☒ Resource Protection

☐ Geotech Soil Boring

Consulting Firm Landau Assoc

Unique Ecology Well ID Tag No. ALB-058

Property Owner Boeing - Auburn

Site Address 700 15th St SW

City Auburn **County** King

Location SE 1/4-1/4SW 1/4 Sec 24 Twn 21NR 4E Select One ☒ BWM ☐ WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Zane Huckins

Driller/Engineer /Trainee Signature [signature]

Driller or Trainee License No. 3179

Tax Parcel No. _____

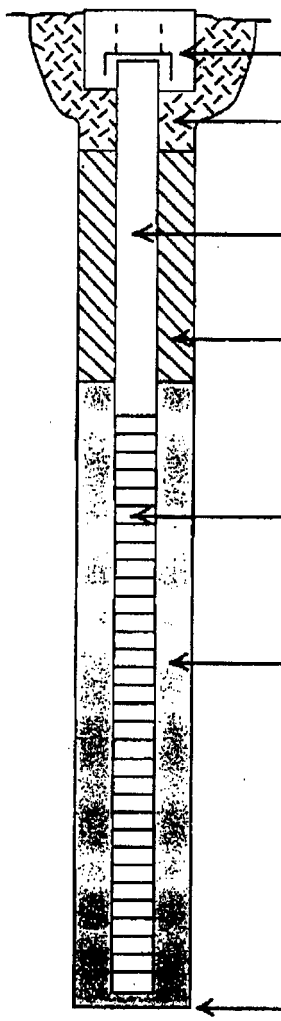
Cased or Uncased Diameter 6" **Static Level** _____

Work/Decommission Start Date 08/14/2017

Work/Decommission Completed Date 08/14/2017

If trainee, licensed driller's Signature and License No. _____

Construction/Design — Well Data AGW105 — Formation Description



MONUMENT TYPE: Flush

CONCRETE SURFACE SEAL 0 - 3 ft.

PVC BLANK "x

BACKFILL 3 - 60 ft.

TYPE: Bentonite Chips

PVC SCREEN "x

SLOT SIZE:

TYPE:

GRAVEL PACK ft.

MATERIAL:

WELL DEPTH 55.5 ft

Abandonment Data:

0 - 3 ft. Restore Surface

3 - 60 ft. Bentonite chips

- ft.

- ft.

- ft.

REMARKS

Abandon 2" MW below well depth. Remove monument and bollards. Overdrill with 6" sonic casing. Backfill with bentonite chips and restore surface.

LANDAU ASSOCIATES

Well Decommissioning Record

Project Name: Boeing Auburn
Project Number: 025164.140.109
Location: Auburn, WA; AGW105
Date:8/14/2017
Client: Boeing
Landau Representative: KMG/AJJ
Sub Contractor : Cascade Drilling
Decommissioning Method: Overdrilling

Type of Well: Stick-up Monitoring Well
Type of Casing: 2 in PVC; schedule 40
Well Depth: 55 ft
Casing Diameter: 2 in
Depth to Water: N/A
Screen Interval: 45 – 55 ft
Well Annulus Diameter: 8 in
Filter Pack Interval: 44 – 55 ft
Notes: Removed 3 posts around well. Removed 46 ft of PVC casing. Removed PDB from screen.

If well was backfilled or grouted **N/A**

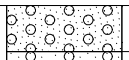
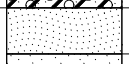
Type of backfill or grout used:
Volume of well casing and screen:
Volume of well casing, screen, and filter pack:
Volume of backfill or grout material used:
Weight of grout used:
Notes:

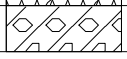
If well was over-drilled

Type of drilling equipment used: Limited-access sonic drill rig
Diameter of drill bit: 4 in
Total depth of overdrilling: 60 ft
Type of backfill or grout used: Bentonite chips (medium)
Volume of over-drilled boring:
Volume of backfill or grout used:
Weight of grout used: 50 lbs/bag * 8 bags = 400 lbs
Notes: Overdrilling was completed with 6 inch sonic casing.

Notes and Comments (materials removed during overdrilling, geology or groundwater encountered, surface conditions, unsatisfactory or unusual conditions, etc.):
Well was damaged and PVC inside the stick-up portion was shattered.

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.

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Auburn, Washington

Soil Classification System and Key

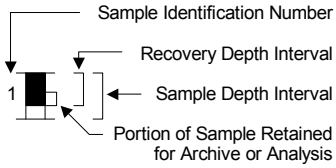
Figure 3-1 (1 of 2)

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

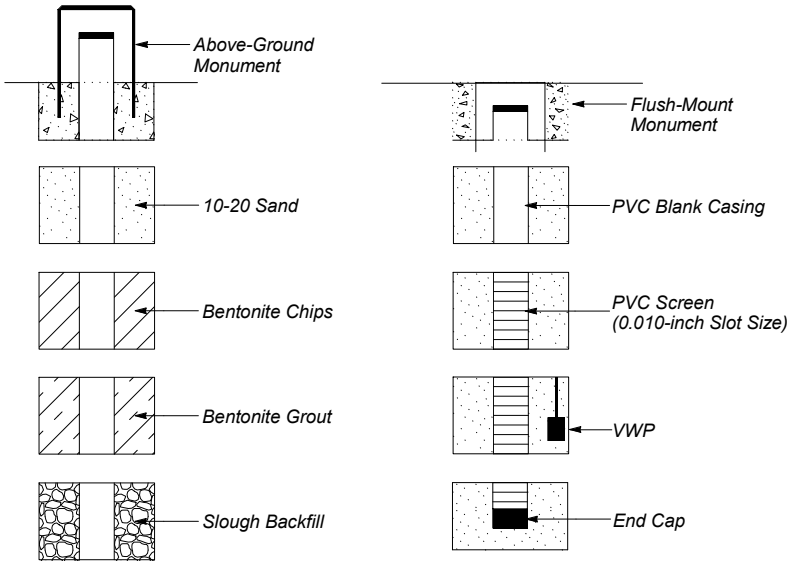
Groundwater

▽ 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



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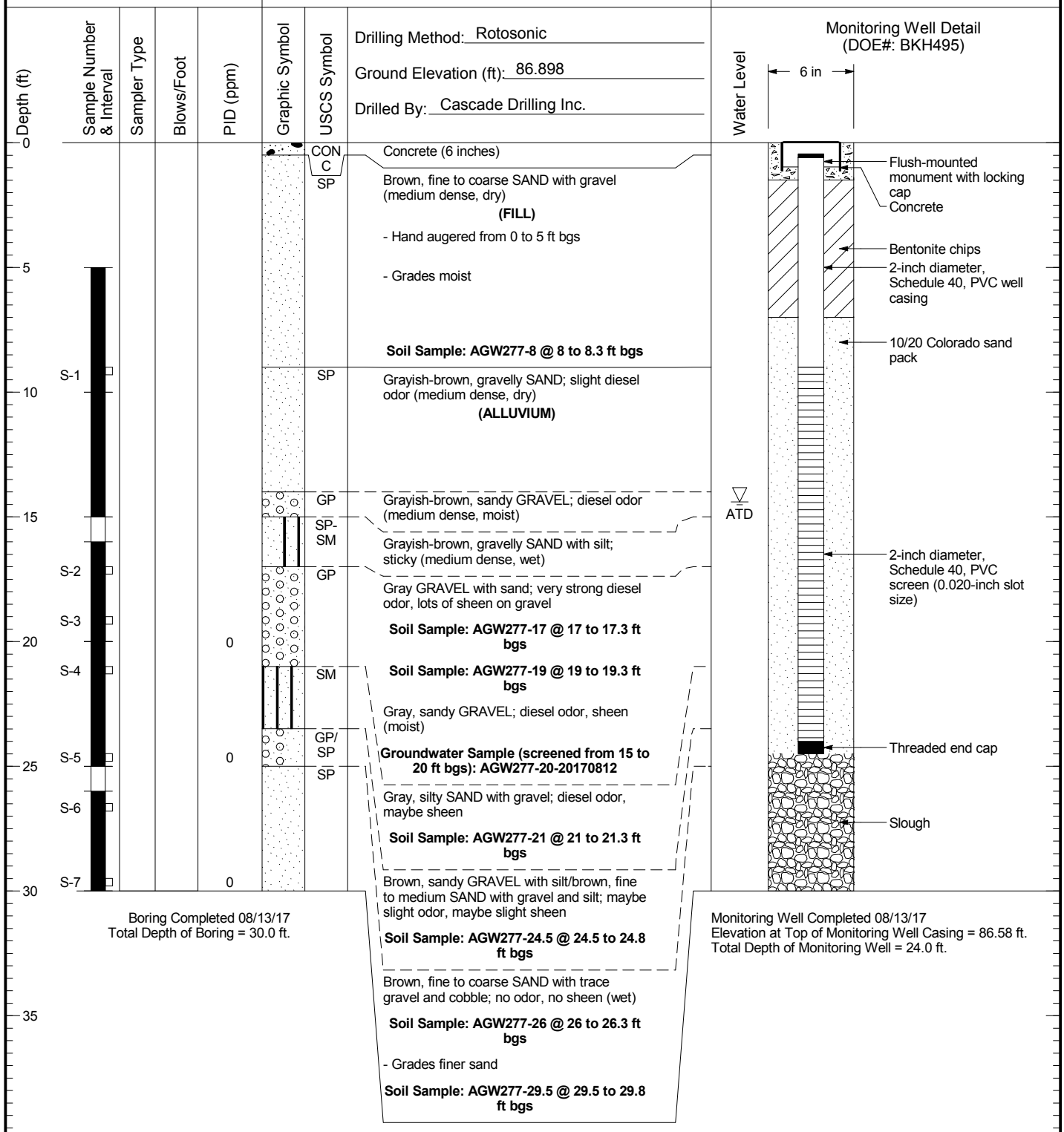
Soil Classification System and Key

Figure 3-1 (2 of 2)

AGW277



Boring Completed 08/13/17
Total Depth of Boring = 30.0 ft.

Monitoring Well Completed 08/13/17
Elevation at Top of Monitoring Well Casing = 86.58 ft.
Total Depth of Monitoring Well = 24.0 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.
4. **DOE Unique Well Number: BKH495**

025164.103 10/9/17 V:\PROJECTS\025164 - MASTER FILE.GPJ WELL LOG

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Log of Monitoring Well AGW277

Figure 3-2

AGW278

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

Drilling Method: Rotosonic
Ground Elevation (ft): 86.744
Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Soil Profile	Water Level
0						CONC	Concrete (9 inches) - Concrete coring completed 8/17/2017	
						SP-SM	Hand augered to 5.3 ft bgs. Brown, fine to coarse SAND with gravel and silt (dense, damp) **(FILL)**	
				192				
5				91				
	S-1			85			**Soil Sample: AGW278-7.5 @ 7.5 to 7.8 ft bgs**	
							- Grades dark gray	
10				69.8				
	S-2			55			**Soil Sample: AGW278-11 @ 11 to 11.3 ft bgs**	
				51				ATD
				57		GP	Gray, fine GRAVEL (pea gravel) with sand (dense, wet)	
15	S-3			60		SP-SM	Dark gray, fine to coarse SAND with gravel and silt (dense, wet)	
				56			**Soil Sample: AGW278-15 @ 15 to 15.3 ft bgs**	
20				57				
				49		GP	Gray, fine GRAVEL (pea gravel) (medium dense, wet)	
				19.5		SP-SM	Dark gray, gravelly, fine to coarse SAND with silt (medium dense, wet) **(ALLUVIUM)**	
25	S-4					GP	Gray, fine GRAVEL with some cobble and silt (mostly fine gravel) (medium dense, wet)	
				15			**Soil Sample: AGW278-25 @ 25 to 25.3 ft bgs**	
30	S-5					SP	Dark gray, fine to medium SAND (medium dense, wet)	
				14.4			**Soil Sample: AGW278-30 @ 30 to 30.3 ft bgs**	
							- Grades gravelly	
							- Grades without gravel	
35								

Monitoring Well Detail (DOE#: BIM582)

6 in

- Flush-mounted monument with locking cap
- Coated Bentonite Pellets
- 10/20 Colorado sand pack
- Sample Port 1: tubing perforations in Channel 1 with 100 mesh wrapped screen from 14.5 to 17 ft bgs
- Coated Bentonite Pellets
- 10/20 Colorado sand pack
- Sample Port 2: tubing perforations in Channel 2 with 100 mesh wrapped screen from 24 to 25 ft bgs
- Coated Bentonite Pellets

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. **DOE Unique Well Number: BIM582**

025164.103 10/9/17 V:\PROJECTS\025164 - MASTER FILE.GPJ WELL LOG

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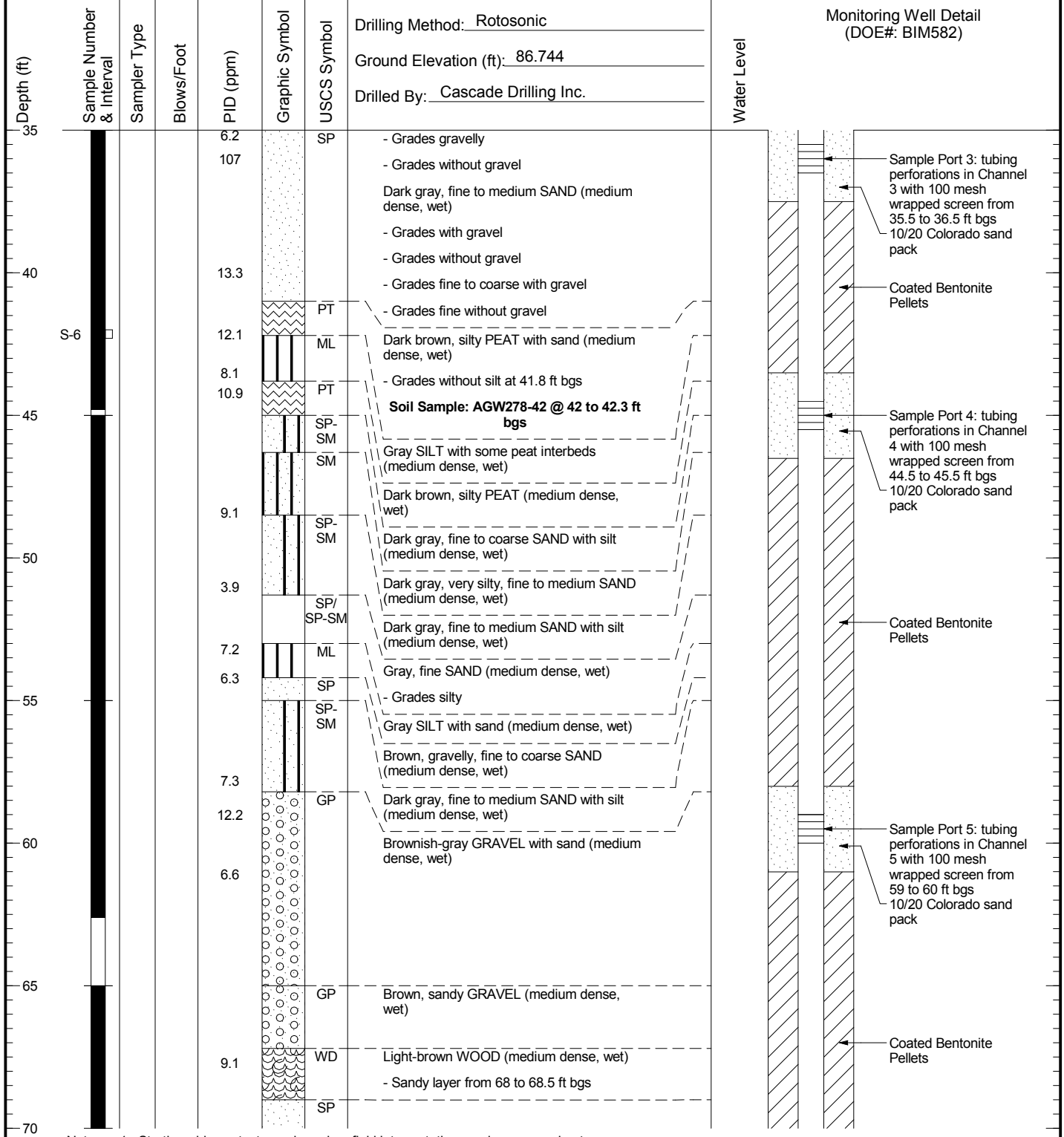
Boeing Auburn Remedial Investigation
Auburn, Washington

Log of Monitoring Well AGW278

Figure 3-3 (1 of 4)

AGW278



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. **DOE Unique Well Number: BIM582**

025164.103 10/9/17 V:\PROJECTS\025164 - MASTER FILE.GPJ WELL LOG

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Boeing Auburn Remedial Investigation
Auburn, Washington

Log of Monitoring Well AGW278

Figure 3-3 (2 of 4)

AGW278

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

Drilling Method: Rotosonic
Ground Elevation (ft): 86.744
Drilled By: Cascade Drilling Inc.

Monitoring Well Detail
(DOE#: BIM582)

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Soil Description	Water Level
70				5.3		SP	Dark gray, fine to medium SAND (medium dense, wet)	
				3.7		GP	Brownish-gray, sandy GRAVEL (medium dense, wet)	
75				5.1		GP	Gray, fine GRAVEL with sand (medium dense, wet)	
				15.2		SP	Dark gray, fine SAND (medium dense, wet)	
80								
							- Grades to fine to coarse with gravel	
				10.7			- Grades to fine without gravel	
85								
				3.7			- Grades with silt	
							- Grades without silt	
90								
95								
100								
				1.6				
105								

Sample Port 6: tubing perforations in Channel 6 with 100 mesh wrapped screen from 79 to 80 ft bgs 10/20 Colorado sand pack

Coated Bentonite Pellets

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. **DOE Unique Well Number: BIM582**

025164.103 10/9/17 V:\PROJECTS\025164 - MASTER FILE.GPJ WELL LOG

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Boeing Auburn Remedial Investigation
Auburn, Washington

Log of Monitoring Well AGW278

Figure
3-3
(3 of 4)

AGW278

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Water Level
105						SP	
				4.1			
				4.1		SP-SM	
110							
115							

Drilling Method: Rotosonic

Ground Elevation (ft): 86.744

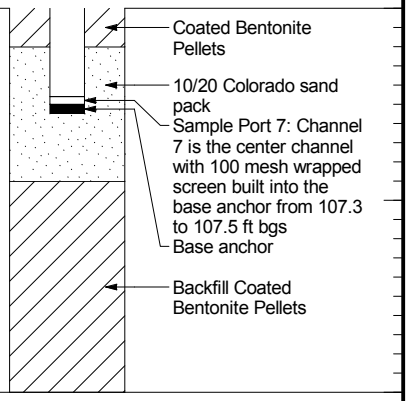
Drilled By: Cascade Drilling Inc.

Dark gray, fine SAND (medium dense, wet)

Gray, very silty, fine to medium SAND with angular to subangular gravel and clay (medium dense, wet)

(OSCEOLA MUD FLOW)

Monitoring Well Detail
(DOE#: BIM582)



Boring Completed 08/18/17
Total Depth of Boring = 115.0 ft.

Monitoring Well Completed 08/19/17
Elevation at Top of Monitoring Well Casing = 86.42 ft.
Total Depth of Monitoring Well = 109.0 ft.

120

125

130

135

140

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. **DOE Unique Well Number: BIM582**

025164.103 10/9/17 V:\PROJECTS\025164 - MASTER FILE.GPJ WELL LOG

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Auburn, Washington

Log of Monitoring Well AGW278

Figure
3-3
(4 of 4)