INTERIM MEASURE COMPLETION REPORT

NORTH AREA STORMWATER SYSTEM RETROFIT

Boeing Plant 2
Seattle/Tukwila, Washington

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LIST OF ABBREVIATIONS/ACRONYMS

Abbreviation/Acronym	Definition
Boeing	The Boeing Company
Bgs	below ground surface
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
COC	constituent of concern
EPA	United States Environmental Protection Agency
FMCL	Final Media Cleanup Level
HASP	Health and Safety Plan
IM	interim measure
IRMA	Industrial Risk Management Area
NPDES	National Pollutant Discharge Elimination System
Order	Administrative Order on Consent
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyls
PID	photoionization detector
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SRMA	Shoreline Risk Management Area
SOP	standard operating procedure
SVOC	semivolatile organic compound
TMCL	Target Media Cleanup Level
TPH	total petroleum hydrocarbons
VOC	volatile organic compound

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1.0 INTRODUCTION

This Interim Measure (IM) Completion Report has been prepared on behalf of The Boeing Company (Boeing) for the Plant 2 facility in Seattle/Tukwila, Washington. It summarizes the excavation and sampling that were completed when retrofitting the North Area stormwater system during 2011 and 2012 and provides a preliminary as-built drawing documenting design changes to the system. The IM Completion Report has been prepared, and the IM performed, in accordance with Administrative Order on Consent (Order) No. 1092-01-22-3008(h) between Boeing and the United States Environmental Protection Agency (EPA) Region X. The Order is issued pursuant to Section 3008(h) of the Solid Waste Disposal Act as amended, also referred to as the Resource Conservation and Recovery Act (RCRA).

In September 2010, Boeing submitted to the EPA the *Stormwater System Work Plan To Control Storm Drain Discharges For Boeing Plant 2* (Golder 2010a). Included in that work plan were the conceptual design for the site-wide reconfiguration of stormwater lines and outfalls, and a discussion of potential stormwater treatment options. The September 2010 work plan was approved by EPA in October 2010. Subsequent to the approval of the work plan, Boeing completed the detailed design for retrofitting the North Area stormwater system in accordance with the objectives indicated in the approved work plan, and the City of Seattle approved that design and issued Boeing permits for retrofitting the system.

In June 2011, Boeing submitted to the EPA the *Interim Measure Work Plan, North Area Stormwater System Retrofit, Boeing Plant 2*, (Golder 2011b). The IM Work Plan (Golder 2011b) detailed the proposed stormwater system retrofit components, activities, and associated soil excavations required to complete the retrofit. The EPA approved the IM Work Plan in June 2011. The final storm system retrofit design and details associated with the Round 6 stormwater source control monitoring were provided in an addendum to the June 2011 work plan in October 2011 (Golder 2011c).

As part of the sediment cleanup action and within the context of a Duwamish-wide initiative, potential sources of contamination must be identified and demonstrated to be eliminated or controlled. An objective of source control is to prevent recontamination of cleaned sediment areas, including from contaminants that might be transported through stormwater drainage systems. Similarly, the Order requires Boeing to “investigate and clean up releases of contaminants to the environment from Plant 2”, including contaminants potentially conveyed via stormwater. This IM Completion Report describes soil excavation and sampling activities that were conducted when the North Area stormwater system was retrofitted to improve the treatment and quality of stormwater before its discharge to the Duwamish Waterway. Specific modifications to the North Area stormwater system required to construct the new North Area stormwater system are itemized and discussed. Monitoring of stormwater that will be discharged from the new system is addressed in a separate IM Work Plan (Golder 2011c).

1.1 Background

The Plant 2 facility is located on 107 acres between the Duwamish Waterway and East Marginal Way South in Seattle and Tukwila. Boeing assembled aircraft and/or manufactured airplane parts at Plant 2 from the late 1930s through the mid-1990s. Some of the plant processes used hazardous chemicals, including heavy metals (chromium, zinc, copper, cadmium, and silver), cyanide, mineral acids and bases, petroleum products, polychlorinated biphenyls (PCBs), and

chlorinated solvents, such as trichloroethene, for degreasing. Plant 2 was also used for office and administrative functions and was Boeing's corporate headquarters until 2002. Many older buildings have been demolished, and the southern and northern sections of the facility have been entirely rebuilt. Plant 2 is now used for mostly research and testing, motor pooling and vehicle maintenance, and warehousing of parts and equipment. Some small-scale manufacturing operations are also ongoing, in conjunction with research and testing functions.

Figure 1 presents a general vicinity map of Plant 2, and Figure 2 presents the locations of stormwater system modifications and excavations that were completed to retrofit the North Area stormwater system. With the exception of stormwater bioswales in the North Area, small landscaped areas throughout the site, and stormwater control features being constructed in the south part of Plant 2, the ground surface at Plant 2 is either paved or covered by buildings. Stormwater falling upon pavement or buildings is discharged to the Duwamish Waterway under a National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Industrial Activities, in compliance with the State of Washington Water Pollution Control Law (Chapter 90.48 RCW) and the Federal Water Pollution Control Act (The Clean Water Act) (Title 33 United States Code, Section 1251 et seq.).

1.2 Project Description

Boeing retrofitted the stormwater system in the North Area of Plant 2, near Building 2-122, to improve the treatment and quality of stormwater before its discharge to the Duwamish Waterway. The project included the installation of five new manholes, storm gates in three of the manholes, new stormwater conveyance pipe, an oil/water separator vault, a stormwater filter system vault, a tidal valve, an overflow weir, and a flap valve. Also included were the enhancement of two bioswales, and the installation of seven new storm filter catch basins for treatment of roof drainage from Building 2-122. The storm filter catch basins for the roof drains were connected to existing storm lines around the perimeter of the building. Drainage from an eighth roof drain was tight-lined to an existing catch basin that drains to a bioswale. Retrofitting of the stormwater system required soil excavations to install the new components. None of the excavations were located within a RCRA unit. The work began in August 2011, and was completed on May 21, 2012.

All project work was conducted in accordance with the requirements of a Health and Safety Plan (HASP) that Boeing's contractor submitted for Boeing's review and comment.

1.2.1 Manholes, Storm Gates, Valves, Pipes, and Vaults

New manholes, storm gates, storm lines, and stormwater treatment vaults were installed along storm line B and storm line A, near the southwest corner of Building 2-122 (Figure 2). A new manhole (MH-1) equipped with a storm gate was installed on storm line B near its outfall, to enable diversion of the line B flow to the new treatment vaults. New storm lines and manholes MH-2 and MH-3 were installed to connect the line B storm gate manhole to the new treatment vaults, a shut-off valve was installed just downgradient of MH-1, between MH-1 and MH-2, and a storm gate was installed in MH-3. Flow from line B is being diverted to the line A treatment system except for overflows during peak storm events or maintenance periods when some line B flows are discharged through the line B outfall. The storm gate in MH-3 also allows the

diversion of some flows from line B to bypass the new treatment vaults directly to MH-5 during peak storm events or maintenance periods.

An existing fourth manhole (MH-4), located on the east side of the new treatment vaults, was equipped with a storm gate to receive and direct runoff from the parking areas on the south side of Building 2-122 (Figure 2). The storm gate in MH-4 enables the diversion of the flow from the parking areas to the new treatment vaults, except during peak storm events or maintenance periods when some flows will bypass the new treatment vaults directly to MH-5.

A fifth manhole (MH-5) was installed downgradient of the new treatment vaults and connected to the vaults with new storm lines. A flap valve was installed on the upgradient side of MH-5 to protect the treatment vaults from back flooding with tidal water during high tides. An existing manhole (MH-6), located downgradient of MH-5, was modified and connected to MH-5 with a new storm line to direct the flow from the treatment vaults to existing storm lines that flow to the line A outfall. A tidal valve was installed in one of two outfall pipes in a vault near the line A outfall to reduce tidal influence on the stormwater system. An overflow weir was installed in the second of the two outfall pipes to provide additional flow capacity during peak storm events.

The new treatment vaults consist of, from upgradient to downgradient, an oil/water separator vault and filter system vault. The oil/water separator vault is a concrete structure measuring approximately 17-feet long by 9-feet wide by 6.5-feet deep, and contains an oil retaining baffle, coalescing media, and a sediment weir. The filter system vault is a concrete structure measuring approximately 24-feet long by 8-feet wide by 5.5-feet deep, and contains an energy dissipater and a filtration bay with siphon-actuated filter cartridges. The new pipes and manholes downgradient of the new treatment vaults tie-in the treatment vaults to existing storm line discharge pipes.

1.2.2 Bioswales

Two existing bioswales, A1 and A4, are respectively located on the north and south sides of Building 2-122 (Figure 2). Both bioswales were enhanced within their current profile by installing new perforated drain pipes, gravel, filter media, and cover material.

1.2.3 Roof Drains and Storm Filter Catch Basins

Previously, the configuration of the storm drainage system on the roof of Building 2-122 consisted of approximately 32 pairs of roof drain primary inlets and overflow inlets. The primary inlets were connected directly to the stormwater system with downspouts and piping. The overflow inlets were connected to eight downspouts that discharged to the ground surface around the perimeter of the building during major storm (overflow) events. When the stormwater system was retrofitted in 2011 and 2012, the primary inlets and overflow inlets were switched, such that the primary inlets now discharge stormwater through seven of the downspouts to new filtered catch basins around the perimeter of the building. The eighth downspout is connected directly to the existing stormwater system due to constraints imposed by existing building features, and the flow from that roof drain discharges to a bioswale. During storm (overflow) events, the overflow inlets discharge stormwater through piping directly to the existing stormwater system.

New storm filter catch basins were installed at seven of eight downspout locations around the perimeter of Building 2-122 where the roof drain downspouts formerly discharged to the ground surface. The locations of the eight downspouts, clockwise from the northeast corner of Building 2-122, are respectively identified as 3A, 3B, 3C, 3D, 3E, 3F, 5A, and 5B (Figure 3). The catch basins contain between one and four siphon-actuated filters, depending on the anticipated flow volume from the roof drains. New concrete-curbed storm filter aprons were installed to convey the flow from the roof drains to the new storm filter catch basins. New pipe was installed to tie-in each of the new filtered catch basins to existing storm lines.

One filtered catch basin was not installed as originally planned at the downspout for roof drain 3F, due to underground obstructions (foundations and utilities) that prevented the installation. Rather, new pipe was installed to connect the downspout directly to the existing stormwater system, at a catch basin from which the flow drains to Bioswale A4 (Figure 2).

2.0 OBJECTIVE OF INTERIM MEASURE

The purpose of retrofitting the North Area stormwater system was to improve the treatment and quality of stormwater before its discharge to the Duwamish Waterway. Retrofitting the stormwater system required soil excavations to install the new components. As such, the objective specific to the IM Work Plan was to:

- Provide historical soil and groundwater quality data to support construction bid documents and development of contractor health and safety documents and protocol
- Identify locations of excavations to address known areas of contaminated soil based on Target Media Cleanup Levels (TMCLs) Residential Use, and Industrial Use criteria
- Describe environmental support activities to be conducted during excavation
- Describe the procedure used to update (with new data) the Plant 2 RCRA contamination database information associated with soil removed during demolition

This IM Completion Report documents the performance of those activities. As a construction-support IM Completion Report, this work was not intended to be a compliance-based final remedy or assume the methodology of future potential corrective measures. Work performed under this IM, however, was done in a manner supportive of that which might be required for a final remedy.

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3.0 PRECONSTRUCTION HISTORICAL DATA REVIEW

3.1 Previous Studies

Several historical RCRA and non-RCRA soil/groundwater and sediment investigations have been conducted in the area of the retrofitted storm line. The IM Work Plan presented summaries of major investigations that produced data evaluated to develop the IM Work Plan and to support the retrofit of the North Area stormwater system. The major investigations included the following:

- RCRA Facility investigation (RFI), Corrective Measures Study (CMS) and Corrective Measures Implementation (CMI)
- CMS Data Gap Investigations

The review of historical data was presented in Section 4 of the IM Work Plan and is summarized below.

3.2 Historical Borings

The preconstruction review of historical analytical data specific to the construction of the North Area stormwater system retrofit indicated that twelve borings were located within a 25-foot radius of the work areas as follows:

- Three borings were located within a 25-foot radius of the manholes, pipes, and treatment vaults that were installed between storm lines A and B
- One boring was located within a 25-foot radius of Bioswale A4
- Three borings were located within a 25-foot radius of Bioswale A1
- One boring was located within a 25-foot radius of the work area near the catch basin for roof drain 3A
- One boring was located within a 25-foot radius of the work area near the catch basin for roof drain 3D
- Three borings were located within a 25-foot radius of the work area near the catch basin for roof drain 3F

Soil samples were collected in all twelve of the borings and groundwater samples were collected in eight of the borings. The boring locations were shown on Figure 3 of the IM Work Plan.

3.2.1 Soil

When the IM Work Plan was submitted, the stormwater system project was located within two area types and adjacent to a third area type based on conceptual future uses that were considered at that time: the Stormwater and Industrial Areas and the Habitat Area respectively. The Stormwater Area was indicated by blue shading, the Habitat Area was indicated by gold shading, and the Industrial Area was unshaded and located upland of the Stormwater and Habitat Areas as presented in Figure 3 of the IM Work Plan. Soil analytical data within a 25-foot

buffer of excavations planned in each area were evaluated based on comparison to the applicable TMCL and land use criteria as presented in Table 1 of the IM Work Plan, recognizing that TMCLs as submitted in late May 2011 had not yet been approved by EPA. As such, the criteria used in the IM Work Plan to evaluate the analytical data were as follows:

- Stormwater Area – TMCL, Residential Use, and Industrial Use criteria
- Industrial Area – Industrial Use criteria

Detected constituents of concern (COCs) in soil samples, and the subset of COCs that were detected in concentrations above the applicable criteria were presented in Table 3 of the IM Work Plan. The soil analytical data were discussed in Section 4 of the IM Work Plan, and all soil analytical results, including non-detects, were presented in Table A1 of electronic Appendix A in the IM Work Plan. The data are briefly summarized below.

No soil COCs were detected in concentrations above the applicable criteria in ten of the borings, and soil COCs were detected in concentrations above the applicable criteria in two of the borings. The two borings in which COCs were detected in concentrations above the applicable criteria included NA-DP-08 and HP-AL-34 (Figure 3 of the IM Work Plan).

Boring NA-DP-08 was located adjacent to the new storm line that connected Line B to the new stormwater treatment vaults on Line A. COCs detected in concentrations above the residential use criteria or the EPA TMCLs in NA-DP-08 included mercury and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) - benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene) at 4 to 5 feet below ground surface (bgs); and arsenic, mercury tetrachloroethene, and cPAHs at 9 to 10 feet bgs. Based upon the detection of COCs in concentrations above the applicable criteria at boring NA-DP-08, and the location of that boring alongside the required excavation for the installation of the new storm line to tie-in line B to line A, a target excavation was planned and conducted for the removal of the impacted soil at that location. Details of supplemental and confirmational sampling conducted in association with the excavation at NA-DP-08 are provided in Sections 5.1.2 and 5.1.3, respectively.

Boring HP-AL-34 was located within 25 feet of Bioswale A1, but was outside the construction area of that bioswale. Trichloroethene was detected at a concentration above the applicable criteria in HP-AL-34 at a depth of 2.5 to 4 feet bgs. Since the location of boring HP-AL-34 was outside the construction area for Bioswale A1, no target excavation was planned at that location during the retrofit project but will be addressed under the Corrective Measures Study process.

3.2.2 Groundwater

Historical groundwater samples were collected in eight of the twelve borings that were located within a 25-foot radius of the excavation areas required for the retrofit of the North Area stormwater system. Groundwater samples were collected in three borings near the location of the new manholes, pipes and treatment vaults that were installed between storm lines B and A; in three borings near Bioswale A1; and in two borings near the new catch basin for roof drain 3F. Recent and historical groundwater analytical data were evaluated based on comparison to the EPA Groundwater TMCLs that were being used when the IM Work Plan was submitted.

Although no groundwater remedial actions were planned during the IM, groundwater data were reviewed and provided for the purpose of construction worker health and safety. Detected groundwater sample COCs and those COCs that were detected in concentrations above the groundwater TMCLs were discussed in Section 4 and presented in Table 4 of the IM Work Plan. All groundwater analytical data were presented in Table A2 of electronic Appendix A in the IM Work Plan.

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4.0 EXCAVATIONS

Excavations required to retrofit the stormwater system as indicated in Section 1.2 of this IM Completion Report ranged in depth from approximately 1 to 11 feet bgs:

- The installation of the new manholes, storm lines and treatment vaults for storm lines B and A required the excavation of an estimated 1,100 cubic yards of soil. The excavations ranged in depth from approximately 5 to 11 feet bgs. Although groundwater was encountered in the deepest excavations, removal of groundwater was not required to complete the excavations.
- A target excavation was completed at the location of historical boring NA-DP-08 (Figure 2); adjacent to the new storm line that connects line B to the new treatment vaults on line A. The excavation was conducted to remove soil impacted with cPAHs and metals, as discussed in Section 3.2.1 of this IM Completion Report and Section 5.1 of the IM Work Plan (Golder 2011b). The target excavation measured approximately 10 feet square, extended to a depth of approximately 11 feet bgs, and resulted in the removal of approximately 40 cubic yards of soil. The excavation was conducted to reduce the potential for future remedial actions in this location under the RCRA process that could jeopardize the integrity of the new stormline; however, there is no presumption that this excavation is considered a final remedy.
- The enhancement of the bioswales required the excavation of approximately 72 cubic yards of material at Bioswale A4 and 12 yards of material at Bioswale A1. The excavations generally consisted of shallow excavation and regrading of the bioswales in preparation for placing new bioswale filtering materials. Groundwater was not encountered in the bioswale excavations.
- The installation of the new storm filter catch basins and filter aprons at the locations of seven downspouts, pipes to tie-in the catch basins to existing storm lines, and a pipe to tie-in the eighth downspout to an existing storm line required the removal of 14 to 50 cubic yards of pavement and soil at each of the locations, or a cumulative total of approximately 250 cubic yards of material. The excavations ranged in depth from approximately 1 foot bgs for the filter aprons to 5 feet bgs for the storm filter catch basins to as much as 10 feet bgs to install pipes to connect to existing storm lines. Groundwater was not encountered in these excavations.

All excavated soil was properly characterized for reuse or disposal. Groundwater was not removed from any of the excavations.

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5.0 CONSTRUCTION SUPPORT ACTIVITIES

Construction support activities included visual monitoring of the removal of pavement and soil from the excavation areas, monitoring the excavated materials as needed for volatile organic compounds (VOCs) using a photoionization detector (PID), and soil sampling. The excavated materials were segregated as they were removed and properly characterized for reuse or disposal.

5.1 Soil Sampling

Six soil samples were collected in the target excavation at the location of boring NA-DP-08, and one soil sample was collected in a trench near roof drain 5A. The samples consisted of grab soil samples. The soil sampling is summarized in Table 4 and discussed below.

5.1.1 Evaluation Criteria

The evaluation criteria and the conceptual use area types that were presented in the IM Work Plan were modified after the IM Work Plan was approved and are presented as Final Media Cleanup Levels (FMCLs) in Uplands Corrective Measure Study Volume Xa: South Plant 2 Corrective Measures Study Report (EPI. et. al 2012 [Pending]). The current evaluation criteria are presented in Tables 1 and 2, and the current boundaries of the re-named conceptual use areas are shown in Figure 2. The stormwater system retrofit project was conducted within the boundaries of two conceptual land use areas: The Industrial Risk Management Area (IRMA) and the Unpaved Shoreline Risk Management Area (Unpaved SRMA). In Figure 2, the IRMA is the unshaded area located upland of the Unpaved SRMA, and the Unpaved SRMA is the yellow-shaded area located between the IRMA and the Bank Risk Management Area or the Habitat Risk Management Area.

Analytical data for soil samples collected during the North Area Stormwater System Retrofit project were compared to the appropriate revised criteria and conceptual land use area types as presented in Tables 1 and 2, and shown in Figure 2 respectively. The criteria for soil removal includes the IRMA FMCL in the Industrial Area and the Unpaved SRMA FMCL in the Unpaved Shoreline Area.

Detected COCs in soil samples, and the subset of COCs that were detected in concentrations above the applicable criteria are presented in Table 3. The soil analytical data are discussed below. All soil analytical results, including non-detects, are presented in Table A of Appendix A.

5.1.2 Supplemental Sampling

Soil sampling was conducted to supplement existing data where the target excavation at NA-DP-08 resulted in the removal of soil where previous RCRA samples were collected. As such, three samples were collected from the target excavation's east sidewall near the original locations of three NA-DP-08 samples that were removed by the excavation. The supplemental samples were collected from 0 to 1 foot bgs (P2IM-NASW-01), 4 to 5 feet bgs (P2IM-NASW-02) and 9 to 10 feet bgs (P2IM-NASW-03), and analyzed for VOCs, SVOCs, PAHs, cPAHs, PCBs, metals, and TPH.

The analytical results for the supplemental samples were compared to the Unpaved SRMA FMCL criteria. The results indicated that Total PCBs were detected in sample P2IM-NASW-01

at a depth of 0 to 1 foot bgs at a concentration of 145 micrograms/kilograms (µg/kg), above the Unpaved SRMA FMCL criteria of 30 µg/kg. Soil represented by this sample will be addressed by the Corrective Measures Study process.

The analytical results also indicated that cPAHs were detected in samples P2IM-NASW-01 and P2IM-NASW-02 at a depths of 0 to 1 foot bgs and 4 to 5 feet bgs (respectively)at concentrations below the Unpaved SRMA FMCLs for that COC. Additionally, VOCs, SVOCs, metals, and/or total petroleum hydrocarbons (TPH) were variously detected in all three samples at concentrations below their respective Unpaved SRMA FMCLs. Soil represented by these samples will be further evaluated under the Corrective Measures Study process.

5.1.3 Confirmation Sampling

Three confirmation samples were collected in the NA-DP-08 target excavation and one sample was collected near roof drain 5A to confirm that contaminated soil had been removed. In the NA-DP-08 target excavation, one sample (P2IM-SM-04) was collected from the north sidewall a depth of 4 to 5 feet bgs, a second sample (P2IM-SM-05) was collected from the south sidewall at a depth of 4 to 5 feet bgs, and a third sample (P2IM-NASW-06) was collected from the bottom of the excavation at a depth of 11 to 12 feet bgs. The samples from the NA-DP-08 target excavation were analyzed for SVOCs, cPAHs, and metals. One sample (P2IM-NASW-08) was collected at a depth of 4 feet bgs in a trench near roof drain 5A where the PID indicated the potential presence of VOCs in the soil, and the sample was analyzed for VOCs and metals. The sample locations are shown in Figure 2.

The analytical results for the confirmation samples from the NA-DP-08 target excavation were compared to the Unpaved SRMA FMCL criteria, and the results for the sample from the trench near roof drain 5A were compared to the IRMA FMCL criteria. The analytical results indicated that no COCs were detected in any of the confirmation samples at concentrations above the applicable FMCL criteria. Soil represented by these samples will be further evaluated under the Corrective Measures Study process.

5.2 Laboratory Analysis

Soil sampling analytical methods, reporting limits and laboratory quality assurance and quality control were subject to Section 36 of Boeing's January 2011 version of the *Compendium of Sampling and Analysis Plans and Quality Assurance Project Plans, Section 36, Laboratory QA Plan, SOPs, MDL Studies, and CLs* (Golder 2011a).

6.0 DESIGN CHANGES FROM WORK PLAN

Several minor design changes were made as a result of site conditions that were not anticipated in the approved IM Work Plan. Each of the changes were specific to detailed design aspects of the system and as such were not communicated to EPA with the exception of the change to the 36-inch diameter tidal valve, which necessitated a schedule delay and was communicated to EPA in an email (Boeing 2012). The following is a brief description of the design changes:

- The locations of MH-2, MH-3, the Oil-Water Separator vault, the Filter Vault, and the storm line connecting line B to the line A treatment vaults were shifted 12 feet west of the design location to avoid underground obstructions and utilities, and the removal of existing trees.
- Rather than installing a 48-inch diameter tidal valve in MH 2-448, a 36-inch diameter tidal valve was installed in one of two 36-inch diameter outfall pipes at vault 2-449, and an overflow weir was installed in the other 36-inch diameter outfall pipe at vault 2-449. The 36-inch diameter valve and the weir were installed after several unsuccessful attempts to functionally install the 48-inch valve in MH 2-448.
- The design intended the installation of a filter catch basin and piping to tie-in roof drain 3F to existing catch basin (CB) 2-368. A filter catch basin was not installed as planned for roof drain 3F, due to underground obstructions including foundations and utilities. Rather, flow from the downspout was piped directly to CB 2-369, which drains to Bioswale A4 south of building 2-122.
- Rather than replacing existing manhole 2-374 with new manhole MH-4, the existing manhole 2-374 was utilized, and is shown in Figure 2 as MH-4. The manhole was modified as needed to install a new stormgate per the design.
- The orientations of several of the filter catch basins for roof drains were rotated as needed to avoid obstructions such as foundations and utilities.

None of the design changes will materially affect the overall function of the retrofitted stormwater system.

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7.0 SUMMARY

The North Area Stormwater system was retrofitted to improve the treatment and quality of stormwater before its discharge to the Duwamish Waterway. The retrofit included the following:

- The installation of five new manholes
- The installation of storm gates in three of the manholes
- The installation of new stormwater conveyance pipe
- The installation of an oil/water separator vault and a stormwater filter system vault
- The installation of a tidal valve and an overflow weir near the outfall for storm line A
- The installation of a flap valve at a manhole downgradient of the treatment vaults to protect the vaults against tidal backflooding
- The installation of seven new storm filter catch basins to treat roof drainage from Building 2-122, and the installation of new pipes to connect all roof drainage to the stormwater system
- The enhancement of two bioswales
- The diversion of stormwater from storm line B to the new treatment vaults at Storm line A

The project was completed in late May 2012 when the 36-inch diameter tidal valve was successfully installed.

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8.0 REFERENCES

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TABLES

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Table 1: Soil Evaluation Criteria by Use Area Type
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

FMCL Based Evaluation Criteria for Plant 2 Projects			
Area Type	**Location**	**Evaluation Criteria**	**RCRA Action**
Industrial Risk Management Area (IRMA)	Unshaded Area between East Marginal Way S. and Upland Edge of SRMA as shown in Figure 2	Industrial	RCRA: Upland Soil
Unpaved Shoreline Risk Management Area (SRMA)	Yellow-shaded Area between IRMA and Bank Risk Management Area or Habitat Risk Management Area as Shown in Figure 2	Unpaved Shoreline	RCRA: Upland Soil

Notes: Industrial and Unpaved Shoreline Area Cleanup Criteria are implemented through FMCLs

Abbreviations:

FMCLs -Final Media Cleanup Levels (EPI et. al. 2012 Pending)

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Table 2: Soil Cleanup Levels by Use Area Type
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Constituent	Units	Evaluation Criteria			Criteria for Removal by Area Type	
		Industrial Risk Management Area FMCL (IRMA FMCL)	Unpaved Shoreline Risk Management Area FMCL (Unpaved SRMA FMCL)	TMCL	IRMA FMCL	Unpaved SRMA FMCL
INORGANICS						
Antimony	mg/kg	200	31	31	200	31
Arsenic	mg/kg	88	20	20	88	20
Barium	mg/kg	99,000	15,000	100	99,000	15,000
Cadmium	mg/kg	450	4	4	450	4
Chromium(VI)	mg/kg	28	1.20	1.20	28	1.20
Cobalt	mg/kg	150	23	--	150	23
Copper	mg/kg	20,000	80	80	20,000	80
Cyanide	mg/kg	10,000	20	20	10,000	20
Iron	mg/kg	360,000	59,000	--	360,000	59,000
Lead	mg/kg	1,000	250	250	1,000	250
Manganese	mg/kg	12,000	1,800	1,800	12,000	1,800
Mercury	mg/kg	28	1.5	1.5	28	1.5
Mercury (inorganic salts)	µg/kg	150,000	23,000	--	150,000	23,000
Molybdenum	mg/kg	2,500	390	--	2,500	390
Nickel	mg/kg	10,000	210	210	10,000	210
Selenium	mg/kg	2,500	390	1.00	2,500	390
Zinc	mg/kg	150,000	1,400	1,400	150,000	1,400
SEMIVOLATILE ORGANIC COMPOUNDS						
Phthalates						
bis(2-Ethylhexyl)phthalate	µg/kg	770,000	35,000	35,000	770,000	35,000
Carcinogenic Polycyclic Aromatic Hydrocarbons						
Total cPAH as Bap TEQ	µg/kg	1,400	140	15	1,400	140
Non-carcinogenic Polycyclic Aromatic Hydrocarbons						
Naphthalene	µg/kg	180,000	3,600	3,600	180,000	3,600
1-Methylnaphthalene	µg/kg	350,000	16,000	16,000	350,000	16,000
Pyrene	µg/kg	11,000,000	240,000	240,000	11,000,000	240,000
POLYCHLORINATED BIPHENYLS						
Total PCB	µg/kg	10,000	30	1.8	10,000	30
VOLATILE ORGANIC COMPOUNDS						
Chlorinated Volatile Organic Compounds						
Vinyl chloride	µg/kg	670	670	0.081	670	670
Trichloroethene	µg/kg	270	18	18	270	18
1,1,2,2-Tetrachloroethane	µg/kg	23,000	13	13	23,000	13
1,1,2-Trichloroethane	µg/kg	48,000	73	73	48,000	73
1,1-Dichloroethane	µg/kg	3,300	710	710	3,300	710
1,1-Dichloroethene	µg/kg	1,000,000	81	81	1,000,000	81
1,2,4-Trichlorobenzene	µg/kg	490,000	80	80	490,000	80
cis-1,2-Dichloroethene	µg/kg	160,000	2,600	2,600	160,000	2,600
Tetrachloroethene	µg/kg	560	1.6	1.6	560	1.6
Methylene chloride	µg/kg	11,000	650	650	11,000	650
Aromatic Volatile Organic Compounds						
Benzene	µg/kg	1,100	93	93	1,100	93
Ethylbenzene	µg/kg	240,000	230	230	240,000	230
Xylenes (total)	µg/kg	29,000,000	100,000	100,000	29,000,000	100,000
Xylenes (total)	µg/kg	630,000	200,000	200,000	630,000	200,000

Table 2: Soil Cleanup Levels by Use Area Type
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Constituent	Units	Evaluation Criteria			Criteria for Removal by Area Type	
		Industrial Risk Management Area FMCL (IRMA FMCL)	Unpaved Shoreline Risk Management Area FMCL (Unpaved SRMA FMCL)	TMCL	IRMA FMCL	Unpaved SRMA FMCL
PETROLEUM HYDROCARBONS						
TPH (undifferentiated)	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH - Bunker C	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH, Gasoline Range	mg/kg	30	30	30	30	30
TPH - Heavy Fuel Oil Range	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH - Jet fuel as Jet A	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH - Jet fuel as JP-4	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH - Kerosene Range	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH - Lube Oil Range	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH, Mineral Spirits Range	mg/kg	100	100	100	100	100
TPH, Diesel Range	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH, Motor Oil Range	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH - Non-petroleum hydrocarbon as diesel	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH, Oil and Grease	mg/kg	2,000	2,000	2,000	2,000	2,000
TPH - Petroleum hydrocarbon as diesel	mg/kg	2,000	2,000	2,000	2,000	2,000

Notes:

Abbreviations:

FMCL - Final Media Cleanup Levels (EPI. et. al. 2012 Pending)

TMCL -Target Media Cleanup Level (Boeing 2011)

Table 3: Soil COC Detections and Exceedances
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	1-Methylnaphthalene	3.5	J	TRUE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	2-Butanone	7.4		TRUE	µg/kg							430000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	2-Methylnaphthalene	5.5		TRUE	µg/kg							230000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Acenaphthene	3.8	J	TRUE	µg/kg							230000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Acenaphthylene	3.2	J	TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Acetone	71		TRUE	µg/kg							510000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Aluminum	9930		TRUE	mg/kg							77000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Anthracene	4.2	J	TRUE	µg/kg							1600000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1254	80		TRUE	µg/kg							0.29	YES
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1260	65		TRUE	µg/kg							5.4	YES
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Arsenic	6		TRUE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Barium	42.9		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Benzo(a)anthracene	23		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Benzo(a)pyrene	33		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Benzo(g,h,i)perylene	44		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Beryllium	0.2		TRUE	mg/kg							160	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Cadmium	0.3		TRUE	mg/kg	450	NO	4	NO	4	NO	4	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Carbon Disulfide	22		TRUE	µg/kg							75000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Chromium	18.4		TRUE	mg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Chrysene	33		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Cobalt	5.7		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Copper	19.5		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Dibenz(a,h)anthracene	4.7		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Dibenzofuran	4.4	J	TRUE	µg/kg							120000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Fluoranthene	50		TRUE	µg/kg							230000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Fluorene	2.7	J	TRUE	µg/kg							150000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Indeno(1,2,3-cd)pyrene	21		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Iron	14100		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Lead	15		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Magnesium	3300		TRUE	mg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Manganese	165		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 7471A	Mercury	0.04		TRUE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Molybdenum	0.5		TRUE	mg/kg	2500	NO	390	NO	390	NO	20	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Naphthalene	6		TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Nickel	14		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Phenanthrene	24		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Pyrene	53		TRUE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Total Benzofluoranthenes	58		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Total cPAH as Bap TEQ	37.73		TRUE	µg/kg	1400	NO	140	NO	140	NO	15	YES
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Total PCB	145		TRUE	µg/kg	10000	NO	220	NO	30	YES	1.8	YES
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	NWTPH-Dx-Cleaned	TPH - Bunker C	280		TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	NWTPH-Dx-Cleaned	TPH - Diesel Range	18	J	TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	NWTPH-Dx-Cleaned	TPH - Motor Oil Range	160		TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Vanadium	45.2		TRUE	mg/kg							700	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Zinc	51		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	1-Methylnaphthalene	19		TRUE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	2-Methylnaphthalene	22		TRUE	µg/kg							230000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Acenaphthene	42		TRUE	µg/kg							230000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Acenaphthylene	6.2		TRUE	µg/kg								

Note: Shading indicates exccedance of screening criteria

Table 3: Soil COC Detections and Exceedances
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Acetone	29		TRUE	µg/kg							510000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Aluminum	9300		TRUE	mg/kg							77000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Anthracene	26		TRUE	µg/kg							1600000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Arsenic	6		TRUE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Barium	43.4		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(a)anthracene	44		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(a)pyrene	50		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(g,h,i)perylene	29		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Beryllium	0.1		TRUE	mg/kg							160	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Cadmium	0.3		TRUE	mg/kg	450	NO	4	NO	4	NO	4	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Carbazole	14	J	TRUE	µg/kg							50000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Chromium	15.5		TRUE	mg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Chrysene	58		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Cobalt	4.9		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Copper	17		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Dibenz(a,h)anthracene	3.6	J	TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Dibenzofuran	27		TRUE	µg/kg							120000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Fluoranthene	80		TRUE	µg/kg							230000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Fluorene	28		TRUE	µg/kg							150000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Indeno(1,2,3-cd)pyrene	24		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Iron	12700		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Lead	23		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Magnesium	2500		TRUE	mg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Manganese	136		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 7471A	Mercury	0.05		TRUE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Methylene Chloride	7.4		TRUE	µg/kg	11000	NO	11000	NO	650	NO	650	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Molybdenum	0.5		TRUE	mg/kg	2500	NO	390	NO	390	NO	20	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Naphthalene	17		TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Nickel	11		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Phenanthrene	100		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Pyrene	88		TRUE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Total Benzofluoranthenes	94		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Total cPAH as Bap TEQ	57.38		TRUE	µg/kg	1400	NO	140	NO	140	NO	15	YES
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	NWTPH-Dx-Cleaned	TPH - Bunker C	54		TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	NWTPH-Dx-Cleaned	TPH - Diesel Range	6	J	TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	NWTPH-Dx-Cleaned	TPH - Motor Oil Range	28		TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Vanadium	42.3		TRUE	mg/kg							700	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Zinc	50		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Acetone	17		TRUE	µg/kg							510000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Aluminum	6720		TRUE	mg/kg							77000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Barium	25.6		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Chromium	9	J	TRUE	mg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Cobalt	3.4		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Copper	8.7		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Iron	10800		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Magnesium	1860		TRUE	mg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Manganese	83.6		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Molybdenum	0.5		TRUE	mg/kg	2500	NO	390	NO	390	NO	20	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Naphthalene	2.6	J	TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO

Note: Shading indicates exccedance of screening criteria

Table 3: Soil COC Detections and Exceedances
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Nickel	6		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Phenanthrene	3	J	TRUE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Vanadium	36.6		TRUE	mg/kg							700	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Zinc	20		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	1-Methylnaphthalene	10	J	TRUE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	2-Methylnaphthalene	15		TRUE	µg/kg							230000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Acenaphthylene	8.2	J	TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Aluminum	8420		TRUE	mg/kg							77000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Anthracene	5.2	J	TRUE	µg/kg							1600000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Barium	39.6		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Benzo(a)anthracene	25		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Benzo(a)pyrene	28		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Benzo(g,h,i)perylene	22		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Beryllium	0.1		TRUE	mg/kg							160	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Cadmium	0.3		TRUE	mg/kg	450	NO	4	NO	4	NO	4	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Chromium	12.4		TRUE	mg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Chrysene	33		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Cobalt	4.3		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Copper	14.6		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Fluoranthene	53		TRUE	µg/kg							230000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Indeno(1,2,3-cd)pyrene	19		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Iron	11600		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Lead	18		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Magnesium	2080		TRUE	mg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Manganese	139		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 7471A	Mercury	0.02		TRUE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Naphthalene	40		TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Nickel	8		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Phenanthrene	42		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Pyrene	56		TRUE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Total Benzofluoranthenes	47		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Total cPAH as Bap TEQ	32.73		TRUE	µg/kg	1400	NO	140	NO	140	NO	15	YES
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Vanadium	43.6		TRUE	mg/kg							700	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Zinc	43		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	1-Methylnaphthalene	3.5	J	TRUE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	2-Methylnaphthalene	3.5	J	TRUE	µg/kg							230000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Aluminum	7280		TRUE	mg/kg							77000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Anthracene	3.6	J	TRUE	µg/kg							1600000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Barium	28.9		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(a)anthracene	12	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(a)pyrene	14	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(g,h,i)perylene	12	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Chromium	10.6		TRUE	mg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Chrysene	17	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Cobalt	3.9		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Copper	14.1		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Dibenzofuran	2.4	J	TRUE	µg/kg							120000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Fluoranthene	23		TRUE	µg/kg							230000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Indeno(1,2,3-cd)pyrene	11	J	TRUE	µg/kg								

Note: Shading indicates exccedance of screening criteria

Table 3: Soil COC Detections and Exceedances
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Iron	11100		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Lead	5		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Magnesium	2060		TRUE	mg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Manganese	95.1		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Naphthalene	3.8	J	TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Nickel	8		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Phenanthrene	12	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Pyrene	26		TRUE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Total Benzofluoranthenes	29		TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Total cPAH as Bap TEQ	16.47	J	TRUE	µg/kg	1400	NO	140	NO	140	NO	15	YES
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Vanadium	39.3		TRUE	mg/kg							700	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Zinc	26		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Aluminum	10600		TRUE	mg/kg							77000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Barium	28.3		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Beryllium	0.2		TRUE	mg/kg							160	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Chromium	17.3		TRUE	mg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Cobalt	4.3		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Copper	27.1		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Iron	10000		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Magnesium	2420		TRUE	mg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Manganese	79.7		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Nickel	8		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Phenanthrene	5.4		TRUE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Vanadium	47.4		TRUE	mg/kg							700	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Zinc	34		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Acetone	35		TRUE	µg/kg							510000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Arsenic	7		TRUE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Barium	50.3		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Carbon Disulfide	3.3		TRUE	µg/kg							75000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Chromium	18.1		TRUE	mg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Lead	19		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 7471A	Mercury	0.05		TRUE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO

Note: Shading indicates exccedance of screening criteria

Table 4: Soil Sampling Log
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Sample Number	Sample Date	Depth (ft)	SDG	Location/Purpose		Analytes
				Purpose or Location	Sample Type	
SUPPLEMENTAL SOIL SAMPLES						
P2IM-NASW-01-01-S	9/9/2011	0 - 1	TL75	East Sidewall of Target Excav NA-DP-08, Replaces Sample NA-DP-08-01-S-0	Supplemental	VOCs, SVOCs & SIM PAHs, PCBs, Metals, TPH-Dx (to Bunker C), NWTPH-Gx
P2IM-NASW-02-05-S	9/9/2011	4 - 5	TL75	East Sidewall of Target Excav NA-DP-08, Replaces Sample NA-DP-08-04-S-0	Supplemental	VOCs, SVOCs & SIM PAHs, PCBs, Metals, TPH-Dx (to Bunker C), NWTPH-Gx
P2IM-NASW-03-10-S	9/9/2011	9 - 10	TL75	East Sidewall of Target Excav NA-DP-08, Replaces Sample NA-DP-08-09-S-0	Supplemental	VOCs, SVOCs & SIM PAHs, PCBs, Metals, TPH-Dx (to Bunker C), NWTPH-Gx
CONFIRMATION SOIL SAMPLES						
P2IM-NASW-04-05-S	9/9/2011	4 - 5	TL75	North Sidewall, Target Excav NA-DP-08	Confirmation	SVOCs & SIM PAHs, Metals
P2IM-NASW-05-05-S	9/9/2011	4 - 5	TL75	South Sidewall, Target Excav NA-DP-08	Confirmation	SVOCs & SIM PAHs, Metals
P2IM-NASW-06-12-S	9/9/2011	11 - 12	TL75	Bottom, Target Excav NA-DP-08	Confirmation	SVOCs & SIM PAHs, Metals
P2IM-NASW-08-04-S	9/6/2011	4	TL09	PID indicated potential contamination near Roof Drain 5A, 18ft E of curb in tie-in trench	Confirmation	VOCs, RCRA Metals

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FIGURES

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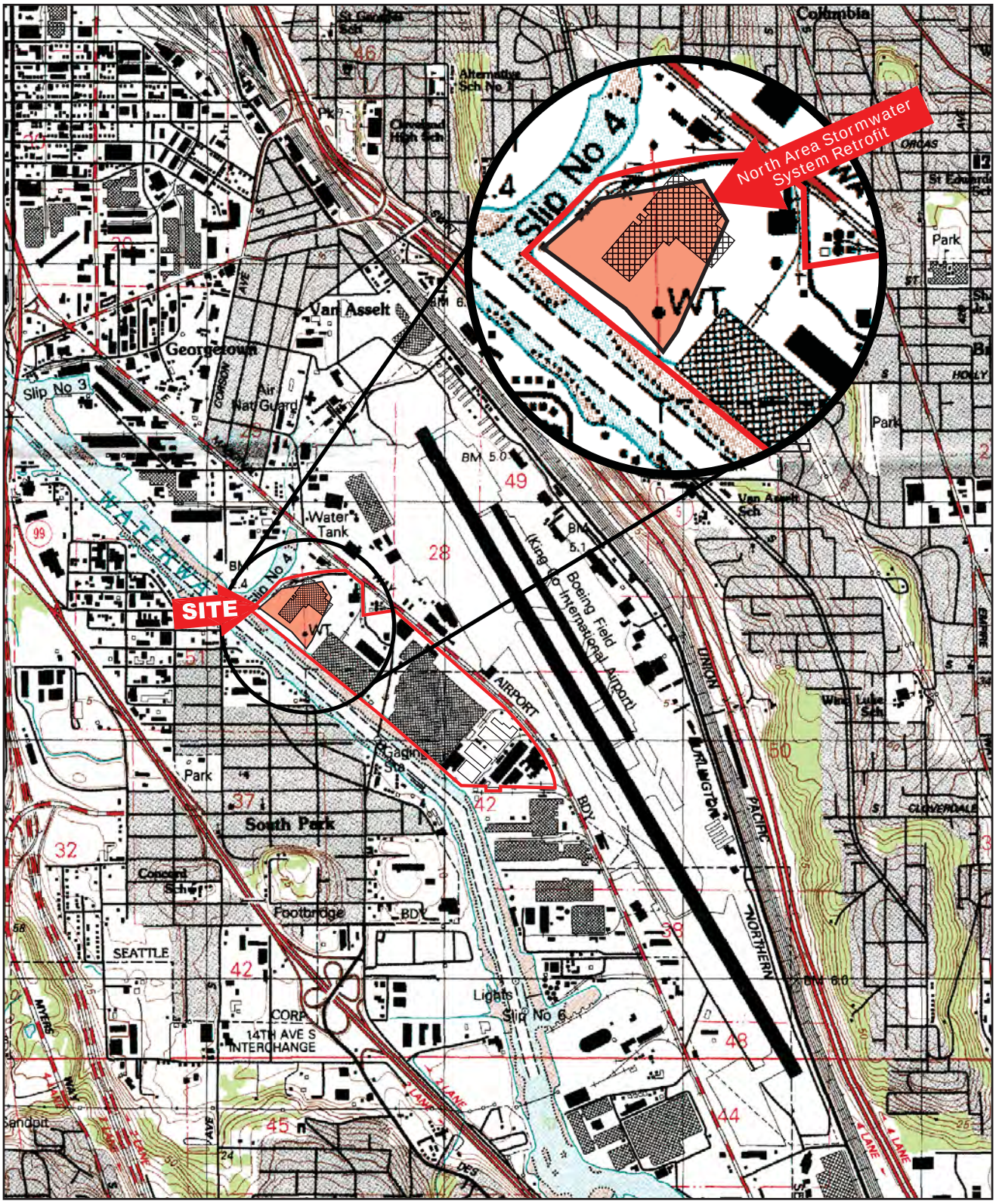

Golder Associates

SHEET	DRAWN BY	REVIEWED BY	DATE
1 of 1	AMP	SM	06/11/12

North Area Stormwater System Retrofit
Boeing Plant 2
Seattle, Washington

Figure 1
Vicinity Map

0131646011300001fig01_R5.ai

EAST MARGINAL WAY SOUTH

2-122 BUILDING

2-123

2-120

2-124

2-10

PLA-1

PLA-2

141

Roof Drain 3A

Roof Drain 3B

Roof Drain 3C

Roof Drain 3D

Roof Drain 3E

Roof Drain 3F

Roof Drain 5A

Roof Drain 5B

MH 2-368

CB 2-369

Enhanced Bioswale A1

Enhanced Bioswale A2

OA 4 Scattered PCB Exceedances

DUWAMISH SLIP NO. 4

New Overflow Weir

Storm Line "A" Outfall

MH 2-449

MH 2-448

New Tideflex Valve

P2IM-NASW-08

MH-6

MH-5

MH-4

MH-3

MH-2

MH-1

New Flap Valve

New Stormgate Manhole

New Stormgate Manhole

New Shut-off Valve

P2IM-NASW-01

P2IM-NASW-02

P2IM-NASW-03

P2IM-NASW-04

P2IM-NASW-05

P2IM-NASW-06

New Oil/Water Separator

New Stormwater Filter System

New Stormgate Manhole

Storm Line "B" Outfall

Target Excavation NA-DP-08

DUWAMISH COMMERCIAL WATERWAY

LEGEND

- New Stormwater System Vaults or Structures
- Bank Risk Mgt Area
- Unpaved Shoreline Risk Mgt Area
- Habitat Risk Mgt Area
- Industrial Risk Mgt Area (unshaded area upland of Unpaved Shoreline & Bank Areas)
- Target Excavation
- New Stormwater System Manhole
- New Storm Line & Flow Direction
- Existing Storm Line & Flow Direction
- Abandoned or Removed Storm Line
- P2IM-NASW-01 Soil Sample Collected in Excavation

TRUE NORTH

PLANT NORTH

0 125 250

SCALE IN FEET

FIGURE 2

PRELIMINARY AS-BUILT

NORTH AREA STORMWATER SYSTEM RETROFIT

IM WORK PLAN COMPLETION

APPENDIX A

TABLE – SOIL ANALYTICAL RESULTS

(ELECTRONIC COPIES ONLY, ON CD ATTACHED TO REPORT)

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Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,1,1,2-Tetrachloroethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,1,1-Trichloroethane	1.2	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,1,2,2-Tetrachloroethane	1.2	U	FALSE	µg/kg	23000	NO	560	NO	13	NO	13	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,1,2-Trichloroethane	1.2	U	FALSE	µg/kg	48000	NO	1100	NO	73	NO	73	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,1,2-Trichlorotrifluoroethane	2.4	UJ	FALSE	µg/kg							430000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,1-Dichloroethane	1.2	U	FALSE	µg/kg	3300	NO	3300	NO	710	NO	710	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,1-Dichloroethene	1.2	U	FALSE	µg/kg	1000000	NO	240000	NO	81	NO	81	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,1-Dichloropropene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,2,3-Trichlorobenzene	5.9	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,2,3-Trichloropropane	2.4	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,2,4-Trichlorobenzene	5.9	U	FALSE	µg/kg	490000	NO	22000	NO	80	NO	80	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,2,4-Trimethylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,2-Dibromo-3-chloropropane	5.9	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,2-Dichlorobenzene	1.2	U	FALSE	µg/kg							68000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,2-Dichloroethane	1.2	U	FALSE	µg/kg							70	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,2-Dichloropropane	1.2	U	FALSE	µg/kg							92	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,3,5-Trimethylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,3-Dichlorobenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,3-Dichloropropane	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	1,4-Dichlorobenzene	1.2	U	FALSE	µg/kg							350	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	1-Methylnaphthalene	3.5	J	TRUE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	2,2-Dichloropropane	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2,2'-Oxybis(1-Chloropropane)	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2,4,5-Trichlorophenol	94	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2,4,6-Trichlorophenol	94	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2,4-Dichlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2,4-Dimethylphenol	37	U	FALSE	µg/kg							95000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2,4-Dinitrophenol	800	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2,4-Dinitrotoluene	94	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2,6-Dinitrotoluene	94	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	2-Butanone	7.4		TRUE	µg/kg							430000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	2-Chloroethylvinylether	5.9	UJ	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2-Chloronaphthalene	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2-Chlorophenol	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	2-Chlorotoluene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	2-Hexanone	5.9	U	FALSE	µg/kg							32000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	2-Methylnaphthalene	5.5		TRUE	µg/kg							230000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2-Methylphenol	19	U	FALSE	µg/kg							250000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2-Nitroaniline	94	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	2-Nitrophenol	94	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	3,3'-Dichlorobenzidine	140	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	3-Nitroaniline	94	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	4,6-Dinitro-2-Methylphenol	190	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	4-Bromophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	4-Chloro-3-methylphenol	94	U	FALSE	µg/kg							740000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	4-Chloroaniline	250	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	4-Chlorophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	4-Chlorotoluene	1.2	U	FALSE	µg/kg							400000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	4-Isopropyltoluene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	4-Methylphenol	37	U	FALSE	µg/kg							41000	NO

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	4-Nitroaniline	94	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	4-Nitrophenol	94	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Acenaphthene	3.8	J	TRUE	µg/kg							230000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Acenaphthylene	3.2	J	TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Acetone	71		TRUE	µg/kg							510000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Acrolein	59	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Acrylonitrile	5.9	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Aluminum	9930		TRUE	mg/kg							77000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Anthracene	4.2	J	TRUE	µg/kg							1600000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Antimony	5	UJ	FALSE	mg/kg	200	NO	31	NO	31	NO	31	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1016	31	U	FALSE	µg/kg							0.72	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1221	31	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1232	31	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1242	31	U	FALSE	µg/kg							0.72	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1248	31	U	FALSE	µg/kg							220	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1254	80		TRUE	µg/kg							0.29	YES
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1260	65		TRUE	µg/kg							5.4	YES
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1262	31	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Aroclor 1268	31	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Arsenic	6		TRUE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Barium	42.9		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Benzene	1.2	U	FALSE	µg/kg	1100	NO	1100	NO	93	NO	93	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Benzo(a)anthracene	23		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Benzo(a)pyrene	33		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Benzo(g,h,i)perylene	44		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Benzoic Acid	370	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Benzyl Alcohol	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Beryllium	0.2		TRUE	mg/kg							160	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	bis(2-Chloroethoxy)methane	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	bis(2-Chloroethyl)ether	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	bis(2-Ethylhexyl)phthalate	39	U	FALSE	µg/kg	770000	NO	35000	NO	35000	NO	35000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Bromobenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Bromochloromethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Bromodichloromethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Bromoethane	2.4	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Bromoform	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Bromomethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Butylbenzylphthalate	19	UJ	FALSE	µg/kg							1700	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Cadmium	0.3		TRUE	mg/kg	450	NO	4	NO	4	NO	4	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Carbazole	19	U	FALSE	µg/kg							50000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Carbon Disulfide	22		TRUE	µg/kg							75000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Carbon Tetrachloride	1.2	U	FALSE	µg/kg							21	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Chlorobenzene	1.2	U	FALSE	µg/kg							26000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Chloroethane	1.2	UJ	FALSE	µg/kg							280000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Chloroform	1.2	U	FALSE	µg/kg							200	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Chloromethane	1.2	U	FALSE	µg/kg							1600	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Chromium	18.4		TRUE	mg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Chrysene	33		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	cis-1,2-Dichloroethene	1.2	UJ	FALSE	µg/kg	160000	NO	160000	NO	2600	NO	2600	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	cis-1,3-Dichloropropene	1.2	U	FALSE	µg/kg								

Note: Shading indicates exceedance of screening criteria

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Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Cobalt	5.7		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Copper	19.5		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Dibenz(a,h)anthracene	4.7		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Dibenzofuran	4.4	J	TRUE	µg/kg							120000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Dibromochloromethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Dibromomethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Diethylphthalate	47	U	FALSE	µg/kg							760000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Dimethylphthalate	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Di-n-Butylphthalate	19	U	FALSE	µg/kg							26000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Di-n-octylphthalate	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Ethylbenzene	1.2	U	FALSE	µg/kg	240000	NO	5400	NO	230	NO	230	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Ethylene Dibromide	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Fluoranthene	50		TRUE	µg/kg							230000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Fluorene	2.7	J	TRUE	µg/kg							150000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Hexachlorobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Hexachlorobutadiene	5.9	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Hexachlorocyclopentadiene	370	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Hexachloroethane	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Indeno(1,2,3-cd)pyrene	21		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Iron	14100		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Isophorone	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Isopropylbenzene	1.2	U	FALSE	µg/kg							78000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Lead	15		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	m,p-Xylene	1.2	U	FALSE	µg/kg							160000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Magnesium	3300		TRUE	mg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Manganese	165		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 7471A	Mercury	0.04		TRUE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Methyl Iodide	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Methyl isobutyl ketone	5.9	U	FALSE	µg/kg							170000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Methylene Chloride	2.4	U	FALSE	µg/kg	11000	NO	11000	NO	650	NO	650	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Molybdenum	0.5		TRUE	mg/kg	2500	NO	390	NO	390	NO	20	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270DSIM	Naphthalene	6		TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	n-Butylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Nickel	14		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Nitrobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	N-Nitroso-Di-N-Propylamine	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	N-Nitrosodiphenylamine	19	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	n-Propylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	o-Xylene	1.2	U	FALSE	µg/kg							200000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Pentachlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Phenanthrene	24		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Phenol	19	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Pyrene	53		TRUE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	sec-Butylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Selenium	5	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	1	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Silver	0.3	U	FALSE	mg/kg							170	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Styrene	1.2	U	FALSE	µg/kg							6300000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	tert-Butylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Tetrachloroethene	1.2	U	FALSE	µg/kg	560	NO	560	NO	1.6	NO	1.6	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 200.8	Thallium	0.2	U	FALSE	mg/kg								

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Tin	1	U	FALSE	mg/kg							47000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Toluene	1.2	U	FALSE	µg/kg	29000000	NO	5000000	NO	100000	NO	100000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Total Benzofluoranthenes	58		TRUE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8270D	Total cPAH as Bap TEQ	37.73		TRUE	µg/kg	1400	NO	140	NO	140	NO	15	YES
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8082	Total PCB	145		TRUE	µg/kg	10000	NO	220	NO	30	YES	1.8	YES
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	NWTPH-Dx-Cleaned	TPH - Bunker C	280		TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	NWTPH-Dx-Cleaned	TPH - Diesel Range	18	J	TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	NWTPH-Gx	TPH - Gasoline Range	6.3	U	FALSE	mg/kg	30	NO	30	NO	30	NO	30	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	NWTPH-Dx-Cleaned	TPH - Motor Oil Range	160		TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	trans-1,2-Dichloroethene	1.2	U	FALSE	µg/kg							19000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	trans-1,3-Dichloropropene	1.2	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	trans-1,4-Dichloro-2-butene	5.9	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Trichloroethene	1.2	U	FALSE	µg/kg	270	NO	270	NO	18	NO	18	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Trichlorofluoromethane	1.2	U	FALSE	µg/kg							200000	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Vanadium	45.2		TRUE	mg/kg							700	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Vinyl Acetate	5.9	U	FALSE	µg/kg								
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 8260C	Vinyl Chloride	1.2	U	FALSE	µg/kg	670	NO	670	NO	670	NO	0.081	NO
P2IM-NASW-01	P2IM-NASW-01-01-S	9/9/2011	0	1	ft	EPA 6010B	Zinc	51		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,1,1,2-Tetrachloroethane	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,1,1-Trichloroethane	1.1	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,1,2,2-Tetrachloroethane	1.1	U	FALSE	µg/kg	23000	NO	560	NO	13	NO	13	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,1,2-Trichloroethane	1.1	U	FALSE	µg/kg	48000	NO	1100	NO	73	NO	73	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,1,2-Trichlorotrifluoroethane	2.2	UJ	FALSE	µg/kg							430000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,1-Dichloroethane	1.1	U	FALSE	µg/kg	3300	NO	3300	NO	710	NO	710	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,1-Dichloroethene	1.1	U	FALSE	µg/kg	1000000	NO	240000	NO	81	NO	81	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,1-Dichloropropene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,2,3-Trichlorobenzene	5.4	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,2,3-Trichloropropane	2.2	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,2,4-Trichlorobenzene	5.4	U	FALSE	µg/kg	490000	NO	22000	NO	80	NO	80	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,2,4-Trimethylbenzene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,2-Dibromo-3-chloropropane	5.4	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,2-Dichlorobenzene	1.1	U	FALSE	µg/kg							68000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,2-Dichloroethane	1.1	U	FALSE	µg/kg							70	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,2-Dichloropropane	1.1	U	FALSE	µg/kg							92	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,3,5-Trimethylbenzene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,3-Dichlorobenzene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,3-Dichloropropane	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	1,4-Dichlorobenzene	1.1	U	FALSE	µg/kg							350	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	1-Methylnaphthalene	19		TRUE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	2,2-Dichloropropane	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2,2'-Oxybis(1-Chloropropane)	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4,5-Trichlorophenol	90	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4,6-Trichlorophenol	90	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dichlorophenol	180	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dimethylphenol	36	U	FALSE	µg/kg							95000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dinitrophenol	760	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dinitrotoluene	90	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2,6-Dinitrotoluene	90	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	2-Butanone	5.4	U	FALSE	µg/kg							430000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	2-Chloroethylvinylether	5.4	UJ	FALSE	µg/kg								

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Chloronaphthalene	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Chlorophenol	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	2-Chlorotoluene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	2-Hexanone	5.4	U	FALSE	µg/kg							32000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	2-Methylnaphthalene	22		TRUE	µg/kg							230000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Methylphenol	18	U	FALSE	µg/kg							250000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Nitroaniline	90	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Nitrophenol	90	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	3,3'-Dichlorobenzidine	140	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	3-Nitroaniline	90	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	4,6-Dinitro-2-Methylphenol	180	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Bromophenyl-phenylether	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Chloro-3-methylphenol	90	U	FALSE	µg/kg							740000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Chloroaniline	240	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Chlorophenyl-phenylether	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	4-Chlorotoluene	1.1	U	FALSE	µg/kg							400000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	4-Isopropyltoluene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Methylphenol	36	U	FALSE	µg/kg							41000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Nitroaniline	90	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Nitrophenol	90	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Acenaphthene	42		TRUE	µg/kg							230000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Acenaphthylene	6.2		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Acetone	29		TRUE	µg/kg							510000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Acrolein	54	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Acrylonitrile	5.4	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Aluminum	9300		TRUE	mg/kg							77000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Anthracene	26		TRUE	µg/kg							1600000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Antimony	5	UJ	FALSE	mg/kg	200	NO	31	NO	31	NO	31	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Aroclor 1016	31	U	FALSE	µg/kg							0.72	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Aroclor 1221	31	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Aroclor 1232	31	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Aroclor 1242	31	U	FALSE	µg/kg							0.72	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Aroclor 1248	31	U	FALSE	µg/kg							220	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Aroclor 1254	31	U	FALSE	µg/kg							0.29	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Aroclor 1260	31	U	FALSE	µg/kg							5.4	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Aroclor 1262	31	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Aroclor 1268	31	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Arsenic	6		TRUE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Barium	43.4		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Benzene	1.1	U	FALSE	µg/kg	1100	NO	1100	NO	93	NO	93	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(a)anthracene	44		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(a)pyrene	50		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(g,h,i)perylene	29		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzoic Acid	360	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzyl Alcohol	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Beryllium	0.1		TRUE	mg/kg							160	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	bis(2-Chloroethoxy)methane	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	bis(2-Chloroethyl)ether	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	bis(2-Ethylhexyl)phthalate	52	U	FALSE	µg/kg	770000	NO	35000	NO	35000	NO	35000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Bromobenzene	1.1	U	FALSE	µg/kg								

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Bromochloromethane	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Bromodichloromethane	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Bromoethane	2.2	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Bromoform	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Bromomethane	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Butylbenzylphthalate	18	UJ	FALSE	µg/kg							1700	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Cadmium	0.3		TRUE	mg/kg	450	NO	4	NO	4	NO	4	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Carbazole	14	J	TRUE	µg/kg							50000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Carbon Disulfide	1.1	U	FALSE	µg/kg							75000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Carbon Tetrachloride	1.1	U	FALSE	µg/kg							21	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Chlorobenzene	1.1	U	FALSE	µg/kg							26000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Chloroethane	1.1	UJ	FALSE	µg/kg							280000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Chloroform	1.1	U	FALSE	µg/kg							200	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Chloromethane	1.1	U	FALSE	µg/kg							1600	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Chromium	15.5		TRUE	mg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Chrysene	58		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	cis-1,2-Dichloroethene	1.1	UJ	FALSE	µg/kg	160000	NO	160000	NO	2600	NO	2600	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	cis-1,3-Dichloropropene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Cobalt	4.9		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Copper	17		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Dibenz(a,h)anthracene	3.6	J	TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Dibenzofuran	27		TRUE	µg/kg							120000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Dibromochloromethane	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Dibromomethane	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Diethylphthalate	45	U	FALSE	µg/kg							760000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Dimethylphthalate	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Di-n-Butylphthalate	18	U	FALSE	µg/kg							26000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Di-n-octylphthalate	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Ethylbenzene	1.1	U	FALSE	µg/kg	240000	NO	5400	NO	230	NO	230	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Ethylene Dibromide	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Fluoranthene	80		TRUE	µg/kg							230000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Fluorene	28		TRUE	µg/kg							150000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachlorobenzene	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Hexachlorobutadiene	5.4	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachlorocyclopentadiene	360	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachloroethane	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Indeno(1,2,3-cd)pyrene	24		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Iron	12700		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Isophorone	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Isopropylbenzene	1.1	U	FALSE	µg/kg							78000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Lead	23		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	m,p-Xylene	1.1	U	FALSE	µg/kg							160000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Magnesium	2500		TRUE	mg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Manganese	136		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 7471A	Mercury	0.05		TRUE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Methyl Iodide	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Methyl isobutyl ketone	5.4	U	FALSE	µg/kg							170000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Methylene Chloride	7.4		TRUE	µg/kg	11000	NO	11000	NO	650	NO	650	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Molybdenum	0.5		TRUE	mg/kg	2500	NO	390	NO	390	NO	20	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Naphthalene	17		TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO

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IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	n-Butylbenzene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Nickel	11		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Nitrobenzene	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	N-Nitroso-Di-N-Propylamine	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	N-Nitrosodiphenylamine	18	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	n-Propylbenzene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	o-Xylene	1.1	U	FALSE	µg/kg							200000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Pentachlorophenol	180	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Phenanthrene	100		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Phenol	18	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Pyrene	88		TRUE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	sec-Butylbenzene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Selenium	5	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	1	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Silver	0.3	U	FALSE	mg/kg							170	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Styrene	1.1	U	FALSE	µg/kg							6300000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	tert-Butylbenzene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Tetrachloroethene	1.1	U	FALSE	µg/kg	560	NO	560	NO	1.6	NO	1.6	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 200.8	Thallium	0.2	U	FALSE	mg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Tin	1	U	FALSE	mg/kg							47000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Toluene	1.1	U	FALSE	µg/kg	29000000	NO	5000000	NO	100000	NO	100000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Total Benzofluoranthenes	94		TRUE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8270D	Total cPAH as Bap TEQ	57.38		TRUE	µg/kg	1400	NO	140	NO	140	NO	15	YES
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8082	Total PCB	31	U	FALSE	µg/kg	10000	NO	220	NO	30	NO	1.8	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	NWTPH-Dx-Cleaned	TPH - Bunker C	54		TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	NWTPH-Dx-Cleaned	TPH - Diesel Range	6	J	TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	NWTPH-Gx	TPH - Gasoline Range	6.6	U	FALSE	mg/kg	30	NO	30	NO	30	NO	30	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	NWTPH-Dx-Cleaned	TPH - Motor Oil Range	28		TRUE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	trans-1,2-Dichloroethene	1.1	U	FALSE	µg/kg							19000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	trans-1,3-Dichloropropene	1.1	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	trans-1,4-Dichloro-2-butene	5.4	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Trichloroethene	1.1	U	FALSE	µg/kg	270	NO	270	NO	18	NO	18	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Trichlorofluoromethane	1.1	U	FALSE	µg/kg							200000	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Vanadium	42.3		TRUE	mg/kg							700	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Vinyl Acetate	5.4	U	FALSE	µg/kg								
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 8260C	Vinyl Chloride	1.1	U	FALSE	µg/kg	670	NO	670	NO	670	NO	0.081	NO
P2IM-NASW-02	P2IM-NASW-02-05-S	9/9/2011	4	5	ft	EPA 6010B	Zinc	50		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,1,1,2-Tetrachloroethane	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,1,1-Trichloroethane	1.5	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,1,2,2-Tetrachloroethane	1.5	U	FALSE	µg/kg	23000	NO	560	NO	13	NO	13	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,1,2-Trichloroethane	1.5	U	FALSE	µg/kg	48000	NO	1100	NO	73	NO	73	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,1,2-Trichlorotrifluoroethane	2.9	UJ	FALSE	µg/kg							430000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,1-Dichloroethane	1.5	U	FALSE	µg/kg	3300	NO	3300	NO	710	NO	710	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,1-Dichloroethene	1.5	U	FALSE	µg/kg	1000000	NO	240000	NO	81	NO	81	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,1-Dichloropropene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,2,3-Trichlorobenzene	7.3	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,2,3-Trichloropropane	2.9	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,2,4-Trichlorobenzene	7.3	U	FALSE	µg/kg	490000	NO	22000	NO	80	NO	80	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,2,4-Trimethylbenzene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,2-Dibromo-3-chloropropane	7.3	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,2-Dichlorobenzene	1.5	U	FALSE	µg/kg							68000	NO

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,2-Dichloroethane	1.5	U	FALSE	µg/kg							70	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,2-Dichloropropane	1.5	U	FALSE	µg/kg							92	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,3,5-Trimethylbenzene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,3-Dichlorobenzene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,3-Dichloropropane	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	1,4-Dichlorobenzene	1.5	U	FALSE	µg/kg							350	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	1-Methylnaphthalene	4.7	U	FALSE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	2,2-Dichloropropane	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2,2'-Oxybis(1-Chloropropane)	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2,4,5-Trichlorophenol	94	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2,4,6-Trichlorophenol	94	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2,4-Dichlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2,4-Dimethylphenol	38	U	FALSE	µg/kg							95000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2,4-Dinitrophenol	800	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2,4-Dinitrotoluene	94	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2,6-Dinitrotoluene	94	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	2-Butanone	7.3	U	FALSE	µg/kg							430000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2-Chloronaphthalene	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2-Chlorophenol	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	2-Chlorotoluene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	2-Hexanone	7.3	U	FALSE	µg/kg							32000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	2-Methylnaphthalene	4.7	U	FALSE	µg/kg							230000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2-Methylphenol	19	U	FALSE	µg/kg							250000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2-Nitroaniline	94	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	2-Nitrophenol	94	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	3,3'-Dichlorobenzidine	140	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	3-Nitroaniline	94	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	4,6-Dinitro-2-Methylphenol	190	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	4-Bromophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	4-Chloro-3-methylphenol	94	U	FALSE	µg/kg							740000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	4-Chloroaniline	250	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	4-Chlorophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	4-Chlorotoluene	1.5	U	FALSE	µg/kg							400000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	4-Isopropyltoluene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	4-Methylphenol	38	U	FALSE	µg/kg							41000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	4-Nitroaniline	94	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	4-Nitrophenol	94	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Acenaphthene	4.7	U	FALSE	µg/kg							230000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Acenaphthylene	4.7	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Acetone	17		TRUE	µg/kg							510000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Acrolein	73	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Acrylonitrile	7.3	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Aluminum	6720		TRUE	mg/kg							77000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Anthracene	4.7	U	FALSE	µg/kg							1600000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Antimony	5	UJ	FALSE	mg/kg	200	NO	31	NO	31	NO	31	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Aroclor 1016	31	U	FALSE	µg/kg							0.72	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Aroclor 1221	31	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Aroclor 1232	31	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Aroclor 1242	31	U	FALSE	µg/kg							0.72	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Aroclor 1248	31	U	FALSE	µg/kg							220	NO

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Aroclor 1254	31	U	FALSE	µg/kg							0.29	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Aroclor 1260	31	U	FALSE	µg/kg							5.4	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Aroclor 1262	31	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Aroclor 1268	31	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Arsenic	5	U	FALSE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Barium	25.6		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Benzene	1.5	U	FALSE	µg/kg	1100	NO	1100	NO	93	NO	93	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Benzo(a)anthracene	4.7	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Benzo(a)pyrene	4.7	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Benzo(g,h,i)perylene	4.7	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Benzoic Acid	380	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Benzyl Alcohol	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Beryllium	0.1	U	FALSE	mg/kg							160	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	bis(2-Chloroethoxy)methane	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	bis(2-Chloroethyl)ether	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	bis(2-Ethylhexyl)phthalate	29	U	FALSE	µg/kg	770000	NO	35000	NO	35000	NO	35000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Bromobenzene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Bromochloromethane	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Bromodichloromethane	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Bromoethane	2.9	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Bromoform	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Bromomethane	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Butylbenzylphthalate	19	UJ	FALSE	µg/kg							1700	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Cadmium	0.2	U	FALSE	mg/kg	450	NO	4	NO	4	NO	4	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Carbazole	19	U	FALSE	µg/kg							50000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Carbon Disulfide	1.5	U	FALSE	µg/kg							75000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Carbon Tetrachloride	1.5	U	FALSE	µg/kg							21	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Chlorobenzene	1.5	U	FALSE	µg/kg							26000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Chloroethane	1.5	UJ	FALSE	µg/kg							280000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Chloroform	1.5	U	FALSE	µg/kg							200	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Chloromethane	1.5	U	FALSE	µg/kg							1600	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Chromium	9	J	TRUE	mg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Chrysene	4.7	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	cis-1,2-Dichloroethene	1.5	UJ	FALSE	µg/kg	160000	NO	160000	NO	2600	NO	2600	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	cis-1,3-Dichloropropene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Cobalt	3.4		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Copper	8.7		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Dibenz(a,h)anthracene	4.7	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Dibenzofuran	4.7	U	FALSE	µg/kg							120000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Dibromochloromethane	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Dibromomethane	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Diethylphthalate	100	U	FALSE	µg/kg							760000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Dimethylphthalate	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Di-n-Butylphthalate	19	U	FALSE	µg/kg							26000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Di-n-octylphthalate	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Ethylbenzene	1.5	U	FALSE	µg/kg	240000	NO	5400	NO	230	NO	230	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Ethylene Dibromide	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Fluoranthene	4.7	U	FALSE	µg/kg							230000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Fluorene	4.7	U	FALSE	µg/kg							150000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Hexachlorobenzene	19	U	FALSE	µg/kg								

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Hexachlorobutadiene	7.3	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Hexachlorocyclopentadiene	380	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Hexachloroethane	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Indeno(1,2,3-cd)pyrene	4.7	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Iron	10800		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Isophorone	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Isopropylbenzene	1.5	U	FALSE	µg/kg							78000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Lead	2	U	FALSE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	m,p-Xylene	1.5	U	FALSE	µg/kg							160000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Magnesium	1860		TRUE	mg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Manganese	83.6		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 7471A	Mercury	0.02	U	FALSE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Methyl Iodide	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Methyl isobutyl ketone	7.3	U	FALSE	µg/kg							170000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Methylene Chloride	2.9	U	FALSE	µg/kg	11000	NO	11000	NO	650	NO	650	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Molybdenum	0.5		TRUE	mg/kg	2500	NO	390	NO	390	NO	20	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Naphthalene	2.6	J	TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	n-Butylbenzene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Nickel	6		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Nitrobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	N-Nitroso-Di-N-Propylamine	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	N-Nitrosodiphenylamine	19	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	n-Propylbenzene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	o-Xylene	1.5	U	FALSE	µg/kg							200000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Pentachlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Phenanthrene	3	J	TRUE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270D	Phenol	19	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Pyrene	4.7	U	FALSE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	sec-Butylbenzene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Selenium	5	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	1	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Silver	0.3	U	FALSE	mg/kg							170	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Styrene	1.5	U	FALSE	µg/kg							6300000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	tert-Butylbenzene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Tetrachloroethene	1.5	U	FALSE	µg/kg	560	NO	560	NO	1.6	NO	1.6	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 200.8	Thallium	0.2	U	FALSE	mg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Tin	1	U	FALSE	mg/kg							47000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Toluene	1.5	U	FALSE	µg/kg	29000000	NO	5000000	NO	100000	NO	100000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Total Benzofluoranthenes	4.7	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8270DSIM	Total cPAH as Bap TEQ	4.7	U	FALSE	µg/kg	1400	NO	140	NO	140	NO	15	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8082	Total PCB	31	U	FALSE	µg/kg	10000	NO	220	NO	30	NO	1.8	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	NWTPH-Dx-Cleaned	TPH - Bunker C	11	U	FALSE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	NWTPH-Dx-Cleaned	TPH - Diesel Range	5.6	U	FALSE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	NWTPH-Gx	TPH - Gasoline Range	6	U	FALSE	mg/kg	30	NO	30	NO	30	NO	30	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	NWTPH-Dx-Cleaned	TPH - Motor Oil Range	11	U	FALSE	mg/kg	2000	NO	2000	NO	2000	NO	2000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	trans-1,2-Dichloroethene	1.5	U	FALSE	µg/kg							19000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	trans-1,3-Dichloropropene	1.5	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	trans-1,4-Dichloro-2-butene	7.3	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Trichloroethene	1.5	U	FALSE	µg/kg	270	NO	270	NO	18	NO	18	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Trichlorofluoromethane	1.5	U	FALSE	µg/kg							200000	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Vanadium	36.6		TRUE	mg/kg							700	NO

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Vinyl Acetate	7.3	U	FALSE	µg/kg								
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 8260C	Vinyl Chloride	1.5	U	FALSE	µg/kg	670	NO	670	NO	670	NO	0.081	NO
P2IM-NASW-03	P2IM-NASW-03-10-S	9/9/2011	9	10	ft	EPA 6010B	Zinc	20		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	1,2,4-Trichlorobenzene	19	U	FALSE	µg/kg	490000	NO	22000	NO	80	NO	80	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	1,2-Dichlorobenzene	19	U	FALSE	µg/kg							68000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	1,3-Dichlorobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	1,4-Dichlorobenzene	19	U	FALSE	µg/kg							350	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	1-Methylnaphthalene	10	J	TRUE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2,2'-Oxybis(1-Chloropropane)	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4,5-Trichlorophenol	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4,6-Trichlorophenol	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dichlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dimethylphenol	38	U	FALSE	µg/kg							95000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dinitrophenol	800	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dinitrotoluene	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2,6-Dinitrotoluene	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Chloronaphthalene	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Chlorophenol	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	2-Methylnaphthalene	15		TRUE	µg/kg							230000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Methylphenol	19	U	FALSE	µg/kg							250000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Nitroaniline	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Nitrophenol	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	3,3'-Dichlorobenzidine	140	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	3-Nitroaniline	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	4,6-Dinitro-2-Methylphenol	190	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Bromophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Chloro-3-methylphenol	94	U	FALSE	µg/kg							740000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Chloroaniline	250	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Chlorophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Methylphenol	38	U	FALSE	µg/kg							41000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Nitroaniline	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Nitrophenol	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Acenaphthene	14	U	FALSE	µg/kg							230000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Acenaphthylene	8.2	J	TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Aluminum	8420		TRUE	mg/kg							77000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Anthracene	5.2	J	TRUE	µg/kg							1600000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Antimony	6	UJ	FALSE	mg/kg	200	NO	31	NO	31	NO	31	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Arsenic	6	U	FALSE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Barium	39.6		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Benzo(a)anthracene	25		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Benzo(a)pyrene	28		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Benzo(g,h,i)perylene	22		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzoic Acid	380	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzyl Alcohol	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Beryllium	0.1		TRUE	mg/kg							160	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	bis(2-Chloroethoxy)methane	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	bis(2-Chloroethyl)ether	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	bis(2-Ethylhexyl)phthalate	28	U	FALSE	µg/kg	770000	NO	35000	NO	35000	NO	35000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Butylbenzylphthalate	19	UJ	FALSE	µg/kg							1700	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Cadmium	0.3		TRUE	mg/kg	450	NO	4	NO	4	NO	4	NO

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Carbazole	19	U	FALSE	µg/kg							50000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Chromium	12.4		TRUE	mg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Chrysene	33		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Cobalt	4.3		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Copper	14.6		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Dibenz(a,h)anthracene	14	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Dibenzofuran	14	U	FALSE	µg/kg							120000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Diethylphthalate	47	U	FALSE	µg/kg							760000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Dimethylphthalate	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Di-n-Butylphthalate	19	U	FALSE	µg/kg							26000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Di-n-octylphthalate	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Fluoranthene	53		TRUE	µg/kg							230000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Fluorene	14	U	FALSE	µg/kg							150000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachlorobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachlorobutadiene	94	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachlorocyclopentadiene	380	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachloroethane	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Indeno(1,2,3-cd)pyrene	19		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Iron	11600		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Isophorone	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Lead	18		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Magnesium	2080		TRUE	mg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Manganese	139		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 7471A	Mercury	0.02		TRUE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Molybdenum	0.6	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	20	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Naphthalene	40		TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Nickel	8		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Nitrobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	N-Nitroso-Di-N-Propylamine	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	N-Nitrosodiphenylamine	19	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Pentachlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Phenanthrene	42		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270D	Phenol	19	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Pyrene	56		TRUE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Selenium	6	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	1	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Silver	0.3	U	FALSE	mg/kg							170	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 200.8	Thallium	0.2	U	FALSE	mg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Tin	1	U	FALSE	mg/kg							47000	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Total Benzofluoranthenes	47		TRUE	µg/kg								
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Total cPAH as Bap TEQ	32.73		TRUE	µg/kg	1400	NO	140	NO	140	NO	15	YES
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Vanadium	43.6		TRUE	mg/kg							700	NO
P2IM-NASW-04	P2IM-NASW-04-05-S	9/9/2011	4	5	ft	EPA 6010B	Zinc	43		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	1,2,4-Trichlorobenzene	19	U	FALSE	µg/kg	490000	NO	22000	NO	80	NO	80	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	1,2-Dichlorobenzene	19	U	FALSE	µg/kg							68000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	1,3-Dichlorobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	1,4-Dichlorobenzene	19	U	FALSE	µg/kg							350	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	1-Methylnaphthalene	3.5	J	TRUE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2,2'-Oxybis(1-Chloropropane)	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4,5-Trichlorophenol	96	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4,6-Trichlorophenol	96	U	FALSE	µg/kg								

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dichlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dimethylphenol	38	U	FALSE	µg/kg							95000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dinitrophenol	820	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2,4-Dinitrotoluene	96	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2,6-Dinitrotoluene	96	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Chloronaphthalene	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Chlorophenol	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	2-Methylnaphthalene	3.5	J	TRUE	µg/kg							230000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Methylphenol	19	U	FALSE	µg/kg							250000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Nitroaniline	96	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	2-Nitrophenol	96	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	3,3'-Dichlorobenzidine	140	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	3-Nitroaniline	96	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	4,6-Dinitro-2-Methylphenol	190	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Bromophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Chloro-3-methylphenol	96	U	FALSE	µg/kg							740000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Chloroaniline	260	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Chlorophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Methylphenol	38	U	FALSE	µg/kg							41000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Nitroaniline	96	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	4-Nitrophenol	96	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Acenaphthene	4.7	U	FALSE	µg/kg							230000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Acenaphthylene	4.7	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Aluminum	7280		TRUE	mg/kg							77000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Anthracene	3.6	J	TRUE	µg/kg							1600000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Antimony	5	UJ	FALSE	mg/kg	200	NO	31	NO	31	NO	31	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Arsenic	5	U	FALSE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Barium	28.9		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(a)anthracene	12	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(a)pyrene	14	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzo(g,h,i)perylene	12	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzoic Acid	380	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Benzyl Alcohol	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Beryllium	0.1	U	FALSE	mg/kg							160	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	bis(2-Chloroethoxy)methane	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	bis(2-Chloroethyl)ether	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	bis(2-Ethylhexyl)phthalate	32	U	FALSE	µg/kg	770000	NO	35000	NO	35000	NO	35000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Butylbenzylphthalate	19	UJ	FALSE	µg/kg							1700	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Cadmium	0.2	U	FALSE	mg/kg	450	NO	4	NO	4	NO	4	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Carbazole	19	U	FALSE	µg/kg							50000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Chromium	10.6		TRUE	mg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Chrysene	17	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Cobalt	3.9		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Copper	14.1		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Dibenz(a,h)anthracene	4.7	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Dibenzofuran	2.4	J	TRUE	µg/kg							120000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Diethylphthalate	96	U	FALSE	µg/kg							760000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Dimethylphthalate	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Di-n-Butylphthalate	19	U	FALSE	µg/kg							26000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Di-n-octylphthalate	19	U	FALSE	µg/kg								

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Fluoranthene	23		TRUE	µg/kg							230000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Fluorene	4.7	U	FALSE	µg/kg							150000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachlorobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachlorobutadiene	96	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachlorocyclopentadiene	380	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Hexachloroethane	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Indeno(1,2,3-cd)pyrene	11	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Iron	11100		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Isophorone	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Lead	5		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Magnesium	2060		TRUE	mg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Manganese	95.1		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 7471A	Mercury	0.02	U	FALSE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Molybdenum	0.5	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	20	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270DSIM	Naphthalene	3.8	J	TRUE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Nickel	8		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Nitrobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	N-Nitroso-Di-N-Propylamine	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	N-Nitrosodiphenylamine	19	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Pentachlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Phenanthrene	12	J	TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Phenol	19	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Pyrene	26		TRUE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Selenium	5	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	1	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Silver	0.3	U	FALSE	mg/kg							170	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 200.8	Thallium	0.2	U	FALSE	mg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Tin	1	U	FALSE	mg/kg							47000	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Total Benzofluoranthenes	29		TRUE	µg/kg								
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 8270D	Total cPAH as Bap TEQ	16.47	J	TRUE	µg/kg	1400	NO	140	NO	140	NO	15	YES
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Vanadium	39.3		TRUE	mg/kg							700	NO
P2IM-NASW-05	P2IM-NASW-05-05-S	9/9/2011	4	5	ft	EPA 6010B	Zinc	26		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	1,2,4-Trichlorobenzene	19	U	FALSE	µg/kg	490000	NO	22000	NO	80	NO	80	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	1,2-Dichlorobenzene	19	U	FALSE	µg/kg							68000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	1,3-Dichlorobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	1,4-Dichlorobenzene	19	U	FALSE	µg/kg							350	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	1-Methylnaphthalene	4.7	U	FALSE	µg/kg	350000	NO	16000	NO	16000	NO	16000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2,2'-Oxybis(1-Chloropropane)	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2,4,5-Trichlorophenol	97	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2,4,6-Trichlorophenol	97	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2,4-Dichlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2,4-Dimethylphenol	39	U	FALSE	µg/kg							95000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2,4-Dinitrophenol	820	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2,4-Dinitrotoluene	97	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2,6-Dinitrotoluene	97	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2-Chloronaphthalene	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2-Chlorophenol	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	2-Methylnaphthalene	4.7	U	FALSE	µg/kg							230000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2-Methylphenol	19	U	FALSE	µg/kg							250000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2-Nitroaniline	97	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	2-Nitrophenol	97	U	FALSE	µg/kg								

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	3,3'-Dichlorobenzidine	140	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	3-Nitroaniline	97	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	4,6-Dinitro-2-Methylphenol	190	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	4-Bromophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	4-Chloro-3-methylphenol	97	U	FALSE	µg/kg							740000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	4-Chloroaniline	260	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	4-Chlorophenyl-phenylether	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	4-Methylphenol	39	U	FALSE	µg/kg							41000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	4-Nitroaniline	97	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	4-Nitrophenol	97	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Acenaphthene	4.7	U	FALSE	µg/kg							230000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Acenaphthylene	4.7	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Aluminum	10600		TRUE	mg/kg							77000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Anthracene	4.7	U	FALSE	µg/kg							1600000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Antimony	7	UJ	FALSE	mg/kg	200	NO	31	NO	31	NO	31	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Arsenic	7	U	FALSE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Barium	28.3		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Benzo(a)anthracene	4.7	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Benzo(a)pyrene	4.7	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Benzo(g,h,i)perylene	4.7	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Benzoic Acid	390	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Benzyl Alcohol	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Beryllium	0.2		TRUE	mg/kg							160	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	bis(2-Chloroethoxy)methane	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	bis(2-Chloroethyl)ether	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	bis(2-Ethylhexyl)phthalate	29	U	FALSE	µg/kg	770000	NO	35000	NO	35000	NO	35000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Butylbenzylphthalate	19	UJ	FALSE	µg/kg							1700	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Cadmium	0.3	U	FALSE	mg/kg	450	NO	4	NO	4	NO	4	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Carbazole	19	U	FALSE	µg/kg							50000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Chromium	17.3		TRUE	mg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Chrysene	4.7	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Cobalt	4.3		TRUE	mg/kg	150	NO	23	NO	23	NO	12	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Copper	27.1		TRUE	mg/kg	20000	NO	80	NO	80	NO	80	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Dibenz(a,h)anthracene	4.7	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Dibenzofuran	4.7	U	FALSE	µg/kg							120000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Diethylphthalate	48	U	FALSE	µg/kg							760000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Dimethylphthalate	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Di-n-Butylphthalate	19	U	FALSE	µg/kg							26000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Di-n-octylphthalate	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Fluoranthene	4.7	U	FALSE	µg/kg							230000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Fluorene	4.7	U	FALSE	µg/kg							150000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Hexachlorobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Hexachlorobutadiene	97	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Hexachlorocyclopentadiene	390	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Hexachloroethane	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Indeno(1,2,3-cd)pyrene	4.7	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Iron	10000		TRUE	mg/kg	360000	NO	59000	NO	59000	NO	59000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Isophorone	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Lead	3	U	FALSE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Magnesium	2420		TRUE	mg/kg								

Note: Shading indicates exceedance of screening criteria

Table A: Soil Analytical Results
IM Completion Report - North Area Stormwater System Retrofit
Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Manganese	79.7		TRUE	mg/kg	12000	NO	1800	NO	1800	NO	1800	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 7471A	Mercury	0.03	U	FALSE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Molybdenum	0.7	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	20	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Naphthalene	4.7	U	FALSE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Nickel	8		TRUE	mg/kg	10000	NO	210	NO	210	NO	210	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Nitrobenzene	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	N-Nitroso-Di-N-Propylamine	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	N-Nitrosodiphenylamine	19	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Pentachlorophenol	190	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Phenanthrene	5.4		TRUE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270D	Phenol	19	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Pyrene	4.7	U	FALSE	µg/kg	11000000	NO	240000	NO	240000	NO	240000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Selenium	7	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	1	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Silver	0.4	U	FALSE	mg/kg							170	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 200.8	Thallium	0.3	U	FALSE	mg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Tin	1	U	FALSE	mg/kg							47000	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Total Benzofluoranthenes	4.7	U	FALSE	µg/kg								
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 8270DSIM	Total cPAH as Bap TEQ	4.7	U	FALSE	µg/kg	1400	NO	140	NO	140	NO	15	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Vanadium	47.4		TRUE	mg/kg							700	NO
P2IM-NASW-06	P2IM-NASW-06-12-S	9/9/2011	11	12	ft	EPA 6010B	Zinc	34		TRUE	mg/kg	150000	NO	1400	NO	1400	NO	1400	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,1,1,2-Tetrachloroethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,1,1-Trichloroethane	1.2	U	FALSE	µg/kg							1900000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,1,2,2-Tetrachloroethane	1.2	U	FALSE	µg/kg	23000	NO	560	NO	13	NO	13	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,1,2-Trichloroethane	1.2	U	FALSE	µg/kg	48000	NO	1100	NO	73	NO	73	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,1,2-Trichlorotrifluoroethane	2.3	U	FALSE	µg/kg							430000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,1-Dichloroethane	1.2	U	FALSE	µg/kg	3300	NO	3300	NO	710	NO	710	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,1-Dichloroethene	1.2	U	FALSE	µg/kg	1000000	NO	240000	NO	81	NO	81	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,1-Dichloropropene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,2,3-Trichlorobenzene	5.8	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,2,3-Trichloropropane	2.3	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,2,4-Trichlorobenzene	5.8	U	FALSE	µg/kg	490000	NO	22000	NO	80	NO	80	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,2,4-Trimethylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,2-Dibromo-3-chloropropane	5.8	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,2-Dichlorobenzene	1.2	U	FALSE	µg/kg							68000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,2-Dichloroethane	1.2	U	FALSE	µg/kg							70	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,2-Dichloropropane	1.2	U	FALSE	µg/kg							92	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,3,5-Trimethylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,3-Dichlorobenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,3-Dichloropropane	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	1,4-Dichlorobenzene	1.2	U	FALSE	µg/kg							350	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	2,2-Dichloropropane	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	2-Butanone	5.8	U	FALSE	µg/kg							430000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	2-Chloroethylvinylether	5.8	UJ	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	2-Chlorotoluene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	2-Hexanone	5.8	U	FALSE	µg/kg							32000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	4-Chlorotoluene	1.2	U	FALSE	µg/kg							400000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	4-Isopropyltoluene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Acetone	35		TRUE	µg/kg							510000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Acrolein	58	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Acrylonitrile	5.8	U	FALSE	µg/kg								

Note: Shading indicates exceedance of screening criteria

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Boeing Plant 2

Location	Sample ID	Date	Top Depth	Bottom Depth	Depth Unit	Analytical Method	Parameter	Value	Qualifier	Detect	Unit	2011 FMCL - Soil - IRMA	Exceeds 2011 FMCL - Soil - IRMA?	2011 FMCL-Soil-SRMA-Cover	Exceeds 2011 FMCL-Soil-SRMA-Cover?	2011 FMCL-Soil-SRMA-Uncov	Exceeds 2011 FMCL-Soil-SRMA-Uncov?	May 2011 Final Soil TMCL	Exceeds May 2011 Final Soil TMCL?
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Arsenic	7		TRUE	mg/kg	88	NO	20	NO	20	NO	20	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Barium	50.3		TRUE	mg/kg	99000	NO	15000	NO	15000	NO	100	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Benzene	1.2	U	FALSE	µg/kg	1100	NO	1100	NO	93	NO	93	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Bromobenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Bromochloromethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Bromodichloromethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Bromoethane	2.3	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Bromoform	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Bromomethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Cadmium	0.2	U	FALSE	mg/kg	450	NO	4	NO	4	NO	4	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Carbon Disulfide	3.3		TRUE	µg/kg							75000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Carbon Tetrachloride	1.2	U	FALSE	µg/kg							21	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Chlorobenzene	1.2	U	FALSE	µg/kg							26000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Chloroethane	1.2	U	FALSE	µg/kg							280000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Chloroform	1.2	U	FALSE	µg/kg							200	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Chloromethane	1.2	U	FALSE	µg/kg							1600	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Chromium	18.1		TRUE	mg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	cis-1,2-Dichloroethene	1.2	U	FALSE	µg/kg	160000	NO	160000	NO	2600	NO	2600	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	cis-1,3-Dichloropropene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Dibromochloromethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Dibromomethane	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Ethylbenzene	1.2	U	FALSE	µg/kg	240000	NO	5400	NO	230	NO	230	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Ethylene Dibromide	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Hexachlorobutadiene	5.8	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Isopropylbenzene	1.2	U	FALSE	µg/kg							78000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Lead	19		TRUE	mg/kg	1000	NO	250	NO	250	NO	250	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	m,p-Xylene	1.2	U	FALSE	µg/kg							160000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 7471A	Mercury	0.05		TRUE	mg/kg	28	NO	1.5	NO	1.5	NO	1.5	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Methyl Iodide	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Methyl isobutyl ketone	5.8	U	FALSE	µg/kg							170000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Methylene Chloride	2.3	U	FALSE	µg/kg	11000	NO	11000	NO	650	NO	650	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Naphthalene	5.8	U	FALSE	µg/kg	180000	NO	3600	NO	3600	NO	3600	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	n-Butylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	n-Propylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	o-Xylene	1.2	U	FALSE	µg/kg							200000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	sec-Butylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Selenium	5	U	FALSE	mg/kg	2500	NO	390	NO	390	NO	1	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 6010B	Silver	0.3	U	FALSE	mg/kg							170	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Styrene	1.2	U	FALSE	µg/kg							6300000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	tert-Butylbenzene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Tetrachloroethene	1.2	U	FALSE	µg/kg	560	NO	560	NO	1.6	NO	1.6	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Toluene	1.2	U	FALSE	µg/kg	29000000	NO	5000000	NO	100000	NO	100000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	trans-1,2-Dichloroethene	1.2	U	FALSE	µg/kg							19000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	trans-1,3-Dichloropropene	1.2	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	trans-1,4-Dichloro-2-butene	5.8	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Trichloroethene	1.2	U	FALSE	µg/kg	270	NO	270	NO	18	NO	18	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Trichlorofluoromethane	1.2	U	FALSE	µg/kg							200000	NO
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Vinyl Acetate	5.8	U	FALSE	µg/kg								
P2IM-NASW-08-04	P2IM-NASW-08-04-S	9/6/2011	4	4	ft	EPA 8260C	Vinyl Chloride	1.2	U	FALSE	µg/kg	670	NO	670	NO	670	NO	0.081	NO

Note: Shading indicates exceedance of screening criteria

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APPENDIX B

DATA VALIDATION AND ANALYTICAL DATA

(ELECTRONIC COPIES ONLY, ON CD ATTACHED TO REPORT)

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TECHNICAL MEMORANDUM

Date:	12/9/2011	**Project No.:**	013-1646-011.600.01
To:	Will Ernst	**Company:**	The Boeing Company
From:	Jessie Compeau of Informa LLC	**Email:**	Informa_LLC@comcast.net
cc:	Jill Lamberts, Scott Matthees, and Ted Norton, of Golder Associates Inc.		
RE:	**BOEING PLANT 2 – INTERIM MEASURE WORK PLAN - NORTH AREA STORMWATER SYSTEM RETROFIT - 2011**		

1.0 INTRODUCTION

A total of seven soils, one equipment blank, and two trip blank samples were collected in September of 2011. This sampling was conducted as part of the 1994 Administrative Order of Consent between Boeing and EPA Region X and details are specified in the *Interim Measure Work Plan - North Area Stormwater System Retrofit (Golder, 2011).* The purpose of this IM work plan is to retrofit the North Area stormwater system. Soil excavation and sampling activities will be conducted in support of this work plan. Samples were analyzed by Analytical Resources Incorporated (ARI) of Tukwila, Washington for the following parameters:

- Volatile organic compounds (VOCs) by EPA Method 8260C GC/MS
- Semivolatile organic compounds (SVOCs) by EPA Method 8270D GC/MS
- Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8270D GC/MS SIM
- Polychlorinated biphenyls (PCBs) by EPA Method 8082 GC/ECD
- RCRA Metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver) by EPA Methods 6010B and 7471A.
- TCLP RCRA Metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver) by EPA Methods 1311/6010B and 7470A.
- Metals List (Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Tin, Vanadium, and Zinc) by EPA Methods 6010B, 7470A, 7471A, and 200.8.
- Gasoline by Washington State Method NWTPHG
- Diesel and Extended Range Hydrocarbons (Diesel, Motor Oil, Bunker C, and Creosote) by Washington State Method NWTPHD-Extended

Samples were analyzed in accordance with procedures described in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (USEPA SW-846, 3rd edition) 8260C, 8270D, 8270D-SIM, 8082, 6010B, 7470A/7471A, 160.3, 335.4, 9014, and EPA Method 200.8, Revision 5.5; Determination of Trace Elements in Water and Wastes by Inductively Coupled Plasma-Mass Spectrometry; Washington State Methods for Fuel Hydrocarbons, and ARI standard operating procedures.*

2.0 SAMPLE DELIVERY GROUPS, SAMPLES AND ANALYSES

Samples were analyzed and data were reported by the laboratory in batch numbers/sample delivery groups (SDGs) as summarized below:

TL09 (VOC and RCRA TCLP Metals):

P2IM-NASW-08-04-S Trip Blank

Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052 USA
Tel: (425) 883-0777 Fax: (425) 882-5498 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

TL75 (VOCs, SVOCs, PNAs, PCBs, NWTPH-Dx, NWTPH-Gx, and Data Gaps Metals):

P2IM-NASW-01-01-S	P2IM-NASW-02-05-S	P2IM-NASW-03-10-S
P2IM-NASW-04-05-S	P2IM-NASW-05-05-S	P2IM-NASW-06-12-S
P2IM-NASW-07-05-W	Trip Blank	

Quality assurance/quality control (QA/QC) reviews of laboratory data were performed in the laboratory in accordance with the laboratory quality assurance program plan. The data validation QA/QC review focused primarily on laboratory result summary sheets and quality control summary sheets to ensure that work plan data quality objectives were met for the project. Data validation was conducted in accordance with the criteria outlined in the National Functional Guidelines (NFG) for Organic Data Review (EPA, 2008) and the National Functional Guidelines for Inorganic Data Review (EPA, 2004), modified to include method specific requirements of the laboratory analytical methods. Raw data sheets were reviewed as necessary to confirm conditions reported and to support application of qualifiers to analytical results.

The validation level specified in Golder's 2011 *Interim Measure Work Plan - North Area Stormwater System Retrofit (Golder, 2011) Appendix B - Sampling and Analysis Plan (SAP)* is Level 1 which is considered a basic review. The following is a summary of quality control elements associated with each analytical fraction and the status of that element as a result of the data validation process.

3.0 SAMPLING, DOCUMENTATION AND REPORTING

Sample acknowledgements, chain-of-custody, request forms, and data package completeness were evaluated with the following noted:

- Review of the SAP (Golder, 2011) requested analytes indicates that one and/or two of the nine requested PCB Aroclors (Aroclor 1262 and Aroclor 1268) were not analyzed for several SDGs. No action was taken other than note this. Refer to Section 7.0 on PCBs for further information.
- Review of the SAP (Golder, 2011) Sections 4.1.1 and 4.1.2 indicate that supplemental and confirmational soil samples will be collected and analyzed for selected parameters. SAP Section 4.1.3 specifies that during excavation, grab soil samples for waste characterization may be collected and analyzed for known or suspected chemicals of concern. Methods and reporting limits are stipulated in Table 3 of the SAP.
- Multiple SDGs: Case narrative notes indicate that certain continuing calibration analytes (for organic data) are "Q" qualified on Form III (Laboratory Control Sample Results) by ARI to indicate that the detected analyte "does not meet established acceptance criteria". It should be noted that only positive detections in associated samples are qualified (by ARI) as such. Action was taken by the data validator on Form III Q qualified analytes and associated samples (both detects and non-detects).
- Various SDGs: Recorded cooler temperatures occasionally exceeded the recommended temperature (4˚C $\pm$ 2˚C) for sample preservation. No action was taken since the samples are delivered to the laboratory on the same day as sample collection (most frequently within a few hours).
- SAP Table 2 stipulates Metals analysis by USEPA Method 2500. This appears to be a typographical error and was not found in EPA Region X EPA Methods database.
- SAP Table 3 units for Total Petroleum Hydrocarbons in groundwater samples are mg/L but laboratory reporting limits (RLs) are reported at µg/L level. No action was taken other than to note this as a typographical error on Table 3.
- It should be noted that Polycyclic Aromatic Hydrocarbons (PAHs) compounds are also known as Polynuclear Aromatics (PNAs) and these method descriptors are used interchangeably throughout the laboratory reports.

- Multiple SDGs: TCLP Metals and water metal results are reported in mg/L instead of µg/L as noted in the SAP on Table 3. No action was taken other than to note that ARI is attempting to resolve reporting limit formatting issues internally.
- SDG TL75: Equipment blank (Sample P2IM-NASW-07-05-W) was performed on a non-disposable non-dedicated sampling equipment to evaluate effectiveness of decontamination process (sampling equipment utilized in this case was a teaspoon). Equipment blank was tested for VOCs, SVOCs, PNAs, PCBs, TPHG, TPHD, and Metals (refer to Sections 4 through 9 of this report for more details).
- Due to the nature of the field work field duplicate samples were not collected and analyzed for VOCs, SVOCs, PNAs, PCBs, TPHG, TPHD, and metals per the approved SAP (Golder, 2011).

4.0 VOLATILE ORGANIC COMPOUNDS

The laboratory provided a Level 1 data package for the VOC analyses. Case narrative notes included discussions on calibration and these issues are addressed in this section. Items reviewed during validation are summarized below.

4.1 Analytical Methods – *acceptable*

Samples for VOC analysis were analyzed by purge & trap gas chromatography/mass spectrometry (GC/MS) using EPA SW846 Method 8260C.

4.2 Sample Holding Times – *acceptable*

All soil and preserved water samples (including trip blanks) were extracted within 14 days of sample collection.

4.3 Reporting – *acceptable*

No sampling, documentation and reporting discrepancies were noted.

4.4 Laboratory Reporting Limits

The laboratory achieved the reporting limits (RLs) required by the approved SAP (Golder, 2011) with the following discussion:

- Results for total xylenes and total 1,2-dichloroethene are not reported. No action is taken since isomer results are reported and results are additive.

4.5 Instrument Calibration

Case narrative notes indicate various compounds did not meet calibration criteria. As raw data was not provided action was based on case narrative notes which are as follows:

- SDG TL09: Continuing calibration (9/7/11 on FINN5) result for compound 2CEVE was recovered above criteria. Associated samples are non-detect for these compounds. These compounds are qualified as estimated (UJ) to indicate poor calibration results.

4.6 Blank Contamination

The method, trip and equipment blanks were free of contamination with the following exceptions:

- SDG TL09: Methylene chloride was detected at a low level in the associated Trip Blank. No action was taken as it was not detected in associated sample.
- SDG TL75: Low levels of methylene chloride, chloroform, and styrene were detected in the equipment blank (Sample P2IM-NASW-07-05-W). Methylene chloride and styrene

were also detected at low levels (lower in the trip blank) in the accompanying trip blank (9/9/2011). Methylene chloride was also detected in one of the associated soil samples (Sample P2IM-NASW-02-05-S) at 7.4 µg/Kg. No action was taken in this case since the methylene chloride detection in the soil sample is greater than 10X the detection in the equipment blank sample. No action was necessary for compounds chloroform and styrene as they were not detected in associated soil samples.

4.7 Internal Standards – *acceptable*

Case narrative notes indicate internal standard recoveries were within acceptance criteria.

4.8 Surrogate Recovery – acceptable

Surrogate recovery acceptance criteria are not stipulated in the SAP (Golder, 2011). All surrogate recoveries were within ARI specified control limits.

4.9 Matrix Spike Compound Recovery – acceptable

In cases where MS/MSD analyses were not performed refer to LCS/LCSD results for a measure of precision and accuracy. MS/MSD analyses were performed on a selected sample with acceptable recoveries using approved SAP (Golder, 2011) limits which specify "analyte-specfic % recovery range" or ARI control limits.

4.10 Laboratory Control Sample Recovery – acceptable

Laboratory control/laboratory control duplicate samples (LCS/LCSD) were evaluated using approved SAP (Golder, 2011) limits which specify "analyte-specfic % recovery range" or ARI control limits. LCS/LCSD percent recoveries and relative percent difference (RPD) were acceptable and within ARI control limit criteria.

5.0 SEMIVOLATILE ORGANIC COMPOUNDS

The laboratory provided a Level 1 data package for the SVOC analyses. Case narrative notes included discussions on calibration and these issues are addressed. Items reviewed during validation are summarized below.

5.1 Analytical Methods – *acceptable*

Samples for SVOC analysis were analyzed by gas chromatography/mass spectrometry (GC/MS) and using EPA SW846 Method 8270D.

5.2 Sample Holding Times – *acceptable*

All soil samples were extracted within 14 days (7 days for water) of sample collection and analyzed within 40 days of extraction.

5.3 Reporting – acceptable

No sampling, documentation and reporting discrepancies were noted.

5.4 Laboratory Reporting Limits

The laboratory analyzed the requested analytes and achieved the RLs required by the approved SAP (Golder, 2011) with the following exceptions:

- ALL SDGs: For SVOC-GC/MS and SVOC-GC/MS-SIM results benzo(b)fluoranthene and benzo(k)fluoranthene are reported as Total Benzofluoranthenes. Total Benzofluoranthenes includes benzo(b) fluoranthene and benzo(k) fluoranthene benzo(j) fluoranthene. The required reporting limit was met via SVOC-GC/MS-SIM analyses.

Compounds 4-chloroaniline and hexachlorocyclopentadiene soil reporting limits were slightly higher than limits specified in the SAP. No action was taken other than to note this.

5.5 Instrument Calibration

Case narrative notes indicate various compounds did not meet calibration criteria. As raw data was not provided action was based on case narrative notes which are as follows:

- SDG TL75: Continuing calibration (9/21/11 on NT8) results for compound butylbenzylphthalate was recovered above criteria. Associated samples were non-detect for this compound which is qualified as estimated (UJ) to indicate poor calibration results.

5.6 Blank Contamination

The method and equipment blanks were free of contamination with the following exceptions:

- SDG TL75: Compounds dimethylphthalate and bis(2-ethylhexyl)phthalate were detected, respectively, in the soils method blank below the reporting level of (50 µg/Kg) at 44 µg/Kg and slightly above the reporting level at (25 µg/Kg) at 29 µg/Kg. Both compounds are considered common laboratory phthalate contaminants (NFG, 1999) and detections in associated samples are qualified as non-detect (U) due to potential laboratory contamination.
- SDG TL75: Phenol was detected at a low level (1.0 µg /L) at the reporting level (1.0 µg/L) in the equipment blank (Sample P2IM-NASW-07-05-W). No action was required since phenol was not detected in associated soil samples.

5.7 Surrogate Recovery – *acceptable*

Surrogate recovery acceptance criteria are not stipulated in the SAP (Golder, 2011). All surrogate recoveries were within ARI specified control limits.

5.8 Matrix Spike Compound Recovery – *acceptable*

MS/MSD analyses was performed on a selected sample (SDG TL75 - Sample P2IM-NASW-03-10-S) with acceptable recoveries using approved SAP (Golder, 2011) limits which specify "analyte-specific % recovery range" or ARI control limits.

5.9 Laboratory Control Sample Recovery

LCS/LCSD were evaluated using approved SAP (Golder, 2011) limits which specify "analyte-specfic % recovery range" or ARI control limits which appear to be PSEP listed default limits of 30-160% for recoveries and 30% for RPD. LCS/LCSD percent recoveries and RPDs were acceptable and within specified criteria with the following exceptions:

- SDG TL75: Case narrative notes indicate that several water LCS or LCSD recoveries and RPDs are outside of ARI control limit criteria. No action was taken since there was only one compound (phenol) detected in the sample with acceptable LCS/LCSD recoveries and RPD.

6.0 POLYNUCLEAR AROMATIC HYDROCARBONS

The laboratory provided a Level 1 data package for the PAH analyses. Items reviewed during validation are summarized below.

6.1 Analytical Methods – *acceptable*

Samples for PAH analysis were analyzed by selected ion monitoring (SIM) GC/MS using EPA SW846 Method 8270D Selected Ion Monitoring (SIM).

6.2 Sample Holding Times – *acceptable*

All soil samples were extracted within 14 days (7 days for water) of sample collection and analyzed within 40 days of extraction.

6.3 Reporting – *acceptable*

No sampling, documentation and reporting discrepancies were noted.

6.4 Laboratory Reporting Limits – *acceptable*

The laboratory achieved the RLs required by the approved SAP (Golder, 2011).

6.5 Blank Contamination

The method and equipment blanks were free of contamination with the following exceptions:

- SDG TL75: Naphthalene was detected at 0.05 µg/L below the reporting level (0.10 µg/L) in the equipment blank (Sample P2IM-NASW-07-05-W) which is associated with six soil samples. No action was taken since napthalene detections in associated samples are greater than 5X the detection the equipment blank.

6.6 Surrogate Recovery – *acceptable*

Surrogate recovery acceptance criteria are not stipulated in the SAP (Golder, 2011). All surrogate recoveries were within ARI specified control limits.

6.7 Matrix Spike Analysis – *acceptable*

MS/MSD analyses was performed on a selected sample (SDG TL75 - Sample P2IM-NASW-03-10-S) with acceptable recoveries using approved SAP (Golder, 2011) limits which specify "analyte-specific % recovery range" or ARI control limits.

6.8 Laboratory Control Sample Recovery – *acceptable*

LCS/LCSDs were evaluated using approved SAP (Golder, 2011) limits which specify "analyte-specfic % recovery range" or ARI control limits. LCS/LCSD percent recoveries and RPDs were acceptable and within specified criteria were evaluated using ARI control limits. LCS/LCSD percent recoveries and RPDs were acceptable and within specified criteria.

7.0 POLYCHLORINATED BIPHENYLS

The laboratory provided a Level 1 data package for the PCB analyses. Items reviewed during validation are summarized below.

7.1 Analytical Methods – *acceptable*

Samples for PCB analysis were analyzed by GC/ECD using EPA SW846 Method 8082.

7.2 Sample Holding Times and Preservations – *acceptable*

All samples were extracted within 14 days (7 days for water) of sample collection for solids and analyzed within 40 days from the date of extraction.

7.3 Reporting – *acceptable*

No sampling, documentation and reporting discrepancies.

7.4 Laboratory Reporting Limits

The laboratory achieved the RLs required by the SAP with the following exceptions:

- SDG TL75: Nine Arolcors were reported for samples submitted for analyses. The majority of these samples are identified on the Sample Tracking Form as confirmational or supplemental samples.
- The reporting limits were not met in cases in which the samples were analyzed at dilutions due to high concentrations of target compounds.
- SAP Table 3 PCB water reporting limits were not met for the equipment blank (Sample P2IM-NASW-07-05-W - SDG TL75). No action was taken in either case since the equipment blank is used to evaluate soils.

7.5 Blank Contamination – *acceptable*

The method blanks and equipment blank were free of contamination.

7.6 Surrogate Recovery – *acceptable*

All surrogate recoveries were within ARI control limit criteria which are more stringent than the SAP (Golder, 2011) stipulated control limits for soil. ARI surrogate control limits for water are fairly broad but surrogate recovery for samples (SDG TL75) were within Table 7 criteria. No action was taken for related quality assurance sample (method blank or LCS/LCSD) surrogate recoveries that fell outside of Table 7 criteria (Interference-Free).

7.7 Matrix Spike Analysis – *acceptable*

In cases where MS/MSD analyses were not performed refer to LCS/LCSD results for a measure of precision and accuracy. MS/MSD analyses were performed on one selected sample (SDG TL75) with acceptable recoveries using approved SAP Table 7 (Golder, 2011) limits of 40-140% for recoveries and 50% for RPD.

7.8 Laboratory Control Sample Recovery – *acceptable*

Table 7 of the SAP specifies PCB acceptance criteria for solids at 50-130% for recovery range. RPD criteria are not specified thus a default limit of 30% RPD was used. LCS/LCSD percent recoveries and RPDs were acceptable and within specified criteria.

8.0 FUEL HYDROCARBONS

The laboratory provided a full data package for the gas and diesel analyses. The items reviewed during validation are summarized below.

8.1 Analytical Methods – *acceptable*

Samples for fuel hydrocarbon analysis were analyzed by gas chromatography/flame ion detector (GC/FID) using methods specified by Washington State Department of Ecology.

8.2 Sample Holding Times – *acceptable*

All samples were prepared and/or analyzed within the recommended holding times:

- NWTPH-G – All samples were analyzed within 14 days of sample collection (preserved water samples and soil samples) or within 7 days of sample collection (unpreserved water samples).
- NWTPH-Dx – All samples were extracted within 14 days for soils (7 days for water) of sample collection and analyzed within 40 days from collection to analysis.

8.3 Reporting – *acceptable*

No sampling, documentation and reporting discrepancies were noted.

8.4 Laboratory Reporting Limits and Quantitation

The laboratory achieved the RLs required by the approved SAP (Golder, 2011). It should be noted that SAP Table 3 units for groundwater samples (associated samples are Trip Blanks) are expressed in mg/L instead of µg/L. No action was taken since this appears to be a typographical error.

The laboratory compared sample chromatograms with gas, diesel, motor oil, Bunker C and in one case Creosote standard chromatograms and based on this comparison ARI qualified these results as diesel range organics (DRO), gasoline range organics (GRO) to indicate qualitative or quantitative uncertainty with the results (the chromatogram was a poor match or other organics were detected in the sample). NWTPHG or NWTPH-Dx (diesel, motor oil, and Bunker C) sample results qualified 'GRO' or 'DRO' by the laboratory are considered estimated and qualified 'J' as follows:

- SDG TL75: Samples P2IM-NASW-01-01-S and P2IM-NASW-02-05-S diesel results are qualified as estimated (J) due to DRO qualification on the diesel result.

8.5 Blank Contamination – *acceptable*

The method, trip, and equipment blanks were free of contamination.

8.6 Surrogate Recovery – *acceptable*

All surrogate recoveries were within control limits of 40-140% for recoveries as specified in Table 8 of the SAP (Golder 2011).

8.7 Matrix Spike Compound Recovery – *acceptable*

In cases where MS/MSD analyses were not performed refer to LCS/LCSD results for a measure of precision and accuracy. MS/MSD analyses were performed on one selected sample (TL75C) with acceptable recoveries using approved SAP Table 8 (Golder, 2011) limits of 40-140% for recoveries and 50% for RPD.

8.8 Laboratory Control Sample Recovery – *acceptable*

Table 8 of the SAP specifies an NWTPHDx and NWTPHGx acceptance criterion for solids is 50-130% for recoveries. LCS/LCSD percent recoveries and RPDs were acceptable and within specified criteria.

9.0 INORGANICS – TOTAL METALS AND TCLP METALS

The laboratory provided a full data package for inorganic analysis. Items reviewed during validation are summarized below.

9.1 Analytical Methods – *acceptable*

Soil samples for total metals analysis were prepared using EPA Methods 3050B, or CLP. Metals analysis was completed by EPA Methods 6010B and 200.8 (thallium) and 7471A (mercury).

Water samples for total metals analysis were prepared using EPA Methods 3010A, or CLP. Metals analysis was completed by EPA Methods 6010B and 200.8 (thallium) and 7470A (mercury).

Samples for TCLP Metals were prepared using EPA Method 1311 and analysis was performed by EPA Methods 6010B and 7470A (mercury).

9.2 Sample Holding Times – *acceptable*

All samples were prepared and analyzed within the recommended holding period from the date of collection; 180 days for metals and 28 days for mercury. All holding time criteria were met.

9.3 Reporting – *acceptable*

No sampling, documentation and reporting discrepancies were noted.

9.4 Laboratory Reporting Limits

The laboratory achieved the RLs required by the approved SAP with the following exceptions:

- The reporting limits were not met in cases in which the samples were analyzed at dilutions due to high concentrations of target compounds or interferences. No action was taken.
- SDG TL75 - Data Gaps Metals List: Water reporting limit criteria were not met for arsenic, copper, lead, mercury, nickel, or silver. ARI analyzed arsenic, copper, lead, nickel, and silver via EPA Method 6010B not EPA Method 200.8 as stipulated in Table 3 of the SAP. The associated sample (SDG TL75) is an equipment blank. No action is required.
- TCLP RCRA Metals reporting limits are not stipulated in Table 3 of the SAP. No action was taken other than to note this.
- ARI reports water metals results in mg/L instead of µg/L as noted in the SAP on Table 3. No action was taken other than to note that ARI is trying to fix reporting limit formatting issues internally.

9.5 Blank Contamination – acceptable

The method and equipment blanks were free of target compounds.

9.6 Laboratory Control Sample Recovery – *acceptable*

Laboratory control samples were performed with each analytical batch. All LCS recoveries were acceptable and within the approved SAP criteria of 80 to 120% for recoveries (Golder, 2011).

9.7 Matrix Spike Analysis

Matrix spikes were performed on a selected soil sample. Matrix spike percent recoveries were acceptable and within the approved SAP (Golder, 2011) criteria of 75 to 125% for recoveries with the following exceptions:

- Multiple SDGs: Antimony matrix spike results for soils or solids were low and below acceptance criteria. Case narrative notes from August of 2005 indicate that the digestion prep method (EPA 3050B) was ineffective. ALL antimony soil results are non-detect and are qualified as estimated (UJ) due to consistently poor spike recoveries.
- Multiple SDGs: For recoveries that were outside control limits for which sample concentrations were greater than four times the spike concentration, no action was taken.

9.8 Duplicate Analysis – *acceptable*

Laboratory duplicate analysis was performed on selected sample. Duplicate recoveries were acceptable and less than SAP stipulated 20% RPD (Golder, 2011) with one exception:

- SDG TL75: Sample P2IM-NASW-03-10-S laboratory duplicate RPD result for chromium is above criteria at 45.5%. Chromium result for sample P2IM-NASW-03-10-S is qualified as estimated (J) due to poor precision.

10.0 DATA QUALIFIERS

Data qualifiers applied by the laboratory have been removed from the data summary report sheets and superseded by data validation qualifiers as follows:

The following qualifiers were used to modify the data quality and usefulness of individual analytical results.

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

J – The constituent was positively identified and detected; however, the concentration reported is an estimated value because the result is less than the quantitation limit or quality control criteria were not met.

J+ – The constituent was positively identified and detected; however, the concentration reported is an estimated value because the result may be biased high.

J- – The constituent was positively identified and detected; however, the concentration reported is an estimated value because the result may be biased low.

UJ – The constituent was not detected; the associated quantitation limit is an estimated value because quality control criteria were not met.

R – Data are rejected due to significant exceedance of quality control criteria. The analyte may or may not be present. Additional sampling and analysis may be required to determine the presence or absence of the constituent. For statistical reasons, rejected values are not included in the database.

UR – The constituent is rejected at the reported quantitation limit.

DNR - Do not report.

UY – The reporting limit is elevated due to interference. The result is not detected.

11.0 DATA ASSESSMENT

Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the project. This is to certify that I have examined the analytical data and based on the information provided to me by the laboratory, in my professional judgment, the data are acceptable for use except where indicated by data qualifiers, which may modify the usefulness of those individual values.

Jessie Compeau

12/8/2011

Jessie Compeau
Manager, Informa LLC

Date

Jill Lamberts

1/24/2012

Jill Lamberts
Staff Environmental Scientist, GAI

Date

12.0 REFERENCES

EPA 1999, USEPA Contract Laboratory Program, National Functional Guidelines for Organic Data Review, EPA-540/R-99/008. Washington, DC. October 1999.

EPA 2004, USEPA Contract Laboratory Program, National Functional Guidelines for Inorganic Data Review, EPA-540-R-04-004, October, 2004.

Golder Associates Incorporated, 2011. *Interim Measure Work Plan - North Area Stormwater System Retrofit* - Boeing Plant 2, Seattle/Tukwila, Washington. Prepared by Golder Associates Incorporated, June, 2011.

Table 3 Analytical Methods and Reporting Limits

CAS Number	Constituent	Soil Samples			Groundwater Samples			Soil - Industrial Criteria (mg/kg)	Soil - Residential Criteria (mg/kg)	TMCL - Soil - EPA (mg/kg)	Groundwater Criteria Value (µg/L)
		Analytical Method	Laboratory RL	Units	Analytical Method	Laboratory RL	Units				
Metals and Cyanide											
7429-90-5	Aluminum	6010	5.0	mg/kg	6010	50.0	µg/L				
7440-36-0	Antimony	6010	5.0	mg/kg	6010	50.0	µg/L	1400	32	3.5	3.9
7440-38-2	Arsenic	6010	5.0	mg/kg	200.8	0.2	µg/L	88	7.3	7.3	8
7440-39-3	Barium	6010	0.3	mg/kg	6010	3.0	µg/L	700000	16000	101	120
7440-41-7	Beryllium	6010	0.1	mg/kg	6010	1.0	µg/L	7000	160	140	12
7440-43-9	Cadmium	6010	0.2	mg/kg	6010	2.0	µg/L	3500	80	0.77	0.21
16065-83-1	Chromium (III)								120000		
18540-29-9	Chromium (VI)	3500	0.2	mg/kg	3500	10.0	µg/L	11000	240	0.22	0.58
7440-47-3	Chromium (Total)	6010	0.5	mg/kg	6010	5.0	µg/L				
7440-48-4	Cobalt	6010	0.3	mg/kg	6010	3.0	µg/L				
7440-50-8	Copper	6010	0.2	mg/kg	200.8	0.5	µg/L	130000	3200	36	8
7439-89-6	Iron	6010	5.0	mg/kg	6010	50.0	µg/L				
7439-92-1	Lead	6010	2.0	mg/kg	200.8	1.0	µg/L	1000	250	250	2.5
7439-95-4	Magnesium	6010	5.0	mg/kg	6010	50.0	µg/L				
7439-96-5	Manganese	6010	0.1	mg/kg	6010	1.0	µg/L	490000	11000	1700	2000
7439-97-6	Mercury	7471	0.05	mg/kg	7470	0.03 .1	µg/L	350	8	0.07	0.00045
7439-98-7	Molybdenum	6010	0.5	mg/kg	6010	5.0	µg/L				
7440-02-0	Nickel (soluble salts)	6010	1.0	mg/kg	200.8	0.5	µg/L	70000	1600	38	8.2
7782-49-2	Selenium	6010	5.0	mg/kg	6010	50.0	µg/L	18000	400	0.52	5
7440-22-4	Silver	6010	0.3	mg/kg	200.8	0.5	µg/L	18000	400	3.7	2.2
7440-28-0	Thallium (soluble salts)	200.8	0.2	mg/kg	200.8	0.2	µg/L	250	5.6		0.47
7440-31-5	Tin	6010	1.0	mg/kg	6010	10.0	µg/L				
7440-62-2	Vanadium	6010	0.3	mg/kg	6010	3.0	µg/L	25000	560	360	260
7440-66-6	Zinc	6010	1.0	mg/kg	6010	10.0	µg/L	1100000	24000	85	56
57-12-5	Cyanide	335.4	0.1	mg/kg	335.4 (Total)	5.0	µg/L	70000	1600	0.2	1
57-12-5	Cyanide				SM-3500 (WAD)	5.0	µg/L				
Semivolatile Organic Compounds (SVOCs) and Polychlorinated Biphenyls (PCBs)											
83-32-9	Acenaphthene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	210000000	4800000	12000	120
208-96-8	Acenaphthylene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L			66000	
120-12-7	Anthracene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	170000000	24000000	66000	200
56-55-3	Benzo(a)anthracene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	180000	1400	1.9	0.00011
205-99-2	Benzo(b)fluoranthene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	180000	1400	1.9	0.000053
207-08-9	Benzo(k)fluoranthene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	180000	1400	1.9	0.000055
191-24-2	Benzo(g,h,i)perylene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L				
50-32-8	Benzo(a)pyrene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	18000	140	1.9	0.0000066
65-85-0	Benzoic Acid	8270	670.0 320	µg/kg	8270	10.0	µg/L				
100-51-6	Benzyl alcohol	8270	330.0 19	µg/kg	8270	5.0	µg/L				

1,3 DCB extra
1,4
1,2

Table 3 Analytical Methods and Reporting Limits

CAS Number	Constituent	Soil Samples			Groundwater Samples			Soil - Industrial Criteria (mg/kg)	Soil - Residential Criteria (mg/kg)	TMCL - Soil - EPA (mg/kg)	Groundwater Criteria Value (µg/L)
		Analytical Method	Laboratory RL	Units	Analytical Method	Laboratory RL	Units				
101-55-3	4-Bromophenyl-phenylether	8270	67.0	µg/kg	8270	1.0	µg/L				
85-68-7	Butylbenzylphthalate	8270	67.0	µg/kg	8270	1.0	µg/L	700000000	16000000	11	0.41
86-74-8	Carbazole	8270	67.0	µg/kg	8270	1.0	µg/L	6600000	50000		
106-47-8	4-Chloroaniline	8270	250 200.0	µg/kg	8270	3.0	µg/L				
111-91-1	bis(2-Chloroethoxy) Methane	8270	67.0 19	µg/kg	8270	1.0	µg/L				
111-44-4	Bis-(2-Chloroethyl) Ether	8270	130.0 19	µg/kg	8270	2.0	µg/L	120000	910	11	0.43
59-50-7	4-Chloro-3-methylphenol	8270	130.0	µg/kg	8270	2.0	µg/L			5600000	
91-58-7	2-Chloronaphthalene	8270	67.0	µg/kg	8270	1.0	µg/L				
95-57-8	2-Chlorophenol	8270	67.0 19	µg/kg	8270	1.0	µg/L				
7005-72-3	4-Chlorophenyl-phenylether	8270	67.0 94	µg/kg	8270	1.0	µg/L				
218-01-9	Chrysene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	1800000	14000	4.042806906	0.0011
53-70-3	Dibenzo(a,h)anthracene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	180000	1400	1.9	0.000027
132-64-9	Dibenzofuran	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	7000000	160000	15000	
84-74-2	Di-n-butylphthalate	8270	67.0	µg/kg	8270	1.0	µg/L	350000000	8000000	1646.068814	47
91-94-1	3,3'-Dichlorobenzidine	8270	330.0	µg/kg	8270	5.0	µg/L				
120-83-2	2,4-Dichlorophenol	8270	200.0 MDL	µg/kg	8270	10.0	µg/L				
84-66-2	Diethylphthalate	8270	67.0	µg/kg	8270	1.0	µg/L	490000000	64000000	110000	18400
105-67-9	2,4-Dimethylphenol	8270	200.0 37	µg/kg	8270	3.0	µg/L	70000000	1600000	9100	655
131-11-3	Dimethylphthalate	8270	67.0	µg/kg	8270	1.0	µg/L	80000000			1100000
534-52-1	4,6-Dinitro-2-methylphenol	8270	670.0	µg/kg	8270	10.0	µg/L				
117-84-0	Di-n-octylphthalate	8270	67.0	µg/kg	8270	1.0	µg/L	70000000	1600000		
51-28-5	2,4-Dinitrophenol	8270	670.0 800	µg/kg	8270	10.0	µg/L				
121-14-2	2,4-Dinitrotoluene	8270	330.0	µg/kg	8270	5.0	µg/L				
606-20-2	2,6-Dinitrotoluene	8270	330.0	µg/kg	8270	5.0	µg/L				
117-81-7	bis(2-Ethylhexyl)phthalate	8270	67.0	µg/kg	8270	3.0	µg/L	9400000	71000	2900	1.2
206-44-0	Fluoranthene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	140000000	3200000	12000	11
86-73-7	Fluorene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	140000000	3200000	8400	45
118-74-1	Hexachlorobenzene	8270	67.0	µg/kg	8270	1.0	µg/L				
77-47-4	Hexachlorocyclopentadiene	8270	330.0 370	µg/kg	8270	5.0	µg/L				
67-72-1	Hexachloroethane	8270	130.0	µg/kg	8270	2.0	µg/L				
193-39-5	Indeno(1,2,3-cd)pyrene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	180000	1400	1.9	0.000023
78-59-1	Isophorone	8270	67.0	µg/kg	8270	1.0	µg/L				
91-57-6	2-Methylnaphthalene	8270 (SIM)	6.7 19	µg/kg	8270 (SIM)	0.1	µg/L	14000000	320000	222222.2222	150
95-48-7	2-Methylphenol	8270	67.0 19	µg/kg	8270	1.0	µg/L	180000000	4000000	30934.20286	3100
106-44-5	4-Methylphenol	8270	67.0 37	µg/kg	8270	1.0	µg/L	18000000	400000	3300	330
88-74-4	2-Nitroaniline	8270	330.0	µg/kg	8270	5.0	µg/L				
99-09-2	3-Nitroaniline	8270	400.0	µg/kg	8270	5.0	µg/L				
100-01-6	4-Nitroaniline	8270	330.0	µg/kg	8270	5.0	µg/L				

Table 3 Analytical Methods and Reporting Limits

CAS Number	Constituent	Soil Samples			Groundwater Samples			Soil - Industrial Criteria (mg/kg)	Soil - Residential Criteria (mg/kg)	TMCL - Soil - EPA (mg/kg)	Groundwater Criteria Value (µg/L)
		Analytical Method	Laboratory RL	Units	Analytical Method	Laboratory RL	Units				
98-95-3	Nitrobenzene	8270	67.0	µg/kg	8270	1.0	µg/L				
88-75-5	2-Nitrophenol	8270	330.0	µg/kg	8270	5.0	µg/L				
100-02-7	4-Nitrophenol	8270	330.0	µg/kg	8270	5.0	µg/L				
621-64-7	N-Nitroso-di-n-propylamine	8270	130.0 19	µg/kg	8270	2.0	µg/L				
86-30-6	N-Nitrosodiphenylamine	8270	67.0	µg/kg	8270	5.0	µg/L	27000000	200000	90	1.6
108-60-1	2,2'-Oxybis(1-Chloropropane)	8270	67.0 19	µg/kg	8270	1.0	µg/L				
87-86-5	Pentachlorophenol	8270	330.0	µg/kg	8270	5.0	µg/L				
85-01-8	Phenanthrene	8270 (SIM)	6.7	µg/kg	8270	0.1	µg/L			100000	
108-95-2	Phenol	8270	130.0 19	µg/kg	8270	2.0	µg/L	110000000	48000000	320000	41000
129-00-0	Pyrene	8270 (SIM)	6.7	µg/kg	8270 (SIM)	0.1	µg/L	110000000	2400000	11000	9.8
95-95-4	2,4,5-Trichlorophenol	8270	330.0	µg/kg	8270	5.0	µg/L				
88-06-2	2,4,6-Trichlorophenol	8270	330.0	µg/kg	8270	5.0	µg/L				
12674-11-2	Aroclor 1016	8082	33.0	µg/kg	8082	0.01	µg/L	4800	6000	13	0.0000641
-	Aroclor 1016/1242	8082	33.0	µg/kg	8082	0.01	µg/L	4800	500	13	0.000023
11104-28-2	Aroclor 1221	8082	33.0	µg/kg	8082	0.01	µg/L	4800	500	32	0.000023
11141-16-5	Aroclor 1232	8082	33.0	µg/kg	8082	0.01	µg/L				
53469-21-9	Aroclor 1242	8082	33.0	µg/kg	8082	0.01	µg/L	4800	500	13	0.000023
12672-29-6	Aroclor 1248	8082	33.0	µg/kg	8082	0.01	µg/L	4800	500	220	0.000023
11097-69-1	Aroclor 1254	8082	33.0	µg/kg	8082	0.01	µg/L	4800	500	13	0.0000055
11096-82-5	Aroclor 1260	8082	33.0	µg/kg	8082	0.01	µg/L	4800	500	13	0.000023
37324-23-5	Aroclor 1262	8082	33.0	µg/kg	8082	0.01	µg/L	13000	500	220	0.000023
11100-14-4	Aroclor 1268	8082	33.0	µg/kg	8082	0.01	µg/L	13000	500	220	0.000023
-	Total PCBs	8082	33.0	µg/kg	8082	0.01	µg/L	4800	500	13	0.000023
Volatile Organic Compounds (VOCs)											
67-64-1	Acetone	8260	5.0	µg/kg	8260	1.0	µg/L				
107-02-8	Acrolein	8260	50.0	µg/kg	8260	5.0	µg/L				
107-13-1	Acrylonitrile	8260	5.0	µg/kg	8260	0.2	µg/L				
71-43-2	Benzene	8260	1.0	µg/kg	8260	0.2	µg/L				
108-86-1	Bromobenzene	8260	1.0	µg/kg	8260	0.2	µg/L				
74-97-5	Bromochloromethane	8260	1.0	µg/kg	8260	0.2	µg/L				
75-27-4	Bromodichloromethane	8260	1.0	µg/kg	8260	0.2	µg/L	2100000	16000	8.550192	1.8
74-96-4	Bromoethane	8260	2.0	µg/kg	8260	0.2	µg/L				
75-25-2	Bromoform	8260	1.0	µg/kg	8260	0.2	µg/L			41.134368	8.8
74-83-9	Bromomethane	8260	1.0	µg/kg	8260	0.2	µg/L				
78-93-3	2-Butanone	8260	5.0	µg/kg	8260	1.0	µg/L		48000000	300000	73000
104-51-8	n-Butylbenzene	8260	1.0	µg/kg	8260	0.2	µg/L				
135-98-8	sec-Butylbenzene	8260	1.0	µg/kg	8260	0.2	µg/L				
98-06-6	tert-Butylbenzene	8260	1.0	µg/kg	8260	0.2	µg/L				

Table 3 Analytical Methods and Reporting Limits

CAS Number	Constituent	Soil Samples			Groundwater Samples			Soil - Industrial Criteria (mg/kg)	Soil - Residential Criteria (mg/kg)	TMCL - Soil - EPA (mg/kg)	Groundwater Criteria Value (µg/L)
		Analytical Method	Laboratory RL	Units	Analytical Method	Laboratory RL	Units				
103-65-1	n-Propylbenzene	8260	1.0	µg/kg	8260	0.2	µg/L			27557.4	1300
100-42-5	Styrene	8260	1.0	µg/kg	8260	0.2	µg/L				
630-20-6	1,1,1,2-Tetrachloroethane	8260	1.0	µg/kg	8260	0.2	µg/L				
79-34-5	1,1,2,2-Tetrachloroethane	8260	1.0	µg/kg	8260	0.2	µg/L	660000	5000	2	0.33
127-18-4	Tetrachloroethene	8260	1.0	µg/kg	8260	0.2	µg/L	240000	1900	0.4	0.021
108-88-3	Toluene	8260	1.0	µg/kg	8260	0.2	µg/L	280000000	6400000	12000	1300
87-61-6	1,2,3-Trichlorobenzene	8260	5.0	µg/kg	8260	0.5	µg/L				
120-82-1	1,2,4-Trichlorobenzene	8260	5.0	µg/kg	8260	0.5	µg/L	35000000	800000	500	16
71-55-6	1,1,1-Trichloroethane	8260	1.0	µg/kg	8260	0.2	µg/L		160000000	280590.8	46000
79-00-5	1,1,2-Trichloroethane	8260	1.0	µg/kg	8260	0.2	µg/L	2300000	18000	12	2.3
79-01-6	Trichloroethene	8260	1.0	µg/kg	8260	0.2	µg/L	1100000	11000	4.4	0.74
75-69-4	Trichlorofluoromethane	8260	1.0	µg/kg	8260	0.2	µg/L		24000000	81138.02	6900
76-13-1	1,1,2-Trichlorotrifluoroethane	8260	2.0	µg/kg	8260	0.2	µg/L			24000000	
95-63-6	1,2,4-Trimethylbenzene	8260	1.0	µg/kg	8260	0.2	µg/L	180000000	4000000	250	15
108-67-8	1,3,5-Trimethylbenzene	8260	1.0	µg/kg	8260	0.2	µg/L	180000000	4000000	750	45
108-05-4	Vinyl Acetate	8260	5.0	µg/kg	8260	0.2	µg/L				
75-01-4	Vinyl Chloride	8260	1.0	µg/kg	8260	0.2	µg/L	88000	670	15	2.4
-	m,p-Xylene	8260	1.0	µg/kg	8260	0.4	µg/L	700000000	16000000	15636.05333	1300
95-47-6	o-Xylene	8260	1.0	µg/kg	8260	0.2	µg/L	700000000	16000000	19243.52	1600
1330-20-7	Total Xylenes	8260	-	µg/kg	8260	-	µg/L	700000000	16000000	19426.56	1600
Total Petroleum Hydrocarbons											
-	TPH - Diesel Range	NWTPH-D	5	mg/kg	NWTPH-D	500	mg/L	2000		2000	500
-	TPH - Mineral Spirits Range[3]	NWTPH-Dx	5	mg/kg	NWTPH-Dx	250	mg/L	2000		2000	800
-	TPH - Motor Oil Range	NWTPH-Dx	10	mg/kg	NWTPH-Dx	500	mg/L	2000		2000	500
-	TPH - Bunker C	NWTPH-Dx	10	mg/kg	NWTPH-Dx	500	mg/L	2000		2000	
-	TPH - Gasoline Range	NWPTH-G	5	mg/kg	NWPTH-G	250	mg/L	100		100	500

- No CAS number available.

Notes:

1. Method references, reporting limits and method detection limits (MDLs) are updated regularly to the most current reference and based on individual instrument performance, dilutions, and total solids.
2. If soil samples are collected within the riparian fringe during trenching, sample analyses will conform to reporting limits for SMS parameters where reporting limits for selected SVOCs (not including SIM-PAHs) will be reduced to 10 to 20 ug/kg for each parameter.
3. Reported by request only.

Table 3 Analytical Methods and Reporting Limits

CAS Number	Constituent	Soil Samples			Groundwater Samples			Soil - Industrial Criteria (mg/kg)	Soil - Residential Criteria (mg/kg)	TMCL - Soil - EPA (mg/kg)	Groundwater Criteria Value (µg/L)
		Analytical Method	Laboratory RL	Units	Analytical Method	Laboratory RL	Units				
75-15-0	Carbon Disulfide	8260	1.0	µg/kg	8260	0.2	µg/L	350000000	8000000	25406.94	3900
56-23-5	Carbon Tetrachloride	8260	1.0	µg/kg	8260	0.2	µg/L	1000000	7700	1.717233331	0.25
108-90-7	Chlorobenzene	8260	1.0	µg/kg	8260	0.2	µg/L	70000000	1600000	2400	270
75-00-3	Chloroethane	8260	1.0	µg/kg	8260	0.2	µg/L	45000000	350000	106259.72	21000
67-66-3	Chloroform	8260	1.0	µg/kg	8260	0.2	µg/L	22000000	160000	21	4.3
110-75-8	2-Chloroethylvinylether	8260	5.0	µg/kg	8260	0.5	µg/L				
74-87-3	Chloromethane	8260	1.0	µg/kg	8260	0.2	µg/L	10000000	77000	929.0594667	190
95-49-8	2-Chlorotoluene	8260	1.0	µg/kg	8260	0.2	µg/L				
106-43-4	4-Chlorotoluene	8260	1.0	µg/kg	8260	0.2	µg/L				
124-48-1	Dibromochloromethane	8260	1.0	µg/kg	8260	0.2	µg/L				
74-95-3	Dibromomethane	8260	1.0	µg/kg	8260	0.2	µg/L				
96-12-8	1,2-Dibromo-3-chloropropane	8260	5.0	µg/kg	8260	2.0	µg/L				
95-50-1	1,2-Dichlorobenzene	8260	1.0	µg/kg	8260	0.2	µg/L	320000000	7200000	5200	440
541-73-1	1,3-Dichlorobenzene	8260	1.0	µg/kg	8260	0.2	µg/L				
106-46-7	1,4-Dichlorobenzene	8260	1.0	µg/kg	8260	0.2	µg/L				
110-57-6	trans-1,4-Dichloro-2-butene	8260	5.0	µg/kg	8260	1.0	µg/L				
75-34-3	1,1-Dichloroethane	8260	1.0	µg/kg	8260	0.2	µg/L	7000000000	16000000	166.7864843	33
107-06-2	1,2-Dichloroethane	8260	1.0	µg/kg	8260	0.2	µg/L	1400000	11000	17.2717671	3.6
75-35-4	1,1-Dichloroethene	8260	1.0	µg/kg	8260	0.2	µg/L	180000000	4000000	14929.45333	2300
156-59-2	cis-1,2-Dichloroethene	8260	1.0	µg/kg	8260	0.2	µg/L	35000000	800000	3404.582667	670
156-60-5	trans-1,2-Dichloroethene	8260	1.0	µg/kg	8260	0.2	µg/L	70000000	1600000	5100	940
540-59-0	1,2-Dichloroethene (total)	8260	-	µg/kg	8260	-	µg/L				
78-87-5	1,2-Dichloropropane	8260	1.0	µg/kg	8260	0.2	µg/L				
142-28-9	1,3-Dichloropropane	8260	1.0	µg/kg	8260	0.2	µg/L				
594-20-7	2,2-Dichloropropane	8260	1.0	µg/kg	8260	0.2	µg/L				
563-58-6	1,1-Dichloropropene	8260	1.0	µg/kg	8260	0.2	µg/L				
10061-01-5	cis-1,3-Dichloropropene	8260	1.0	µg/kg	8260	0.2	µg/L				
10061-02-6	trans-1,3-Dichloropropene	8260	1.0	µg/kg	8260	0.2	µg/L				
100-41-4	Ethylbenzene	8260	1.0	µg/kg	8260	0.2	µg/L	350000000	8000000	5400	800
106-93-4	Ethylene Dibromide	8260	1.0	µg/kg	8260	0.2	µg/L				
87-68-3	Hexachlorobutadiene	8260	5.0	µg/kg	8260	0.5	µg/L				
591-78-6	2-Hexanone	8260	5.0	µg/kg	8260	1.0	µg/L				
98-82-8	Isopropylbenzene	8260	1.0	µg/kg	8260	0.2	µg/L	350000000	8000000	5068.08	270
99-87-6	4-Isopropyltoluene	8260	1.0	µg/kg	8260	0.2	µg/L				
75-09-2	Methylene Chloride	8260	2.0	µg/kg	8260	0.3	µg/L	18000000	130000	280.005	61
74-88-4	Methyl Iodide	8260	1.0	µg/kg	8260	0.2	µg/L				
108-10-1	4-Methyl-2-Pentanone	8260	5.0	µg/kg	8260	1.0	µg/L				
91-20-3	Naphthalene	8260	5.0	µg/kg	8260	0.5	µg/L	70000000	1600000	3900	110

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-072111**
 METHOD BLANK

Lab Sample ID: MB-072111
LIMS ID: 11-15506
Matrix: Soil
Data Release Authorized:
Reported: 07/25/11

QC Report No: TE94-The Boeing Company
Project: NA Stormwater Retrofit WC PL2C-EMSF
Date Sampled: NA
Date Received: NA

Instrument/Analyst: FINN5/PAB
Date Analyzed: 07/21/11 09:48

Sample Amount: 5.00 g-dry-wt
Purge Volume: 5.0 mL
Moisture: NA

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	2.0	< 2.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	2.0	< 2.0	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U
107-02-8	Acrolein	50	< 50	U

WP/SAP Table 3 VS R.L. check.

JC 11/30/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: MB-072111
METHOD BLANK

Lab Sample ID: MB-072111
LIMS ID: 11-15506
Matrix: Soil
Date Analyzed: 07/21/11 09:48

QC Report No: TE94-The Boeing Company
Project: NA Stormwater Retrofit WC
PL2C-EMSF

CAS Number	Analyte	RL	Result	Q
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U extra
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	Ethylene Dibromide	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	1.0	< 1.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	101%
Bromofluorobenzene	92.0%
d4-1,2-Dichlorobenzene	99.8%

JC 11/30/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: MB-091311
METHOD BLANK

Lab Sample ID: MB-091311
LIMS ID: 11-19754
Matrix: Soil
Data Release Authorized:
Reported: 09/22/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: NA
Date Received: NA

Date Extracted: 09/13/11
Date Analyzed: 09/21/11 15:39
Instrument/Analyst: NT8/VTS
GPC Cleanup: Yes

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	20	< 20 U <130
111-44-4	Bis-(2-Chloroethyl) Ether	20	< 20 U <130
95-57-8	2-Chlorophenol	20	< 20 U <67
541-73-1	1,3-Dichlorobenzene	20	< 20 U extra
106-46-7	1,4-Dichlorobenzene	20	< 20 U extra
100-51-6	Benzyl Alcohol	20	< 20 U <330
95-50-1	1,2-Dichlorobenzene	20	< 20 U extra
95-48-7	2-Methylphenol	20	< 20 U <67
108-60-1	2,2'-Oxybis(1-Chloropropane)	20	< 20 U <67
106-44-5	4-Methylphenol	40	< 40 U <67
621-64-7	N-Nitroso-Di-N-Propylamine	20	< 20 U <130
67-72-1	Hexachloroethane	20	< 20 U <130
98-95-3	Nitrobenzene	20	< 20 U <67
78-59-1	Isophorone	20	< 20 U <67
88-75-5	2-Nitrophenol	100	< 100 U <330
105-67-9	2,4-Dimethylphenol	40	< 40 U <200
65-85-0	Benzoic Acid	400	< 400 U <670
111-91-1	bis(2-Chloroethoxy) Methane	20	< 20 U <67
120-83-2	2,4-Dichlorophenol	200	< 200 U =200
120-82-1	1,2,4-Trichlorobenzene	20	< 20 U extra
91-20-3	Naphthalene	20	< 20 U extra
106-47-8	4-Chloroaniline	270	< 270 U >200
87-68-3	Hexachlorobutadiene	100	< 100 U extra
59-50-7	4-Chloro-3-methylphenol	100	< 100 U <130
91-57-6	2-Methylnaphthalene	20	< 20 U SIM
77-47-4	Hexachlorocyclopentadiene	400	< 400 U >330
88-06-2	2,4,6-Trichlorophenol	100	< 100 U <330
95-95-4	2,4,5-Trichlorophenol	100	< 100 U <330
91-58-7	2-Chloronaphthalene	20	< 20 U <67
88-74-4	2-Nitroaniline	100	< 100 U <330
131-11-3	Dimethylphthalate	20	< 20 U <67
208-96-8	Acenaphthylene	20	< 20 U <SIM
99-09-2	3-Nitroaniline	100	< 100 U <400
83-32-9	Acenaphthene	20	< 20 U SIM
51-28-5	2,4-Dinitrophenol	850	< 850 U <670
100-02-7	4-Nitrophenol	100	< 100 U <330
132-64-9	Dibenzofuran	20	< 20 U SIM
606-20-2	2,6-Dinitrotoluene	100	< 100 U <330
121-14-2	2,4-Dinitrotoluene	100	< 100 U <330
84-66-2	**Diethylphthalate**	**50**	**44 J** <67
7005-72-3	4-Chlorophenyl-phenylether	20	< 20 U <67
86-73-7	Fluorene	20	< 20 U SIM
100-01-6	4-Nitroaniline	100	< 100 U <330
534-52-1	4,6-Dinitro-2-Methylphenol	200	< 200 U <670

5.4

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: MB-091311
METHOD BLANK

Lab Sample ID: MB-091311
LIMS ID: 11-19754
Matrix: Soil
Date Analyzed: 09/21/11 15:39

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	20	< 20 U <67
101-55-3	4-Bromophenyl-phenylether	20	< 20 U <67
118-74-1	Hexachlorobenzene	20	< 20 U <67
87-86-5	Pentachlorophenol	200	< 200 U <330
85-01-8	Phenanthrene	20	< 20 U SIM
86-74-8	Carbazole	20	< 20 U <67
120-12-7	Anthracene	20	< 20 U SIM
84-74-2	Di-n-Butylphthalate	20	< 20 U <67
206-44-0	Fluoranthene	20	< 20 U SIM
129-00-0	Pyrene	20	< 20 U SIM
85-68-7	Butylbenzylphthalate	20	< 20 U <67
91-94-1	3,3'-Dichlorobenzidine	150	< 150 U <330
56-55-3	Benzo(a)anthracene	20	< 20 U SIM
117-81-7	**bis(2-Ethylhexyl)phthalate**	**25**	**29** <67
218-01-9	Chrysene	20	< 20 U SIM
117-84-0	Di-n-Octyl phthalate	20	< 20 U <67
50-32-8	Benzo(a)pyrene	20	< 20 U SIM
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
90-12-0	1-Methylnaphthalene	20	< 20 U Extra.
TOTBFA	Total Benzofluoranthenes	20	< 20 U SIM

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.0%	2-Fluorobiphenyl	68.8%
d14-p-Terphenyl	82.2%	d4-1,2-Dichlorobenzene	69.0%
d5-Phenol	73.6%	2-Fluorophenol	72.1%
2,4,6-Tribromophenol	72.9%	d4-2-Chlorophenol	73.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS

Sample ID: MB-091311
METHOD BLANK

Lab Sample ID: MB-091311
LIMS ID: 11-19754
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: NA
Date Received: NA

Date Extracted: 09/13/11
Date Analyzed: 09/20/11 11:31
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.00 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	5.0	< 5.0 U extra
91-57-6	2-Methylnaphthalene	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	5.0	< 5.0 U extra
208-96-8	Acenaphthylene	5.0	< 5.0 U
83-32-9	Acenaphthene	5.0	< 5.0 U
86-73-7	Fluorene	5.0	< 5.0 U
85-01-8	Phenanthrene	5.0	< 5.0 U
120-12-7	Anthracene	5.0	< 5.0 U
206-44-0	Fluoranthene	5.0	< 5.0 U
129-00-0	Pyrene	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	5.0	< 5.0 U
218-01-9	Chrysene	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	5.0	< 5.0 U
132-64-9	Dibenzofuran	5.0	< 5.0 U
TOTBFA	Total Benzofluoranthenes	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	74.3%
d14-Dibenzo(a,h)anthracen	74.0%

18

17 required but 25 Benzo(b) Benzo(k) which is Reported as Total BFA.

Extra is naphthalene. 1-methylnaph.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-072211
METHOD BLANK

Lab Sample ID: MB-072211
LIMS ID: 11-15506
Matrix: Soil
Data Release Authorized:
Reported: 07/25/11

QC Report No: TE94-The Boeing Company
Project: NA Stormwater Retrofit WC
PL2C-EMSF
Date Sampled: NA
Date Received: NA

Date Extracted: 07/22/11
Date Analyzed: 07/23/11 20:50
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.0 g
Final Extract Volume: 4.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	33	< 33 U
53469-21-9	Aroclor 1242	33	< 33 U
12672-29-6	Aroclor 1248	33	< 33 U
11097-69-1	Aroclor 1254	33	< 33 U
11096-82-5	Aroclor 1260	33	< 33 U
11104-28-2	Aroclor 1221	33	< 33 U
11141-16-5	Aroclor 1232	33	< 33 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	66.2%
Tetrachlorometaxylene	61.8%

1262
1268 Not RUN.

FORM I

TE94 : 00042

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: METHOD BLANK

Lab Sample ID: TE94MB
LIMS ID: 11-15506
Matrix: Soil
Data Release Authorized:
Reported: 07/25/11

QC Report No: TE94-The Boeing Company
Project: NA Stormwater Retrofit WC PL2C-EMSF
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	07/21/11	6010B	07/22/11	7440-38-2	Arsenic	5	5	U
3050B	07/21/11	6010B	07/22/11	7440-39-3	Barium	0.3	0.3	U
3050B	07/21/11	6010B	07/22/11	7440-43-9	Cadmium	0.2	0.2	U
3050B	07/21/11	6010B	07/22/11	7440-47-3	Chromium	0.5	0.5	U
3050B	07/21/11	6010B	07/22/11	7439-92-1	Lead	2	2	U
CLP	07/21/11	7471A	07/22/11	7439-97-6	Mercury	ok 0.02 <0.05	0.02	U
3050B	07/21/11	6010B	07/22/11	7782-49-2	Selenium	5	5	U
3050B	07/21/11	6010B	07/22/11	7440-22-4	Silver	0.3	0.3	U

8

U-Analyte undetected at given RL
RL-Reporting Limit

R.L. Check.
Limited List of metals. (RCRA metals)
check this.

RCRA metals (8) - Ag, As, Ba, Cd, Cr, Hg, Pb, Se.

FORM-I

TE94 : 000053

Appendix 20.3
ARI's Routine Method 8260B Target Analytes
Internal Standards, Quantitation Ions, and Calibration Criteria

Internal Standard Associated Analyte[1]	CAS Number	Primary Ion	Secondary Ion(s)	Min RRF	Max %RSD	Max %D
Pentafluorobenzene (IS)[1]				--	--	--
Acetone	67-64-1	42	58	0.01	20	20
Acrolein	107-02-8	56	55, 58	0.01	20	20
Acrylonitrile	107-13-1	53	52, 51	0.01	20	20
Bromochloromethane	74-97-5	128	49, 130	0.01	20	20
Bromomethane	74-83-9	94	96	0.01	20	20
2-Butanone	78-93-3	43	57, 72	0.01	20	20
Carbon disulfide	75-15-0	76	78	0.01	20	20
Chloroethane	75-00-3	64	66	0.01	20	20
Chloroform	67-66-3	83	85	0.02	20	20
Chloromethane	74-87-3	50	52	0.01	20	20
Dibromofluoromethane	1868-53-7	111	113	0.01	20	20
Dichlorodifluoromethane	75-71-8	85	87	0.01	20	20
1,1-Dichloroethane	75-34-3	63	65, 83	0.02	20	20
1,1-Dichloroethene	75-35-4	96	61, 98	0.05	20	20
cis-1,2-Dichloroethene	156-59-2	96	61, 98	0.01	20	20
trans-1,2-Dichloroethene	156-60-5	96	61, 98	0.01	20	20
2,2-Dichloropropane	78-87-5	77	97	0.01	20	20
1,1,2-Trichloroethane	79-00-5	97	99	0.01	20	20
Methyl tert butyl ether	1634-04-4	73	57	0.01	20	20
Methylene chloride	75-09-2	84	86, 49	0.01	20	20
1,1,1-Trichloroethane	71-55-6	97	--	0.01	20	20
Trichlorofluoromethane	75-69-4	101	103	0.01	20	20
Vinyl acetate	108-05-4	43	86	0.01	20	20
Vinyl chloride	75-01-4	62	64	0.01	20	20
1,2-Dichloroethane -d4(surrogate	107-06-2	62	98	0.01	20	20
1,1,2-trichloro -1,2,2-trifluoroethane	76-13-1	101	85, 151	0.01	20	20
Iodomethane	74-88-4	142	127	0.01	20	20
Trans-1,4-dichloro-2-butene	110-57-6	53	75	0.01	20	20
~~Trichloroethene~~	79-01-6	95	130	0.02	20	20
Chlorobenzene-d5 (IS)	108-90-7	117	82	--	--	--
Chlorodibromomethane	124-48-1	129	127	0.02	20	20
Chlorobenzene	108-90-7	112	77, 114	0.05	20	20
1,3-Dichloropropane	142-28-9	76	78	0.01	20	20
Ethylbenzene	100-41-4	91	106	0.01	20	20

Internal Standard Associated Analyte[1]	CAS Number	Primary Ion	Secondary Ion(s)	Min RRF	Max %RSD	Max %D
2-Hexanone	91-78-6	43	58, 57, 100	0.01	20	20
Styrene	100-42-5	104	78	0.03	20	20
1-chlorohexane	544-10-5	91	55	0.01	20	20
Methylcyclohexane	108-87-2	83	55	0.01	20	20
Cyclohexane	110-82-7	84	56	0.01	20	20
Cyclohexanone	108-94-1	55	42, 98	0.01	20	20
n-Hexane	110-54-3	56	57	0.01	20	20
1,1,1,2-Tetrachloroethane	630-20-6	131	133, 119	0.01	20	20
Tetrachloroethene	127-18-4	166	164, 168, 129	0.02	20	20
M + p-Xylene	108-38-3, 106-42-3	106	91	0.01	20	20
o-Xylene	95-47-6	106	91	0.03	20	20
4-Bromofluorobenzene(surrogate)	400-00-4	95	174	0.01	20	20
1,4-Difluorobenzene (IS)		114	88	0.01	20	20
Benzene	71-43-2	78	52, 77	0.05	20	20
Bromodichloromethane	75-27-4	83	85	0.01	20	20
Toluene-d8(surrogate)	108-88-3	98	100	0.01	20	20
Carbon tetrachloride	56-23-5	117	119	0.01	20	20
2-Chloroethyl vinyl ether	110-75-2	63	65, 106	0.05	20	20
1,2-Dibromoethane	106-93-4	107	109, 188	0.01	20	20
Dibromomethane	74-95-3	93	95, 174	0.01	20	20
1,2-Dichloroethane	107-06-2	62	98	0.01	20	20
1,2-Dichloropropane	78-87-5	63	112	0.01	20	20
1,1-Dichloropropene	563-58-6	75	110, 77	0.01	20	20
cis-1,3-Dichloropropene	10061-01-5	75	77, 110	0.02	20	20
trans-1,3-Dichloropropene	10061-02-6	75	77, 110	0.01	20	20
4-Methyl-2-pentanone	108-10-1	58	43, 100	0.01	20	20
Toluene	108-88-3	92	91	0.04	20	20
1,1,2-trichloroethane	79-00-5	97	--	0.01	20	20
1,4-Dichlorobenzene-d4 (IS)	106-46-7	150	152	0.01	20	20
Bromobenzene	108-86-1	159	77, 158	0.01	20	20
Bromoform	75-25-2	173	175, 254	0.01	20	20
n-Butylbenzene	104-51-4	91	92, 134	0.01	20	20
1,1,2,2-tetrachloroethane	79-34-5	131	133, 119	0.01	20	20
1,2,3-trichloropropane	96-18-4	110	75, 77	0.01	20	20
trans-1,4-dichloro 2-butene	110-57-6	53	75	0.01	20	20
d4-1,2-Dichlorobenzene(surrogate)	95-50-1	150	152	--	--	--
sec-Butylbenzene	135-98-8	105	134	0.01	20	20
tert-Butylbenzene	98-06-6	119	91, 134	0.01	20	20

Internal Standard Associated Analyte[1]	CAS Number	Primary Ion	Secondary Ion(s)	Min RRF	Max %RSD	Max %D
2-Chlorotoluene	95-49-8	91	126	0.01	20	20
4-Chlorotoluene	106-43-4	91	126	0.01	20	20
1,2-Dibromo-3-chloropropane	96-12-8	75	155, 157	0.005	20	20
1,2-Dichlorobenzene	95-50-1	146	111, 148	0.04	20	20
1,3-Dichlorobenzene	541-73-1	146	111, 148	0.06	20	20
1,4-Dichlorobenzene	106-46-7	146	111, 148	0.05	20	20
Hexachlorobutadiene	87-68-3	225	223, 227	0.01	20	20
Isopropyl benzene	98-82-8	105	120	0.01	20	20
p-Isopropyltoluene	98-87-6	119	134, 91	0.01	20	20
Naphthalene	91-20-3	128	129, 127	0.01	20	20
n-Propylbenzene	103-65-1	91	120	0.01	20	20
1,1,2,2-Tetrachloroethane	79-34-5	83	131, 85	0.03	20	20
1,2,3-Trichlorobenzene	87-61-6	180	145	0.01	20	20
1,2,4-Trichlorobenzene	120-82-1	180	97, 85	0.02	20	20
1,2,3-Trichloropropane	98-18-4	110	75, 77	0.01	20	20
1,2,4-Trimethylbenzene	95-63-6	105	120	0.01	20	20
1,3,5-Trimethylbenzene	95-63-6	105	120		20	20

1 – Compound designations: IS = Internal Standard, SS = Surrogate Standard

Hexachloro 1,3-butadiene.

Chain of Custody Record & Laboratory Analysis Request

DV · Done ·

5

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: TC09	Turn-around Requested: 24hr.	Page: 1 of 1	
ARI Client Company: Boeing	Phone:	Date: 9/6/11	Ice Present? Y
Client Contact: Eberlin Schwinn		No. of Coolers: 1	Cooler Temps: 19.4
Client Project Name: NA Stormwater Retrofit			
Client Project #: P21M-NASW	Samplers: J. Lamberts		

Sample ID	Date	Time	Matrix	No. Containers	Jet	RCRA Metals	TCLP Metals						Notes/Comments
Trip Blank	9/6/11	-	DI	3	✓								
P21M-NASW-08-04-S	1	1545	S	5	✓	✓	HOLD						SA Roof Drain Tie in

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
cc T. Norton S. Matthews M.T. Donnelly A. Neir W. Ernst.	(Signature)	(Signature)	(Signature)	(Signature)
	Printed Name: J. Lamberts	Printed Name: Jennifer Millsap	Printed Name:	Printed Name:
	Company: colder	Company: ARI	Company:	Company:
	Date & Time: 9/6/2011 1630	Date & Time: 9/6/11 1630	Date & Time:	Date & Time:

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

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

TL09

DV Qual Entry QA ✓

SDG	Samp_Name	Lab_QC	Param_Name	Fraction	Value	Interpt_Qual	Val_Qual	Lab_Qual	Unit_Res	Detect	Use_Qual	Anal_Meth	Samp_Date	Event_Name
TL09	P2IM-NASW-08-04-S	IN	2-Chloroethylvinylether	N	5.8	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	06-Sep-11	Plant 2 NA Stormwater Retrofit
TL09	Trip Blanks-TL09	IN	2-Chloroethylvinylether	N	5	UJ	UJ	U	µg/L	FALSE	A	EPA 8260C	06-Sep-11	Plant 2 NA Stormwater Retrofit

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Soil/VOCs by EPA Method 8260C GC/MS-Method	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 11/30/2011	SDG: TL09	Proj. No.: 013-1646-011.700.01
Reviewed by: [signature] — Date: 1/23/2012	Sample Collection Dates: 9/6/11	

Cooler Temperature: ~~13.6~~ 19.4°C

Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method).

CN/CRF: Samples received in good condition. Refer to cover letter notes regarding CCAL 9/7/11 and LCS/LCSD.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	P2IM-NASW-08-04-S/TL09A	Trip Blanks/TL09B																		
Completeness of analyses:	A	A																		
Preservation:	A	A																		
Holding times: DA: 7/21/11 and 7/22/11 <14 days	A	A																		
GC/MS Tuning (if applicable):	NA	NA																		
Initial Calibration Criteria:	NA	NA																		
Continuing Calibration Criteria:	X	X																		
Method Blanks:	A	A																		
LCS/LCSD %R/RPD: LCS/LCSD-09/07/11 soil and LCS/LCSD-09/07/11 water	X	A																		
Surrogate %R:	A	A																		
MS/MSD:	NA	NA																		
Internal Standards Performance:	A	A																		
Reporting Limits:	A	A																		
Completeness of Analyte List:	A	A																		
Field Duplicate Pair:	NA	NA																		
Equipment/Field /Trip Blank:	NA	X																		

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Soil/VOCs by EPA Method 8260C GC/MS-Method	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection.	SDG: TL09	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/6/11	

VOCs CCAL Q qualified by laboratory for all associated Form III flagged analytes. 2CEVE. Action estimate (J/UJ) associated 2CEVE results.

VOCs Soil LCS/LCSD are out of control high for 2CEVE. No action 2CEVE is already qualified due to CCAL issue with 2CEVE.

Trip Blank - DCM at 2.0 (RL is 2.0). No action DCM not detected in associated sample. Not in MB.

INORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Soil/Metals by EPA 3050B/6010B & CLP/EPA 7471A for Hg	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau of Informa LLC — Date: 11/30/2011	SDG: TL09	Proj. No.: 013-1646-011.700.01
Reviewed by: Jill Fowler — Date: 1/23/2012	Sample Collection Dates: 9/6/11	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Sample identification and validation criteria (per WP Level I, EPA NFG 2004, ARI QA/QC criteria and analytical reference method. CN/CRF: No anomalies noted.	P2IM-NASW-08-04-S/TL09A																			
Completeness of Analyses:	A																			
Preservation:	A																			
Holding Times: D.A. 9/7/11 for Hg and 9/8/11 <180 Days for remaining metals	A																			
ICP/AA ICV/CCV (90-110%):	NA																			
CVAA ICV/CCV (80-120%):	NA																			
ICP Interference Check (80-120%):	NA																			
ICP Serial Dilution (<10%D for >50X IDL):	NA																			
Method Blanks: See note next page.	A																			
LCS %R (80-120%):	A																			
Lab Duplicate, ≤20% RPD (≤35% for soils) for values ≥5X CRDL or ±CRDL (±2XCRDL for soils) for values ≤5X CRDL:	NA																			
MS/MSD:	NA																			
Reporting Limits:	A																			
Completeness of Analyte List:	A																			
Field Duplicate Pair:	NA																			
Equipment/Field Blank:	NA																			

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

INORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Soil/Metals by EPA 3050B/6010B & CLP/EPA 7471A for Hg	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: None.	SDG: TL09	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/6/11	

RL Check: ARI ran RCRA metals as requested on the chain. All RLs were met.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: P2IM-NASW-08-04-S**
 SAMPLE

Lab Sample ID: TL09A
LIMS ID: 11-19129
Matrix: Soil
Data Release Authorized:
Reported: 09/08/11

QC Report No: TL09-The Boeing Company
Project: NA Stormwater Retrofit
P2IM-NASW
Date Sampled: 09/06/11
Date Received: 09/06/11

Instrument/Analyst: FINN5/PAB
Date Analyzed: 09/07/11 16:55

Sample Amount: 4.31 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 9.2%

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	1.2	< 1.2	U
74-83-9	Bromomethane	1.2	< 1.2	U
75-01-4	Vinyl Chloride	1.2	< 1.2	U
75-00-3	Chloroethane	1.2	< 1.2	U
75-09-2	Methylene Chloride	2.3	< 2.3	U
67-64-1	**Acetone**	**5.8**	**35**	
75-15-0	**Carbon Disulfide**	**1.2**	**3.3**	
75-35-4	1,1-Dichloroethene	1.2	< 1.2	U
75-34-3	1,1-Dichloroethane	1.2	< 1.2	U
156-60-5	trans-1,2-Dichloroethene	1.2	< 1.2	U
156-59-2	cis-1,2-Dichloroethene	1.2	< 1.2	U
67-66-3	Chloroform	1.2	< 1.2	U
107-06-2	1,2-Dichloroethane	1.2	< 1.2	U
78-93-3	2-Butanone	5.8	< 5.8	U
71-55-6	1,1,1-Trichloroethane	1.2	< 1.2	U
56-23-5	Carbon Tetrachloride	1.2	< 1.2	U
108-05-4	Vinyl Acetate	5.8	< 5.8	U
75-27-4	Bromodichloromethane	1.2	< 1.2	U
78-87-5	1,2-Dichloropropane	1.2	< 1.2	U
10061-01-5	cis-1,3-Dichloropropene	1.2	< 1.2	U
79-01-6	Trichloroethene	1.2	< 1.2	U
124-48-1	Dibromochloromethane	1.2	< 1.2	U
79-00-5	1,1,2-Trichloroethane	1.2	< 1.2	U
71-43-2	Benzene	1.2	< 1.2	U
10061-02-6	trans-1,3-Dichloropropene	1.2	< 1.2	U
110-75-8	2-Chloroethylvinylether	5.8	< 5.8	U vJ
75-25-2	Bromoform	1.2	< 1.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.8	< 5.8	U
591-78-6	2-Hexanone	5.8	< 5.8	U
127-18-4	Tetrachloroethene	1.2	< 1.2	U
79-34-5	1,1,2,2-Tetrachloroethane	1.2	< 1.2	U
108-88-3	Toluene	1.2	< 1.2	U
108-90-7	Chlorobenzene	1.2	< 1.2	U
100-41-4	Ethylbenzene	1.2	< 1.2	U
100-42-5	Styrene	1.2	< 1.2	U
75-69-4	Trichlorofluoromethane	1.2	< 1.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	2.3	< 2.3	U
179601-23-1	m,p-Xylene	1.2	< 1.2	U
95-47-6	o-Xylene	1.2	< 1.2	U
95-50-1	1,2-Dichlorobenzene	1.2	< 1.2	U
541-73-1	1,3-Dichlorobenzene	1.2	< 1.2	U
106-46-7	1,4-Dichlorobenzene	1.2	< 1.2	U
107-02-8	Acrolein	58	< 58	U

JC 11/30/2011

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: P2IM-NASW-08-04-S
SAMPLE

Lab Sample ID: TL09A
LIMS ID: 11-19129
Matrix: Soil
Date Analyzed: 09/07/11 16:55

QC Report No: TL09-The Boeing Company
Project: NA Stormwater Retrofit
P2IM-NASW

CAS Number	Analyte	RL	Result	Q
74-88-4	Methyl Iodide	1.2	< 1.2	U
74-96-4	Bromoethane	2.3	< 2.3	U
107-13-1	Acrylonitrile	5.8	< 5.8	U
563-58-6	1,1-Dichloropropene	1.2	< 1.2	U
74-95-3	Dibromomethane	1.2	< 1.2	U
630-20-6	1,1,1,2-Tetrachloroethane	1.2	< 1.2	U
96-12-8	1,2-Dibromo-3-chloropropane	5.8	< 5.8	U
96-18-4	1,2,3-Trichloropropane	2.3	< 2.3	U
110-57-6	trans-1,4-Dichloro-2-butene	5.8	< 5.8	U
108-67-8	1,3,5-Trimethylbenzene	1.2	< 1.2	U
95-63-6	1,2,4-Trimethylbenzene	1.2	< 1.2	U
87-68-3	Hexachlorobutadiene	5.8	< 5.8	U
106-93-4	Ethylene Dibromide	1.2	< 1.2	U
74-97-5	Bromochloromethane	1.2	< 1.2	U
594-20-7	2,2-Dichloropropane	1.2	< 1.2	U
142-28-9	1,3-Dichloropropane	1.2	< 1.2	U
98-82-8	Isopropylbenzene	1.2	< 1.2	U
103-65-1	n-Propylbenzene	1.2	< 1.2	U
108-86-1	Bromobenzene	1.2	< 1.2	U
95-49-8	2-Chlorotoluene	1.2	< 1.2	U
106-43-4	4-Chlorotoluene	1.2	< 1.2	U
98-06-6	tert-Butylbenzene	1.2	< 1.2	U
135-98-8	sec-Butylbenzene	1.2	< 1.2	U
99-87-6	4-Isopropyltoluene	1.2	< 1.2	U
104-51-8	n-Butylbenzene	1.2	< 1.2	U
120-82-1	1,2,4-Trichlorobenzene	5.8	< 5.8	U
91-20-3	Naphthalene	5.8	< 5.8	U
87-61-6	1,2,3-Trichlorobenzene	5.8	< 5.8	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	94.3%
Bromofluorobenzene	83.9%
d4-1,2-Dichlorobenzene	99.6%

JC 11/30/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
Page 1 of 2 **SAMPLE**

Lab Sample ID: TL09B
LIMS ID: 11-19130
Matrix: Water
Data Release Authorized:
Reported: 09/08/11

QC Report No: TL09-The Boeing Company
Project: NA Stormwater Retrofit
P2IM-NASW
Date Sampled: 09/06/11
Date Received: 09/06/11

Instrument/Analyst: FINN5/PAB
Date Analyzed: 09/07/11 17:26

Sample Amount: 5.00 mL
Purge Volume: 5.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	**Methylene Chloride**	**2.0**	**2.0**	
67-64-1	Acetone	10	< 10	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U UJ
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	2.0	< 2.0	U
179601-23-1	m,p-Xylene	2.0	< 2.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U
107-02-8	Acrolein	10	< 10	U

JC 11/30/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
 SAMPLE

Lab Sample ID: TL09B
LIMS ID: 11-19130
Matrix: Water
Date Analyzed: 09/07/11 17:26

QC Report No: TL09-The Boeing Company
Project: NA Stormwater Retrofit
P2IM-NASW

CAS Number	Analyte	RL	Result	Q
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	Ethylene Dibromide	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	5.0	< 5.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	103%
Bromofluorobenzene	94.0%
d4-1,2-Dichlorobenzene	100%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

JC 11/30/11

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: P2IM-NASW-08-04-S
SAMPLE

Lab Sample ID: TL09A
LIMS ID: 11-19129
Matrix: Soil
Data Release Authorized:
Reported: 09/09/11

QC Report No: TL09-The Boeing Company
Project: NA Stormwater Retrofit
P2IM-NASW
Date Sampled: 09/06/11
Date Received: 09/06/11

Percent Total Solids: 89.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	09/07/11	6010B	09/07/11	**7440-38-2**	**Arsenic**	5	**7**	
3050B	09/07/11	6010B	09/07/11	**7440-39-3**	**Barium**	0.3	**50.3**	
3050B	09/07/11	6010B	09/07/11	7440-43-9	Cadmium	0.2	0.2	U
3050B	09/07/11	6010B	09/07/11	**7440-47-3**	**Chromium**	0.5	**18.1**	
3050B	09/07/11	6010B	09/07/11	**7439-92-1**	**Lead**	2	**19**	
CLP	09/07/11	7471A	09/08/11	**7439-97-6**	**Mercury**	0.02	**0.05**	
3050B	09/07/11	6010B	09/07/11	7782-49-2	Selenium	5	5	U
3050B	09/07/11	6010B	09/07/11	7440-22-4	Silver	0.3	0.3	U

U-Analyte undetected at given RL
RL-Reporting Limit

JC 11/30/11

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: TL75	Turn-around Requested: standard
ARI Client Company: Boeing	Phone: J. Lamberts 206 465 2163
Client Contact: E. Schwinn	
Client Project Name: NASWS Retrofit	
Client Project #: P21M	Samplers: J. Lamberts

Page: 1 of 1	
Date: 9/9/2011	Ice Present? Y
No. of Coolers: 1	Cooler Temps: 13.6

Sample ID	Date	Time	Matrix	No. Containers	VOC	SVOC + SIMPAH	PCBs	Metals *	NWTPH-DX to Bunker C	NWTPH-Gx			Notes/Comments
					Analysis Requested								
P21M-NASW-01-01-S	9/9/2011	1145	S	9	X	X	X	X	X	X			0-1 ft
P21M-NASW-02-05-S		1115	S	9	X	X	X	X	X	X			4-5 ft
P21M-NASW-03-10-S		1110	S	22	X	X	X	X	X	X			MS/MSD 9-10 ft
P21M-NASW-04-05-S		1125	S	2		X		X					4-5 ft
P21M-NASW-05-05-S		1135	S	2		X		X					4-5 ft
P21M-NASW-06-12-S		1100	S	2		X		X					11-12 ft
P21M-NASW-07-05-W		1205	DI	12	X	X	X	X	X	X			
Trip Blank.	9/9/2011	–	DI	3	X					X			

* see SAP for Metals List.

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by (Signature)	Received by (Signature)
P/s cc T. Norton, S. Matthews, J. Lamberts, A. Neir, W. Ernst, MJ Donnelly	Jeff Lamberts	Jennifer Millsap		
	Printed Name: J. Lamberts	Printed Name: Jennifer Millsap	Printed Name	Printed Name.
	Company: GAI	Company: ARI	Company.	Company:
	Date & Time: 9/9/2011 1315	Date & Time: 9/9/11 1315	Date & Time.	Date & Time.

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

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

TL75

DV Qual Entry QA ✓

SDG	Samp_Name	Lab_QC	Param_Name	Fraction	Value	Interpt_Qual	Val_Qual	Lab_Qual	Unit_Res	Detect	Use_Qual	Anal_Meth	Samp_Date	Event_Name
TL75	P2IM-NASW-01-01-S	IN	Antimony	T	5	UJ	UJ	U	mg/kg	FALSE	A	EPA 6010B	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-01-01-S	IN	TPH - Diesel Range	N	18	J	J		mg/kg	TRUE	A	NWTPH-Dx-Cleaned	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-01-01-S	IN	bis(2-Ethylhexyl)phthalate	N	39	U	U	B	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-01-01-S	IN	Butylbenzylphthalate	N	19	UJ	UJ	U	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-01-01-S	IN	1,1,2-Trichlorotrifluoroethane	N	2.4	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-01-01-S	IN	2-Chloroethylvinylether	N	5.9	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-01-01-S	IN	Chloroethane	N	1.2	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-01-01-S	IN	cis-1,2-Dichloroethene	N	1.2	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-02-05-S	IN	TPH - Diesel Range	N	6	J	J		mg/kg	TRUE	A	NWTPH-Dx-Cleaned	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-06-12-S	IN	bis(2-Ethylhexyl)phthalate	N	29	U	U	B	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-06-12-S	IN	Butylbenzylphthalate	N	19	UJ	UJ	U	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-02-05-S	IN	1,1,2-Trichlorotrifluoroethane	N	2.2	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-02-05-S	IN	2-Chloroethylvinylether	N	5.4	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-02-05-S	IN	Chloroethane	N	1.1	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-02-05-S	IN	cis-1,2-Dichloroethene	N	1.1	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-02-05-S	IN	bis(2-Ethylhexyl)phthalate	N	52	U	U	B	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-02-05-S	IN	Butylbenzylphthalate	N	18	UJ	UJ	U	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-02-05-S	IN	Antimony	T	5	UJ	UJ	U	mg/kg	FALSE	A	EPA 6010B	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-03-10-S	IN	Chloroethane	N	1.5	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-03-10-S	IN	cis-1,2-Dichloroethene	N	1.5	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-04-05-S	IN	Antimony	T	6	UJ	UJ	U	mg/kg	FALSE	A	EPA 6010B	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-03-10-S	IN	Antimony	T	5	UJ	UJ	U	mg/kg	FALSE	A	EPA 6010B	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-03-10-S	IN	Chromium	T	9	J	J		mg/kg	TRUE	A	EPA 6010B	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-04-05-S	IN	bis(2-Ethylhexyl)phthalate	N	28	U	U	B	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-04-05-S	IN	Butylbenzylphthalate	N	19	UJ	UJ	U	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-05-05-S	IN	Diethylphthalate	N	96	U	U	B	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-05-05-S	IN	bis(2-Ethylhexyl)phthalate	N	32	U	U	B	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-05-05-S	IN	Butylbenzylphthalate	N	19	UJ	UJ	U	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-05-05-S	IN	Antimony	T	5	UJ	UJ	U	mg/kg	FALSE	A	EPA 6010B	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-06-12-S	IN	Antimony	T	7	UJ	UJ	U	mg/kg	FALSE	A	EPA 6010B	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-03-10-S	IN	1,1,2-Trichlorotrifluoroethane	N	2.9	UJ	UJ	U	µg/kg	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-03-10-S	IN	2-Chloroethylvinylether	N	7.3	R	R	U	µg/kg	FALSE	R	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-03-10-S	IN	bis(2-Ethylhexyl)phthalate	N	29	U	U	B	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-03-10-S	IN	Butylbenzylphthalate	N	19	UJ	UJ	U	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-03-10-S	IN	Diethylphthalate	N	100	U	U	B	µg/kg	FALSE	A	EPA 8270D	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-07-05-W	IN	Methylene Chloride	N	0.6	U	U		µg/L	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-07-05-W	IN	Styrene	N	1	U	U		µg/L	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	P2IM-NASW-07-05-W	IN	Hexachlorobutadiene	N	0.5	UJ	UJ	U	µg/L	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit
TL75	Trip Blank-TL75	IN	Hexachlorobutadiene	N	0.5	UJ	UJ	U	µg/L	FALSE	A	EPA 8260C	09-Sep-11	Plant 2 NA Stormwater Retrofit

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Equipment Blank/VOCs by EPA Method 8260C GC/MS-Method	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: [signature] — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

Cooler Temperature: 13.6°C. See note next page.

Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method).

CN/CRF: Samples received in good condition. Refer to cover letter notes regarding low CCAL, method blank contamination.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	P2IM-NASW-07-05-W/TL75G	Trip Blank/TL75H																		
Completeness of analyses:	A	A																		
Preservation:	A	A																		
Holding times: DA: 9/21/11 and 9/9/11 <14 days	A	A																		
GC/MS Tuning (if applicable):	NA	NA																		
Initial Calibration Criteria:	NA	NA																		
Continuing Calibration Criteria:	X	X																		
Method Blanks:	X	X																		
LCS/LCSD %R/RPD: LCS/LCSD-09/21/11	A	A																		
Surrogate %R:	A	A																		
MS/MSD:	NA	NA																		
Internal Standards Performance:	A	A																		
Reporting Limits:	A	A																		
Completeness of Analyte List:	A	A																		
Field Duplicate Pair:	NA	NA																		
Equipment/Trip Blank:	X	X																		

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Equipment Blank/VOCs by EPA Method 8260C GC/MS-Method	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection. No action on 13.6oC cooler temp since samples did not have sufficient time to cool.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

Case Narrative Notes: Water CCAL is out of control low for hexachlorobutadiene. ACTION: Estimate (UJ/J) hexachlorobutadiene results.

Case Narrative Notes: Water Method Blank (MB-092111) contained naphthalene and hexachlorobutadiene. Compounds naphthalene and hexachlorobutadiene were not detected in associated sample and Trip Blank.

Note: Trip Blank - Low level hits of Methylene Chloride (DCM) at 0.5 "J" Qualified by ARI(DCM RL 0.5) AND Styrene at 0.2 "J" Qualified by ARI (Styrene RL 0.2).

Note: Low levels of methylene chloride, chloroform, and styrene were detected in the equipment blank (Sample P2IM-NASW-07-05-W). Methylene chloride and styrene were also detected at low levels (lower in the trip blank) in the accompanying trip blank (9/9/2011). Methylene chloride was also detected in one of the associated soil samples (Sample P2IM-NASW-02-05-S) at 7.4 µg/Kg. No action was taken in this case since the methylene chloride detection in the soil sample is greater than 10X the detection in the equipment blank sample. No action was necessary for compounds chloroform and styrene as they were not detected in associated soil samples.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Soils/VOCs by EPA Method 8260C GC/MS-Method	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: Jill Lauller — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

Cooler Temperature: 13.6°C. See note next page.

Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method).

CN/CRF: Samples received in good condition. Refer to cover letter notes for soil VOCs regarding high CCAL, LCSD and MS/MSD results.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	P2IM-NASW-01-01-S/TL75A	P2IM-NASW-02-05-S/TL75B	P2IM-NASW-03-10-S/TL75C																	
Completeness of analyses:	A	A	A																	
Preservation:	A	A	A																	
Holding times: DA: 9/20/11 <14 days	A	A	A																	
GC/MS Tuning (if applicable):	NA	NA	NA																	
Initial Calibration Criteria:	NA	NA	NA																	
Continuing Calibration Criteria:	X	X	X																	
Method Blanks:	A	A	A																	
LCS/LCSD %R/RPD: LCS/LCSD-09/20/11	A	A	A																	
Surrogate %R:	A	A	A																	
MS/MSD: TL75C	NA	NA	X																	
Internal Standards Performance:	A	A	A																	
Reporting Limits:	A	A	A																	
Completeness of Analyte List:	A	A	A																	
Field Duplicate Pair:	NA	NA	NA																	
Equipment/Field /Trip Blank:	NA	NA	NA																	

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Soils/VOCs by EPA Method 8260C GC/MS-Method	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection. No action on 13.6oC cooler temp since samples did not have sufficient time to cool.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

Case Narrative Notes: Soil CCAL is out of control high for Form III "Q" Qualified analytes chloroethane, cis-1,2-dichloroethene, 2CEVE, and CFC-113. ACTION: Estimate (UJ/J) chloroethane, cis-1,2-dichloroethane, 2CEVE, and CFC-113 results in associated samples.

Case Narrative Notes: LCSD compound chloroethane is out of control high. LCS is in control. ACTION: Chloroethane is already qualified due to CCAL issues. No action taken due to elevated LCSD % recovery.

Case Narrative Notes: VOC MS/MSD % recovery high/low for several compounds. ACTION: Sample TL75C is ND with the exception of acetone detected at 17 ppb (RL 7.3 ppb). Focused review on low MS/MSD recoveries. ACTION: R qualify 2CEVE results due to NA on recovery. The R qualifier supercedes (estimated UJ/ J due to CCAL results) qualifier on this sample only. Arcrolein was also low but with in ME critiera. (low level ME limits 40-151).

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Water/SVOCs by EPA Method 8270D GC/MS-Method		Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC	Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: [signature]	Date: 1/23/2012	Sample Collection Dates: 9/9/11	

Cooler Temperature: 13.6°C. See note next page.

Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method).

CN/CRF: Samples received in good condition. Refer to notes on cover letter (next page) water surrogates out on LCS/LCSD and LCS/LCSD control limit critiera not met for several analytes. See next page for more information.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	P2IM-NASW-07-05-W/TL75G																			
Completeness of analyses:	A																			
Preservation:	A																			
Holding times: DE: 9/13/11 < 7 days and D.A. 9/20/11 < 40 days	A																			
GC/MS Tuning (if applicable):	NA																			
Initial Calibration Criteria:	NA																			
Continuing Calibration Criteria:	X																			
Method Blanks: MB-091311	A																			
LCS/LCSD %R/RPD: LCS/LCSD-09/13/11	A																			
Surrogate %R:	A																			
MS/MSD:	NA																			
Internal Standards Performance:	NA																			
Reporting Limits:	A																			
Completeness of Analyte List:	A																			
Field Duplicate Pair:	NA																			
Equipment/Field /Trip Blank:	X																			

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Water/SVOCs by EPA Method 8270D GC/MS-Method	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection. No action on 13.6°C cooler temp since samples did not have sufficient time to cool.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

Case Narrative Notes: Water surrogate TBP % recovery is high at 126% for both LCS/LCSD (CL is 52-123%). TBP % Recovery for assocaiated sample and method blank are acceptable. No ACTION required.

Case Narrative Notes: LCS/LCSD % R and RPD are outside control limit criteria.

Phenol was detected at a low level (1.0 µg /L) at the reporting level (1.0 µg/L) in the equipment blank (Sample P2IM-NASW-07-05-W). No action was required since phenol was not detected in associated soil samples.

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Spike Recovery Control Limits for Analysis of Aqueous Samples Semi-Volatile Organic Compounds (SVOA) EPA SW-846 Methods 8270D [9]

Effective: 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

Extraction Method:	**Liquid-Liquid Extract [1]**	**Liquid-Liquid ME[1,2]**	**Separatory Funnel [1]**	**Separatory Funnel - ME[1,2]**
Sample Weight / Final Volume:	500 to 0.5 mL	500 to 0.5 mL	500 to 0.5 mL	500 to 0.5 mL
LCS Spike Recovery [8]				
Phenol [3]	50 - **100**	43 - 103	16 - **100**	6 - **100**
Bis-(2-chloroethyl) ether	52 - **100**	45 - 105	41 - 112	29 - 124
2-Chlorophenol	56 - **100**	49 - 103	43 - 111	32 - 122
1,3-Dichlorobenzene	23 - **100**	15 - **100**	32 - **100**	22 - 103
1,4-Dichlorobenzene	25 - **100**	17 - **100**	32 - **100**	22 - 103
Benzyl Alcohol	19 - 100	**10** - 114	22 - 100	9 - 113
1,2-Dichlorobenzene	30 - **100**	22 - **100**	34 - **100**	24 - 104
2-Methylphenol	52 - **100**	44 - 106	36 - 110	24 - 122
2,2'-oxybis(1-chloropropane)	32 - 111	19 - 124	29 - 118	14 - 133
4-Methylphenol	53 - 102	45 - 110	38 - 104	27 - 115
N-Nitroso-di-n-propylamine	43 - 104	33 - 114	38 - 115	25 - 128
Hexachloroethane	12 - **100**	**10** - **100**	24 - **100**	13 - 100
Nitrobenzene	33 - 125	18 - 140	45 - 106	35 - 116
Isophorone	57 - 115	47 - 125	55 - 119	44 - 130
2-Nitrophenol	56 - 102	48 - 110	46 - 118	34 - 130
2,4-Dimethyphenol	29 - **100**	20 - **100**	28 - 105	15 - 118
Bis-(2-chloroethoxy) methane	54 - 101	46 - 109	44 - 118	32 - 130
Benzoic Acid [3]	**10** - 131	**10** - 151	11 - **100**	**10** - **100**
2,4-Dichlorophenol	56 - 104	48 - 112	43 - 121	30 - 134
1,2,4-Trichlorobenzene	27 - **100**	18 - **100**	35 - **100**	25 - 107
Naphthalene	45 - **100**	38 - **100**	36 - 111	24 - 124
4-Chloroaniline [3]	**10** - 139	**10** - 161	10 - 174	**10** - 201
2-Chloronaphthalene	45 - **100**	37 - 105	39 - 118	26 - 131
Hexachlorobutadiene	**10** - **100**	**10** - **100**	24 - **100**	12 - 108
4-Chloro-3-methylphenol	53 - 109	44 - 118	45 - 122	32 - 135
2-Methylnaphthalene	46 - **100**	38 - 100	45 - 103	35 - 113
Hexachlorocyclopentadiene	**10** - **100**	**10** - **100**	23 - 108	**10** - 122
2,4,6-Trichlorophenol	58 - 108	50 - 116	48 - 122	36 - 134
2,4,5-Trichlorophenol	58 - 107	50 - 115	48 - 122	36 - 134
2-Nitroaniline	50 - 107	41 - 117	48 - 118	36 - 130
Dimethylphthalate	58 - 107	50 - 115	50 - 120	38 - 132
Acenaphthylene	57 - 100	50 - 107	50 - 119	39 - 131
2,6-Dinitrotoluene	58 - 112	49 - 121	48 - 133	34 - 147
3-Nitroaniline [3]	21 - 150	**10** - 172	54 - 140	40 - 154
Acenaphthene	51 - **100**	43 - 106	41 - 120	28 - 133
2,4-Dinitrophenol	12 - 169	**10** - 195	23 - 176	**10** - 202

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Spike Recovery Control Limits for Analysis of Aqueous Samples Semi-Volatile Organic Compounds (SVOA) EPA SW-846 Methods 8270D [9]

Effective: 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

Extraction Method:	**Liquid-Liquid Extract [1]**	**Liquid-Liquid ME[1,2]**	**Separatory Funnel [1]**	**Separatory Funnel - ME[1,2]**
Sample Weight / Final Volume:	500 to 0.5 mL	500 to 0.5 mL	500 to 0.5 mL	500 to 0.5 mL
Dibenzofuran	57 - 100	50 - 107	51 - 114	41 - 125
4-Nitrophenol [3]	35 - 119	21 - 133	13 - **100**	**10 - 100**
2,4-Dinitrotoluene	58 - 117	48 - 127	51 - 134	37 - 148
Fluorene	56 - 104	48 - 112	50 - 120	38 - 132
Diethylphthlalate	52 - 111	42 - 121	48 - 122	36 - 134
4-Chlorophenyl-phenyl ether	55 - 104	47 - 112	50 - 118	39 - 129
4-Nitroaniline	49 - 112	39 - 123	42 - 136	26 - 152
4,6-Dinitro-2-Methylphenol	13 - 139	**10** - 160	32 - 121	17 - 136
N-Nitrosodiphenylamine	60 - 136	47 - 149	58 - 141	44 - 155
4-Bromophenyl-phenyl ether	55 - 103	47 - 111	50 - 122	38 - 134
Hexachlorobenzene	54 - 106	45 - 115	47 - 125	34 - 138
Pentachlorophenol	46 - 114	35 - 125	35 - 130	19 - 146
Phenanthrene	56 - 102	48 - 110	49 - 120	37 - 132
Anthracene	56 - 101	49 - 109	53 - 116	43 - 127
Carbazole	60 - 108	52 - 116	57 - 122	46 - 133
Di-n-butylphthalate	56 - 112	47 - 121	57 - 121	46 - 132
Fluoranthene	57 - 110	48 - 119	56 - 119	46 - 130
Pyrene	48 - 119	36 - 131	37 - 143	19 - 161
Butylbenzylphthalate	51 - 114	41 - 125	34 - 152	14 - 172
Benzo(a)Anthracene	55 - 105	47 - 113	49 - 129	36 - 142
3,3'-Dichlorbenzidine [3]	**10** - 128	**10** - 148	50 - 128	37 - 141
Chrysene	55 - 104	47 - 112	45 - 128	31 - 142
bis(2-Ethylhexyl) phthalate	28 - 164	**10** - 187	57 - 133	44 - 146
Di-n-octylphthalate	57 - 107	49 - 115	52 - 120	41 - 131
Benzofluoranthene(s) (Total)	30 - 160[10]	30 - 160[10]	30 - 160[10]	30 - 160[10]
Benzo(a)Pyrene	45 - 103	35 - 113	46 - 109	36 - 120
Indeno(1,2,3-cd)Pyrene	35 - 118	21 - 132	34 - 136	17 - 153
Dibenz(a,h)anthracene	42 - 119	29 - 132	41 - 134	26 - 150
Benzo(g,h,i)Perylene	39 - 123	25 - 137	41 - 133	26 - 148
Aniline [3]	**10 - 100**	**10 - 100**	28 - 126	12 - 142
1,2-Diphenylhydrazine /Azobenzene	57 - 109	48 - 118	55 - 119	44 - 130
N-Nitrosodimethylamine	49 - **100**	41 - 104	31 - **100**	21 - 105
1-Methylnaphthalene	46 - **100**	37 - 107	43 - 115	31 - 127
1,4-Dioxane	40 - **100**	30 - 108	30 - 160 [4]	30 - 160 [4]
Pyridine	-	-	25 - **100**	15 - **100**
Tributyl Phosphate	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]
Dibutyl Phenyl Phosphate	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]

Spike Recovery Control Limits for Analysis of Aqueous Samples Semi-Volatile Organic Compounds (SVOA) EPA SW-846 Methods 8270D [9]

Effective: 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

Extraction Method:	Liquid-Liquid Extract [1]	Liquid-Liquid ME[1,2]	Separatory Funnel [1]	Separatory Funnel - ME[1,2]
Sample Weight / Final Volume:	500 to 0.5 mL	500 to 0.5 mL	500 to 0.5 mL	500 to 0.5 mL
Butyl Diphenyl Phosphate	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]
Triphenyl Phosphate	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]
Butylated Hydroxytoluene (BHT)	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]	30 - 160 [4]
MB / LCS Surrogate Recovery				
d4-2-Chlorophenol	53 - 100	(5)	49 - 101	(5)
d4-1,2-Dichlorobenzene	38 - **100**	(5)	40 - **100**	(5)
2,4,6-Tribromophenol	52 - 123	(5)	51 - 122	(5)
2-Fluorophenol	46 - **100**	(5)	31 - **100**	(5)
d5-Phenol [3]	50 - 100	52 - 108	19 - **100**	12 - **100**
d5-Nitrobenzene	46 - 100	(5)	46 - 101	(5)
2-Fluorobiphenyl	49 - **100**	(5)	49 - 103	(5)
d14-p-Terphenyl	53 - 119	(5)	49 - 130	(5)
d8-1,4-Dioxane	45 - **100**	(5)	30 - 160 [4]	(5)
Sample Surrogate Recovery				
d4-2-Chlorophenol	44 - **100**	(5)	23 - 104	(5)
d4-1,2-Dichlorobenzene	32 - **100**	(5)	22 - **100**	(5)
2,4,6-Tribromophenol	48 - 118	(5)	22 - 125	(5)
2-Fluorophenol	38 - **100**	(5)	18 - **100**	(5)
d5-Phenol	41 - **100**	32 - 104	**10** - **100**	17 - **100**
d5-Nitrobenzene	39 - **100**	(5)	21 - 106	(5)
2-Fluorobiphenyl	42 - **100**	(5)	26 - 104	(5)
d14-p-Terphenyl	26 - 114	(5)	11 - 132	(5)
d8-1,4-Dioxane	32 - **100**	(5)	30 - 160 [4]	(5)

(1) Control Limits calculated using all data generated 1/1/07 through 12/1/07.
(2) **ME** = A **marginal exceedance** defined in the NELAC Standard [6] as beyond the CL but still within the ME limits. ARI defines ME limits as between 3 and 4 standard deviations around the mean with upper limit ≥ 100%. A maximum of four marginal exceedances are acceptable. Five or more marginal exceedances in an analysis require corrective action.
(3) These are "**poor performers**" defined in the DoD QSM[7] as compounds that "produce low mean recoveries and high standard deviations, resulting in wide LCS control limits with particularly low lower control limits (sometimes-negative values). ARI does not control batch acceptance based on these compounds since there is a high level of uncertainty in their recovery."
(4) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. **DO NOT** use these limits as the sole reason to reject the data from a batch of analyses.
(5) Marginal Exceedances not allowed for surrogate unless it is a "poor performer".
(6) **2003 NELAC Standard (EPA/600/R-04/003), July 2003**, Chapter 5, pages 251-252.
(7) Page 182 of: **Department of Defense Quality Systems Manual for Environmental Laboratories, Version 3 Final, March 2005** Prepared By Environmental Data Quality Workgroup, Department of Navy, Lead Service (Based On National Environmental Laboratory Accreditation Conference (NELAC) Chapter 5 (Quality Systems) NELAC Voted Version – 5 June 2003
(8) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.
(9) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(10) Default limits pending generation of historic limits for total benzofluoranthrenes (7/29/10)

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Soils/SVOCs by EPA Method 8270D GC/MS-Method	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: Jill Fanelli — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

Cooler Temperature: 13.6°C. See note next page.

Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method).

CN/CRF: Samples received in good condition. Refer to cover letter notes regarding high CCAL, method blank contamination and soil MS/MSD results. See next page for more information.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	P2IM-NASW-01-01-S/TL75A	P2IM-NASW-02-05-S/TL75B	P2IM-NASW-03-10-S/TL75C	P2IM-NASW-04-05-S/TL75D	P2IM-NASW-05-05-S/TL75E	P2IM-NASW-06-12-S/TL75F														
Completeness of analyses:	A	A	A	A	A	A														
Preservation:	A	A	A	A	A	A														
Holding times: DE: 9/13/11 < 14 days and D.A. 9/21/11 < 40 days	A	A	A	A	A	A														
GC/MS Tuning (if applicable):	NA	NA	NA	NA	NA	NA														
Initial Calibration Criteria:	NA	NA	NA	NA	NA	NA														
Continuing Calibration Criteria:	X	X	X	X	X	X														
Method Blanks: MB-091311	X	X	X	X	X	X														
LCS/LCSD %R/RPD: LCS/LCSD-09/13/11	A	A	A	A	A	A														
Surrogate %R:	A	A	A	A	A	A														
MS/MSD: TL75C	NA	NA	X	NA	NA	NA														
Internal Standards Performance:	NA	NA	NA	NA	NA	NA														
Reporting Limits:	A	A	A	A	A	A														
Completeness of Analyte List:	A	A	A	A	A	A														
Field Duplicate Pair:	NA	NA	NA	NA	NA	NA														
Equipment/Field /Trip Blank:	NA	NA	NA	NA	NA	NA														

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Soils/SVOCs by EPA Method 8270D GC/MS-Method	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection. No action on 13.6°C cooler temp since samples did not have sufficient time to cool.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

Case Narrative Notes: Soil CCAL is out of control high for butylbenzylphthalate ACTION: Estimate (UJ/J)all associated butylbenzylphthalate results.

Case Narrative Notes: Soil Method Blank (MB-091311) contained diethylphthalate at 44 "J" slightly below ARI RL (RL is 50 ppb) and BEHP at 29 (RL is 25 ppb). Compound diethylphthalate and BEHP are qualified as not detected (U) when detected used the 10X rule for phthalate which is a common laboratory contaminant. Note that the diethylphthalate is a little below RL. NFG guidelines stipulate that professional judgement used to qualify associated results in cases.

Case Narrative Notes: MS/MSD recovery critiera is 30-160 using ARI web site (PSEP-10g to 1 ml for 8270D). ME defaults are the same. Hexachlorocylcopentadiene RPD is elevated above 30% RPD. No action both MS/MSD inside critiera.

	Diethylphthalate		BEHP			
	Amt Qual	RL	Amt	Qual	RL	
TL75A	NO		39	BU	23	
B	NO		52	BU	22	
C	100BU	47	29	BU	23	
D	NO		28	BU	23	
E	96BU	48	32	BU	24	
F	NO		29	BU	24	
	44	Action Level approx 440			29	290 Action Level

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Spike Recovery Control Limits for Analysis of Soil & Sediment Semi-Volatile Organic Compounds (SVOA) EPA SW-846 Method 8270D with Ultrasonic Extraction [1,8]

Effective: 5/11/11

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

Extraction / Analytical Method:	**8270D**	**8270D ME[2]**	**PSEP [3]**	**PSEP ME[2,3]**
Sample Weight / Final Volume:	7.5 g to 0.5 mL	7.5 g to 0.5 mL	10 g to 1 mL	10 g to 1 mL
LCS Spike Recovery [9]				
Phenol	48 - **100**	41 - **100**	30 - 160	30 - 160
Bis-(2-chloroethyl) ether	32 - **100**	22 - 104	30 - 160	30 - 160
2-Chlorophenol	44 - **100**	37 - **100**	30 - 160	30 - 160
1,3-Dichlorobenzene	39 - **100**	33 - **100**	30 - 160	30 - 160
1,4-Dichlorobenzene	40 - **100**	34 - **100**	30 - 160	30 - 160
Benzyl Alcohol	**10** - **100**	**10** - **100**	30 - 160	30 - 160
1,2-Dichlorobenzene	42 - **100**	36 - **100**	30 - 160	30 - 160
2-Methylphenol	44 - **100**	37 - **100**	30 - 160	30 - 160
2,2'-oxybis(1-chloropropane)	21 - **100**	**10** - 107	30 - 160	30 - 160
4-Methylphenol	45 - **100**	37 - 100	30 - 160	30 - 160
N-Nitroso-di-n-propylamine	36 - **100**	27 - 101	30 - 160	30 - 160
Hexachloroethane	35 - **100**	28 - **100**	30 - 160	30 - 160
Nitrobenzene	27 - 102	15 - 115	30 - 160	30 - 160
Isophorone	47 - **100**	39 - 105	30 - 160	30 - 160
2-Nitrophenol	46 - **100**	40 - **100**	30 - 160	30 - 160
2,4-Dimethyphenol	41 - **100**	34 - **100**	30 - 160	30 - 160
Bis-(2-chloroethoxy) methane	40 - **100**	32 - **100**	30 - 160	30 - 160
Benzoic Acid [4]	**10** - 138	**10** - 159	30 - 160	30 - 160
2,4-Dichlorophenol	48 - **100**	41 - **100**	30 - 160	30 - 160
1,2,4-Trichlorobenzene	43 - **100**	35 - **100**	30 - 160	30 - 160
Naphthalene	44 - **100**	38 - **100**	30 - 160	30 - 160
4-Chloroaniline [4]	16 - **100**	**10** - 113	30 - 160	30 - 160
2-Chloronaphthalene	48 - **100**	42 - **100**	30 - 160	30 - 160
Hexachlorobutadiene	40 - **100**	33 - **100**	30 - 160	30 - 160
4-Chloro-3-methylphenol	50 - **100**	42 - 104	30 - 160	30 - 160
2-Methylnaphthalene	48 - **100**	42 - **100**	30 - 160	30 - 160
Hexachlorocyclopentadiene	20 - 114	**10** - 130	30 - 160	30 - 160
2,4,6-Trichlorophenol	51 - **100**	44 - 100	30 - 160	30 - 160
2,4,5-Trichlorophenol	50 - **100**	43 - 103	30 - 160	30 - 160
2-Nitroaniline	45 - **100**	36 - 106	30 - 160	30 - 160
Dimethylphthalate	53 - **100**	46 - 103	30 - 160	30 - 160
Acenaphthylene	50 - **100**	43 - 100	30 - 160	30 - 160
2,6-Dinitrotoluene	54 - 100	46 - 108	30 - 160	30 - 160
3-Nitroaniline [4]	22 - 117	**10** - 133	30 - 160	30 - 160
Acenaphthene	48 - **100**	41 - **100**	30 - 160	30 - 160

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Spike Recovery Control Limits for Analysis of Soil & Sediment Semi-Volatile Organic Compounds (SVOA) EPA SW-846 Method 8270D with Ultrasonic Extraction [1,8]

Effective: 5/11/11

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

Extraction / Analytical Method:	**8270D**	**8270D ME[2]**	**PSEP [3]**	**PSEP ME[2,3]**
Sample Weight / Final Volume:	7.5 g to 0.5 mL	7.5 g to 0.5 mL	10 g to 1 mL	10 g to 1 mL
2,4-Dinitrophenol	12 - 147	**10** - 170	30 - 160	30 - 160
Dibenzofuran	53 - **100**	47 - **100**	30 - 160	30 - 160
4-Nitrophenol	18 - 107	**10** - 122	30 - 160	30 - 160
2,4-Dinitrotoluene	57 - 106	49 - 114	30 - 160	30 - 160
Fluorene	54 - **100**	48 - 100	30 - 160	30 - 160
Diethylphthlalate	52 - 100	44 - 108	30 - 160	30 - 160
4-Chlorophenyl-phenyl ether	54 - **100**	48 - **100**	30 - 160	30 - 160
4-Nitroaniline	27 - 110	13 - 124	30 - 160	30 - 160
4,6-Dinitro-2-Methylphenol	21 - 122	**10** - 139	30 - 160	30 - 160
N-Nitrosodiphenylamine	44 - 145	27 - 162	30 - 160	30 - 160
4-Bromophenyl-phenyl ether	52 - **100**	45 - 101	30 - 160	30 - 160
Hexachlorobenzene	50 - **100**	42 - 104	30 - 160	30 - 160
Pentachlorophenol	45 - **100**	36 - 108	30 - 160	30 - 160
Phenanthrene	53 - **100**	46 - 101	30 - 160	30 - 160
Anthracene	49 - **100**	41 - 105	30 - 160	30 - 160
Carbazole	45 - 111	34 - 122	30 - 160	30 - 160
Di-n-butylphthalate	55 - 106	47 - 115	30 - 160	30 - 160
Fluoranthene	54 - 105	46 - 114	30 - 160	30 - 160
Pyrene	48 - 106	38 - 116	30 - 160	30 - 160
Butylbenzylphthalate	46 - 111	35 - 122	30 - 160	30 - 160
Benzo(a)Anthracene	51 - 101	43 - 109	30 - 160	30 - 160
3,3'-Dichlorbenzidine [4]	**10** - 112	**10** - 129	30 - 160	30 - 160
Chrysene	56 - **100**	50 - 102	30 - 160	30 - 160
Bis(2-Ethylhexyl) phthalate	57 - 114	48 - 124	30 - 160	30 - 160
Di-n-octylphthalate	56 - 100	49 - 107	30 - 160	30 - 160
Benzofluoranthene(s) (Total)	30 - 160[10]	30 - 160[10]	30 - 160	30 - 160
Benzo(a)Pyrene	51 - **100**	43 - 105	30 - 160	30 - 160
Indeno(1,2,3-cd)Pyrene	38 - 104	27 - 115	30 - 160	30 - 160
Dibenz(a,h)anthracene	41 - 107	30 - 118	30 - 160	30 - 160
Benzo(g,h,i)Perylene	36 - 107	24 - 119	30 - 160	30 - 160
Aniline [4]	**10** - **100**	**10** - 103	30 - 160	30 - 160
1,2-Diphenylhydrazine (Azobenzene)	48 - 101	39 - 110	30 - 160	30 - 160
N-Nitrosodimethylamine	31 - **100**	21 - 101	30 - 160	30 - 160
1-Methylnaphthalene	48 - **100**	41 - **100**	30 - 160	30 - 160
Pyridine	**10** - **100**	**10** - **100**	30 - 160	30 - 160
MB/LCS Surrogate Recovery				

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Spike Recovery Control Limits for Analysis of Soil & Sediment Semi-Volatile Organic Compounds (SVOA) EPA SW-846 Method 8270D with Ultrasonic Extraction [1,8]

Effective: 5/11/11

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

Extraction / Analytical Method:	**8270D**	**8270D ME[2]**	**PSEP [3]**	**PSEP ME[2,3]**
Sample Weight / Final Volume:	7.5 g to 0.5 mL	7.5 g to 0.5 mL	10 g to 1 mL	10 g to 1 mL
d4-2-Chlorophenol	43 - **100**	(5)	30 - 160	(5)
d4-1,2-Dichlorobenzene	34 - **100**	(5)	30 - 160	(5)
2,4,6-Tribromophenol	47 - 109	(5)	30 - 160	(5)
2-Fluorophenol	14 - 100	(5)	30 - 160	(5)
d5-Phenol [4]	39 - **100**	**10** - 133	30 - 160	30 -160
d5-Nitrobenzene	39 - **100**	(5)	30 - 160	(5)
2-Fluorobiphenyl	44 - **100**	(5)	30 - 160	(5)
d14-p-Terphenyl	55 - 106	(5)	30 - 160	(5)
Sample Surrogate Recovery				
d4-2-Chlorophenol	33 - **100**	(5)	30 - 160	(5)
d4-1,2-Dichlorobenzene	30 - **100**	(5)	30 - 160	(5)
2,4,6-Tribromophenol	28 - 116	(5)	30 - 160	(5)
2-Fluorophenol	**10** - **100**	(5)	30 - 160	(5)
d5-Phenol [4]	31 - **100**	21 - 101	30 - 160	30 -160
d5-Nitrobenzene	32 - **100**	(5)	30 - 160	(5)
2-Fluorobiphenyl	36 - **100**	(5)	30 - 160	(5)
d14-p-Terphenyl	35 - 113	(5)	30 - 160	(5)

(1) Control Limits calculated using all data generated 1/1/08 through 12/1/08.
(2) **ME** = A **marginal exceedance** defined in the NELAC Standard [6] as beyond the CL but still within the ME limits. ARI defines ME limits as 4 standard deviations around the mean with upper limit ≥ 100% A maximum of 4 marginal exceedances are acceptable. (≥ 5 marginal exceedances in an analysis require corrective action).
(3). Preparation = Microwave Extraction (EPA method 3546) & Gel Permeation Chromatography (GPC) clean-up.
(4) These are "**poor performers**" defined in the DoD QSM [7] as compounds that "produce low mean recoveries and high standard deviations, resulting in wide LCS control limits with particularly low lower control limits (sometimes-negative values). ARI does not control batch acceptance based on these compounds since there is a high level of uncertainty in their recovery."
(5) Marginal Exceedances not allowed for surrogate unless it is a "poor performer".
(6) **2003 NELAC Standard (EPA/600/R-04/003), July 2003**, Chapter 5, pages 251-252.
(7) Page 182 of: **Department of Defense Quality Systems Manual for Environmental Laboratories, Version 3 Final, March 2005** Prepared By Environmental Data Quality Workgroup, Department of Navy, Lead Service (Based NELAC Chapter 5 (Quality Systems) NELAC Voted Version – 5 June 2003
(8) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(9) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.
(10) Default limits pending generation of historic limits for total benzofluoranthrenes (7/29/10)

OSWER 9240.1-05A-P
PB99-963506
EPA540/R-99/008
October 1999

USEPA CONTRACT LABORATORY PROGRAM NATIONAL FUNCTIONAL GUIDELINES FOR ORGANIC DATA REVIEW

Office of Emergency and Remedial Response
U.S. Environmental Protection Agency
Washington, DC 20460

V. Blanks

A. **Review Items:** Form I SV-1 *[Form I LCSV-1]*, Form I SV-2 *[Form I LCSV-2]*, Form IV SV *[Form IV LCSV]*, chromatograms, and quantitation reports.

B. **Objective:**

The purpose of laboratory (or field) blank analyses is to determine the existence and magnitude of contamination problems resulting from laboratory (or field) activities. The criteria for evaluation of blanks apply to any blank associated with the samples (e.g., method blanks, instrument blanks, trip blanks, and equipment blanks). If problems with any blank exist, all associated data must be carefully evaluated to determine whether or not there is an inherent variability in the data, or if the problem is an isolated occurrence not affecting other data.

C. **Criteria:**

1. No contaminants should be found in the blanks.

2. The method blank must be analyzed on each GC/MS system used to analyze that specific group or set of samples.

D. **Evaluation:**

1. Review the results of all associated blank, Form I SV-1, Form I SV-2, and raw data (chromatograms and quantitation reports) to evaluate the presence of target and non-target compounds in the blanks.

2. Verify that a method blank analysis has been reported per matrix, per concentration level, for each extraction batch and for each GC/MS system used to analyze semivolatile samples. The reviewer can use the method blank summary (Form IV SV) to assist in identifying samples associated with each method blank.

E. **Action:**

If the appropriate blanks were not analyzed with the frequency described above, then the data reviewer should use professional judgement to determine if the associated sample data should be qualified. The reviewer may need to obtain additional information from the laboratory. The situation should be noted for EPA Project Officer action.

Action in the case of unsuitable blank results depends on the circumstances and origin of the blank. Positive sample results should be reported unless the concentration of the compound in the sample is less than or equal to 10 times (10x) the amount in any blank for the **common phthalate contaminants**, or 5 times the amount for other compounds. In instances where more than one blank is associated with a given sample, qualification should be based upon a comparison with the associated blank having the highest concentration of a contaminant. The results must not be corrected by subtracting any blank value.

Specific actions are as follows:

If a semivolatile compound is found in a blank but not found in the sample, no action is taken. If the contaminants found are volatile target compounds (or interfering non-target compounds) at significant concentrations above the CRQL, then this should be noted for EPA Project Officer action.

2. Any semivolatile compound detected in the sample (other than the common phthalate contaminants), that was also detected in any associated blank, is qualified if the sample concentration is less than five times (5x) the blank concentration. The quantitation limit may also be elevated. Typically, the sample CRQL is elevated to the concentration found in the sample. The reviewer should use professional judgement to determine if further elevation of the CRQL is required. For phthalate contaminants, the results are qualified "U" by elevating the sample quantitation limit to the sample concentration when the sample result is less than 10x the blank concentration.

   The reviewer should note that blanks may not involve the same weights, volumes, or dilution factors as the associated samples. These factors must be taken into consideration when applying the "5x" and "10x" criteria, such that a comparison of the total amount of contamination is actually made.

   Additionally, there may be instances where little or no contamination was present in the associated blanks, but qualification of the sample was deemed necessary. Contamination introduced through dilution is one example. Although it is not always possible to determine, instances of this occurring can be detected when contaminants are found in the diluted sample result, but are absent in the undiluted sample result. Since both results are not routinely reported, it may be impossible to verify this source of contamination. However, if the reviewer determines that the contamination is from a source other than the sample, he/she should qualify the data. In this case, the "5x" or "10x" rules may not apply; the sample value should be reported as a non-detect. An explanation of the rationale used for this determination should be provided in the narrative accompanying the Regional Data Assessment Summary.

3. If gross contamination exists (i.e., saturated peaks by GC/MS), all affected compounds in the associated samples should be qualified as unusable (R), due to interference. This should be noted for EPA Project Officer action if the contamination is suspected of having an effect on the sample results.

4. If inordinate amounts of other target compounds are found at low levels in the blank(s), it may be indicative of a problem and should be noted for EPA Project Officer action.

5. The same consideration given to the target compounds should also be given to Tentatively Identified Compounds (TICs) which are found in both the sample and associated blank(s). (See SV Section XIII for TIC guidance.)

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Equipment Blank (Water)/PNAs by EPA 8270D-SIM GC/MS	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: [signature] — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Cooler Temperature: 13.6°C. See note next page. Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method). CN/CRF: Samples received in good condition. No anomalies noted.	P2IM-NASW-07-05-W/TL75G																			
Completeness of analyses:	A																			
Preservation:	A																			
Holding times: DE: 9/14/11 < 7 days and D.A. 9/20/11 < 40 days	A																			
GC/MS Tuning (if applicable):	NA																			
Initial Calibration Criteria:	NA																			
Continuing Calibration Criteria:	A																			
Method Blanks: MB-091311	A																			
LCS/LCSD %R/RPD: LCS/LCSD-09/14/11	A																			
Surrogate %R:	A																			
MS/MSD:	NA																			
Internal Standards Performance:	NA																			
Reporting Limits:	A																			
Completeness of Analyte List:	A																			
Field Duplicate Pair:	NA																			
Equipment/Field /Trip Blank:	X																			

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Equipment Blank (Water)/PNAs by EPA 8270D-SIM GC/MS	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection. No action on 13.6°C cooler temp since samples did not have sufficient time to cool.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

SDG TL75: Naphthalene was detected at 0.05 µg/L below the reporting level (0.10 µg/L) in the equipment blank (Sample P2IM-NASW-07-05-W) which is associated with six soil samples. No action was taken since napthalene detections in associated samples are greater than 5X the detection the equipment blank.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Soils/PNAs by EPA 8270D-SIM GC/MS	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: Jill Fossler — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

Cooler Temperature: 13.6°C. See note next page.

Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method).

CN/CRF: Samples received in good condition. No anomalies noted.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	P2IM-NASW-01-01-S/TL75A	P2IM-NASW-02-05-S/TL75B	P2IM-NASW-03-10-S/TL75C	P2IM-NASW-04-05-S/TL75D	P2IM-NASW-05-05-S/TL75E	P2IM-NASW-06-12-S/TL75F														
Completeness of analyses:	A	A	A	A	A	A														
Preservation:	A	A	A	A	A	A														
Holding times: DE: 9/13/11 < 14 days and D.A. 9/21/11 < 40 days	A	A	A	A	A	A														
GC/MS Tuning (if applicable):	NA	NA	NA	NA	NA	NA														
Initial Calibration Criteria:	NA	NA	NA	NA	NA	NA														
Continuing Calibration Criteria:	A	A	A	A	A	A														
Method Blanks: MB-091311	A	A	A	A	A	A														
LCS/LCSD %R/RPD: LCS/LCSD-09/13/11	A	A	A	A	A	A														
Surrogate %R:	A	A	A	A	A	A														
MS/MSD: TL75C	NA	NA	A	NA	NA	NA														
Internal Standards Performance:	NA	NA	NA	NA	NA	NA														
Reporting Limits:	A	A	A	A	A	A														
Completeness of Analyte List:	A	A	A	A	A	A														
Field Duplicate Pair:	NA	NA	NA	NA	NA	NA														
Equipment/Field /Trip Blank:	NA	NA	NA	NA	NA	NA														

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Soils/PNAs by EPA 8270D-SIM GC/MS	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection. No action on 13.6oC cooler temp since samples did not have sufficient time to cool.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Equipment Blank (Water)/PCBs by GC/ECD Method SW8082	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC	Date: 12/1-2/2011	SDG: TL75
Reviewed by: [signature]	Date: 1/23/2012	Sample Collection Dates: 9/9/11

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Cooler Temperature: 13.6°C Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method. CN/CRF: Samples received in good condition.	P2IM-NASW-07-05-W/TL75G																			
Completeness of analyses:	A																			
Preservation:	A																			
Holding times: D.E. 9/14/11 and D.A. 9/20/11	A																			
GC/MS Tuning (if applicable):	NA																			
Initial Calibration Criteria:	NA																			
Continuing Calibration Criteria:	NA																			
Method Blanks: MB-091411	A																			
LCS/LCSD %R/RPD: LCS/LCSD-09/14/11	A																			
Surrogate %R:	A																			
MS/MSD:	NA																			
Internal Standards Performance:	NA																			
Reporting Limits:	A																			
Completeness of Analyte List:	A																			
Field Duplicate Pair:	NA																			
Equipment/Field Blank:	A																			

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Equipment Blank (Water)/PCBs by GC/ECD Method SW8082	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

Case Narrative Notes: None pertaining to PCB testing.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Soil/PCBs by GC/ECD Method SW8082	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: Jill Jarl — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

Cooler Temperature: 13.6oC

Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method.

CN/CRF: Samples received in good condition.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	P2IM-NASW-01-01-S/TL75A	P2IM-NASW-02-05-S/TL75B	P2IM-NASW-03-10-S/TL75C																	
Completeness of analyses:	A	A	A																	
Preservation:	A	A	A																	
Holding times: D.E. 9/13/11 and D.A. 9/20/11	A	A	A																	
GC/MS Tuning (if applicable):	NA	NA	NA																	
Initial Calibration Criteria:	NA	NA	NA																	
Continuing Calibration Criteria:	NA	NA	NA																	
Method Blanks:	A	A	A																	
LCS/LCSD %R/RPD: LCS/LCSD-09/13/11	A	A	A																	
Surrogate %R:	A	A	A																	
MS/MSD: TL75C	NA	NA	A																	
Internal Standards Performance:	NA	NA	NA																	
Reporting Limits:	A	A	A																	
Completeness of Analyte List:	A	A	A																	
Field Duplicate Pair:	NA	NA	NA																	
Equipment/Field Blank:	NA	NA	NA																	

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Soil/PCBs by GC/ECD Method SW8082	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

Case Narrative Notes: None pertaining to PCB testing.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Equipment Blank (Water)/TPHG (gasoline range - toluene to naphthalene) by WA State Method NWTPHG	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: Jill Jarvel — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Cooler Temperature: 13.6oC Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method. CN/CRF: Samples received in good condition. No anomalies noted.	P2IM-NASW-07-05-W/TL75G	Trip Blank/TL75H																		
Completeness of analyses:	A	A																		
Preservation:	A	A																		
Holding times: D.A. 9/13/11	A	A																		
GC/MS Tuning (if applicable):	NA	NA																		
Initial Calibration Criteria:	NA	NA																		
Continuing Calibration Criteria:	NA	NA																		
Method Blanks:	A	A																		
LCS/LCSD %R/RPD: LCS/LCSD-09/13/11	A	A																		
Surrogate %R:	A	A																		
MS/MSD:	NA	NA																		
Internal Standards Performance:	NA	NA																		
Reporting Limits:	A	A																		
Completeness of Analyte List:	A	A																		
Field Duplicate Pair:	NA	NA																		
Equipment/Trip Blank:	A	A																		

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Equipment Blank (Water)/TPHG (gasoline range - toluene to naphthalene) by WA State Method NWTPHG	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection.	SDG: TE94	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 7/20/11	

Case Narrative Notes: None pertaining to gasoline.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Soil/TPHG (Gasoline - quant range are from toluene to naphthalene) by NWTPHG.	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: Jill Lalle — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

Cooler Temperature: 13.6oC Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method. CN/CRF: Samples received in good condition. No anomalies noted.	1 P2IM-NASW-01-01-S/TL75A	2 P2IM-NASW-02-05-S/TL75B	3 P2IM-NASW-03-10-S/TL75C	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Completeness of analyses:	A	A	A																	
Preservation:	A	A	A																	
Holding times: D.A. 9/13/11	A	A	A																	
GC/MS Tuning (if applicable):	NA	NA	NA																	
Initial Calibration Criteria:	NA	NA	NA																	
Continuing Calibration Criteria:	NA	NA	NA																	
Method Blanks:	A	A	A																	
LCS/LCSD %R/RPD: LCS/LCSD-09/13/11	A	A	A																	
Surrogate %R:	A	A	A																	
MS/MSD: TL75C	NA	NA	NA																	
Internal Standards Performance:	NA	NA	NA																	
Reporting Limits:	A	A	A																	
Completeness of Analyte List:	A	A	A																	
Field Duplicate Pair:	NA	NA	NA																	
Equipment/Field Blank:	NA	NA	NA																	

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Soil/TPHG (Gasoline - quant range are from toluene to naphthalene) by NWTPHG.	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

Case Narrative Notes: No anomalies noted.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Equipment Blank (Water)/Total Diesel Range Hydrocarbons (Diesel, Motor Oil and Bunker C)	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: [signature] — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Cooler Temperature: 13.6oC Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method. CN/CRF: Samples received in good condition. No anomalies noted.	P2IM-NASW-07-05-W/TL75G																			
Completeness of analyses:	A																			
Preservation:	A																			
Holding times: D.E. 9/13/11 and D.A. 9/14/11	A																			
GC/MS Tuning (if applicable):	NA																			
Initial Calibration Criteria:	NA																			
Continuing Calibration Criteria:	NA																			
Method Blanks: MB-091311	A																			
LCS/LCSD %R/RPD: LCS/LCSD-09/13/11	A																			
Surrogate %R:	A																			
MS/MSD:	NA																			
Internal Standards Performance:	NA																			
Reporting Limits:	A																			
Completeness of Analyte List:	A																			
Field Duplicate Pair:	NA																			
Equipment/Field Blank:	A																			

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Equipment Blank (Water)/Total Diesel Range Hydrocarbons (Diesel, Motor Oil and Bunker C)	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

Case Narrative Notes: None pertaining to Diesel and Extended Range by WA State Method NWTPHD. Chain of custody request for NWTPH-Dx + Bunker C - met.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Soil/Total Diesel Range Hydrocarbons (Diesel, Motor Oil and Bunker C)	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau/Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: Jill Paulle — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

Cooler Temperature: 13.6oC Sample identification and validation criteria (per WP Level I, EPA NFG 1999, ARI QA/QC criteria and analytical reference method. CN/CRF: Samples received in good condition. No anomalies noted.	1 PL2C-NABS-WC-01-S/TE94A	2 PL2C-NABS-WC-02-S/TE94B	3 PL2C-NABS-WC-03-S/TE94C	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Completeness of analyses:	A	A	A																	
Preservation:	A	A	A																	
Holding times: D.E. 9/12/11 and D.A. 9/15/11	A	A	A																	
GC/MS Tuning (if applicable):	NA	NA	NA																	
Initial Calibration Criteria:	NA	NA	NA																	
Continuing Calibration Criteria:	NA	NA	NA																	
Method Blanks: MB-091211	A	A	A																	
LCS/LCSD %R/RPD: LCS/LCSD-09/12/11	A	A	A																	
Surrogate %R:	A	A	A																	
MS/MSD:	NA	NA	NA																	
Internal Standards Performance:	NA	NA	NA																	
Reporting Limits:	A	A	A																	
Completeness of Analyte List:	A	A	A																	
Field Duplicate Pair:	NA	NA	NA																	
Equipment/Field Blank:	NA	NA	NA																	

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

ORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Soil/Total Diesel Range Hydrocarbons (Diesel, Motor Oil and Bunker C)	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: Samples delivered to ARI same day as sample collection.	SDG: TE94	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 7/20/11	

Case Narrative Notes: None pertaining to Diesel and Extended Range by WA State Method NWTPHD. Chain of custody request for NWTPH-Dx + Bunker C - met.

ARI "DRO" qualified all diesel results to indicate that quantitation of diesel range peaks C12 to C24 are not identifiable. Estimate TL75A and TL75B associated diesel results (J).

INORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Equipment Blank (Water)/Metals by EPA 3050B/6010B/200.8 & CLP/EPA 7470A for Hg	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau of Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: Jill Lamlee — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Sample identification and validation criteria (per WP Level I, EPA NFG 2004, ARI QA/QC criteria and analytical reference method. CN/CRF: No anomalies noted.	P2IM-NASW-07-05-W/TL75G																			
Completeness of Analyses:	A																			
Preservation:	A																			
Holding Times: D.A. 9/16/11 for Hg and 9/15-16/11 <180 Days for remaining metals	A																			
ICP/AA ICV/CCV (90-110%):	NA																			
CVAA ICV/CCV (80-120%):	NA																			
ICP Interference Check (80-120%):	NA																			
ICP Serial Dilution (<10%D for >50X IDL):	NA																			
Method Blanks: See note next page.	A																			
LCS %R (80-120%):	A																			
Lab Duplicate, ≤20% RPD (≤35% for soils) for values ≥5X CRDL or ±CRDL (±2XCRDL for soils) for values ≤5X CRDL: TL75C	NA																			
MS/MSD:	NA																			
Reporting Limits:	A																			
Completeness of Analyte List:	A																			
Field Duplicate Pair:	NA																			
Equipment/Field Blank:	A																			

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

INORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Equipment Blank (Water)/Metals by EPA 3050B/6010B/200.8 & CLP/EPA 7470A for Hg	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: None.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

INORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 1

Matrix/Method: Soil/Metals by EPA 3050B/6010B/200.8 & CLP/EPA 7471A for Hg	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Validated by: Jessie Compeau of Informa LLC — Date: 12/1-2/2011	SDG: TL75	Proj. No.: 013-1646-011.700.01
Reviewed by: [signature] — Date: 1/23/2012	Sample Collection Dates: 9/9/11	

Sample identification and validation criteria (per WP Level I, EPA NFG 2004, ARI QA/QC criteria and analytical reference method. CN/CRF: Matrix spike recovery is low for antimony and chromium RPD is high. No other notes on CN/CRF.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	P2IM-NASW-01-01-S/TL75A	P2IM-NASW-02-05-S/TL75B	P2IM-NASW-03-10-S/TL75C	P2IM-NASW-04-05-S/TL75D	P2IM-NASW-05-05-S/TL75E	P2IM-NASW-06-12-S/TL75F														
Completeness of Analyses:	A	A	A	A	A	A														
Preservation:	A	A	A	A	A	A														
Holding Times: D.A. 9/16/11 for Hg and 9/15-16/11 <180 Days for remaining metals	A	A	A	A	A	A														
ICP/AA ICV/CCV (90-110%):	NA	NA	NA	NA	NA	NA														
CVAA ICV/CCV (80-120%):	NA	NA	NA	NA	NA	NA														
ICP Interference Check (80-120%):	NA	NA	NA	NA	NA	NA														
ICP Serial Dilution (<10%D for >50X IDL):	NA	NA	NA	NA	NA	NA														
Method Blanks: See note next page.	A	A	A	A	A	A														
LCS %R (80-120%):	A	A	A	A	A	A														
Lab Duplicate, ≤20% RPD (≤35% for soils) for values ≥5X CRDL or ±CRDL (±2XCRDL for soils) for values ≤5X CRDL: TL75C	NA	NA	X	NA	NA	NA														
MS/MSD: TL75C	NA	NA	X	NA	NA	NA														
Reporting Limits:	A	A	A	A	A	A														
Completeness of Analyte List:	A	A	A	A	A	A														
Field Duplicate Pair:	NA	NA	NA	NA	NA	NA														
Equipment/Field Blank:	NA	NA	NA	NA	NA	NA														

Note: X = Criteria were evaluated and not met. A = Criteria were evaluated and met. N = Data was not available for review. NA = Not applicable.

INORGANIC DATA VALIDATION WORKSHEET (LEVEL I) - PAGE 2

Matrix/Method: Soil/Metals by EPA 3050B/6010B/200.8 & CLP/EPA 7471A for Hg	Lab: ARI	Project: Boeing Plant 2 NA stormwater Retrofit
Comments: None.	SDG: TL75	Proj. No.: 013-1646-011.700.01
	Sample Collection Dates: 9/9/11	

Aluminum and Iron - Matrix spike recovery is H qualified because sample amount is >4X the spike amount.

Antimony - Matrix spike result is low at 48.6 %. J/UJ all associated results due to poor spike recovery - Note in report.

RL Check: ARI ran RCRA metals as requested on the chain. All RLs were met except on 200.8 methods and mercury. Note in report.

Chromium RPD is high at 45.5% 9.0/14.3. J qualify chromium results parent only.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: P2IM-NASW-07-05-W**
 SAMPLE

Lab Sample ID: TL75G
LIMS ID: 11-19758
Matrix: Water
Data Release Authorized:
Reported: 09/22/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Instrument/Analyst: NT5/PAB
Date Analyzed: 09/21/11 12:18

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q	
74-87-3	Chloromethane	0.5	< 0.5	U	
74-83-9	Bromomethane	1.0	< 1.0	U	
75-01-4	Vinyl Chloride	0.2	< 0.2	U	
75-00-3	Chloroethane	0.2	< 0.2	U	
75-09-2	**Methylene Chloride**	**0.5**	**0.6**		u
67-64-1	Acetone	5.0	< 5.0	U	
75-15-0	Carbon Disulfide	0.2	< 0.2	U	
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U	
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U	
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U	
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U	
67-66-3	**Chloroform**	**0.2**	**0.2**	**J**	
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U	
78-93-3	2-Butanone	5.0	< 5.0	U	
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U	
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U	
108-05-4	Vinyl Acetate	1.0	< 1.0	U	
75-27-4	Bromodichloromethane	0.2	< 0.2	U	
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U	
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U	
79-01-6	Trichloroethene	0.2	< 0.2	U	
124-48-1	Dibromochloromethane	0.2	< 0.2	U	
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U	
71-43-2	Benzene	0.2	< 0.2	U	
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U	
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U	
75-25-2	Bromoform	0.2	< 0.2	U	
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U	
591-78-6	2-Hexanone	5.0	< 5.0	U	
127-18-4	Tetrachloroethene	0.2	< 0.2	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U	
108-88-3	Toluene	0.2	< 0.2	U	
108-90-7	Chlorobenzene	0.2	< 0.2	U	
100-41-4	Ethylbenzene	0.2	< 0.2	U	
100-42-5	**Styrene**	**0.2**	**1.0**		u
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U	
179601-23-1	m,p-Xylene	0.4	< 0.4	U	
95-47-6	o-Xylene	0.2	< 0.2	U	
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U	
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U	
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U	
107-02-8	Acrolein	5.0	< 5.0	U	

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: P2IM-NASW-07-05-W**
 SAMPLE

Lab Sample ID: TL75G
LIMS ID: 11-19758
Matrix: Water
Date Analyzed: 09/21/11 12:18

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result	Q
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U UJ
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	99.8%
Bromofluorobenzene	96.1%
d4-1,2-Dichlorobenzene	96.8%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: P2IM-NASW-01-01-S**
 SAMPLE

Lab Sample ID: TL75A
LIMS ID: 11-19752
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Instrument/Analyst: FINN5/PAB
Date Analyzed: 09/20/11 16:32

Sample Amount: 4.25 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 4.2%

CAS Number	Analyte	RL	Result	Q	
74-87-3	Chloromethane	1.2	< 1.2	U	
74-83-9	Bromomethane	1.2	< 1.2	U	
75-01-4	Vinyl Chloride	1.2	< 1.2	U	
75-00-3	Chloroethane	1.2	< 1.2	U	UJ
75-09-2	Methylene Chloride	2.4	< 2.4	U	
67-64-1	**Acetone**	**5.9**	**71**		
75-15-0	**Carbon Disulfide**	**1.2**	**22**		
75-35-4	1,1-Dichloroethene	1.2	< 1.2	U	
75-34-3	1,1-Dichloroethane	1.2	< 1.2	U	
156-60-5	trans-1,2-Dichloroethene	1.2	< 1.2	U	
156-59-2	cis-1,2-Dichloroethene	1.2	< 1.2	U	UJ
67-66-3	Chloroform	1.2	< 1.2	U	
107-06-2	1,2-Dichloroethane	1.2	< 1.2	U	
78-93-3	**2-Butanone**	**5.9**	**7.4**		
71-55-6	1,1,1-Trichloroethane	1.2	< 1.2	U	
56-23-5	Carbon Tetrachloride	1.2	< 1.2	U	
108-05-4	Vinyl Acetate	5.9	< 5.9	U	
75-27-4	Bromodichloromethane	1.2	< 1.2	U	
78-87-5	1,2-Dichloropropane	1.2	< 1.2	U	
10061-01-5	cis-1,3-Dichloropropene	1.2	< 1.2	U	
79-01-6	Trichloroethene	1.2	< 1.2	U	
124-48-1	Dibromochloromethane	1.2	< 1.2	U	
79-00-5	1,1,2-Trichloroethane	1.2	< 1.2	U	
71-43-2	Benzene	1.2	< 1.2	U	
10061-02-6	trans-1,3-Dichloropropene	1.2	< 1.2	U	
110-75-8	2-Chloroethylvinylether	5.9	< 5.9	U	UJ
75-25-2	Bromoform	1.2	< 1.2	U	
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.9	< 5.9	U	
591-78-6	2-Hexanone	5.9	< 5.9	U	
127-18-4	Tetrachloroethene	1.2	< 1.2	U	
79-34-5	1,1,2,2-Tetrachloroethane	1.2	< 1.2	U	
108-88-3	Toluene	1.2	< 1.2	U	
108-90-7	Chlorobenzene	1.2	< 1.2	U	
100-41-4	Ethylbenzene	1.2	< 1.2	U	
100-42-5	Styrene	1.2	< 1.2	U	
75-69-4	Trichlorofluoromethane	1.2	< 1.2	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	2.4	< 2.4	U	UJ
179601-23-1	m,p-Xylene	1.2	< 1.2	U	
95-47-6	o-Xylene	1.2	< 1.2	U	
95-50-1	1,2-Dichlorobenzene	1.2	< 1.2	U	
541-73-1	1,3-Dichlorobenzene	1.2	< 1.2	U	
106-46-7	1,4-Dichlorobenzene	1.2	< 1.2	U	
107-02-8	Acrolein	59	< 59	U	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: P2IM-NASW-01-01-S**
 SAMPLE

Lab Sample ID: TL75A
LIMS ID: 11-19752
Matrix: Soil
Date Analyzed: 09/20/11 16:32

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result	Q
74-88-4	Methyl Iodide	1.2	< 1.2	U
74-96-4	Bromoethane	2.4	< 2.4	U
107-13-1	Acrylonitrile	5.9	< 5.9	U
563-58-6	1,1-Dichloropropene	1.2	< 1.2	U
74-95-3	Dibromomethane	1.2	< 1.2	U
630-20-6	1,1,1,2-Tetrachloroethane	1.2	< 1.2	U
96-12-8	1,2-Dibromo-3-chloropropane	5.9	< 5.9	U
96-18-4	1,2,3-Trichloropropane	2.4	< 2.4	U
110-57-6	trans-1,4-Dichloro-2-butene	5.9	< 5.9	U
108-67-8	1,3,5-Trimethylbenzene	1.2	< 1.2	U
95-63-6	1,2,4-Trimethylbenzene	1.2	< 1.2	U
87-68-3	Hexachlorobutadiene	5.9	< 5.9	U
106-93-4	Ethylene Dibromide	1.2	< 1.2	U
74-97-5	Bromochloromethane	1.2	< 1.2	U
594-20-7	2,2-Dichloropropane	1.2	< 1.2	U
142-28-9	1,3-Dichloropropane	1.2	< 1.2	U
98-82-8	Isopropylbenzene	1.2	< 1.2	U
103-65-1	n-Propylbenzene	1.2	< 1.2	U
108-86-1	Bromobenzene	1.2	< 1.2	U
95-49-8	2-Chlorotoluene	1.2	< 1.2	U
106-43-4	4-Chlorotoluene	1.2	< 1.2	U
98-06-6	tert-Butylbenzene	1.2	< 1.2	U
135-98-8	sec-Butylbenzene	1.2	< 1.2	U
99-87-6	4-Isopropyltoluene	1.2	< 1.2	U
104-51-8	n-Butylbenzene	1.2	< 1.2	U
120-82-1	1,2,4-Trichlorobenzene	5.9	< 5.9	U
91-20-3	Naphthalene	5.9	< 5.9	U
87-61-6	1,2,3-Trichlorobenzene	5.9	< 5.9	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	95.7%
d8-Toluene	98.4%
Bromofluorobenzene	87.5%
d4-1,2-Dichlorobenzene	99.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: P2IM-NASW-02-05-S**
 SAMPLE

Lab Sample ID: TL75B
LIMS ID: 11-19753
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Instrument/Analyst: FINN5/PAB
Date Analyzed: 09/20/11 16:59

Sample Amount: 4.62 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 9.2%

CAS Number	Analyte	RL	Result	Q	
74-87-3	Chloromethane	1.1	< 1.1	U	
74-83-9	Bromomethane	1.1	< 1.1	U	
75-01-4	Vinyl Chloride	1.1	< 1.1	U	
75-00-3	Chloroethane	1.1	< 1.1	U	UJ
75-09-2	**Methylene Chloride**	**2.2**	**7.4**		
67-64-1	**Acetone**	**5.4**	**29**		
75-15-0	Carbon Disulfide	1.1	< 1.1	U	
75-35-4	1,1-Dichloroethene	1.1	< 1.1	U	
75-34-3	1,1-Dichloroethane	1.1	< 1.1	U	
156-60-5	trans-1,2-Dichloroethene	1.1	< 1.1	U	
156-59-2	cis-1,2-Dichloroethene	1.1	< 1.1	U	UJ
67-66-3	Chloroform	1.1	< 1.1	U	
107-06-2	1,2-Dichloroethane	1.1	< 1.1	U	
78-93-3	2-Butanone	5.4	< 5.4	U	
71-55-6	1,1,1-Trichloroethane	1.1	< 1.1	U	
56-23-5	Carbon Tetrachloride	1.1	< 1.1	U	
108-05-4	Vinyl Acetate	5.4	< 5.4	U	
75-27-4	Bromodichloromethane	1.1	< 1.1	U	
78-87-5	1,2-Dichloropropane	1.1	< 1.1	U	
10061-01-5	cis-1,3-Dichloropropene	1.1	< 1.1	U	
79-01-6	Trichloroethene	1.1	< 1.1	U	
124-48-1	Dibromochloromethane	1.1	< 1.1	U	
79-00-5	1,1,2-Trichloroethane	1.1	< 1.1	U	
71-43-2	Benzene	1.1	< 1.1	U	
10061-02-6	trans-1,3-Dichloropropene	1.1	< 1.1	U	
110-75-8	2-Chloroethylvinylether	5.4	< 5.4	U	UJ
75-25-2	Bromoform	1.1	< 1.1	U	
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.4	< 5.4	U	
591-78-6	2-Hexanone	5.4	< 5.4	U	
127-18-4	Tetrachloroethene	1.1	< 1.1	U	
79-34-5	1,1,2,2-Tetrachloroethane	1.1	< 1.1	U	
108-88-3	Toluene	1.1	< 1.1	U	
108-90-7	Chlorobenzene	1.1	< 1.1	U	
100-41-4	Ethylbenzene	1.1	< 1.1	U	
100-42-5	Styrene	1.1	< 1.1	U	
75-69-4	Trichlorofluoromethane	1.1	< 1.1	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	2.2	< 2.2	U	UJ
179601-23-1	m,p-Xylene	1.1	< 1.1	U	
95-47-6	o-Xylene	1.1	< 1.1	U	
95-50-1	1,2-Dichlorobenzene	1.1	< 1.1	U	
541-73-1	1,3-Dichlorobenzene	1.1	< 1.1	U	
106-46-7	1,4-Dichlorobenzene	1.1	< 1.1	U	
107-02-8	Acrolein	54	< 54	U	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: P2IM-NASW-02-05-S**
 SAMPLE

Lab Sample ID: TL75B
LIMS ID: 11-19753
Matrix: Soil
Date Analyzed: 09/20/11 16:59

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result	Q
74-88-4	Methyl Iodide	1.1	< 1.1	U
74-96-4	Bromoethane	2.2	< 2.2	U
107-13-1	Acrylonitrile	5.4	< 5.4	U
563-58-6	1,1-Dichloropropene	1.1	< 1.1	U
74-95-3	Dibromomethane	1.1	< 1.1	U
630-20-6	1,1,1,2-Tetrachloroethane	1.1	< 1.1	U
96-12-8	1,2-Dibromo-3-chloropropane	5.4	< 5.4	U
96-18-4	1,2,3-Trichloropropane	2.2	< 2.2	U
110-57-6	trans-1,4-Dichloro-2-butene	5.4	< 5.4	U
108-67-8	1,3,5-Trimethylbenzene	1.1	< 1.1	U
95-63-6	1,2,4-Trimethylbenzene	1.1	< 1.1	U
87-68-3	Hexachlorobutadiene	5.4	< 5.4	U
106-93-4	Ethylene Dibromide	1.1	< 1.1	U
74-97-5	Bromochloromethane	1.1	< 1.1	U
594-20-7	2,2-Dichloropropane	1.1	< 1.1	U
142-28-9	1,3-Dichloropropane	1.1	< 1.1	U
98-82-8	Isopropylbenzene	1.1	< 1.1	U
103-65-1	n-Propylbenzene	1.1	< 1.1	U
108-86-1	Bromobenzene	1.1	< 1.1	U
95-49-8	2-Chlorotoluene	1.1	< 1.1	U
106-43-4	4-Chlorotoluene	1.1	< 1.1	U
98-06-6	tert-Butylbenzene	1.1	< 1.1	U
135-98-8	sec-Butylbenzene	1.1	< 1.1	U
99-87-6	4-Isopropyltoluene	1.1	< 1.1	U
104-51-8	n-Butylbenzene	1.1	< 1.1	U
120-82-1	1,2,4-Trichlorobenzene	5.4	< 5.4	U
91-20-3	Naphthalene	5.4	< 5.4	U
87-61-6	1,2,3-Trichlorobenzene	5.4	< 5.4	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	97.9%
d8-Toluene	102%
Bromofluorobenzene	93.8%
d4-1,2-Dichlorobenzene	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: P2IM-NASW-03-10-S**
 SAMPLE

Lab Sample ID: TL75C
LIMS ID: 11-19754
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Instrument/Analyst: FINN5/PAB
Date Analyzed: 09/20/11 17:27

Sample Amount: 3.41 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 12.1%

CAS Number	Analyte	RL	Result	Q	
74-87-3	Chloromethane	1.5	< 1.5	U	
74-83-9	Bromomethane	1.5	< 1.5	U	
75-01-4	Vinyl Chloride	1.5	< 1.5	U	
75-00-3	Chloroethane	1.5	< 1.5	U	UJ
75-09-2	Methylene Chloride	2.9	< 2.9	U	
67-64-1	**Acetone**	**7.3**	**17**		
75-15-0	Carbon Disulfide	1.5	< 1.5	U	
75-35-4	1,1-Dichloroethene	1.5	< 1.5	U	
75-34-3	1,1-Dichloroethane	1.5	< 1.5	U	
156-60-5	trans-1,2-Dichloroethene	1.5	< 1.5	U	
156-59-2	cis-1,2-Dichloroethene	1.5	< 1.5	U	UJ
67-66-3	Chloroform	1.5	< 1.5	U	
107-06-2	1,2-Dichloroethane	1.5	< 1.5	U	
78-93-3	2-Butanone	7.3	< 7.3	U	
71-55-6	1,1,1-Trichloroethane	1.5	< 1.5	U	
56-23-5	Carbon Tetrachloride	1.5	< 1.5	U	
108-05-4	Vinyl Acetate	7.3	< 7.3	U	
75-27-4	Bromodichloromethane	1.5	< 1.5	U	
78-87-5	1,2-Dichloropropane	1.5	< 1.5	U	
10061-01-5	cis-1,3-Dichloropropene	1.5	< 1.5	U	
79-01-6	Trichloroethene	1.5	< 1.5	U	
124-48-1	Dibromochloromethane	1.5	< 1.5	U	
79-00-5	1,1,2-Trichloroethane	1.5	< 1.5	U	
71-43-2	Benzene	1.5	< 1.5	U	
10061-02-6	trans-1,3-Dichloropropene	1.5	< 1.5	U	
110-75-8	2-Chloroethylvinylether	7.3	< 7.3	U	R
75-25-2	Bromoform	1.5	< 1.5	U	
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.3	< 7.3	U	
591-78-6	2-Hexanone	7.3	< 7.3	U	
127-18-4	Tetrachloroethene	1.5	< 1.5	U	
79-34-5	1,1,2,2-Tetrachloroethane	1.5	< 1.5	U	
108-88-3	Toluene	1.5	< 1.5	U	
108-90-7	Chlorobenzene	1.5	< 1.5	U	
100-41-4	Ethylbenzene	1.5	< 1.5	U	
100-42-5	Styrene	1.5	< 1.5	U	
75-69-4	Trichlorofluoromethane	1.5	< 1.5	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	2.9	< 2.9	U	UJ
179601-23-1	m,p-Xylene	1.5	< 1.5	U	
95-47-6	o-Xylene	1.5	< 1.5	U	
95-50-1	1,2-Dichlorobenzene	1.5	< 1.5	U	
541-73-1	1,3-Dichlorobenzene	1.5	< 1.5	U	
106-46-7	1,4-Dichlorobenzene	1.5	< 1.5	U	
107-02-8	Acrolein	73	< 73	U	

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: P2IM-NASW-03-10-S
SAMPLE

Lab Sample ID: TL75C
LIMS ID: 11-19754
Matrix: Soil
Date Analyzed: 09/20/11 17:27

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result	Q
74-88-4	Methyl Iodide	1.5	< 1.5	U
74-96-4	Bromoethane	2.9	< 2.9	U
107-13-1	Acrylonitrile	7.3	< 7.3	U
563-58-6	1,1-Dichloropropene	1.5	< 1.5	U
74-95-3	Dibromomethane	1.5	< 1.5	U
630-20-6	1,1,1,2-Tetrachloroethane	1.5	< 1.5	U
96-12-8	1,2-Dibromo-3-chloropropane	7.3	< 7.3	U
96-18-4	1,2,3-Trichloropropane	2.9	< 2.9	U
110-57-6	trans-1,4-Dichloro-2-butene	7.3	< 7.3	U
108-67-8	1,3,5-Trimethylbenzene	1.5	< 1.5	U
95-63-6	1,2,4-Trimethylbenzene	1.5	< 1.5	U
87-68-3	Hexachlorobutadiene	7.3	< 7.3	U
106-93-4	Ethylene Dibromide	1.5	< 1.5	U
74-97-5	Bromochloromethane	1.5	< 1.5	U
594-20-7	2,2-Dichloropropane	1.5	< 1.5	U
142-28-9	1,3-Dichloropropane	1.5	< 1.5	U
98-82-8	Isopropylbenzene	1.5	< 1.5	U
103-65-1	n-Propylbenzene	1.5	< 1.5	U
108-86-1	Bromobenzene	1.5	< 1.5	U
95-49-8	2-Chlorotoluene	1.5	< 1.5	U
106-43-4	4-Chlorotoluene	1.5	< 1.5	U
98-06-6	tert-Butylbenzene	1.5	< 1.5	U
135-98-8	sec-Butylbenzene	1.5	< 1.5	U
99-87-6	4-Isopropyltoluene	1.5	< 1.5	U
104-51-8	n-Butylbenzene	1.5	< 1.5	U
120-82-1	1,2,4-Trichlorobenzene	7.3	< 7.3	U
91-20-3	Naphthalene	7.3	< 7.3	U
87-61-6	1,2,3-Trichlorobenzene	7.3	< 7.3	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	96.0%
d8-Toluene	103%
Bromofluorobenzene	92.2%
d4-1,2-Dichlorobenzene	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blank**
 SAMPLE

Lab Sample ID: TL75H
LIMS ID: 11-19759
Matrix: Water
Data Release Authorized:
Reported: 09/22/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Instrument/Analyst: NT5/PAB
Date Analyzed: 09/21/11 12:46

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.5	< 0.5	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	**Methylene Chloride**	**0.5**	**0.5**	**J**
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	1.0	< 1.0	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	**Styrene**	**0.2**	**0.2**	**J**
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.2	< 0.2	U
179601-23-1	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blank**
 SAMPLE

Lab Sample ID: TL75H
LIMS ID: 11-19759
Matrix: Water
Date Analyzed: 09/21/11 12:46

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result	Q
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U UJ
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	105%
d8-Toluene	98.2%
Bromofluorobenzene	98.1%
d4-1,2-Dichlorobenzene	99.4%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-07-05-W
SAMPLE

Lab Sample ID: TL75G
LIMS ID: 11-19758
Matrix: Water
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/20/11 20:37
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
108-95-2	**Phenol**	**1.0**	**1.0**
111-44-4	Bis-(2-Chloroethyl) Ether	1.0	< 1.0 U
95-57-8	2-Chlorophenol	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	5.0	< 5.0 U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0 U
95-48-7	2-Methylphenol	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	1.0	< 1.0 U
106-44-5	4-Methylphenol	1.0	< 1.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	1.0	< 1.0 U
67-72-1	Hexachloroethane	1.0	< 1.0 U
98-95-3	Nitrobenzene	1.0	< 1.0 U
78-59-1	Isophorone	1.0	< 1.0 U
88-75-5	2-Nitrophenol	5.0	< 5.0 U
105-67-9	2,4-Dimethylphenol	1.0	< 1.0 U
65-85-0	Benzoic Acid	10	< 10 U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	5.0	< 5.0 U
120-82-1	1,2,4-Trichlorobenzene	1.0	< 1.0 U
91-20-3	Naphthalene	1.0	< 1.0 U
106-47-8	4-Chloroaniline	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	1.0	< 1.0 U
59-50-7	4-Chloro-3-methylphenol	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	5.0	< 5.0 U
95-95-4	2,4,5-Trichlorophenol	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	1.0	< 1.0 U
88-74-4	2-Nitroaniline	5.0	< 5.0 U
131-11-3	Dimethylphthalate	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
99-09-2	3-Nitroaniline	5.0	< 5.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	10	< 10 U
100-02-7	4-Nitrophenol	5.0	< 5.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	5.0	< 5.0 U
121-14-2	2,4-Dinitrotoluene	5.0	< 5.0 U
84-66-2	Diethylphthalate	1.0	< 1.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-07-05-W
SAMPLE

Lab Sample ID: TL75G
LIMS ID: 11-19758
Matrix: Water
Date Analyzed: 09/20/11 20:37

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result
7005-72-3	4-Chlorophenyl-phenylether	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
100-01-6	4-Nitroaniline	5.0	< 5.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	85.2%	2-Fluorobiphenyl	78.0%
d14-p-Terphenyl	100%	d4-1,2-Dichlorobenzene	68.4%
d5-Phenol	82.7%	2-Fluorophenol	81.1%
2,4,6-Tribromophenol	102%	d4-2-Chlorophenol	86.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-01-01-S
SAMPLE

Lab Sample ID: TL75A
LIMS ID: 11-19752
Matrix: Soil
Data Release Authorized:
Reported: 09/22/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/21/11 18:04
Instrument/Analyst: NT8/VTS
GPC Cleanup: Yes

Sample Amount: 10.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 4.2%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
111-44-4	Bis-(2-Chloroethyl) Ether	19	< 19 U
95-57-8	2-Chlorophenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	19	< 19 U
106-44-5	4-Methylphenol	37	< 37 U
621-64-7	N-Nitroso-Di-N-Propylamine	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
98-95-3	Nitrobenzene	19	< 19 U
78-59-1	Isophorone	19	< 19 U
88-75-5	2-Nitrophenol	94	< 94 U
105-67-9	2,4-Dimethylphenol	37	< 37 U
65-85-0	Benzoic Acid	370	< 370 U
111-91-1	bis(2-Chloroethoxy) Methane	19	< 19 U
120-83-2	2,4-Dichlorophenol	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
106-47-8	4-Chloroaniline	250	< 250 U
87-68-3	Hexachlorobutadiene	94	< 94 U
59-50-7	4-Chloro-3-methylphenol	94	< 94 U
91-57-6	2-Methylnaphthalene	19	< 19 U
77-47-4	Hexachlorocyclopentadiene	370	< 370 U
88-06-2	2,4,6-Trichlorophenol	94	< 94 U
95-95-4	2,4,5-Trichlorophenol	94	< 94 U
91-58-7	2-Chloronaphthalene	19	< 19 U
88-74-4	2-Nitroaniline	94	< 94 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
99-09-2	3-Nitroaniline	94	< 94 U
83-32-9	Acenaphthene	19	< 19 U
51-28-5	2,4-Dinitrophenol	800	< 800 U
100-02-7	4-Nitrophenol	94	< 94 U
132-64-9	Dibenzofuran	19	< 19 U
606-20-2	2,6-Dinitrotoluene	94	< 94 U
121-14-2	2,4-Dinitrotoluene	94	< 94 U
84-66-2	Diethylphthalate	47	< 47 U
7005-72-3	4-Chlorophenyl-phenylether	19	< 19 U
86-73-7	Fluorene	19	< 19 U
100-01-6	4-Nitroaniline	94	< 94 U
534-52-1	4,6-Dinitro-2-Methylphenol	190	< 190 U

JC 12/2/2011

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-01-01-S
SAMPLE

Lab Sample ID: TL75A
LIMS ID: 11-19752
Matrix: Soil
Date Analyzed: 09/21/11 18:04

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result	
86-30-6	N-Nitrosodiphenylamine	19	< 19 U	
101-55-3	4-Bromophenyl-phenylether	19	< 19 U	
118-74-1	Hexachlorobenzene	19	< 19 U	
87-86-5	Pentachlorophenol	190	< 190 U	
85-01-8	**Phenanthrene**	**19**	**24**	
86-74-8	Carbazole	19	< 19 U	
120-12-7	Anthracene	19	< 19 U	
84-74-2	Di-n-Butylphthalate	19	< 19 U	
206-44-0	**Fluoranthene**	**19**	**50**	
129-00-0	**Pyrene**	**19**	**53**	
85-68-7	Butylbenzylphthalate	19	< 19 U	UJ
91-94-1	3,3'-Dichlorobenzidine	140	< 140 U	
56-55-3	**Benzo(a)anthracene**	**19**	**23**	
117-81-7	**bis(2-Ethylhexyl)phthalate**	**23**	**39 B**	u
218-01-9	**Chrysene**	**19**	**33**	
117-84-0	Di-n-Octyl phthalate	19	< 19 U	
50-32-8	**Benzo(a)pyrene**	**19**	**33**	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**19**	**21**	
53-70-3	Dibenz(a,h)anthracene	19	< 19 U	
191-24-2	**Benzo(g,h,i)perylene**	**19**	**33**	
90-12-0	1-Methylnaphthalene	19	< 19 U	
TOTBFA	**Total Benzofluoranthenes**	**19**	**58**	

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	75.8%	2-Fluorobiphenyl	82.8%
d14-p-Terphenyl	102%	d4-1,2-Dichlorobenzene	69.0%
d5-Phenol	80.3%	2-Fluorophenol	78.5%
2,4,6-Tribromophenol	91.5%	d4-2-Chlorophenol	79.7%

JC 12/2/20

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-02-05-S
SAMPLE

Lab Sample ID: TL75B
LIMS ID: 11-19753
Matrix: Soil
Data Release Authorized:
Reported: 09/22/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/21/11 18:40
Instrument/Analyst: NT8/VTS
GPC Cleanup: Yes

Sample Amount: 11.1 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 9.2%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	18	< 18 U
111-44-4	Bis-(2-Chloroethyl) Ether	18	< 18 U
95-57-8	2-Chlorophenol	18	< 18 U
541-73-1	1,3-Dichlorobenzene	18	< 18 U
106-46-7	1,4-Dichlorobenzene	18	< 18 U
100-51-6	Benzyl Alcohol	18	< 18 U
95-50-1	1,2-Dichlorobenzene	18	< 18 U
95-48-7	2-Methylphenol	18	< 18 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	18	< 18 U
106-44-5	4-Methylphenol	36	< 36 U
621-64-7	N-Nitroso-Di-N-Propylamine	18	< 18 U
67-72-1	Hexachloroethane	18	< 18 U
98-95-3	Nitrobenzene	18	< 18 U
78-59-1	Isophorone	18	< 18 U
88-75-5	2-Nitrophenol	90	< 90 U
105-67-9	2,4-Dimethylphenol	36	< 36 U
65-85-0	Benzoic Acid	360	< 360 U
111-91-1	bis(2-Chloroethoxy) Methane	18	< 18 U
120-83-2	2,4-Dichlorophenol	180	< 180 U
120-82-1	1,2,4-Trichlorobenzene	18	< 18 U
91-20-3	**Naphthalene**	**18**	**14 J**
106-47-8	4-Chloroaniline	240	< 240 U
87-68-3	Hexachlorobutadiene	90	< 90 U
59-50-7	4-Chloro-3-methylphenol	90	< 90 U
91-57-6	**2-Methylnaphthalene**	**18**	**19**
77-47-4	Hexachlorocyclopentadiene	360	< 360 U
88-06-2	2,4,6-Trichlorophenol	90	< 90 U
95-95-4	2,4,5-Trichlorophenol	90	< 90 U
91-58-7	2-Chloronaphthalene	18	< 18 U
88-74-4	2-Nitroaniline	90	< 90 U
131-11-3	Dimethylphthalate	18	< 18 U
208-96-8	Acenaphthylene	18	< 18 U
99-09-2	3-Nitroaniline	90	< 90 U
83-32-9	**Acenaphthene**	**18**	**37**
51-28-5	2,4-Dinitrophenol	760	< 760 U
100-02-7	4-Nitrophenol	90	< 90 U
132-64-9	**Dibenzofuran**	**18**	**26**
606-20-2	2,6-Dinitrotoluene	90	< 90 U
121-14-2	2,4-Dinitrotoluene	90	< 90 U
84-66-2	Diethylphthalate	45	< 45 U
7005-72-3	4-Chlorophenyl-phenylether	18	< 18 U
86-73-7	**Fluorene**	**18**	**28**
100-01-6	4-Nitroaniline	90	< 90 U
534-52-1	4,6-Dinitro-2-Methylphenol	180	< 180 U

JC 12/2/201

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-02-05-S
SAMPLE

Lab Sample ID: TL75B
LIMS ID: 11-19753
Matrix: Soil
Date Analyzed: 09/21/11 18:40

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	18	< 18 U
101-55-3	4-Bromophenyl-phenylether	18	< 18 U
118-74-1	Hexachlorobenzene	18	< 18 U
87-86-5	Pentachlorophenol	180	< 180 U
85-01-8	**Phenanthrene**	**18**	**100**
86-74-8	**Carbazole**	**18**	**14 J**
120-12-7	**Anthracene**	**18**	**26**
84-74-2	Di-n-Butylphthalate	18	< 18 U
206-44-0	**Fluoranthene**	**18**	**80**
129-00-0	**Pyrene**	**18**	**88**
85-68-7	Butylbenzylphthalate	18	< 18 U UJ
91-94-1	3,3'-Dichlorobenzidine	140	< 140 U
56-55-3	**Benzo(a)anthracene**	**18**	**44**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**22**	**52 B** u
218-01-9	**Chrysene**	**18**	**58**
117-84-0	Di-n-Octyl phthalate	18	< 18 U
50-32-8	**Benzo(a)pyrene**	**18**	**50**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**18**	**24**
53-70-3	Dibenz(a,h)anthracene	18	< 18 U
191-24-2	**Benzo(g,h,i)perylene**	**18**	**29**
90-12-0	**1-Methylnaphthalene**	**18**	**15 J**
TOTBFA	**Total Benzofluoranthenes**	**18**	**94**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	61.6%	2-Fluorobiphenyl	68.2%
d14-p-Terphenyl	95.8%	d4-1,2-Dichlorobenzene	61.8%
d5-Phenol	72.7%	2-Fluorophenol	71.5%
2,4,6-Tribromophenol	85.6%	d4-2-Chlorophenol	71.6%

JC 12/2/2011

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-03-10-S
SAMPLE

Lab Sample ID: TL75C
LIMS ID: 11-19754
Matrix: Soil
Data Release Authorized:
Reported: 09/22/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/21/11 19:17
Instrument/Analyst: NT8/VTS
GPC Cleanup: Yes

Sample Amount: 10.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 12.1%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
111-44-4	Bis-(2-Chloroethyl) Ether	19	< 19 U
95-57-8	2-Chlorophenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	19	< 19 U
106-44-5	4-Methylphenol	38	< 38 U
621-64-7	N-Nitroso-Di-N-Propylamine	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
98-95-3	Nitrobenzene	19	< 19 U
78-59-1	Isophorone	19	< 19 U
88-75-5	2-Nitrophenol	94	< 94 U
105-67-9	2,4-Dimethylphenol	38	< 38 U
65-85-0	Benzoic Acid	380	< 380 U
111-91-1	bis(2-Chloroethoxy) Methane	19	< 19 U
120-83-2	2,4-Dichlorophenol	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
106-47-8	4-Chloroaniline	250	< 250 U
87-68-3	Hexachlorobutadiene	94	< 94 U
59-50-7	4-Chloro-3-methylphenol	94	< 94 U
91-57-6	2-Methylnaphthalene	19	< 19 U
77-47-4	Hexachlorocyclopentadiene	380	< 380 U
88-06-2	2,4,6-Trichlorophenol	94	< 94 U
95-95-4	2,4,5-Trichlorophenol	94	< 94 U
91-58-7	2-Chloronaphthalene	19	< 19 U
88-74-4	2-Nitroaniline	94	< 94 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
99-09-2	3-Nitroaniline	94	< 94 U
83-32-9	Acenaphthene	19	< 19 U
51-28-5	2,4-Dinitrophenol	800	< 800 U
100-02-7	4-Nitrophenol	94	< 94 U
132-64-9	Dibenzofuran	19	< 19 U
606-20-2	2,6-Dinitrotoluene	94	< 94 U
121-14-2	2,4-Dinitrotoluene	94	< 94 U
84-66-2	**Diethylphthalate**	**47**	**100 B**
7005-72-3	4-Chlorophenyl-phenylether	19	< 19 U
86-73-7	Fluorene	19	< 19 U
100-01-6	4-Nitroaniline	94	< 94 U
534-52-1	4,6-Dinitro-2-Methylphenol	190	< 190 U

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-03-10-S
SAMPLE

Lab Sample ID: TL75C
LIMS ID: 11-19754
Matrix: Soil
Date Analyzed: 09/21/11 19:17

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
101-55-3	4-Bromophenyl-phenylether	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	190	< 190 U
85-01-8	Phenanthrene	19	< 19 U
86-74-8	Carbazole	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	Fluoranthene	19	< 19 U
129-00-0	Pyrene	19	< 19 U
85-68-7	Butylbenzylphthalate	19	< 19 U UJ
91-94-1	3,3'-Dichlorobenzidine	140	< 140 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**23**	**29 B** U
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
90-12-0	1-Methylnaphthalene	19	< 19 U
TOTBFA	Total Benzofluoranthenes	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.4%	2-Fluorobiphenyl	71.6%
d14-p-Terphenyl	93.4%	d4-1,2-Dichlorobenzene	67.2%
d5-Phenol	73.7%	2-Fluorophenol	72.0%
2,4,6-Tribromophenol	85.2%	d4-2-Chlorophenol	72.3%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-04-05-S
SAMPLE

Lab Sample ID: TL75D
LIMS ID: 11-19755
Matrix: Soil
Data Release Authorized:
Reported: 09/22/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/21/11 21:06
Instrument/Analyst: NT8/VTS
GPC Cleanup: Yes

Sample Amount: 10.7 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 11.8%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
111-44-4	Bis-(2-Chloroethyl) Ether	19	< 19 U
95-57-8	2-Chlorophenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	19	< 19 U
106-44-5	4-Methylphenol	38	< 38 U
621-64-7	N-Nitroso-Di-N-Propylamine	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
98-95-3	Nitrobenzene	19	< 19 U
78-59-1	Isophorone	19	< 19 U
88-75-5	2-Nitrophenol	94	< 94 U
105-67-9	2,4-Dimethylphenol	38	< 38 U
65-85-0	Benzoic Acid	380	< 380 U
111-91-1	bis(2-Chloroethoxy) Methane	19	< 19 U
120-83-2	2,4-Dichlorophenol	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	**Naphthalene**	**19**	**19**
106-47-8	4-Chloroaniline	250	< 250 U
87-68-3	Hexachlorobutadiene	94	< 94 U
59-50-7	4-Chloro-3-methylphenol	94	< 94 U
91-57-6	2-Methylnaphthalene	19	< 19 U
77-47-4	Hexachlorocyclopentadiene	380	< 380 U
88-06-2	2,4,6-Trichlorophenol	94	< 94 U
95-95-4	2,4,5-Trichlorophenol	94	< 94 U
91-58-7	2-Chloronaphthalene	19	< 19 U
88-74-4	2-Nitroaniline	94	< 94 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
99-09-2	3-Nitroaniline	94	< 94 U
83-32-9	Acenaphthene	19	< 19 U
51-28-5	2,4-Dinitrophenol	800	< 800 U
100-02-7	4-Nitrophenol	94	< 94 U
132-64-9	Dibenzofuran	19	< 19 U
606-20-2	2,6-Dinitrotoluene	94	< 94 U
121-14-2	2,4-Dinitrotoluene	94	< 94 U
84-66-2	Diethylphthalate	47	< 47 U
7005-72-3	4-Chlorophenyl-phenylether	19	< 19 U
86-73-7	Fluorene	19	< 19 U
100-01-6	4-Nitroaniline	94	< 94 U
534-52-1	4,6-Dinitro-2-Methylphenol	190	< 190 U

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-04-05-S
SAMPLE

Lab Sample ID: TL75D
LIMS ID: 11-19755
Matrix: Soil
Date Analyzed: 09/21/11 21:06

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
101-55-3	4-Bromophenyl-phenylether	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	190	< 190 U
85-01-8	**Phenanthrene**	**19**	**27**
86-74-8	Carbazole	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**44**
129-00-0	**Pyrene**	**19**	**49**
85-68-7	Butylbenzylphthalate	19	< 19 U UJ
91-94-1	3,3'-Dichlorobenzidine	140	< 140 U
56-55-3	**Benzo(a)anthracene**	**19**	**18 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**23**	**28 B** u
218-01-9	**Chrysene**	**19**	**27**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**19**	**20**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**19**	**14 J**
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	**Benzo(g,h,i)perylene**	**19**	**15 J**
90-12-0	1-Methylnaphthalene	19	< 19 U
TOTBFA	**Total Benzofluoranthenes**	**19**	**36**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	66.8%	2-Fluorobiphenyl	66.2%
d14-p-Terphenyl	83.8%	d4-1,2-Dichlorobenzene	61.6%
d5-Phenol	69.1%	2-Fluorophenol	67.1%
2,4,6-Tribromophenol	86.7%	d4-2-Chlorophenol	68.4%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-05-05-S
SAMPLE

Lab Sample ID: TL75E
LIMS ID: 11-19756
Matrix: Soil
Data Release Authorized:
Reported: 09/22/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/21/11 21:43
Instrument/Analyst: NT8/VTS
GPC Cleanup: Yes

Sample Amount: 10.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 7.0%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
111-44-4	Bis-(2-Chloroethyl) Ether	19	< 19 U
95-57-8	2-Chlorophenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	19	< 19 U
106-44-5	4-Methylphenol	38	< 38 U
621-64-7	N-Nitroso-Di-N-Propylamine	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
98-95-3	Nitrobenzene	19	< 19 U
78-59-1	Isophorone	19	< 19 U
88-75-5	2-Nitrophenol	96	< 96 U
105-67-9	2,4-Dimethylphenol	38	< 38 U
65-85-0	Benzoic Acid	380	< 380 U
111-91-1	bis(2-Chloroethoxy) Methane	19	< 19 U
120-83-2	2,4-Dichlorophenol	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
106-47-8	4-Chloroaniline	260	< 260 U
87-68-3	Hexachlorobutadiene	96	< 96 U
59-50-7	4-Chloro-3-methylphenol	96	< 96 U
91-57-6	2-Methylnaphthalene	19	< 19 U
77-47-4	Hexachlorocyclopentadiene	380	< 380 U
88-06-2	2,4,6-Trichlorophenol	96	< 96 U
95-95-4	2,4,5-Trichlorophenol	96	< 96 U
91-58-7	2-Chloronaphthalene	19	< 19 U
88-74-4	2-Nitroaniline	96	< 96 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
99-09-2	3-Nitroaniline	96	< 96 U
83-32-9	Acenaphthene	19	< 19 U
51-28-5	2,4-Dinitrophenol	820	< 820 U
100-02-7	4-Nitrophenol	96	< 96 U
132-64-9	Dibenzofuran	19	< 19 U
606-20-2	2,6-Dinitrotoluene	96	< 96 U
121-14-2	2,4-Dinitrotoluene	96	< 96 U
84-66-2	**Diethylphthalate**	**48**	**96 B** u
7005-72-3	4-Chlorophenyl-phenylether	19	< 19 U
86-73-7	Fluorene	19	< 19 U
100-01-6	4-Nitroaniline	96	< 96 U
534-52-1	4,6-Dinitro-2-Methylphenol	190	< 190 U

JC 9/21/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-05-05-S
SAMPLE

Lab Sample ID: TL75E
LIMS ID: 11-19756
Matrix: Soil
Date Analyzed: 09/21/11 21:43

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
101-55-3	4-Bromophenyl-phenylether	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	190	< 190 U
85-01-8	**Phenanthrene**	**19**	**12 J**
86-74-8	Carbazole	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	**Fluoranthene**	**19**	**23**
129-00-0	**Pyrene**	**19**	**26**
85-68-7	Butylbenzylphthalate	19	< 19 U UJ
91-94-1	3,3'-Dichlorobenzidine	140	< 140 U
56-55-3	**Benzo(a)anthracene**	**19**	**12 J**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**24**	**32 B** u
218-01-9	**Chrysene**	**19**	**17 J**
117-84-0	Di-n-Octyl phthalate	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**19**	**14 J**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**19**	**11 J**
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	**Benzo(g,h,i)perylene**	**19**	**12 J**
90-12-0	1-Methylnaphthalene	19	< 19 U
TOTBFA	**Total Benzofluoranthenes**	**19**	**29**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	73.2%	2-Fluorobiphenyl	73.0%
d14-p-Terphenyl	88.0%	d4-1,2-Dichlorobenzene	65.8%
d5-Phenol	74.8%	2-Fluorophenol	71.7%
2,4,6-Tribromophenol	88.5%	d4-2-Chlorophenol	72.8%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-06-12-S
SAMPLE

Lab Sample ID: TL75F
LIMS ID: 11-19757
Matrix: Soil
Data Release Authorized:
Reported: 09/22/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/21/11 22:19
Instrument/Analyst: NT8/VTS
GPC Cleanup: Yes

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 27.0%

CAS Number	Analyte	RL	Result
108-95-2	Phenol	19	< 19 U
111-44-4	Bis-(2-Chloroethyl) Ether	19	< 19 U
95-57-8	2-Chlorophenol	19	< 19 U
541-73-1	1,3-Dichlorobenzene	19	< 19 U
106-46-7	1,4-Dichlorobenzene	19	< 19 U
100-51-6	Benzyl Alcohol	19	< 19 U
95-50-1	1,2-Dichlorobenzene	19	< 19 U
95-48-7	2-Methylphenol	19	< 19 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	19	< 19 U
106-44-5	4-Methylphenol	39	< 39 U
621-64-7	N-Nitroso-Di-N-Propylamine	19	< 19 U
67-72-1	Hexachloroethane	19	< 19 U
98-95-3	Nitrobenzene	19	< 19 U
78-59-1	Isophorone	19	< 19 U
88-75-5	2-Nitrophenol	97	< 97 U
105-67-9	2,4-Dimethylphenol	39	< 39 U
65-85-0	Benzoic Acid	390	< 390 U
111-91-1	bis(2-Chloroethoxy) Methane	19	< 19 U
120-83-2	2,4-Dichlorophenol	190	< 190 U
120-82-1	1,2,4-Trichlorobenzene	19	< 19 U
91-20-3	Naphthalene	19	< 19 U
106-47-8	4-Chloroaniline	260	< 260 U
87-68-3	Hexachlorobutadiene	97	< 97 U
59-50-7	4-Chloro-3-methylphenol	97	< 97 U
91-57-6	2-Methylnaphthalene	19	< 19 U
77-47-4	Hexachlorocyclopentadiene	390	< 390 U
88-06-2	2,4,6-Trichlorophenol	97	< 97 U
95-95-4	2,4,5-Trichlorophenol	97	< 97 U
91-58-7	2-Chloronaphthalene	19	< 19 U
88-74-4	2-Nitroaniline	97	< 97 U
131-11-3	Dimethylphthalate	19	< 19 U
208-96-8	Acenaphthylene	19	< 19 U
99-09-2	3-Nitroaniline	97	< 97 U
83-32-9	Acenaphthene	19	< 19 U
51-28-5	2,4-Dinitrophenol	820	< 820 U
100-02-7	4-Nitrophenol	97	< 97 U
132-64-9	Dibenzofuran	19	< 19 U
606-20-2	2,6-Dinitrotoluene	97	< 97 U
121-14-2	2,4-Dinitrotoluene	97	< 97 U
84-66-2	Diethylphthalate	48	< 48 U
7005-72-3	4-Chlorophenyl-phenylether	19	< 19 U
86-73-7	Fluorene	19	< 19 U
100-01-6	4-Nitroaniline	97	< 97 U
534-52-1	4,6-Dinitro-2-Methylphenol	190	< 190 U

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: P2IM-NASW-06-12-S
SAMPLE

Lab Sample ID: TL75F
LIMS ID: 11-19757
Matrix: Soil
Date Analyzed: 09/21/11 22:19

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	19	< 19 U
101-55-3	4-Bromophenyl-phenylether	19	< 19 U
118-74-1	Hexachlorobenzene	19	< 19 U
87-86-5	Pentachlorophenol	190	< 190 U
85-01-8	Phenanthrene	19	< 19 U
86-74-8	Carbazole	19	< 19 U
120-12-7	Anthracene	19	< 19 U
84-74-2	Di-n-Butylphthalate	19	< 19 U
206-44-0	Fluoranthene	19	< 19 U
129-00-0	Pyrene	19	< 19 U
85-68-7	Butylbenzylphthalate	19	< 19 U UJ
91-94-1	3,3'-Dichlorobenzidine	140	< 140 U
56-55-3	Benzo(a)anthracene	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**24**	**29 B** u
218-01-9	Chrysene	19	< 19 U
117-84-0	Di-n-Octyl phthalate	19	< 19 U
50-32-8	Benzo(a)pyrene	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	19	< 19 U
90-12-0	1-Methylnaphthalene	19	< 19 U
TOTBFA	Total Benzofluoranthenes	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.8%	2-Fluorobiphenyl	69.8%
d14-p-Terphenyl	85.4%	d4-1,2-Dichlorobenzene	66.0%
d5-Phenol	72.4%	2-Fluorophenol	72.8%
2,4,6-Tribromophenol	82.0%	d4-2-Chlorophenol	71.9%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS

Sample ID: P2IM-NASW-07-05-W
SAMPLE

Lab Sample ID: TL75G
LIMS ID: 11-19758
Matrix: Water
Data Release Authorized:
Reported: 09/20/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/14/11
Date Analyzed: 09/20/11 06:43
Instrument/Analyst: NT4/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**0.10**	**0.05 J**
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U
TOTBFA	Total Benzofluoranthenes	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	69.7%
d14-Dibenzo(a,h)anthracene	63.0%

12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS

Sample ID: P2IM-NASW-01-01-S
SAMPLE

Lab Sample ID: TL75A
LIMS ID: 11-19752
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/21/11 14:54
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 11.01 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 4.2%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	4.5	6.0
91-57-6	2-Methylnaphthalene	4.5	5.5
90-12-0	1-Methylnaphthalene	4.5	3.5 J
208-96-8	Acenaphthylene	4.5	3.2 J
83-32-9	Acenaphthene	4.5	3.8 J
86-73-7	Fluorene	4.5	2.7 J
85-01-8	Phenanthrene	4.5	17
120-12-7	Anthracene	4.5	4.2 J
206-44-0	Fluoranthene	4.5	21
129-00-0	Pyrene	4.5	20
56-55-3	Benzo(a)anthracene	4.5	15
218-01-9	Chrysene	4.5	20
50-32-8	Benzo(a)pyrene	4.5	21
193-39-5	Indeno(1,2,3-cd)pyrene	4.5	14
53-70-3	Dibenz(a,h)anthracene	4.5	4.7
191-24-2	Benzo(g,h,i)perylene	4.5	44
132-64-9	Dibenzofuran	4.5	4.4 J
TOTBFA	Total Benzofluoranthenes	4.5	30

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	97.0%
d14-Dibenzo(a,h)anthracen	115%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS

Sample ID: P2IM-NASW-02-05-S
SAMPLE

Lab Sample ID: TL75B
LIMS ID: 11-19753
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/20/11 14:06
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.98 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 9.2%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	4.6	17
91-57-6	2-Methylnaphthalene	4.6	22
90-12-0	1-Methylnaphthalene	4.6	19
208-96-8	Acenaphthylene	4.6	6.2
83-32-9	Acenaphthene	4.6	42
86-73-7	Fluorene	4.6	28
85-01-8	Phenanthrene	4.6	77
120-12-7	Anthracene	4.6	14
206-44-0	Fluoranthene	4.6	51
129-00-0	Pyrene	4.6	48
56-55-3	Benzo(a)anthracene	4.6	22
218-01-9	Chrysene	4.6	30
50-32-8	Benzo(a)pyrene	4.6	26
193-39-5	Indeno(1,2,3-cd)pyrene	4.6	18
53-70-3	Dibenz(a,h)anthracene	4.6	3.6 J
191-24-2	Benzo(g,h,i)perylene	4.6	22
132-64-9	Dibenzofuran	4.6	27
TOTBFA	Total Benzofluoranthenes	4.6	50

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	81.0%
d14-Dibenzo(a,h)anthracen	94.7%

JC 12/12/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS

Sample ID: P2IM-NASW-03-10-S
SAMPLE

Lab Sample ID: TL75C
LIMS ID: 11-19754
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/20/11 14:37
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.56 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 12.1%

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**4.7**	**2.6 J**
91-57-6	2-Methylnaphthalene	4.7	< 4.7 U
90-12-0	1-Methylnaphthalene	4.7	< 4.7 U
208-96-8	Acenaphthylene	4.7	< 4.7 U
83-32-9	Acenaphthene	4.7	< 4.7 U
86-73-7	Fluorene	4.7	< 4.7 U
85-01-8	**Phenanthrene**	**4.7**	**3.0 J**
120-12-7	Anthracene	4.7	< 4.7 U
206-44-0	Fluoranthene	4.7	< 4.7 U
129-00-0	Pyrene	4.7	< 4.7 U
56-55-3	Benzo(a)anthracene	4.7	< 4.7 U
218-01-9	Chrysene	4.7	< 4.7 U
50-32-8	Benzo(a)pyrene	4.7	< 4.7 U
193-39-5	Indeno(1,2,3-cd)pyrene	4.7	< 4.7 U
53-70-3	Dibenz(a,h)anthracene	4.7	< 4.7 U
191-24-2	Benzo(g,h,i)perylene	4.7	< 4.7 U
132-64-9	Dibenzofuran	4.7	< 4.7 U
TOTBFA	Total Benzofluoranthenes	4.7	< 4.7 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	75.3%
d14-Dibenzo(a,h)anthracen	89.3%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS

Sample ID: P2IM-NASW-04-05-S
SAMPLE

Lab Sample ID: TL75D
LIMS ID: 11-19755
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/21/11 15:25
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 11.02 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 3.00
Percent Moisture: 11.8%

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**14**	**40**
91-57-6	**2-Methylnaphthalene**	**14**	**15**
90-12-0	**1-Methylnaphthalene**	**14**	**10 J**
208-96-8	**Acenaphthylene**	**14**	**8.2 J**
83-32-9	Acenaphthene	14	< 14 U
86-73-7	Fluorene	14	< 14 U
85-01-8	**Phenanthrene**	**14**	**42**
120-12-7	**Anthracene**	**14**	**5.2 J**
206-44-0	**Fluoranthene**	**14**	**53**
129-00-0	**Pyrene**	**14**	**56**
56-55-3	**Benzo(a)anthracene**	**14**	**25**
218-01-9	**Chrysene**	**14**	**33**
50-32-8	**Benzo(a)pyrene**	**14**	**28**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**14**	**19**
53-70-3	Dibenz(a,h)anthracene	14	< 14 U
191-24-2	**Benzo(g,h,i)perylene**	**14**	**22**
132-64-9	Dibenzofuran	14	< 14 U
TOTBFA	**Total Benzofluoranthenes**	**14**	**47**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	98.0%
d14-Dibenzo(a,h)anthracen	91.0%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS

Sample ID: P2IM-NASW-05-05-S
SAMPLE

Lab Sample ID: TL75E
LIMS ID: 11-19756
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/20/11 16:41
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.56 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 7.0%

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**4.7**	**3.8 J**
91-57-6	**2-Methylnaphthalene**	**4.7**	**3.5 J**
90-12-0	**1-Methylnaphthalene**	**4.7**	**3.5 J**
208-96-8	Acenaphthylene	4.7	< 4.7 U
83-32-9	Acenaphthene	4.7	< 4.7 U
86-73-7	Fluorene	4.7	< 4.7 U
85-01-8	**Phenanthrene**	**4.7**	**9.8**
120-12-7	**Anthracene**	**4.7**	**3.6 J**
206-44-0	**Fluoranthene**	**4.7**	**15**
129-00-0	**Pyrene**	**4.7**	**16**
56-55-3	**Benzo(a)anthracene**	**4.7**	**10**
218-01-9	**Chrysene**	**4.7**	**16**
50-32-8	**Benzo(a)pyrene**	**4.7**	**12**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.7**	**8.4**
53-70-3	Dibenz(a,h)anthracene	4.7	< 4.7 U
191-24-2	**Benzo(g,h,i)perylene**	**4.7**	**10**
132-64-9	**Dibenzofuran**	**4.7**	**2.4 J**
TOTBFA	**Total Benzofluoranthenes**	**4.7**	**27**

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	75.7%
d14-Dibenzo(a,h)anthracen	88.3%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS

Sample ID: P2IM-NASW-06-12-S
SAMPLE

Lab Sample ID: TL75F
LIMS ID: 11-19757
Matrix: Soil
Data Release Authorized: B
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/20/11 17:12
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.60 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 27.0%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	4.7	< 4.7 U
91-57-6	2-Methylnaphthalene	4.7	< 4.7 U
90-12-0	1-Methylnaphthalene	4.7	< 4.7 U
208-96-8	Acenaphthylene	4.7	< 4.7 U
83-32-9	Acenaphthene	4.7	< 4.7 U
86-73-7	Fluorene	4.7	< 4.7 U
85-01-8	**Phenanthrene**	**4.7**	**5.4**
120-12-7	Anthracene	4.7	< 4.7 U
206-44-0	Fluoranthene	4.7	< 4.7 U
129-00-0	Pyrene	4.7	< 4.7 U
56-55-3	Benzo(a)anthracene	4.7	< 4.7 U
218-01-9	Chrysene	4.7	< 4.7 U
50-32-8	Benzo(a)pyrene	4.7	< 4.7 U
193-39-5	Indeno(1,2,3-cd)pyrene	4.7	< 4.7 U
53-70-3	Dibenz(a,h)anthracene	4.7	< 4.7 U
191-24-2	Benzo(g,h,i)perylene	4.7	< 4.7 U
132-64-9	Dibenzofuran	4.7	< 4.7 U
TOTBFA	Total Benzofluoranthenes	4.7	< 4.7 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	58.0%
d14-Dibenzo(a,h)anthracen	74.7%

JC 12/12/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082

Sample ID: P2IM-NASW-07-05-W
SAMPLE

Lab Sample ID: TL75G
LIMS ID: 11-19758
Matrix: Water
Data Release Authorized:
Reported: 09/20/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/14/11
Date Analyzed: 09/20/11 09:15
Instrument/Analyst: ECD7/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	1.0	< 1.0 U
53469-21-9	Aroclor 1242	1.0	< 1.0 U
12672-29-6	Aroclor 1248	1.0	< 1.0 U
11097-69-1	Aroclor 1254	1.0	< 1.0 U
11096-82-5	Aroclor 1260	1.0	< 1.0 U
11104-28-2	Aroclor 1221	1.0	< 1.0 U
11141-16-5	Aroclor 1232	1.0	< 1.0 U
37324-23-5	Aroclor 1262	1.0	< 1.0 U
11100-14-4	Aroclor 1268	1.0	< 1.0 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	57.5%
Tetrachlorometaxylene	67.0%

FC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082

Sample ID: P2IM-NASW-01-01-S
SAMPLE

Lab Sample ID: TL75A
LIMS ID: 11-19752
Matrix: Soil
Data Release Authorized: MW
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/20/11 14:03
Instrument/Analyst: ECD7/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 4.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 4.2%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	31	< 31 U
53469-21-9	Aroclor 1242	31	< 31 U
12672-29-6	Aroclor 1248	31	< 31 U
11097-69-1	**Aroclor 1254**	**31**	**80**
11096-82-5	**Aroclor 1260**	**31**	**65**
11104-28-2	Aroclor 1221	31	< 31 U
11141-16-5	Aroclor 1232	31	< 31 U
37324-23-5	Aroclor 1262	31	< 31 U
11100-14-4	Aroclor 1268	31	< 31 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	70.2%
Tetrachlorometaxylene	77.5%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082

Sample ID: P2IM-NASW-02-05-S
SAMPLE

Lab Sample ID: TL75B
LIMS ID: 11-19753
Matrix: Soil
Data Release Authorized: MW
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/20/11 14:26
Instrument/Analyst: ECD7/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.0 g-dry-wt
Final Extract Volume: 4.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 9.2%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	31	< 31 U
53469-21-9	Aroclor 1242	31	< 31 U
12672-29-6	Aroclor 1248	31	< 31 U
11097-69-1	Aroclor 1254	31	< 31 U
11096-82-5	Aroclor 1260	31	< 31 U
11104-28-2	Aroclor 1221	31	< 31 U
11141-16-5	Aroclor 1232	31	< 31 U
37324-23-5	Aroclor 1262	31	< 31 U
11100-14-4	Aroclor 1268	31	< 31 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	70.0%
Tetrachlorometaxylene	74.5%

JC 12/12/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082

Sample ID: P2IM-NASW-03-10-S
SAMPLE

Lab Sample ID: TL75C
LIMS ID: 11-19754
Matrix: Soil
Data Release Authorized:
Reported: 09/21/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Date Extracted: 09/13/11
Date Analyzed: 09/20/11 14:49
Instrument/Analyst: ECD7/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.0 g-dry-wt
Final Extract Volume: 4.00 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 12.1%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	31	< 31 U
53469-21-9	Aroclor 1242	31	< 31 U
12672-29-6	Aroclor 1248	31	< 31 U
11097-69-1	Aroclor 1254	31	< 31 U
11096-82-5	Aroclor 1260	31	< 31 U
11104-28-2	Aroclor 1221	31	< 31 U
11141-16-5	Aroclor 1232	31	< 31 U
37324-23-5	Aroclor 1262	31	< 31 U
11100-14-4	Aroclor 1268	31	< 31 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	67.0%
Tetrachlorometaxylene	69.5%

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Water

Data Release Authorized:
Reported: 09/16/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

ARI ID	Client ID	Analysis Date	DL	Range	Result
MB-091311	Method Blank	09/13/11	1.0	Gasoline	< 0.25 U
11-19758		PID3		HC ID	---
				Trifluorotoluene	99.8%
				Bromobenzene	96.0%
TL75G	P2IM-NASW-07-05-W	09/13/11	1.0	Gasoline	< 0.25 U
11-19758		PID3		HC ID	---
				Trifluorotoluene	102%
				Bromobenzene	95.4%
TL75H	Trip Blank	09/13/11	1.0	Gasoline	< 0.25 U
11-19759		PID3		HC ID	---
				Trifluorotoluene	103%
				Bromobenzene	98.1%

Gasoline values reported in mg/L (ppm)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

JC 12/2/2011

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TPHG by Method NWTPHG
Matrix: Soil

Data Release Authorized: MW
Reported: 09/16/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
Event: P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

ARI ID	Client ID	Analysis Date	Basis	Range	Result
MB-091311	Method Blank	09/13/11	Dry	Gasoline	< 5.0 U
11-19752		PID3		HC ID	---
				Trifluorotoluene	99.8%
				Bromobenzene	96.0%
TL75A	P2IM-NASW-01-01-S	09/13/11	Dry	Gasoline	< 6.3 U
11-19752		PID3		HC ID	---
				Trifluorotoluene	99.5%
				Bromobenzene	94.5%
TL75B	P2IM-NASW-02-05-S	09/13/11	Dry	Gasoline	< 6.6 U
11-19753		PID3		HC ID	---
				Trifluorotoluene	103%
				Bromobenzene	97.4%
TL75C	P2IM-NASW-03-10-S	09/13/11	Dry	Gasoline	< 6.0 U
11-19754		PID3		HC ID	---
				Trifluorotoluene	102%
				Bromobenzene	95.4%

Gasoline values reported in mg/kg (ppm)

Quantitation on total peaks in the gasoline range from Toluene to Naphthalene.

GAS: Indicates the presence of gasoline or weathered gasoline.
GRO: Positive result that does not match an identifiable gasoline pattern.

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

JC 12/9/2011

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 1
Matrix: Water

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

Data Release Authorized:
Reported: 09/15/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-091311	Method Blank	09/13/11	09/14/11	1.00	Diesel	0.10	< 0.10 U
11-19758	HC ID: ---		FID4A	1.0	Motor Oil	0.20	< 0.20 U
					Bunker C	0.20	< 0.20 U
					o-Terphenyl		87.3%
TL75G	P2IM-NASW-07-05-W	09/13/11	09/14/11	1.00	Diesel	0.10	< 0.10 U
11-19758	HC ID: ---		FID4A	1.0	Motor Oil	0.20	< 0.20 U
					Bunker C	0.20	< 0.20 U
					o-Terphenyl		80.7%

Reported in mg/L (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
Bunker C quantitation on total peaks in the range from C10 to C38.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

JC
12/2/11

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 1
Matrix: Soil

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM

Data Release Authorized:
Reported: 09/15/11

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-091211	Method Blank	09/12/11	09/14/11	1.00	Diesel	5.0	< 5.0 U
11-19752	HC ID: ---		FID4A	1.0	Motor Oil	10	< 10 U
					Bunker C	10	< 10 U
					o-Terphenyl		92.9%
TL75A	P2IM-NASW-01-01-S	09/12/11	09/15/11	1.00	**Diesel**	**5.1**	**18** J
11-19752	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**10**	**160**
					Bunker C	**10**	**280**
					o-Terphenyl		70.4%
TL75B	P2IM-NASW-02-05-S	09/12/11	09/15/11	1.00	**Diesel**	**5.4**	**6.0** J
11-19753	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**11**	**28**
					Bunker C	**11**	**54**
					o-Terphenyl		81.4%
TL75C	P2IM-NASW-03-10-S	09/12/11	09/15/11	1.00	Diesel	5.6	< 5.6 U
11-19754	HC ID: ---		FID4A	1.0	Motor Oil	11	< 11 U
					Bunker C	11	< 11 U
					o-Terphenyl		86.4%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
Bunker C quantitation on total peaks in the range from C10 to C18.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: P2IM-NASW-07-05-W
SAMPLE

Lab Sample ID: TL75G
LIMS ID: 11-19758
Matrix: Water
Data Release Authorized:
Reported: 09/19/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	09/12/11	6010B	09/15/11	7429-90-5	Aluminum	0.05	0.05	U
3010A	09/12/11	6010B	09/15/11	7440-36-0	Antimony	0.05	0.05	U
3010A	09/12/11	6010B	09/15/11	7440-38-2	Arsenic	0.05	0.05	U
3010A	09/12/11	6010B	09/15/11	7440-39-3	Barium	0.003	0.003	U
3010A	09/12/11	6010B	09/15/11	7440-41-7	Beryllium	0.001	0.001	U
3010A	09/12/11	6010B	09/15/11	7440-43-9	Cadmium	0.002	0.002	U
3010A	09/12/11	6010B	09/15/11	7440-47-3	Chromium	0.005	0.005	U
3010A	09/12/11	6010B	09/15/11	7440-48-4	Cobalt	0.003	0.003	U
3010A	09/12/11	6010B	09/15/11	7440-50-8	Copper	0.002	0.002	U
3010A	09/12/11	6010B	09/15/11	7439-89-6	Iron	0.05	0.05	U
3010A	09/12/11	6010B	09/15/11	7439-92-1	Lead	0.02	0.02	U
3010A	09/12/11	6010B	09/15/11	7439-95-4	Magnesium	0.05	0.05	U
3010A	09/12/11	6010B	09/15/11	7439-96-5	Manganese	0.001	0.001	U
7470A	09/12/11	7470A	09/16/11	7439-97-6	Mercury	0.0001	0.0001	U
3010A	09/12/11	6010B	09/15/11	7439-98-7	Molybdenum	0.005	0.005	U
3010A	09/12/11	6010B	09/15/11	7440-02-0	Nickel	0.01	0.01	U
3010A	09/12/11	6010B	09/15/11	7782-49-2	Selenium	0.05	0.05	U
3010A	09/12/11	6010B	09/15/11	7440-22-4	Silver	0.003	0.003	U
200.8	09/12/11	200.8	09/16/11	7440-28-0	Thallium	0.0002	0.0002	U
3010A	09/12/11	6010B	09/15/11	7440-31-5	Tin	0.01	0.01	U
3010A	09/12/11	6010B	09/15/11	7440-62-2	Vanadium	0.003	0.003	U
3010A	09/12/11	6010B	09/15/11	7440-66-6	Zinc	0.01	0.01	U

U-Analyte undetected at given RL
RL-Reporting Limit

FC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: P2IM-NASW-01-01-S
SAMPLE

Lab Sample ID: TL75A
LIMS ID: 11-19752
Matrix: Soil
Data Release Authorized:
Reported: 09/19/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Percent Total Solids: 96.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	09/14/11	6010B	09/15/11	**7429-90-5**	**Aluminum**	5	**9,930**	
3050B	09/14/11	6010B	09/15/11	7440-36-0	Antimony	5	5	U UJ
3050B	09/14/11	6010B	09/15/11	**7440-38-2**	**Arsenic**	5	**6**	
3050B	09/14/11	6010B	09/15/11	**7440-39-3**	**Barium**	0.3	**42.9**	
3050B	09/14/11	6010B	09/15/11	**7440-41-7**	**Beryllium**	0.1	**0.2**	
3050B	09/14/11	6010B	09/15/11	**7440-43-9**	**Cadmium**	0.2	**0.3**	
3050B	09/14/11	6010B	09/15/11	**7440-47-3**	**Chromium**	0.5	**18.4**	
3050B	09/14/11	6010B	09/15/11	**7440-48-4**	**Cobalt**	0.3	**5.7**	
3050B	09/14/11	6010B	09/15/11	**7440-50-8**	**Copper**	0.2	**19.5**	
3050B	09/14/11	6010B	09/15/11	**7439-89-6**	**Iron**	5	**14,100**	
3050B	09/14/11	6010B	09/15/11	**7439-92-1**	**Lead**	2	**15**	
3050B	09/14/11	6010B	09/15/11	**7439-95-4**	**Magnesium**	5	**3,300**	
3050B	09/14/11	6010B	09/15/11	**7439-96-5**	**Manganese**	0.1	**165**	
CLP	09/13/11	7471A	09/16/11	**7439-97-6**	**Mercury**	0.02	**0.04**	
3050B	09/14/11	6010B	09/15/11	**7439-98-7**	**Molybdenum**	0.5	**0.5**	
3050B	09/14/11	6010B	09/15/11	**7440-02-0**	**Nickel**	1	**14**	
3050B	09/14/11	6010B	09/15/11	7782-49-2	Selenium	5	5	U
3050B	09/14/11	6010B	09/15/11	7440-22-4	Silver	0.3	0.3	U
3050B	09/14/11	200.8	09/16/11	7440-28-0	Thallium	0.2	0.2	U
3050B	09/14/11	6010B	09/15/11	7440-31-5	Tin	1	1	U
3050B	09/14/11	6010B	09/15/11	**7440-62-2**	**Vanadium**	0.3	**45.2**	
3050B	09/14/11	6010B	09/15/11	**7440-66-6**	**Zinc**	1	**51**	

U-Analyte undetected at given RL
RL-Reporting Limit

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: P2IM-NASW-02-05-S
SAMPLE

Lab Sample ID: TL75B
LIMS ID: 11-19753
Matrix: Soil
Data Release Authorized:
Reported: 09/19/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Percent Total Solids: 90.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	09/14/11	6010B	09/15/11	**7429-90-5**	**Aluminum**	5	**9,300**	
3050B	09/14/11	6010B	09/15/11	7440-36-0	Antimony	5	5	U UJ
3050B	09/14/11	6010B	09/15/11	**7440-38-2**	**Arsenic**	5	**6**	
3050B	09/14/11	6010B	09/15/11	**7440-39-3**	**Barium**	0.3	**43.4**	
3050B	09/14/11	6010B	09/15/11	**7440-41-7**	**Beryllium**	0.1	**0.1**	
3050B	09/14/11	6010B	09/15/11	**7440-43-9**	**Cadmium**	0.2	**0.3**	
3050B	09/14/11	6010B	09/15/11	**7440-47-3**	**Chromium**	0.5	**15.5**	
3050B	09/14/11	6010B	09/15/11	**7440-48-4**	**Cobalt**	0.3	**4.9**	
3050B	09/14/11	6010B	09/15/11	**7440-50-8**	**Copper**	0.2	**17.0**	
3050B	09/14/11	6010B	09/15/11	**7439-89-6**	**Iron**	5	**12,700**	
3050B	09/14/11	6010B	09/15/11	**7439-92-1**	**Lead**	2	**23**	
3050B	09/14/11	6010B	09/15/11	**7439-95-4**	**Magnesium**	5	**2,500**	
3050B	09/14/11	6010B	09/15/11	**7439-96-5**	**Manganese**	0.1	**136**	
CLP	09/13/11	7471A	09/16/11	**7439-97-6**	**Mercury**	0.03	**0.05**	
3050B	09/14/11	6010B	09/15/11	**7439-98-7**	**Molybdenum**	0.5	**0.5**	
3050B	09/14/11	6010B	09/15/11	**7440-02-0**	**Nickel**	1	**11**	
3050B	09/14/11	6010B	09/15/11	7782-49-2	Selenium	5	5	U
3050B	09/14/11	6010B	09/15/11	7440-22-4	Silver	0.3	0.3	U
3050B	09/14/11	200.8	09/16/11	7440-28-0	Thallium	0.2	0.2	U
3050B	09/14/11	6010B	09/15/11	7440-31-5	Tin	1	1	U
3050B	09/14/11	6010B	09/15/11	**7440-62-2**	**Vanadium**	0.3	**42.3**	
3050B	09/14/11	6010B	09/15/11	**7440-66-6**	**Zinc**	1	**50**	

U-Analyte undetected at given RL
RL-Reporting Limit

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: P2IM-NASW-03-10-S
SAMPLE

Lab Sample ID: TL75C
LIMS ID: 11-19754
Matrix: Soil
Data Release Authorized:
Reported: 09/19/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Percent Total Solids: 92.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q	
3050B	09/14/11	6010B	09/15/11	**7429-90-5**	**Aluminum**	5	**6,720**		
3050B	09/14/11	6010B	09/15/11	7440-36-0	Antimony	5	5	U	UJ
3050B	09/14/11	6010B	09/15/11	7440-38-2	Arsenic	5	5	U	
3050B	09/14/11	6010B	09/15/11	**7440-39-3**	**Barium**	0.3	**25.6**		
3050B	09/14/11	6010B	09/15/11	7440-41-7	Beryllium	0.1	0.1	U	
3050B	09/14/11	6010B	09/15/11	7440-43-9	Cadmium	0.2	0.2	U	
3050B	09/14/11	6010B	09/15/11	**7440-47-3**	**Chromium**	0.5	**9.0**		J
3050B	09/14/11	6010B	09/15/11	**7440-48-4**	**Cobalt**	0.3	**3.4**		
3050B	09/14/11	6010B	09/15/11	**7440-50-8**	**Copper**	0.2	**8.7**		
3050B	09/14/11	6010B	09/15/11	**7439-89-6**	**Iron**	5	**10,800**		
3050B	09/14/11	6010B	09/15/11	7439-92-1	Lead	2	2	U	
3050B	09/14/11	6010B	09/15/11	**7439-95-4**	**Magnesium**	5	**1,860**		
3050B	09/14/11	6010B	09/15/11	**7439-96-5**	**Manganese**	0.1	**83.6**		
CLP	09/13/11	7471A	09/16/11	7439-97-6	Mercury	0.02	0.02	U	
3050B	09/14/11	6010B	09/15/11	**7439-98-7**	**Molybdenum**	0.5	**0.5**		
3050B	09/14/11	6010B	09/15/11	**7440-02-0**	**Nickel**	1	**6**		
3050B	09/14/11	6010B	09/15/11	7782-49-2	Selenium	5	5	U	
3050B	09/14/11	6010B	09/15/11	7440-22-4	Silver	0.3	0.3	U	
3050B	09/14/11	200.8	09/16/11	7440-28-0	Thallium	0.2	0.2	U	
3050B	09/14/11	6010B	09/15/11	7440-31-5	Tin	1	1	U	
3050B	09/14/11	6010B	09/15/11	**7440-62-2**	**Vanadium**	0.3	**36.6**		
3050B	09/14/11	6010B	09/15/11	**7440-66-6**	**Zinc**	1	**20**		

U-Analyte undetected at given RL
RL-Reporting Limit

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: P2IM-NASW-04-05-S
SAMPLE

Lab Sample ID: TL75D
LIMS ID: 11-19755
Matrix: Soil
Data Release Authorized:
Reported: 09/19/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Percent Total Solids: 88.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	09/14/11	6010B	09/15/11	**7429-90-5**	**Aluminum**	6	**8,420**	
3050B	09/14/11	6010B	09/15/11	7440-36-0	Antimony	6	6	U UJ
3050B	09/14/11	6010B	09/15/11	7440-38-2	Arsenic	6	6	U
3050B	09/14/11	6010B	09/15/11	**7440-39-3**	**Barium**	0.3	**39.6**	
3050B	09/14/11	6010B	09/15/11	**7440-41-7**	**Beryllium**	0.1	**0.1**	
3050B	09/14/11	6010B	09/15/11	**7440-43-9**	**Cadmium**	0.2	**0.3**	
3050B	09/14/11	6010B	09/15/11	**7440-47-3**	**Chromium**	0.6	**12.4**	
3050B	09/14/11	6010B	09/15/11	**7440-48-4**	**Cobalt**	0.3	**4.3**	
3050B	09/14/11	6010B	09/15/11	**7440-50-8**	**Copper**	0.2	**14.6**	
3050B	09/14/11	6010B	09/15/11	**7439-89-6**	**Iron**	6	**11,600**	
3050B	09/14/11	6010B	09/15/11	**7439-92-1**	**Lead**	2	**18**	
3050B	09/14/11	6010B	09/15/11	**7439-95-4**	**Magnesium**	6	**2,080**	
3050B	09/14/11	6010B	09/15/11	**7439-96-5**	**Manganese**	0.1	**139**	
CLP	09/13/11	7471A	09/16/11	**7439-97-6**	**Mercury**	0.02	**0.02**	
3050B	09/14/11	6010B	09/15/11	7439-98-7	Molybdenum	0.6	0.6	U
3050B	09/14/11	6010B	09/15/11	**7440-02-0**	**Nickel**	1	**8**	
3050B	09/14/11	6010B	09/15/11	7782-49-2	Selenium	6	6	U
3050B	09/14/11	6010B	09/15/11	7440-22-4	Silver	0.3	0.3	U
3050B	09/14/11	200.8	09/16/11	7440-28-0	Thallium	0.2	0.2	U
3050B	09/14/11	6010B	09/15/11	7440-31-5	Tin	1	1	U
3050B	09/14/11	6010B	09/15/11	**7440-62-2**	**Vanadium**	0.3	**43.6**	
3050B	09/14/11	6010B	09/15/11	**7440-66-6**	**Zinc**	1	**43**	

U-Analyte undetected at given RL
RL-Reporting Limit

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: P2IM-NASW-05-05-S
SAMPLE

Lab Sample ID: TL75E
LIMS ID: 11-19756
Matrix: Soil
Data Release Authorized:
Reported: 09/19/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Percent Total Solids: 93.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	09/14/11	6010B	09/15/11	**7429-90-5**	**Aluminum**	5	**7,280**	
3050B	09/14/11	6010B	09/15/11	7440-36-0	Antimony	5	5	U UJ
3050B	09/14/11	6010B	09/15/11	7440-38-2	Arsenic	5	5	U
3050B	09/14/11	6010B	09/15/11	**7440-39-3**	**Barium**	0.3	**28.9**	
3050B	09/14/11	6010B	09/15/11	7440-41-7	Beryllium	0.1	0.1	U
3050B	09/14/11	6010B	09/15/11	7440-43-9	Cadmium	0.2	0.2	U
3050B	09/14/11	6010B	09/15/11	**7440-47-3**	**Chromium**	0.5	**10.6**	
3050B	09/14/11	6010B	09/15/11	**7440-48-4**	**Cobalt**	0.3	**3.9**	
3050B	09/14/11	6010B	09/15/11	**7440-50-8**	**Copper**	0.2	**14.1**	
3050B	09/14/11	6010B	09/15/11	**7439-89-6**	**Iron**	5	**11,100**	
3050B	09/14/11	6010B	09/15/11	**7439-92-1**	**Lead**	2	**5**	
3050B	09/14/11	6010B	09/15/11	**7439-95-4**	**Magnesium**	5	**2,060**	
3050B	09/14/11	6010B	09/15/11	**7439-96-5**	**Manganese**	0.1	**95.1**	
CLP	09/13/11	7471A	09/16/11	7439-97-6	Mercury	0.02	0.02	U
3050B	09/14/11	6010B	09/15/11	7439-98-7	Molybdenum	0.5	0.5	U
3050B	09/14/11	6010B	09/15/11	**7440-02-0**	**Nickel**	1	**8**	
3050B	09/14/11	6010B	09/15/11	7782-49-2	Selenium	5	5	U
3050B	09/14/11	6010B	09/15/11	7440-22-4	Silver	0.3	0.3	U
3050B	09/14/11	200.8	09/16/11	7440-28-0	Thallium	0.2	0.2	U
3050B	09/14/11	6010B	09/15/11	7440-31-5	Tin	1	1	U
3050B	09/14/11	6010B	09/15/11	**7440-62-2**	**Vanadium**	0.3	**39.3**	
3050B	09/14/11	6010B	09/15/11	**7440-66-6**	**Zinc**	1	**26**	

U-Analyte undetected at given RL
RL-Reporting Limit

JC 12/2/11

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: P2IM-NASW-06-12-S
SAMPLE

Lab Sample ID: TL75F
LIMS ID: 11-19757
Matrix: Soil
Data Release Authorized:
Reported: 09/19/11

QC Report No: TL75-The Boeing Company
Project: NASWS Retrofit
P2IM
Date Sampled: 09/09/11
Date Received: 09/09/11

Percent Total Solids: 73.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
3050B	09/14/11	6010B	09/15/11	**7429-90-5**	**Aluminum**	7	**10,600**	
3050B	09/14/11	6010B	09/15/11	7440-36-0	Antimony	7	7	U UJ
3050B	09/14/11	6010B	09/15/11	7440-38-2	Arsenic	7	7	U
3050B	09/14/11	6010B	09/15/11	**7440-39-3**	**Barium**	0.4	**28.3**	
3050B	09/14/11	6010B	09/15/11	**7440-41-7**	**Beryllium**	0.1	**0.2**	
3050B	09/14/11	6010B	09/15/11	7440-43-9	Cadmium	0.3	0.3	U
3050B	09/14/11	6010B	09/15/11	**7440-47-3**	**Chromium**	0.7	**17.3**	
3050B	09/14/11	6010B	09/15/11	**7440-48-4**	**Cobalt**	0.4	**4.3**	
3050B	09/14/11	6010B	09/15/11	**7440-50-8**	**Copper**	0.3	**27.1**	
3050B	09/14/11	6010B	09/15/11	**7439-89-6**	**Iron**	7	**10,000**	
3050B	09/14/11	6010B	09/15/11	7439-92-1	Lead	3	3	U
3050B	09/14/11	6010B	09/15/11	**7439-95-4**	**Magnesium**	7	**2,420**	
3050B	09/14/11	6010B	09/15/11	**7439-96-5**	**Manganese**	0.1	**79.7**	
CLP	09/13/11	7471A	09/16/11	7439-97-6	Mercury	0.03	0.03	U
3050B	09/14/11	6010B	09/15/11	7439-98-7	Molybdenum	0.7	0.7	U
3050B	09/14/11	6010B	09/15/11	**7440-02-0**	**Nickel**	1	**8**	
3050B	09/14/11	6010B	09/15/11	7782-49-2	Selenium	7	7	U
3050B	09/14/11	6010B	09/15/11	7440-22-4	Silver	0.4	0.4	U
3050B	09/14/11	200.8	09/16/11	7440-28-0	Thallium	0.3	0.3	U
3050B	09/14/11	6010B	09/15/11	7440-31-5	Tin	1	1	U
3050B	09/14/11	6010B	09/15/11	**7440-62-2**	**Vanadium**	0.4	**47.4**	
3050B	09/14/11	6010B	09/15/11	**7440-66-6**	**Zinc**	1	**34**	

U-Analyte undetected at given RL
RL-Reporting Limit

JC 12/2/11

APPENDIX C

FIELD NOTES

(ELECTRONIC COPIES ONLY, ON CD ATTACHED TO REPORT)

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BP2 Demo WC 2011

013-1646-011.300.02 7/12/2011

sunny, 55F

1300 J. Lamberts onsite to arrange test pit digging with Harper.
Spoke with Reef + Jeff. Congrete + small backhoe will be brought onsite. on 7/13/2011

Gathered up equipment for sampling

1500 J. Lamberts offsite to lab to get sample bottles

Notes from 7/8/2011 Locate H+S tailgate
0630 Met w/ T. Norton to locate sampling locations.
Use GPS + tape to mark out spots in SA2, 1A2, 1A1-WC-02, 1A5, 1A4.
Could not mark out 1A3 because area was under demolition.
Could not mark out SA1 because area was being covered by soil piles + concrete piles from tunnels.

0800 Met with Mark from APS to locate sampling spots:

jsl 7/12/2011

BP2 Demo WC 2011

013-1646-011.300.02 sunny 60F 7/12/2011

1A1-WC-01: inside 2-41 Bldg - ok. Just need to be careful with Access.

1A1-WC-02: APS could not perform locate. He is not allowed to work in areas where there is no concrete. This spot is on bare soil.

SA1-WC-01, 02, 03, 04: APS could not perform locate. Bare soil + locations are under soil piles + concrete piles.

1A5-WC-01, 02: Area cleared.

1A4-WC-01, 02: Sample locations had to be moved off old SW line, 2ft to west. otherwise clear.

1A3-WC-01: could not locate. Area under demolition.

1A2-WC-01: @ corner of 2-49 (SE). Had to move off of corner + away from telephone line.

jsl 7/12/2011

BP2 Demo WC 2011

013-1646-011.300.02 sunny 50F 7/12/2011

SA2-WC-01,02,03,04,05,06,07,08,09:
all cleared. Shifted SA2-WC-02,03,04,05,08 off of new duct bank asphalt and to edge of new asphalt (towards east). Shifted SA2-WC-01,06,07 15ft to east.

SA2-WC-10 : cleared

SA2-WC-11 : cleared. Prefer location that was marked to the W of barriers

SA2-WC-12 : shifted to avoid old gas line. cleared.

1200 Mark from APS offsite.
J. Lambert's offsite

JS| 7/12/2011

BP2 Demo WC 2011

013-1646-011.300.02 sunny 50F 7/13/2011

0700 J. Lambert's onsite to perform sampling for BP2 Demo WC.
H+S tailgate

Gathered up gear for sampling.

Spoke w/ M. Lumpkin - Harper (Jeff) said that equipment to be onsite by 930.

0830 Prepared sample labels.

1000 Walked around w/ Jeff w/ Harper to show sample locations
Decided to start with 1A5, 1A3.
Remarked locations w/ GPS. (and SA2)

1230 Concrete broken around 1A5, and 1A3
They began pulling concrete right away

1250 Moved to SA2 to show where locations are. Concrete breaker is 'Morris'

1350 Removed concrete from 1A5.
Placed soil on plastic.

1400 started digging hole @ 1A5-WC-02

1410 Collect sample @ 5-7 'bgs

1425 Collect sample @ 10-11 'bgs
Hole dug to 13' bgs

JS|

013-1646-011.300.02 sunny 70

1430 Concrete breaker finished up @ SA2 - 9 holes prepared.

1425 started digging hole @ IA5-WC-01
1435 @ 9' bgs
1445 @ 11' bgs. Pit complete @ 11' bgs.

1435 Collect sample @ 10-11' bgs
1440 Collect sample @ 5-7' bgs.

After sampling, refilled pits w/ soil, tamped down. left concrete

1515 Finished filling pits @ IA5
1530 Pulled concrete @ IA3
1540 Pulled concrete @ SA2. from 9 locations
Will start test pits tomorrow.

Told M. Lumpkin that we will start @ 8am. tomorrow. Will get concrete breaker to open up spots @ SA2 -10, 11, 12 and IA2 and IA4 and IA1-WC-01

Jeff Lambert

013-1646-011.300.02 sunny 70F

Mini Excavator is 200-142
PC 138 USLC Komatsu
Operator is: Chris Nolan

1600 Finished moving concrete from test pits SA2 - #1-9.
1615 wrote up COC. Packed samples on ice

1630 J. Lamberts offsite

Jeff Lambert

013-1646-011.300.02 Overcast 65F 7/14/2011

0800 J. Lamberts onsite
H+S tailgate
Prepped for work @ IA3.
Called Jeff @ Harper to arrange excavation
0900 Gary laid out plastic sheets @ IA3 for soil.
Started digging pit @ IA3
0900 Collected 1-2' sample
0912 collected 5-6' sample
0920 collected 9-10' sample.
0925 finished pit to 10' + filled back in

JLP

2011 BP2 Demo WC

013-1646-011.300 overcast rainy 65F 7/14/2011

0940 Began digging hole @ SA2-WC-Ø9
0950 Collect sample @ 1-2'
1000 Collect sample 5-6'
1008 Collect sample 9-10'
1010 finished hole SA2-WC-Ø9 to 10' and filled back in.
1020 Began digging hole @ SA2-WC-Ø7
1025 Collect sample @ 1-2'
1034 Collect sample 5-6'
1050 Collect sample 9-10'
1055 finished hole SA2-WC-Ø7 to 10' and filled back in - Got new operator 'Joe'
1115 Moved to hole SA2-WC-Ø8 and began digging until we found black metal debris + burnt material. Started @ 5
1126 ended @ ~~7.5~~' 8'
~~1205~~ Collect sample @ ~~6-7~~' JSI 5-6'
1130 Collect sample @ 7-8' at base of metals
1135 Finished hole @ SA2-WC-Ø8. to 8' and filled back in.
1155 Moved to hole SA2-WC-Ø5 and began digging until we found black metal debris + burnt material. It started @ 6' and ended @ 7.5'.

JSI

2011 BP2 Demo WC

013-1646-011.300 overcast rainy 65F 7/14/2011

1205 Collected sample @ 6-7'
1220 Dug past metal debris + collected a sample @ 8-9' to find extent of contamination
1225 finished hole SA2-WC-Ø5 and filled back in
1300 Lunch
1330 Moved to hole SA2-WC-Ø6 and began digging
1340 ~~Sa~~ Collected sample @ 1-2'
1347 Collected sample @ 5-6'
1358 Collected sample @ 9-10'
1405 Finished hole SA2-WC-Ø6 and filled back in.
Moved to pit SA2-WC-Ø4 and began digging
1410 Collect sample @ 1-2' white + pinkish crystalline material - sugary
1430 Collect sample @ 3-4' metals debris
1436 Collect sample @ 5-6' below metals
1440 Finished hole @ SA2-WC-Ø8 and filled back in
1500 Moved to pit SA2-WC-Ø3 and began digging

JSI

2011 BP2 DemoWC 7/14/2011

013-1646-011.300 overcast rainy 65

1502 Collect sample @ 1-2' metals debris
1515 Collect sample @ 4-5' below metals
but nearby pea gravel - which could
have been an old tank
1520 Finished pit @ 6' @SA2-WC-Ø3
Filled back in. completed pit log
1600 Packed up samples on ice
into coolers
filled out COC
1645 offsite to lab.

Jill Lemmler

013-1646-011.300 2011 BP2 DemoWC 7/15/2011
overcast 70F

0600 onsite
H+S tailgate, stretch + flex.
0700 Moved to SA2-WC-01 to begin digging
0710 Hit concrete foundation @ 1 ft.
0720 Moved to SA2-WC-02 to dig until we
can break thru concrete
Spoke w/ T. Norton. We will be meeting
w/ AMEC on Monday to do pits
SA2-WC-10, 11, 12 by the river
He also said that if we can't get by

JSI

013-1646-011.300 overcast 70

concrete to shift over latterally to
collect samples.

0739 Collect sample @ SA2-WC-02 @ 3-4' - in metals debris
0745 Collect sample @ SA2-WC-02 @ 4-5'
below metals debris
0750 Filled hole back in. Total depth
of hole @ 6.5' @ SA2-WC-02. Finished pit log
0800 Larger ~~track~~ backhoe came over
and busted thru concrete @ SA2-WC-01
0813 Collect sample @ 1-2'
0830 Collect sample @ 5-6'
0840 Collect sample @ 9-10'
0 Finished hole @ 10', Filled back
in @ SA2-WC-01, Completed pit log.
0900 Moved over to IA1-WC-02
to begin digging. Called T. Norton to confirm location.
0945 Collect sample @ 5-6' - He also suggested doing SA1 pits
1000 Collect sample @ 9-10'
Finished hole @ 10' and filled
back in. Completed pit log
1005 Marked out pit locations for
SA1-WC-01, 02, 03, 04

JSI

2011 BP2 Demo WC

013-1646-011.300 sunny 70 7/15/11

1015 Excavator moved over to pit SA1-WC-02 to begin digging.
1021 Collect sample @ 5-6'
1030 Collect sample @ 9-10'
Finished pit @ 10' @ SA1-WC-02 and filled back in. Completed pit log
1045 Moved to pit SA1-WC-01 and started digging
1052 Collect sample @ 5-6'
1105 Collect sample @ 9-10'
Finished pit to 10' and filled back in. Completed pit log
1120 Moved to pit SA1-WC-Ø3 and started digging
1130 Collect sample @ 5-6'
1140 Collect sample @ 9-10'
Finished pit to 10' and filled back in. Completed pit log.
1155 Moved to pit SA1-WC-Ø4 and started digging
1200 Collect sample @ 5-6'
1210 Collect sample @ 9-10'
Finished pit to 10' and filled back in. Completed pit log

JS'

2011 BP2 Demo WC

013-1646-011.300 Sunny 70 7/15/2011

1230 Cleaned up, labelled jars, filled out COC. Packed jars in coolers w/ ice.

Called J. Kranzer w/ Harper to let him know plan for monday:
- Open concrete on SA2-WC-10, 11, 12
- open concrete on IA4, IA2
- check if we can open concrete @ IA1-WC-01
- sample SA2-WC-10, 11, 12 first.

1438 Finished paperwork.
1500 offsite for day

Jill Franklin

013-1646-011.300 2011 BP2 Demo WC 7/18/2011
sunny 70

0600 J. Lambert's onsite
H+S tailgate, stretch + flex
0630 Prepped bottles + equipment
0715 M. Gleason (Boeing) onsite. I showed him locations, he mentioned where water + SW were.

2011 BP2 Demo WC 7/18/2011
sunny 75F

013-1646-011.300.02

0730. called T. Norton to confirm sample parameters

0745 Nick Gauson (Boeing) & Jim Dransfield (AMEC) onsite

0750 Joe (Harper) breaks open concrete @ SA2-WC-10, 11, and 12.

0756 Breaks open concrete @ 1A2-WC-01

0800-1000 - waited for Access to use the Backhoe. Spoke w/ Jeff + found out that equipment no longer available today. Plan on Thursday.

1030 Jim Dransfield offsite

Met w/ T. Norton to determine how to access 1A4 sample locations. He suggested using slack in wire + pass trackhoe underneath it.

1231 Prepped to sample TSCA concrete from underflow flume, feature 74-112 from Roll off # 910212. Sampling 5 gal bucket of concrete for treatability sample to be sent to WM

Sample ID: P2CS-Demo-WC-22-C

1530 J. Lamberts offsite

JL

2011 BP2 Demo WC 7/21/2011

013-1646-011.300.02 Overcast 60F

0600 J. Lamberts onsite
H+S tailgate, stretch + flex

0630 prepped bottles + equipment

0730 Moved to SA2-WC-10, 11, 12 to sample

0745 J. Dransfield on site (AMEC)

0750 move to SA2-WC-12 + begin digging

0756 Collect sample @ 1-2'

0758 Collect collocate @ 1-2'

0828 Collect sample @ 5-6'

0840 Collect sample @ 9-10'

0850 Collect sample @ 3-4' with burnt ash + om debris

0900 Finished hole @ 10', completed pit log, Filled back in. Tried to dig to GW, but pit caved in

0925 move to SA2-WC-11 and begin digging

0928 collect sample @ 1-2'

0934 Collect metals debris sample @ 3-4'

0946 collect sample @ 9-10'

1000 finished pit SA2-WC-11 to 11.5', tried to find gw but pit kept caving. Finished pit log, filled pit back in

JSL

2011 BP2 Demo WC 7/21/2011

013-1646-011.300 Sunny 75

1015 Moved to SA2-WC-10 + began digging
1023 Collected sample @ 1-2'
1030 Collected sample @ 5-6' - TPH odor -
1050 Kept digging to 11.5' to find bottom of diesel saturated soil. Collected sample @ 10-11'
1100 finished pit SA2-WC-10 to 11.5', completed log, filled back in.
1130 Moved to IA 2-WC-01 by 2-49 Bldg and started digging.
1142 collected sample @ 1-2'
1150 collected sample @ 5-6'
1200 collected sample @ 9-10'
1200 finished pit to 10', Completed log, filled back in.
1215 Moved to IA4 and began breaking concrete
1415 Started digging @ IA4-WC-01,
1430 Collected sample @ 5-6'
1435 collected sample @ 9-10'
1440 Finished pit @ 10', completed log, filled back in

* 1400 - took equipment blank - water poured over spoon - P21M-IA4-WC-02-10-3

JSI

2011 BP2 Demo WC 7/21/2011

013-1646-011.300 Sunny 75

1500 Started digging @ IA4-WC-02 @ 7' bgs, hit a possible fibre optic cable conduit. Stopped digging and called Jonathan Parsons, Jeff (Harper), and Andrew Baird. Andrew said to cover it + leave it until tomorrow + will find out if it is live. Also called T. Norton.
1600 ~~J. Lamberts of~~ Packed up samples, filled out COC + notes, J. Lamberts offsite to lab.

JSI

013-1646-011.300 2011 BP2 Demo WC Sunny 65F 7/22/2011

0600 J. Lamberts onsite
H+S tailgate, stretch + flex
0630 called A. Baird re: cables we hit yesterday: No problem all are disconnected. We can complete the test pit @ IA4-WC-02. Arranged with Harper to continue digging.
0900 Started digging @ IA4-WC-02

JSI

2011 BP2 Demo WC

013-1646-011.300 Sunny 70 7/22/2011

0903 Collect sample @ 5-6'

0918 Collect sample @ 9-10'

0925 finish hole to 10', completed log, took photos, filled hole back in.

1000 Checked out 1A1-WC-01 in 2-41 Bldg to find out if it was safe to dig - ok for today

1015 opened concrete @ 1A1-WC-01

1025 Began digging @ 1A1-WC-01

1030 Collect sample @ 1-2'

1040 Collect sample @ 5-6'

1050 Collect sample @ 9-10'

1055 Completed hole to 10', finish log, took photos + filled back in.

- Some notes on 1A 4-WC-01 and 02;
  - both holes were shifted 8 ft to the west of the GPS marked locations.
- SA2-WC-11 was shifted 10 ft to East of marked location.

All other locations are where their GPS locations are marked.

1200 Finished up paperwork, called T. Norton, offsite.

JSL

~~013-1646-011. North Area Stormwater System Retrofits 8/1/2011~~

2011 Demo Waste Char

103-93505 sunny 75F 8/2/2011

1140 J. Lamberts onsite to perform WC sampling on oil electrical boxes. stored in 2-48 bldg Haz Waste Storage

On pallets there are 6 Pot Heads/Transformers
4 Large Transformers
1 Insulated Power Cable
2 small pot heads/Transformers

Each are labelled with a number
Took some photos

1206 Sampled Pot Head labelled Vault #2, #1.
P2D-WC-19-0

1217 Sampled Pot Head Labelled Vault #7, #1
P2D-WC-20-0

1232 Sampled Pot Head Labelled Vault #2, #4.

To sample the above 3, we opened a lid with a screwdriver + used a spoon to sample the thick black, tar-like oil.

JSL

2011 Demo Waste Char 8/2/2011
103-93505 sunny 75F

The spoons + gloves were disposed of after sampling. The screwdriver was also thrown out.

1243 Sampled Large Transformer #3
P2D-WC-22-0

1247 Sampled Large Transformer #1
P2D-WC-23-0

To sample, opened a port with a wrench and used a spoon to sample the black tarry oil. Threw spoon + wrench out after sampling. Wrapped transformer up in plastic

1301 Sampled Insulated Power Cable
P2D-WC-24-0

To sample, pulled plastic sheeting off + sampled the leaking sticky tar oil from cracks along metal shell. Threw spoon out after sampling. Wrapped it back up in plastic

1330 Tried to sample small transformers but could not find access point. Will need power tools to access into cells.

JSL

2011 Demo Waste Char 8/2/2011
103-93505 sunny 75

Cleaned up, placed samples on ice. Threw out all tools + left in bags on ~~pts~~ pallets.

1400 Wrote COC, offsite to lab.

JSL

2011 BP2 Demo WC

103-93505 Sunny 70 8/3/2011

0900 J. Lamberts onsite to perform WC sampling on oil electrical boxes stored in 2-48 bldg Haz Waste Storage.

1000 Sampled small transformer #1
P2D-WC-25-0
To sample, used a drill bit to drill thru metal casing to make a hole large enough to sample thru. Used a spoon to get sample into jar.

Drill bit + spoon + PPE thrown out with other equip from 8/2/2011, left on pallet for disposal

1030 Cleaned up, placed sample on ice. Wrote COC, offsite to lab.

* Could not sample casing too hard to get thru w/ drill.
Called T. Norton. He will attempt to sample

jcl

IMWP

013-1646-011.900 NA SS Retrofit 8/10/2011

0500 J. Lamberts onsite.
No one around.

0600 J. Lamberts meets with Ken Wolle of Anthony to do walk around.

Notes:

Bioswale A1: Profiled to go to Alaska Street. He estimates 2 trucks will be needed. Contact Eberlin to let her know.

Bioswale A4: Will do in 2 parts. Still need profile.

Target excavation: NADP08
- near a tree - concerned about roots, can we move over? Also nearby power duct line on E side of 10ft excavation.

Trees near MH #3, 4, 5: Proposing to shift over to W 14 ft to avoid trees.

Roof Drain Diversion C776: MH inside building according to survey. Planning to move to S, nearby actual overflow drain + divert to MH in roadway Pending Boeing approval.

IMWP NASWS Retrofit

013-1646-011.900 clear 60F 8/10/11

Tide Check Valve:
plan to install early on so tides don't affect excavations

0630 Called S. Matthews to pass along above information.
He will be onsite ~9am to do walk through.

0800 Arranged w/ T. Sager for disposal location of soil from NA-DP-08: to be placed on plastic on a pile, then moved as needed + tracked.

Two trucks to be onsite tomorrow @ 1200 for transport of soil from Bioswale A1.

Check on gw + tidal water issues + what to do if water is encountered during digs

1100 Went + took 'before' photos of area to be retrofitted.

1400 Offsite

JSI

IMWP NASWS Retrofit

013-1646-011.900 clear 70 8/11/11

0500 J. Lamberts onsite with KC Wade
Ken Wolk, Casey from Bud Martin
Anthony Construction
H+S tailgate

Prepped safety equipment.

Discussed plan for work.
1 keep things clean
2 don't track soil

0630 Begin clearing @ A1
- leaving some veg.
- make slope, bottom clear + flat.
- make gentle fall from top to bottom.
- scraping 3-6" of material off surface along grade

0730 Finish scraping A1
produced a pile 6'x 10'x 4'
mostly om + grass, sandy loam.
PID = 0.0ppm throughout digging

Took photos

JSI

013-1646-011.900 Clem 70 8/11/11

800 ~~Ka~~ Construction people laid out reinforced concrete + straw wattles to put gravel + other construction materials onto during work.

Called S. Matthews to discuss progress

830 Discussed removing some dead shrubs along edge of bioswale in order to gain access to bioswale so that they can dump perlite + gravel in without having to move it too many times

0900 Anthony Construction (AC) checking survey points in Bioswale A1 to ensure grade is ok from top to bottom.

0930 AC begins clearing a bit more soil away to get grade to spec.
PID = 0.0 - 0.3ppm
Took photos - getting into some sand + gravel materials, 3-4" chunks of rock
~~Soil~~ some silty sand @ bottom. @ E end of A1

JSI

013-1646-011.900 8/11/11

1000 AC had to remove some trees + limbs in A1 in order to gain access. It will be shipped out with the rest of the material.

1030 Dump Truck w/ 7/8 rock arrives + dumps load on plastic.

Eberlin (Boeing) onsite with new plan for OWS area - to be shifted over ft towards waterway

Check on MH#4 to see where it goes

Talked about plan + schedule
City of Seattle inspector to be coming on Monday 8/15 to check on pipe before it gets covered with material at A1

1200 Total soil pile in A1 is ~ 10' x 14' x 3-4"

1210 Dump Truck arrives to take away soil from A1 to Alaskan disposal site.
Begin loading truck

JSI

IMWP NASWS Retrofit

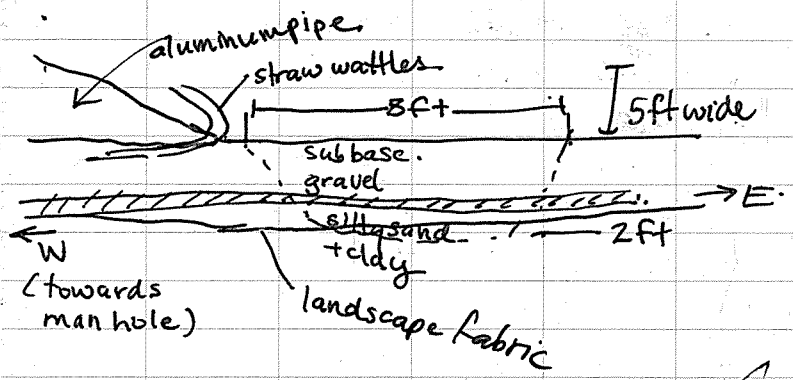
013-1646-011.900 Sunny 70 8/11/11

1315 Truck loaded + offsite ~12 yards of material

1330 Began searching for 4" pipe @ W end of A1 in order to remove and plug.
Took photos.

Located ~~1 ft~~ 1.5-2' ~~bg~~ below grade. of bioswale. - white 4" perforated underdrain pipe.

PID = 0.0ppm.



JSL

NA SWS Retrofit

013-1646-011.900 Sunny 70 8/11/11

1400 - Cut open pipe, filled end with concrete patch
- Filled hole back in.

Started laying out 6" perforated PVC pipe from end to end.

1500 offsite until 5am Monday 8/15/11

Joe Lamber

013164601 1.900 overcast 60 8/15/2011

0500 onsite
H+S tailgate.
Blocked off parking spots

618 Begin digging 'bathtub' @ W end of Bioswale A1. 8'x20'x1'
This is to be filled with quarry spall, 6" size.

They are going to lose the soil on the slope along the bioswale
PID = 0-2.6ppm.

JSL

NASWS Retrofit

013-1646-011.900 overcast 65F 8/15/2011

0700 spread soil along Bioswale Slope A1

0800 used survey equipment to ensure levels were correct. PID = 0.0 - 0.8 ppm

0900 Getting 6" quarry spall in to fill 'bathtub' @ W end and to build pyramid on edge. They will be starting to give the pipe together today, onto A4 by wednesday.

Spoke to T. Norton (Golder) about soils:

Bioswale A4 - shipped offsite, same as A1

Target Excavation (NA-DP-08): TBD. Data says can be used in industrial area (Demo) but want to make sure WP is followed

Vault + other excavation: To be trucked over to Demo area as 'Industrial' soils.

1100 Began trucking in 7/8" washed rock for surrounding pipe. They will trench out spot for pipe. Construction employees noted that pipe will be

187726376 80

/JSI

013-1646-011.900 overcast 65F 8/15/2011

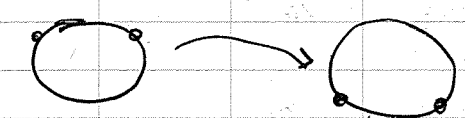
laid on bare ground, which may end up causing clogging. Maybe need a filter sock?

1130 Dumped a load of 6" quarry spall into small 'bath tub' @ ~~base~~ W edge of A1 and spread out rocks according to plan.

Trenched out 7/8" rock for pipe + started gluing pipe together

1230 Started laying + gluing pipe together

1400 City of Seattle inspector onsite to inspect pipe
- told them to turn pipe over



T. Norton onsite, asked him about wrapping pipe in fabric to prevent silt + soil from washing into pipe. He called Kent Angelos, then Kent told us to call D. Pankani @ Geosyntec. D. Pankani said no fabric,

/JSI

013-1646-011.900 Sunny 70F ~~overcast 65F~~ NASWS Retrofit 8/15/2011

It was considered in the design

City Inspector says work is ok, construction contractor can build out the remaining work and at Bioswale A4 and call when the work is completed.

1445 T. Norton offsite

1500 J. Lamberts offsite Jill Lamber

013-1646-011.900.01 overcast 65F 8/16/2011

0500 J. Lamberts onsite, H+S tailgate

AC workers onsite. KC Wade, Bud Martin, Ken Wolle, Dave.

0600 Begin filling Bioswale A1 with ~~3~~/8" crushed, cleaned gravel.

0730 Construction ~~material~~ meeting @ MH #1

- Soil backfill material - testing, where does demo get it.
- what to do with bioswale A4
- arrange w/ TSager for soil to 1A.

JSI

013-1646-011.900. Sunny 70 NASWS Retrofit 8/16/2011

Attendees: Eberlyn Schwinn
S Matthees
T. Norton
K. Wolle
Samara
Johnathan Ridgeway

Backfill: Pea Gravel ?
CDM ?

Arrange trucking of 1A material across site

Need a truck (x2) for removal of Bioswale A4 soil tomorrow

0900 Begin filling Bioswale A1 with Ecology mix. Looks like 5/8 gravel with sand and some perelite

Moved material around + smoothed it out 1' deep @ W end, thickening to 3' deep @ east end.

1000 Building clean out for E end of Bioswale A4.

Taking photos throughout.

JSI

Sunny 75

NASWS Retrofit
8/16/2011

013-1646-011.900

12.31 More ecology mix (filter media)
trucked + dumped into A4
(1 Truck + pup)

1400 More 3/8 washed gravel
More ~~eco~~ filter media

Bioswale A1 nearly filled to spec.

Clean out constructed, ready for install.

They are waiting on GAC + more 6" rock for E end of bioswale.

Still need to build berm along center.

1430 J Lamberts offsite

NASWS Retrofit
8/17/2011

clear 60F

013-1646-011.900

0500 J. Lamberts onsite
H+S tailgate
crew begins constructing fence around Bioswale A4.
They will begin digging today at A4. And finish as much as possible @ A1
Noted that irrigation still on around bioswale A4.

1 truck to ~~g~~ come today @ 12.
to take away Bioswale A4 soil + plants to Columbia Ridge Land fill
There should be no free liquids.
Golder is not to sign BOL.

When excavating @ A4, need to be careful of plants, trees, and cannot undermine rock wall.

Will work on W edge towards bridge, then on E side of bridge.

For the in to manhole @ W end, soil will be trenched, then there will be a quick shore installed. Soil ~~ea~~ is to be

JSI

NASWS Retrofit

clear 65

013-1646-011.900 8/17/2011

0700 AC back @ A1 to smooth out material brought in yesterday. Filter media starts @ 1' thickness @ W end, thickening to 3' thickness @ E end. Mini is smoothing out + grading and checking thicknesses.
Took photos.

0730 E. Schwinn called:
Truck to arrive @ 12 to take out A4 soil.
Trucking soil from OWS to be arranged by AC + Golder & Harper to send over to Demo Area
Signing of BOL to be performed by Boeing Rep.
Truck arriving @ 10 to take away Steam Line Project soil.

0800 Working on grade @ A1.
0830 J. Ridgeway onsite @ A1
Walked around, left.

0900 continuing to grade material

JSI

NASWS Retrofit

013-1646-011.900 Sunny 70 8/17/2011

1000. Truck from Alaska St, onsite to offload soil from Steam Line excavation. Approx 2.5 to 3 yards from 2 piles. One by guard shack on 14th Ave, one by E Marginal Way

There is one other pile on E side of Marginal Way (on NBF) but Landau to watch loading with another truck.

Dave Oskamp of Boeing signed BOL. and left right away.

Took photos.

1030 Dump Truck offsite to Alaska Way

1000 (at same time) work began on Bioswale A4, removing grasses + soil along length btwn bridge + W edge of swale.
PID = 0.0ppm at various pts along swale.
Took photos.
Approx 8 x 6 x 4' of material in pile (8 yards)

JSI

sunny 70

NASWS Retrofit
8/17/2011

013-1646-011.900

Soil is going directly to Columbia Ridge via Alaska.

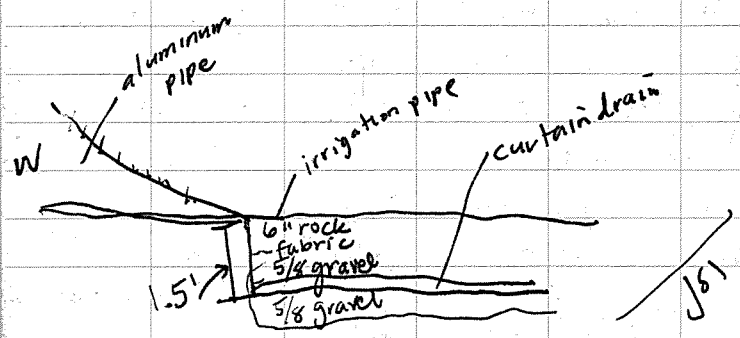
Soil is light brown, sandy, dry, some gravel, OM.

Soil for trench tie in btwn bioswale + MH @ W end of swale can be reused (per Ted Norton).

1130 Digging down 1.5ft below pipe on W end. Found a curtain drain @ 1.25ft, wrapped in 5/8 gravel and a landscape fabric.

1" irrigation pipe ~~@~~ along ~~end~~ ditch @ same depth as aluminum pipe - Teufl Landscaping came + turned off water.

Pulled out curtain drain, plan to plug it from manhole.



NASWS Retrofit
8/17/2011

Sunny 70

013-1646-011.900

1140 track came off of hoe.

1200 Dump truck onsite for A4 material. He was told to sit and wait while they fixed hoe. Called and emailed Eberlin to let her know.

1230 Track back on, started loading. Called eberlin, also emailed J. Ridgeway.

Continued trench @ 1.5' below bottom of aluminum pipe.

PID = 0.0 ppm

Size of pile: 8 X 12 X 5 ~ 18 yards of soil + plants + OM.

1330 Let Eberlin know that they are about 30 mins away from being done.

1400 Finished filling truck, Eberlin signed BOL.

1430 Cleaned up, offsite

[signature]

cloudy 55F NASWS Retrofit

013-1646-011.900.01 08/18/2011

0500 J. Lamberts on site.
H+S tailgate

0649 Began digging in bioswale A4 to correct depth to install new pipe. PID = 0.0 ppm

Begin working on trench to ~~6~~ MH @ W end of Bioswale A4, trimming trees, removing plants, laying out where trench is going

PID = 0.0 ppm.

~~loose, sandy, dry, brown soil, some 6" rock + some 5/8 gravel, roots, OM~~ jsl 8/18/11

Attempting to save plants.
Trench Soil:
→ Loose, brown, homogeneous, med sand, some 6" rock + 5/8 gravel, roots + OM, ~~dr~~ dry, SW-SP, fill.

0800 - cutting + capping irrigation so that it can be pulled out of the way and not turn on by accident. They will fix it after. jsl

overcast 60F NASWS Retrofit

013-1646-011.900.01 8/18/2011

@5ft bgs: 7/8 gravel bedding (for around MH)
Getting ready to set up shoring for trench.

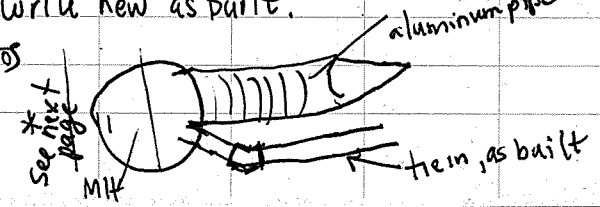
0840 @ 6ft bgs, getting ready to go into trench to install tie in PID = 0.0 ppm
J. Lamberts told them it was ok to pump water in MH downstream.

68" bgs: native soil:
loose, med brown, homogeneous fine-med sand, trace silt, ~~[illegible]~~, dry, SM-SP, alluvium.

0900 Begin building tie in @ W end of Bioswale A4
1030 S Matthees onsite - Spoke about pumping water in MH downstream. → This is ok to do. (Like SWSC work) jsl 8/18/2011
1130 Grouted sand collar to MH, tie in is built out to edge of aluminum pipe.

Repaired irrigation line, backfilled a little on tie in PID = 0.0 ppm

Tie in a bit different than plan.
AC to write new as built.
See photos



overcast 70

NASWS Retrofit

8/18/2011

013-1646-011.900.01

1145 Backfilled enough to remove shoring

Tie in description:

Sand collar came out of MH wall @ 45° angle towards S, pipe ran ~3ft, then 45° angle back along alignment of aluminum pipe.

1200 AC changing out tracks on 50D Rubber Track Hoe.

1400 Finished backfilling trench + replanted plants

1430 J. Lamberts offsite

013-1646-011.900.01 overcast 65 8/22/2011

0500 J. Lamberts onsite

HES tailgate

0700 Anthony Construction still not onsite called K. Wolke. He says they will be onsite by 9am.

0700 J. Lamberts offsite to other job.

0900 T. Sager calls - AC onsite + prepping equipment. Will start digging by 10am.

0915 J. Lamberts onsite

AC prepping gear.

Cal'd PID 2020

100ppm Isobutylene, 0.0ppm air

1100 AC offsite after prepping equipment

They have a mobile mini onsite for equipment, are building a storage space for backfill

1310 Begin surveying trench to lay out pipe @ A4. With a laser level

PID = 0.0ppm.

1340 Begin digging in trench @ A4.

T. Norton onsite - Soil W of boundary to Demo Site, Soil E of boundary can be reused except Bioswale soil.

JSL

013-1646-011.900.01 overcast 65 NASWS Retrofit 8/22/2011.

1345 PID= 0.0ppm

Starting to rain - PID responding to humidity @ 0.8-1.1ppm. Re zeroed PID.

Dewatering:
if water from MH or CB: can be pumped down to the next MH.

if GW - needs to be pumped into drums, tested + treated. OR left in place.

1400 PID= 0.0ppm

1415 Stopped digging for day
J. Lamberts offsite

Joe Lamberts

013-1646-011.900.01 overcast 65F NASWS Retrofit 8/23/2011

0500 J Lamberts onsite H+S Stallgate

0600 Spoke w/ KC Wade: receiving SW concrete forms today, no digging until later.

0740 KC asked where to find 402. Will determine @ mtg.

Spoke w/ J. Krauzer @ Harper: area is cleared out for soil from excavations @ demo site. Anthony is responsible for keeping piles covered + secured with plastic. Golden will stake + label piles for origin of soils + tracking.

0800 Construction meeting
to work Friday 8/26/2011

Soil from cal Portland - Sumara to get data to Ted + Norton

8/25 - Trucks for Bioswale A4
530, 630 arrival, solos.

8/25 GAC. in.
8/26 Complete Bioswales

NASWS Retrofit

013-1646-011.900.01 overcast 65F 8/23/2011

Labor Day Work.
(Saturday - Sawcut (perhaps Friday) 3hrs
Friday - Fences 4pm
Closed thru Tuesday.
Saturday - Dig
- Structure
- Backfill + Compaction
into Sunday - finish + pave.
Monday - Not on duty - possible
Tuesday - Paving
Drum for slurry from HazWaste

Locate - may need to reroute depending on utilities.

5A : Door Access
Saw Cutting this week.
Fencing

Yardage of soil - timeline

Need info on trucks.

0900 Digging @ Bioswale A4 - Trench for pipe.
PID=0.0ppm

NASWS Retrofit

013-1646-011.900.01 overcast 70F 8/23/2011

Cal'd PID - 100ppm Isobutylene
- 0 to air

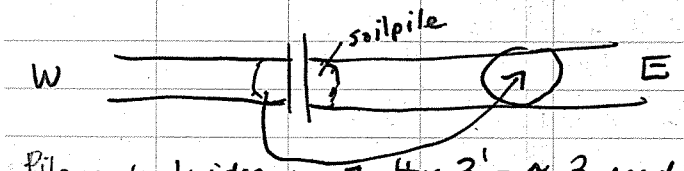
Took photos
They are using a laser level to determine trench depth/dimensions

PID=0.0ppm

1100 Continuing trench. PID=0.0ppm

Some questons came up regarding width of trench. Plans show 7ft but they are only digging ~2.5ft This will reduce volume of gravel to be placed.

1148 Too much soil to fit under bridge. Using loader to bring soil over to other side of Bioswale



Pile under bridge : 7x4x3' = ~ 3 yards
Pile on E side of bridge : 10x5x7' = ~13 yards
↳ KCWade estimates ~8 yards total

NASWS Retrofit

013-1646-011.900.01 overcast 70F 8/23/2011

1240 Completed trench from W end to bridge @ bioswale A4.

Placed + glued pipe together to edge of bridge.
Protected irrigation line

1250 Started backfilling with 7/8" gravel to a depth of 1ft above ground surface.

Approx 10t 7/8 gravel dropped into trench.

1330 Begin spreading 7/8 gravel out to plan depth.

1400 Placed 6" riprap @ W end of Bioswale A4.

1415 Started placing Filter Media

Took photos throughout.

Finished placing filter media

1500 J. Lamberts offsite

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

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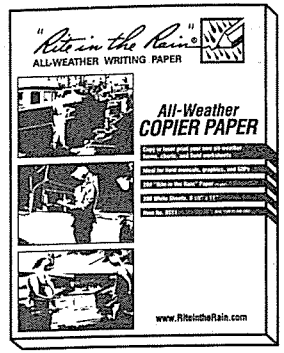

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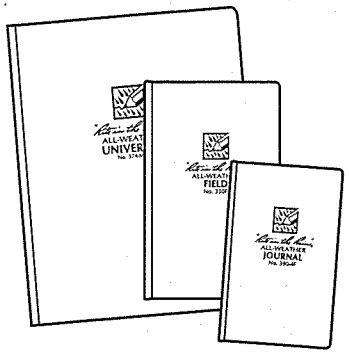
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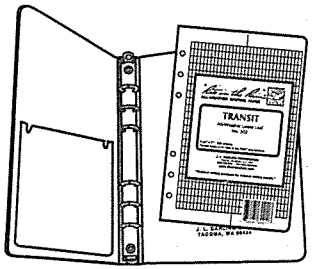

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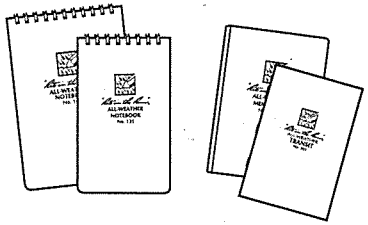
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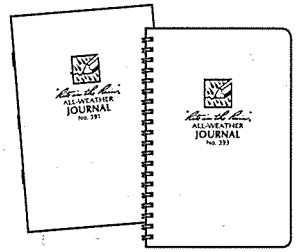

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August 2011 - September 2011

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ALL-WEATHER WRITING PAPER

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Project ~~Ator~~ Boeing Plant 2
013-1646-011

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CONTENTS

PAGE	REFERENCE	DATE
2	013-1646-011.900.01 North Area SWS Retrofit	8/24/2011

0500 J. Lamberts onsite
H+S tailgate
Mobilized over to E end of Bioswale A4. To begin scraping soil + plants out today, shipping out tomorrow - 4 trucks arranged for materials to go to Arlington.

They had completed laying filter media on W end of Bioswale A4 after I had left. Appears to be to grade, nearly to bridge.

Goal is to complete all work in both Bioswales by Fri 8/26/2011. GAC will be delivered Fri.

0530 Cal'd PID 2020 → 100 ppm isobutylene
→ 0 ppm air.
0630 Changing out track on rubber track hoe
0800 Starting to dig out E side of Bioswale A4
PID = 0.0 ppm.
0830 KC Wade asks if he can pump stormwater out of CB, along cabb,

JSI 8/24/11

into next downstream CB rather than into the same CB outfall pipe. Called S. Matthees for clarification. He called Ray Power (Boeing) who said: normally this would be ok but they didn't want to stir up any sediment that might go to the discharge, so instead, we can pump directly onto the grass nearby. An email was sent out by S. Matthees
Also: need to locate who holds 402 permit. Need to call Eberlin. (NPDES Permit)

0900 PID = 0.0 ppm.
0930 PID = 0.0 ppm.
0950 Digging under bridge
PID = 0.0 ppm.
1000 Eberlin Schwinn onsite. Working on organizing loading dock work for Labor Day wkend.
I asked her about 402 (NPDES) permit form. She will ask Ray Power.

JSI 8/24/11

sunny 70

NASWS Retrofit

013-1646-011.900.01

8/24/2011

1000 PID=0.0ppm

AC is digging soil + OM, loading into loaders then moving it to the far east edge of Bioswale and building a pile for load out tomorrow.

Taking photos.

1030 PID=0.0ppm

1100 PID=0.0ppm

1130 PID=0.0ppm

1145 T. Norton on site to take over for afternoon. [signature]

Take over logbook from Jill

1200 AC continues to work Bioswale

Approx. ~30 ft of vegetation left to remove - No sign of staining in soil or soil stockpile located @ E end of swale.

1250 AC clear vegetation graded base and is excavating secondary trench for drain pipe soil appears unimpacted (No PID)

[signature]

8/24/11

NASWS Retrofit

013 1646 011 900 01

T. Norton

8/24/2011

Sunny mild lt breeze ~75°F

1310 AC is laying drain pipe to East of bridge and excavating last 30 ft of veg. No soil impacts observed.

1420 AC completed removal of veg up to E stockpile they have a little more work to do grading and excavating the secondary trench.

No indication of impacted soils ~~Noted~~ observed.

AC is closing down for the day.

1545 Talked to Will Ernst RE need for analytical for gravel (const material) used in Bioswale reconstruction

We concurred that it is not likely required but Will would like me to check with Ci Bach for consistency within Boeing.

[signature]

8/24/11

NASWS Retrofit

013-1646-011.900.01 clear 60F no breeze 8/25/2011

0500 J. Lamberts onsite

H+S tailgate - see HASP signatory pages.

Attendees: J Lamberts
KC Wade
Mike Huffman
Ken Wolle
John Davis.

Waiting on dump trucks to ship soil from Bioswale A4 offsite to Columbia Ridge in Arlington Oregon. They are expecting 4 trucks.

0530 cal'd PID 2020 - 100ppm isobutylene
- 0 ppm air

0630 Still no trucks

Size of soil pile: 26' x 8' x 6' = approx 46 yards

total volume will be larger because they have to still complete trench @ far east portion of Bioswale A4.

Took photos.

jsl 8/25/2011

NASWS Retrofit

013-1646-011.900.01 clear 60F no breeze 8/25/2011

0630 In the meantime, AC is backfilling over pipe with 7/8 washed gravel rock to a total depth of 12" ags

0635 First truck onsite. Begin placing soil from Bioswale A4 into truck. R Trucking, George, WA.

0650 E. Schwinn onsite, checking on trucks. Will have to email her when it is time to sign BOL. She is in meetings all day. She said for dust control, some water is ok. Use hydrants.

0705 1st truck filled. Emailed E. Schwinn

0710 PID Battery died, recharging. No staining observed.

E. Schwinn onsite to sign BOL
1st truck offsite.
~~12~~ 16-18 yards.

jsl

JLLambert 8/25/11

NASWS Retrofit

013-1646-011.900.01 clear 60F no breeze 8/25/2011

0715 Begin filling 2nd truck.
Celorie Bros. Trucking

0727 Emailed E. Schwinn to let her know truck nearly full.

0735 Email from T. Norton requesting samples of Bioswale fill materials per W. Ernst. Sample gravel, filter material (crushed rock + perelite); and GAC; as well as any other material

0740 Boeing Fire onsite to request that fire lanes be kept open + not blocked by equipment.

0745 AC Continuing to dig secondary trench for drain pipe

0800 2nd Truck filled, ~~12~~ 16-18 yards
E. Schwin onsite to sign BOL.
PID=0.0ppm. No staining observed.
E. Schwinn also signed BOL for 3rd truck

0805 2nd truck offsite
Begin filling 3rd truck.
Celorie Bros. Trucking

Jill Lamb 8/25/2011

NASWS Retrofit

013-1646-011.900.01 clear 60F no breeze 8/25/2011

Spoke w/ E. Schwinn:
- Soils to Demo Area are to be piled in separate piles for each day. At end of day AC is to cover in plastic securely. At this point Harper takes control of piles and will maintain them. Golden will track soil.

There will be a new pile created for each day.

0845 Levelling and grading final 30ft portion of E end of bioswale A4 in order to fill truck. Also working on secondary trench.
PID=0.0ppm, No staining observed.

0914 3rd Truck filled, covered and offsite. There is a little bit (~1-2 yards) left over, AC is going to lose

Jill Lamb 8/25/2011

clear 70F NASWS Retrofit
013-1646-011.900.01 no breeze 8/25/2011

extra soil along trench.

Total in 3rd truck ~14-16 yards

Total for 2nd half of Bioswale A4:
~50 yards.

0915 GAC material onsite

0930 PID along trench 0.0 ppm
No staining observed
Trench completed.

AC Gluing pipe together along trench.

Took photos.

1000 Spreading out gravel to grade
Spreading out perelite filter material to grade

1115 E. Schwinn onsite. Sought clarification of design on E edge of swale from pipe outfall to riprap to cleanout.

[signature] 8/25/11

clear 75F NASWS Retrofit
013-1646-011.900.01 no breeze 8/25/2011

She called D. Pankani @ Geosyntec for clarification:

1. Pipe (outfall)
2. 25ft at level of bottom of outfall of regular soil. It will be planted bioswale.
3. riprap berm. (6")
4. cleanout
5. 10ft GAC filter material
6. Filter material.

AC was to go back + fill in 25ft section with soil as they removed too much material

1130 Building Cleanout
Filling in with gravel and filter material (the trench)
Took photos.

1200 Collected samples of different materials brought into bioswales. ~~All~~ The first two jsl were taken from Bioswale A4. The third from the

[signature] 8/25/11

013-1646-011.900.01 clear 75F no breeze NASWS Retrofit 8/25/2011

original bag before it was placed into a Bioswale.

1200 P2CS-NABS-01-S
7/8 Gravel (washed)

1205 P2CS-NABS-02-S
5/8 Crushed Gravel, perelite, sand Filter Mixture.

1210 P2CS-NABS-03-S
GAC filter material

1230 offsite to get ice
1245 Back onsite.
AC waiting on truck with filter material.
1320 Truck with filter (perelite) material onsite.

1330 Begin dumping filter material.

Confirmed w/ AC - no more earth work for day, only filling in filtermat.
1345 J. Lamberts offsite to lab. JSL 8/25/11

013-1646-011.900.01 clear 65F no breeze NASWS Retrofit 8/26/2011

0500 J. Lamberts onsite

AC already onsite and has crews working on:
- Sawcutting on W end of 2-122 Bldg for Roof Drain 5A
- Prepping for cutting @ 3A
- Completing work @ Bioswale A1
- Completing work @ Bioswale A4

Since yesterday, they had filled in most (except for ~20ft) of Bioswale A4 with filter material, + graded it.

AC had also brought in a load of topsoil for the dirt berm and had used it for filling in hole @ E end of A4.
0538 - Grabbed a jar of this soil for characterization
P2CS-NABS-04-S

0540 Subcontractor Cascade Concrete Cutting begins sawcutting @ 5A JSL 8/26/11

clear 65F NASWS Retrofit
013-1646-011.900.01 no breeze 8/26/2011

0600 Placing more filter media @ A4.
Placing ~~6"~~ 4-8" riprap @ A1 @ E end.
js1

0630 H+S tailgate
see Tracking Form w/ HASP for details + topics.
Attendees: J. Lamberts Golder.
Tim Bersch
Arthur Martin
KC Wade
Ken Wolle
Mike Huffman
John Davis
} Anthony Construction
Jason Gregiore Cascade Concrete Cutting

0645 Begin shovelling dirt berm @ A1
doing it by hand.
Taking photos.

0700 Concrete cutting continues @ 5A. They are drumming up slurry with a Green Non-haz label.

8/26/2011

clear 70F NASWS Retrofit
013-1646-011.900.01 no breeze 8/26/2011

0730 Begin building berm @ A4
0740 Placing more 4-8" riprap @ A1.
0800 S. Matthews onsite to tour around + check work.
0815 Continuing rock berm @ A1, spreading filter material @ A4,

0900 Placing GAC @ A1

Completed cutting concrete @ 5A, moving to 3A.

1020 finished cutting @ 3A.
Placing more GAC @ A1

1120 Placing GAC @ A4.

1130 J. Lamberts offsite to lab

8/26/11

clear 65F
light breeze

NASWS Retrofit
8/29/2011

013-1646-011.100-01

0500 J. Lamberts onsite.

on 8/26/2011 after J. Lamberts left, AC completed construction on Bioswales A1 and A4. All materials have been placed. They only need to plant them per City of Seattle specs.

0530 H+S tailgate - See HASP

Attendees:

J. Lamberts - Golder
K. Wolle
KC Wade
John Dreke
Mike Huffman
Jim Bersch

} Anthony Construction

Plan for day:
Start digging @ 5A + 3A to install filter units. Two crews working.

0616 AC prepping for work.

Cal'd PID ~~20020~~ JSL 2020 - 100ppm isobutylene
Sea 0250 - 0 ppm air

JLL Lamberts 8/29/11

clear 65F
light breeze

NASWS Retrofit
8/29/2011

013-1646-011.900.01

0715 Hand Digging @ 3A - found some wire. PID = 0.0ppm.

0730 Hand Digging @ 5A + marking out excavation

New hand for AC - Kyle

Red paint marks edges of excavation. @ 5A Took photos. Ken Wolle verified it was not power. Excavators will still be careful around red paint.

0745 Digging @ 3A, PID = 0.0ppm
Soil is being placed directly on concrete, will be covered with plastic @ end of day.

0800 Hand digging @ 5A, PID - 0.0ppm
Trying to avoid multiple utilities underground.

0820 Hand digging @ 3A, PID = 0.0ppm.
Trying to avoid multiple utilities underground.

JLL Lamberts 8/29/11

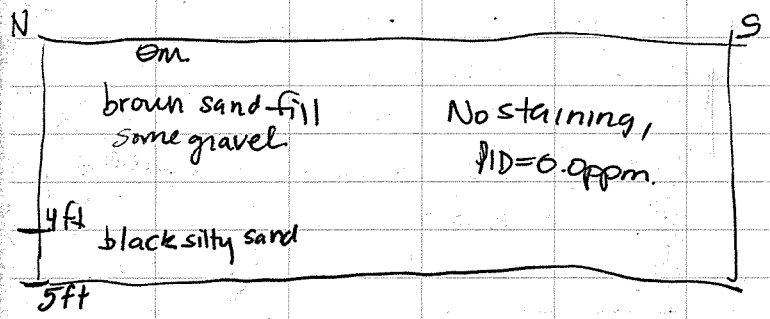
013-1646-011.900.01 Overcast 65F slight breeze NASWS Retrofit 8/29/2011

0900 S. Matthews + T. Sager onsite checking work out.

0950 Still digging @ 5A, PID=0.0ppm
1000 Still digging @ 3A, PID=0.0ppm

1040 Dug to depth @ 5A, PID=0.0ppm

5A pit: 10, 2



1100 3A, still postholing, PID=0.0ppm
1130 AC wants to store soil from 5A, 3A somewhere onsite - will bring over to Demo area. Soil is not to leave site
So far there is ~ 10 yards from 5A, ~3 yards from 3A.
Concrete - contacted E. Schwinn to find out if it can be sent to Demo area as well

JS 8/29/11

NASWS Retrofit 8/29/2011

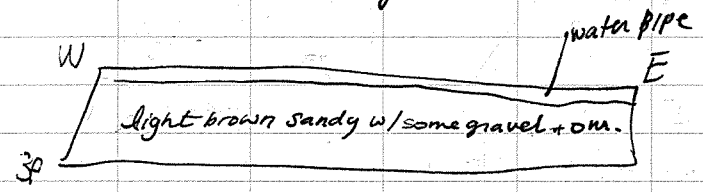
013-1646-011.900.01

1230 Brought a load of soil over to Demo Area ~10 yards from 5A and ~ 3 yards from 3A.

Concrete can be brought over. Does not need to be weighed. Try to separate clean concrete from concrete containing rebar.

Soil requires plastic on bottom (on ground) and be covered @ end of day. Golder will track soil.

1245 3A nearly down to depth. PID: 0.0ppm, no noticable staining.



1300 5A: They have set filter unit in hole on pea gravel + are back filling with pea gravel

1300 Concrete slurry drums picked up

JCL 8/29/11

partly cloudy 65F breezy

NASWS Retrofit 8/29/2011

013-1646-011.900.01

1210 Emailed E. Schwinn + team to update group regarding soil + concrete delivery to demo area.

1400 3A, leaking irrigation line @ NE corner. K. Wolle said not to do anything about it, S. Matthees says to call Eberlin.
Eberlin says:
Flag it + she will let irrigation PM know about it.

PID @ 3A = 0.0ppm, no staining
They have dug to correct depth
Will need stakes to mark + label soil, need to GPS where soil came from.

Taking photos.

1430 getting ready to place filter box @ 3A.

Placed filter box and backfilled with pea gravel and soil spoils

JS 8/29/2011

overcast 65F

NASWS Retrofit 8/29/2011

013-1646-011.900.01

AC got soil pile covered, @ older will stake it to identify source.

1500 J. Lamberts offsite

JL Lamberts
8/29/2011

013-1646-011.900.01 overcast 65F NASWS Retrofit 8/30/2011

0600 J. Lambuts onsite

H+S meeting, see HASP signature pages.

Attendees:

J. Lambuts - Golder

KC Wade
Mike Huffman
John Drake
Tim Bersch
Kyle Oben
} Anthony Construction

0615 cal'd PID 2020, Sea0250 to 100ppm isobutylene, 0ppm air

0630 Getting prepared @ 5A + 3A to dig + build tie ins to stormwater system. Plan is to dig trenches, then lay pipe + build tie ins.

Concrete will go to demo area.

0730 Called T. Sager to go watch while I'm in mtg

0800 Construction Meeting:

- 3F to start Friday 8am.
- Awaiting analytical from Mayes for back fill @ Target Excavation.
- Asphalt @ 3F on Tuesday
- Excavated on Friday
- Soil laydown area needed - parking area along grassy area.

JSI 8/30/11

013-1646-011.900.01 overcast 65F NASWS Retrofit 8/30/2011

- compaction @ TA? testing - Boeing says no.
- Mayes needs to be onsite for 3F compaction testing, proctor, analytical
- Also pave @ 5A on Tuesday.
- TA tomorrow.
- 3C, 3D: on hold, operational concerns.
- Curb on Filter Basins bigger?
- 3F - do we need a ribbon of concrete around edge.
- mark out where disruptions will occur
- BMPs - filter fabric/fencing
- Blocked doors - contractor can block on inside.
- Plants for bioswales? Not specific on City of Seattle - ask city inspector.
- GAC: disappeared into quarry spall wall.
- T1 - Storm Mods, BMPs.
- MH#1: GW seeping in?

0920 Lifted concrete @ 3A, 5A.

T. Sager watched @ 5A - PID = 0.0ppm. He observed no staining.

JSI 8/30/2011

raining, overcast 65F

NASWS Retrofit

013-1646-011.900.01

8/30/2011

0940 @3A, PID=0.0ppm under concrete no staining observed.

Concrete being put into dump truck and will be brought over to Industrial Area, Harper needs to inspect it because there is chicken wire in it.

1030 ~~one~~ two JSL Loads of concrete dropped over @ demo. Wall is "clean", no metal rebar. Concrete continuing to be lifted @5A + 3A. No staining noted, PID=0.0ppm.

1205 3rd Load of concrete dropped @demo. Contains some asphalt from 5A.

Staked soil pile from yesterday:
Label says:
GOLDER - NASWS Retrofit Soils
Placed: 8/29/2011
From: Roof Drains 5A+ 3A, 3B, 18 yards
OK for Reuse in Industrial Area.

JSL 8/30/2011

sunny 70F

NASWS Retrofit

013-1646-011.900.01

8/30/2011

Pile is covered with plastic and sandbags.

1215 ~~Crew~~ Crew JSL @ 5A has asphalt + concrete up, getting ready to start trench + finding 30" storm line for tie in

Crew @ 3A has concrete up, starting to post hold around utilities (white PVC plastic irrigation pipe)

Taking photos.

1230 Crew @ 3A working with Teufel rep. to figure out how to work around irrigation pipes. PID=0.0ppm, no staining observed

1300 Crew @ 5A digging, PID=0.0ppm, No staining observed

Jeff Lemler
8/30/2011

partly cloudy 70F

NASWS Retrofit 8/30/2011

013-1646-011.900.01

Need to check out MH #1 - AC says that GW is leaking into MH. T. Norton will come look tomorrow.

For outfall A, K Angelos wants to come out and see vault, to watch installation of tide gate/valve. Will have to work w/ AC on scheduling

1300 Crew @ 5A asks if they can pile IA soil on bare soil - this is soil that is being reused. S. Matthees says it is ok since it is being reused. If pile is to be left overnight, they must cover it with plastic

They start digging out trench @ 5A. PID=0.0ppm, No visible staining

1330 They are down to 4ft bgs. No staining observed, PID=0.0ppm

1400 Crew @ 3A - digging out trench. PID=0.0ppm, No visible staining

sunny 70F

NASWS Retrofit 8/30/2011

013-1646-011.900.01

1420 Saw something blue @ 6ft, it was styrofoam. (@ 5A) Took a photo.

1430 @ 7ft - hitting concrete chunks + debris

Hit wire on NW corner @ 7ft. Appears to be disconnected.

1445 stopped digging, cleaned up, covered soil piles with plastic, secured equipment

1500 J. Lamberts offsite

8/31/2011

overcast 65F

NASWS Retrofit 8/31/2011

013-1646-011.900.01

0530 J. Lamberts onsite

H+S tailgate

Attendees: See HASP

Tim Bersch
John Dreku
Kyle Oben
KC Wade
Michael Huffman
} Anthony Construction

J. Lamberts - Golder

0545 Calibrate PID 2020, Sea 0250

100ppm isobutylene

0ppm air

Plan for day:

- Keep working on 5A, 3A,
- Start on 3B
- Dig Target Excavation + sample

0600 Prepped bottles + jars

0645 Crew @ 3A:

- leaving 3A for now until utilities can be rerouted
- starting on 3B, No staining, 0.0 ppm

JSL 8/31/11

overcast 65F

NASWS Retrofit 8/31/2011

013-1646-011.900.01

0705 @ 5A, tide is infiltrating into hole. Checked tide - high is @ 706, 10.6 ft. Crew is excavating around, trying not to bring water out of hole

PID = 0.0ppm, No staining observed

0730 @ 5A - tide water receeding PID = 0.0ppm, Crew thinks they have to shift over to find SW line for tie in.

0745 @ 3B - PID = 0.0ppm, no staining observed. They are @ ~2ft bgs

0830 @ 5A - PID = 0.0ppm, no staining observed. Still looking for SW line.

0840 @ 3B - PID = 0.0ppm, no staining observed, Found a ground wire, shifted over

8/31/11 JSL

partly cloudy 65F NASWS Retrofit 8/31/11

013-1646-011.900.01

0845 Crew had placed 2 piles of soil on grass near Target Excavation to save on placing on plastic. However, the area is considered Stormwater/Shoreline Area, therefore Industrial Area soil cannot be placed there. Golder asked them to move it into pkg lot + place on plastic. They said they would as soon as possible

0900 S. Matthews called to check on work + to find out why filter @ 3A was placed perpendicular to bldg instead of plan - I told him it was to fit w/in utility constraints + approved in plan. A new as built will be created. Any of the filters can be adjusted if utilities constrain where the design has placed them.

0915 @ 5A found SW pipe on E edge of pit @ 7.4' bgs. Took photos. Crew also unearthed another pipe

JS 8/31/11

partly cloudy 65 NASWS Retrofit 8/31/2011

013-1646-011.900.01

in SW corner - metal, rusty + was the pipe that was allowing tide waters to enter pit. Took photos.

There is some soil staining (rust color) around the pipe and some black stains as well

0930 @ 3B - Soil has no staining, PID=0.0ppm. Pit is 4.9 x 4 x 3.5' L W D. Took photos

0 Soil that was on grass near TE has been placed on plastic by curb in parking lot. Took photos.

Staked pile with following:
Golder: NASWS Retrofit Soils
Placed: 8/31/2011
From Roof Drains 5A, 3A, 3B
OK for Reuse in Industrial Area.

0945 @ 5A, unearthed SW pipe, going to do confined space entry @ MH down pipe to confirm 30" diameter MH#: 2-454

JS 8/31/11

cloudy 65F NASWS Retrofit 8/31/2011

013-1646-011.900.01

1034 @3B, hole is @ 5' x 4' x 5'3"
L x W x D

PID=0.0ppm, No visible staining.

Called S Matthees about rusty pipe that is infiltrating tide water @5A. He says to document w/ photos + he will investigate.

Sent photos via email and a drawing with location marked.

AC crew thinks it might be a tar pipe.

1145 Crew @ 3B finished excavation. Placed pea gravel + is placing filter box. No staining observed, PID=0.0ppm

1200 S Matthees suggests plugging old pipe with concrete, Golder notifies E. Schwinn for confirmation. E. Schwinn called + emailed to say its ok to plug.

JSI 8/31/2011

sunny 70 NASWS Retrofit 8/31/2011

013-1646-011.900.01

1215 Concrete cutters onsite to cut more concrete 2 ft to east of excavation in order to get access to SW line.

S. Matthees asks why 5A is being tied in @ that location. The plans show it being over to the N more. The reason is that the plans had a MH located inside the building so they had to shift things south. As builts should reflect actual efforts + location of filter box + tie in.

1315 Cutting concrete @5A and along tie-in for MH #6

@3B - digging trench for tie in of roof drain filter. No staining observed, PID=0.0ppm.

Roof Drain has been installed.

1330 - Lifted more asphalt @ 5A, PID=0.0ppm, no staining observed.

JSI 8/31/2011

Sunny 75

NASWS Retrofit 8/31/2011

013-1646-011.900.01

1315 Patched up pipe with concrete
Cleaned out the soil first,
then filled with concrete

Began digging up soil along E
side of 5A ~~Area~~ excavation

PID=0.0ppm, No staining observed

Soils from 5A, 3A, 3B are
being piled in pkg lot
by target area excavation
on plastic. There is also
some left over quarry spall
+ pea gravel material that
was dumped there.

J. Parsons onsite to mark out
locations for test pits
being dug by AMEC.

1400 Digging @ 5A - No staining,
PID=0.0ppm. Dug down to
pipe @ 7.6' bgs.

JS 8/31/2011

Sunny 75

NASWS Retrofit 8/31/2011

013-1646-011.900.01

1415 Trench dug as far as sidewalk
@ 3B. No staining observed,
PID=0.0ppm

Concrete cutter going over to cut
sidewalk to access MH.

1420 J. Parsons + Bill Lockhart of AMEC
onsite to view excavation @
5A.

1425 J. Parsons + B. Lockhart offsite

1430 Called T. Norton to let him
know about AMEC work.

1445 Crew cleaned up, covered soil piles
with plastic

1500 J. Lamberts offsite

Jill Lamberts
8/31/2011

Clear @ 65F

NASWS Retrofit 9/1/2011

013-1646-011.900.01

0530 J. Lamberts onsite
Cal PID 2020, Sea 0250
100 ppm isobutylene
0ppm air

0545 H+S mtg see HASP.
Attendees:
J. Lamberts, Golder
Tim Bersch
John Drake
Kyle Oberg
KC Wade
Michael Huffman
} Anthony Construction

0630 Cutting concrete @ 3B
Exposing pipe @ 5A
Building safety fence to keep people out.

0705 Tide water infiltrating @ 5A, High tide @ 805 am, 10.6'

0710 @ 3B, digging trench + going to remove concrete. Team used

JSl 9/1/11

Clear 65F

NASWS Retrofit 9/1/2011

013-1646-011.900.01

water to aid in cutting concrete. Slurry was left on ground.

PID = 0.0ppm, no visible staining

Pulling concrete - PID = 0.0ppm, no visible staining

0720 @ 5A - digging around pipe (SW)
@ TE - putting up silt fence + BMPs along pathway.

0740 @ 3B - continuing to remove concrete + dig trench. 0.0ppm, no staining observed.

0750 - @ 5A - found a spot on the SW pipe that was damaged by another crew + they had patched it. The AC crew removed concrete + will patch it or use the spot for the tie in.

JSl 9/1/2011

013-1646-011.900.01

0800 AC trenching along pathway by river to build silt fence. Took photos, PID=0.0ppm

0900 Almost ready to tie into MH @ 3B. PID=0.0ppm, No staining observed

Smatthees onsite. Took a look @ MH#1 to see if GW seep occurring. Looks like sfc flow from above.

0915 Building silt fence along pathway

0930 Drilling thru SW pipe @ 5A for tie in
PID=0.0ppm, No staining

There appears to be some existing damage to pipe but the holes aren't all the way thru.

1100 T.Norton onsite - checked out MH# 1 - ok to consider water as SW + it can be pumped out onto vegetated area if

JS1 9/1/11

013-1646-011.900.01

necessary

1230 @ 3B - concrete coring in MH tie in, grade has been set for pipe, working on getting a hole cut into the MH.

@ 5A - crew has cut thru SW line, attached fitting, and is now placing pea gravel around pipe. They will be digging trench for tie in this afternoon.

Took photos.

1400 @ 5A - digging trench, PID=0.0ppm, No staining observed.

Backfilling excavation with same soil that came from the excavation and some pea gravel.

@ 3B - they have finished core + are putting pipe together for tie in.

JS1 9/1/11

1430 @ SA putting pipe together for tie in.

425 286 3641 E. Schwinn's cell # until further notice.

1445 E. Schwinn called. Gave her an update for today. Told her about red paint usage for edges of excavations. Needs to be switched to white. Red is power only.

Also let her know about power conduit @ 3B that was marked but they hit it and bent it. Power was not disrupted.

She has requested more communication and feedback from construction crew about questions, issues, schedules

JSL 9/1/2011

1515 Crew cleaning up, covering soil w/ plastic, securing equipment & Lamberts offsite

Jill Lamberts 9/1/2011

overcast 65F NASWS Retrofit 9/2/2011

013-1646-011.900.01

0530 J. Lamberts onsite

0545 H+S tailgate - see HASP.
Attendees: J. Lamberts, Golder
K. Wolle
KC Wade
J. Dreke
K. Ober
M. Huffman
T. Bersch
} Anthony Construction

Plan for Day.
- Finish @ 3B, - put pipe in
- Dig tie in @ 3A
- Clean up @ 5A to give access to loading dock.
- Start excavation @ 3F (after saw cutting)
-

0700 Digging trench for tie in @ 5A.
PID=0.0ppm, No staining observed.

0715 @3B - installing pipe

0730 Mario + Bud Martin (Anthony Construction onsite)

JS 9/2/11

overcast 65F NASWS Retrofit 9/2/2011

013-1646-011.900.01

0800 Digging Trench @ 5A.
PID = 0.0ppm, No staining

0900 Cutting Concrete @ 3F

0930 Building Silt Fence along OWS area @ edge of parking lot. Crew shaved sod of to a depth of ~6-12 inches. PID=0.0 ppm, No staining observed.

Taking photos

0945 @3B - Backfilling but they have to wait for electrician to fix ground wire and bent conduit.

1000 Cutting concrete @ 3F, Vacuuming up slurry.

1005 Cleaning up @ 5A. In order to give delivery access to Boeing. They covered pipe with plastic + put a board over trench

JS 9/2/2011

Sunny 75F NASWS Retrofit
9/2/2011
013-1646-011.900.01

1020 @ 3B - backfilling
Cleaning up extra soil +
Placing in pile in parking lot.
All extra will go to demo area.

E. Schwinn + J. Ridgeway on site
checking things out.

AC asks about MH#1 - yes
they can pump water out onto
grass per Boeing Ray Power.

1030 Pulling asphalt @ 3F. No
odor, PID=0.0ppm, no
visible staining

1200 Concrete load taken over to
demo area

Digging @ 3F for roof drain.
Lots of concrete chunks +
debris, conduit, pipes, ground
wire. No staining, PID=0.0ppm,

JSI
9/2/2011

Sunny 75F NASWS Retrofit
9/2/2011
013-1646-011.900-01

Also, pumped water out of MH#1
on to nearby grass. Some water
overflowed curb into a cb
in the parking lot. No action
taken other than to notify
E. Schwinn.

1230 @ 3A - digging out to put in pipe
PID=0.0ppm, No staining observed.

1300 Continuing to dig @ 3F
PID=0.0ppm, No staining

1315 E. Schwinn called about
the water going into a
cb from MH#1 - ok, but
not ideal. ~15 gal ~~may to~~ entered
cb II _____.

Also, there is sludge @ bottom
of MH#1. They (AC) will scrape
it out + place in a drum.
Golder will sample for
WC: VOC, RCRA metals,
TCLP Metals (HOLD), PCBs, TPH-D to Bunker C.
(list per T. Norton).

JSI 9/2/11

Sunny 75 NASWS Retrofit
013-1646-011.900.01 9/2/2011

1330 Mayes on site to test compaction @ 5A.

Still digging @ 3F, PID=0.0ppm,

Sent a load of soil from 3F to Demo area. Needs to be staked + covered. It was placed on plastic.

1345 E. Schwinn on site to check on things

1400 @3A - digging. PID=0.0ppm no staining observed. Working around various utilities.

1430 @ 3F - PID=0.0ppm. No staining. Lots of concrete debris, pilings, utilities.

Taking photos.

JSI 9/2/2011

Sunny 80F NASWS Retrofit
013.1646.011.900.01 9/2/2011

1500 @ 3F: hitting a large concrete piling in the way of the pipe tie in. Work has stopped until they can figure out how to proceed
PID=0.0ppm, no staining observed.

1528 Covered piles w/ Plastic In Demo Area
Staked w/ following:

GOLDER NASWS Retrofit Soil
Placed 9/2/2011
From Roof Drains 3F, 3A.
18 yards
On for Reuse in Industrial Area

1615 AC Back with demo hammer to brake through concrete. This action was approved by J. Ridgeway. They will have to work along a potential power utility

JSI 9/2/11

Sunny 75F NASWS Retrofit
013-1646-011.900.01 9/2/2011

1615 Called S Matthees to let him know.

1645 Begin breaking up concrete piling. It is very thick (greater than 6")

J. Ridgeway onsite observing as they go over electrical line

1700 Appears to be a duct bank. They are trying to find edges of it.

PID = 0.0ppm. No staining. Compact concrete rubble all around db making it difficult to go thru material.

1840 Found edges of duct bank. Took photos. PID = 0.0ppm, No staining. Some organic material below duct bank. Trying to figure out how to set run.

JSI 9/2/2011

Continued in book 3

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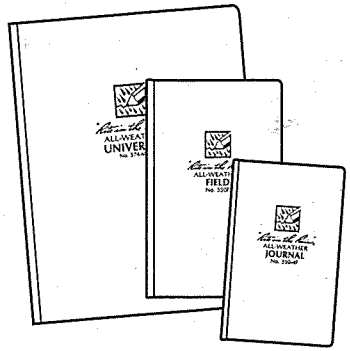
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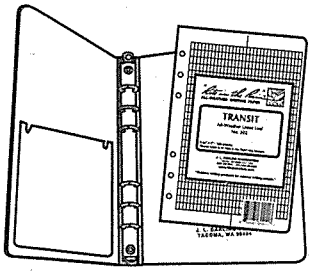
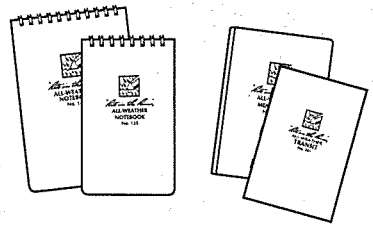


Loose Leaf / Ring Binders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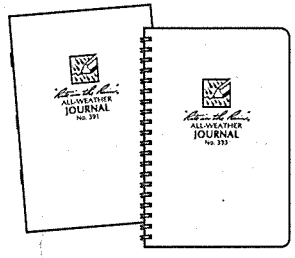
Notebooks

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NASWS Retrofit
Book 3
September 2011
-October 2011

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PAGE	REFERENCE	DATE
1	013-1646-011.900.01 North Area SWS Retrofit	9/3/2011 - 10/17/2011
/	Contact: Eberlin Schuzann 206-662-2679	/
/	Cell ~~425-286-3641~~ 206-384-7078	/
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ALL-WEATHER
LEVEL BOOK

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Project Boeing Plant 2
013-1646-011. ~~900.0~~

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① Sunny 75F NASWS Retrofit

9/2/2011

013-1646-011.900.01

1900 Called S. Matthees to let him know decision:

- Dig out the rest of trench
- Get a hold of engineers to redesign filter box run moved upwards 2ft so that pipe can go above duct bank. Redirect roof drain into filter box using pipe so that it (water) can make it over the lip of the curb and get into the filter box.

1930 Cleaned up, off site.

Jill Lamb
9/2/2011

② clear 65F NASWS Retrofit

9/3/2011

013-1646-011.900.01

0600 J. Lamberts on site

H&S Meeting - see HASP

Attendees: J. Lamberts, Golder

KC Wade
Michael Huffman } Anthony Construction
Ken Wolle

0630 Took photos of all roof drains

0645 AC begins digging out the rest of trench. @ 3F PID=0.0ppm, No odors or stains. Mostly subbase, CDF, sand + gravel.

They are also using demo hammer to break up ~~the~~ gravel.

0700 Cal'd PID 2020 See 0250
100ppm isobutylene
0ppm air

PID not working, humidity causing drift.

Taking photos

JSL
9/3/2011

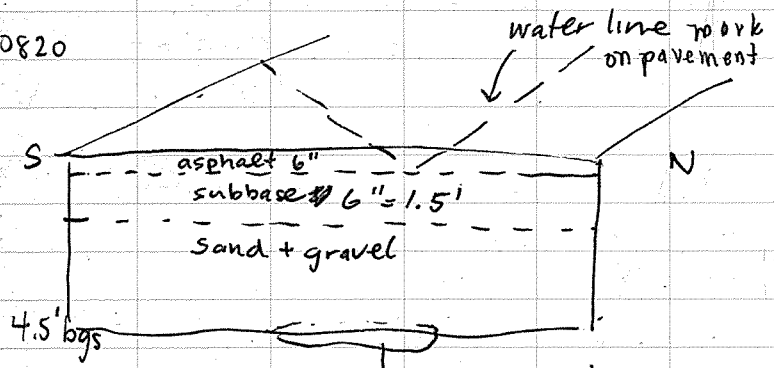
(3) Sunny 80F NASWS Retrofit

9/3/11

013-1646-011.900.01

0800 Continuing to dig + break up material along trench. @ 3F
Taking photos
No PID, but no odor or staining observed.
~18 yards of soil taken to demo area. Will need to stake it. Soil is placed on plastic + covered.

0820



grey clayey soil material with white specks in it. Surrounded with plastic. No odor, PID=0.0ppm. No staining.

JSI 9/3/2011

(4) Sunny 80F NASWS Retrofit

9/3/2011

013-1646-011.900.01

0900 Working on last 8' stretch towards MH.
No staining observed. No odor.
Breaking up concrete chunks in ground with demo hammer.

Ran into more concrete wall @ 8ft from MH. More duct bank?

1030 E. Schwinn onsite - says plate up hole + leave it until next week. Options will be determined. May have to abandon location or tie in to a different MH.

1070 Cleaning up.

1100 J. Lamberts offsite

JSI 9/3/2011

(5) sunny 80F NASWS Retrofit

9/3/2011

013-1646-011.900.01

1130 After J. Lamberts left site, rec'd phone call. E. Schwim directed Anthony to fill back in hole @ 3F and abandon it until a decision could be made about an alternate location. AC used the same soil from 3F, pea gravel, and 3/8 crushed rock. They fenced the area and are going to put down asphalt 9/6/2011.

If necessary, they could use soil leftover from other locations (3A, 3B or 5A); but they didn't have to. (Per conversation w/ T. Norton and S Matthews)

Jill Lamberts
9/3/2011

(6) clear 65F NASWS Retrofit

9/6/2011

013-1646-011.900.01

0600 J. Lamberts onsite

0630 H+S tailgate - see HASP.

Attendees: J. Lamberts - Golder

KC Wade
M Huffman
J. Drehke
K. Oberg
T. Bersch
A. Martin

} Anthony Construction.

0700 Ira Sisson of Mayes onsite to do compaction testing @ 5A, 3F. so that they can put asphalt down.

5A - passed.

3F - failed. He says AC put down incorrect materials - going to get more materials + fill back in again.

KC Wade said they used materials from 5A as back fill, in addition to soil from, 3F, pea gravel

0730 Crews working @ 3A, 3B, 5A.

Fixing up @ 3F

Building concrete forms @ 5A, 3A, 3B.

JS
9/6/2011

(7) Sunny 70F NASWS Retrofit

013-1646-011.900.01 9/6/2011

0800 Construction Mtg.

Attendees: V. Lamberts, Golder.
E. Schwinn } Boeing
J. Ridgeway }
S. Rose } Anthony Construction
K. Wolle }

- 5B starts today
- Finish 5A, 3A, 3B by 9/8
- Target Excavation by 9/8
- Working @ MH#1 - may need to scoop sludge out of bottom + into a drum for sampling. will be putting in weir this week.
- Irrigation - need to work with Boeing.
- Bioswale -
- Photos - provide to AC.
- MH#6 - pump out water to vac truck. go to NBF?
  - coring - what to do with concrete slurry
  - tidal flows.
- OWS - edge of excavation for Duwamish clean up. watch for overlap so they don't hit pea gravel when they excavate for clean up
- Roof top drains, roof protections H+S.

JSI 9/6/2011

(8) Sunny 70F NASWS Retrofit

013-1646-011.900.01 9/6/2011

0900 @ 3A - almost to MH. No staining, No odor. PID not working
@ 5A - nothing happening
@ 3F - digging up material + packing back down to get passing compaction tests.

1000 @ 3B - building cement forms
@ 3A - finished digging, no staining or odor. Took photos. No PID reading. Starting to drill into MH for tie in
@ 3F - still compacting
@ 5A - digging for final piece of tie in

1100 @ 3B - cement forms
@ 3A - drilled thru cement of MH for tie in
@ 3F - compacting
@ 5A - asphalt contractor onsite to pour asphalt.

1130 KC Wade let me know that they are bringing materials over to Demo Area today

JSI 9/6/11

(9) sunny 70F NASWS Retro fit

013-1646-011.900.01 9/6/2011

1230 Cleaning up soil piles in pkg lot by target excavation, and @ 3A/3B and taking them to Demo Area. Will need to stake the piles after they have been covered with plastic

@5A, 3F : placing asphalt, compacting
@3A - placing pipe tie/in, cementing @MH
@3B : forms for concrete

Talked to S. Matthees about what to do with water + sludge @ MH#6. He will look @ historical data + work with E. Schwinn to determine how to dispose of it.

1300 @5A - digging tie in

Cal'd PID 2020, Sea0250
100ppm isobutylene
0ppm air

1320 opened up MH#1 - water back in it. tide gate not working? Contacted S. Matthees.

JS 9/6/11

(10) NASWS Retro fit

9/6/2011

013-1646-011.900.01

1330 10yards from 3B/3A brought to Demo Area today

1400 @3B - forms made
@3A - PID = 0.0ppm, trench finished, placing + gluing pipe together for tie in. Took photos. No staining.

@ 5A - digging final tie in
PID = 0.0ppm. No staining

@ MH#1 - pumped water out, only a few gallons. Going to push sludge out of way for weir installation.

1440 @ 3A - pipe laid + cemented
- fixing irrigation leaks + heads.
@ 5A - digging trench tie in, no odor or stains observed, PID = 0.0 ppm.
@ soil spoil pile - cleaning it up + bringing to Demo Area

JS 9/6/11

(11) sunny 80F NASWS Retrofit 9/6/2011

013-1646-011.900.01

1520 @ 5A - digging trench for tie in

PID - 300 ppm on bottom

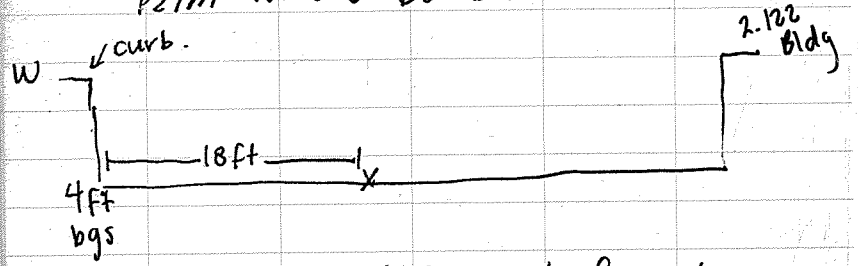
ranging up to greater than 2000 ppm.

Tested in various spots, on spoil pile, on side walls and all are giving PID readings ranging from 150 ppm (on side walls) to 2000 ppm on bottom. Cleared trench + tested breathing zone. Readings are 0 ppm.

Called T. Norton, he says to test with another PID for confirmation and to take a sample from bottom of trench for VOC + metals, 24 hr TAT.

1545 Collect sample

P21M-NASW-08-04-S.



At 4 ft bgs, 18 ft East of curb

Collected 3-40mL vials using EPA 5035 1-2oz and 1-8oz jar.

JS 9/6/11

(12) Sunny 80F NASWS Retrofit 9/6/2011

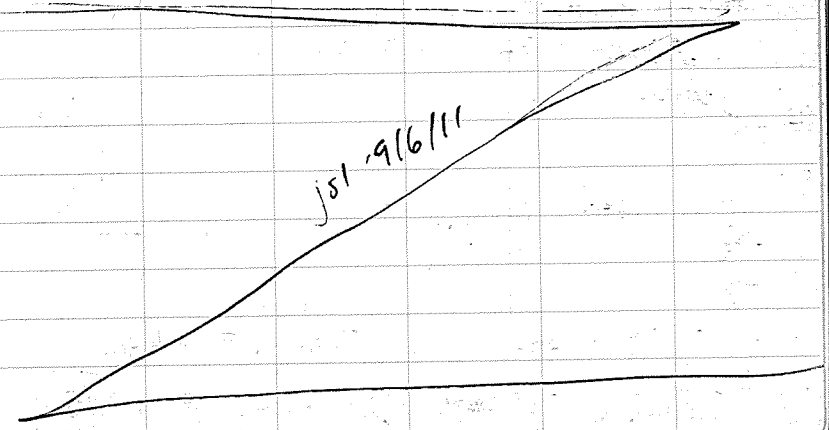
013-1646-011.900.07

Took grab samples in ziploch bags to test with other PID on site. Readings were similar to first PID.

Spoke w/ S. Matthews + he suggests having contractor dig a bit deeper to see if potential contamination can be removed. Soil should be stock piled separately until we receive analysis from lab. Once PID stops responding, a conf. sample will be taken.

1600 Called E. Schwinn to let her know.

1630 J Lambert's offsite to lab.



(13) Clear 65F NASWS Retrofit 9/7/11

013-1646-011.900.01

150545 J. Lamberts onsite

0615 H+S tailgate, see HASP

Attendees: J. Lamberts, Golder

K. Ober
KC Wade
T. Bersch.
J. Drenka
M. Huffman
} Anthony Construction

Plan:

- finish @ 3A, 3B,
- start @
- cleaned up soil piles in pkg lot.
- over excavate @ 5A.
- dig 5A trench a little wider.

0700 cal'd PID 2020 Sea250
100ppm Isobutylene
0ppm air.

PID not working well due to morning humidity changes.

Collected samples @ bottom 15ft, 20ft from curb towards E (towards building) @ side @ 20ft. JSL 9/7/11

(14) Sunny 70F NASWS Retrofit 9/7/11

013-1646-011.900.01

from ~~building~~ curb. Will test PID readings when PID stabilized.

Breathing zone @ 0ppm.

Soil from 5A being placed on plastic ~~concrete~~ in parking lot + being kept separated from other soil.

@ 4ft bgs *
Bottom - 25ft - 85ppm
Side - 25ft* - 285ppm
Bottom - 15ft* 160ppm.

* from curb.

@ 4.5ft bgs *
Bottom 15ft* - 90ppm
Bottom 25ft* - 190ppm.

JSL
@ 5ft bgs *
Bottom 15ft* - 150ppm
Bottom 25ft* - 150ppm.

Getting into some concrete rubble @ 15ft from curb. Going to dig ~~0.5ft~~ 1ft into rubble + stop digging. JSL 9/7/11

013-1646-011.900.01

Going to overexcavate by 2ft (2.5ft from base of pipe) (Per S. Matthews). Collect 1 more sample @ 6ft bgs

@ 5.25ft bgs
Bottom - 15ft from curb - 10ppm.
- in concrete rubble

Found sanitary line @ 5.5ft bgs
Dug around it to clean up hole to 5.5ft bgs. Test again:
@ 5.5ft bgs.
Bottom - 4ppm. (18ft from curb)
Bottom. - 15ft 39 ppm
Bottom - 25ft 32ppm

Collect confirmational samples for VOCs + Metals

0845 P21M-NASW-09-05.5-S
@ 15ft E of curb. in gravel

0855 P21M-NASW-10-05.5-S
@ 25ft E of curb in soil

S Matthews + T. Norton onsite, say to put samples on hold pending analysis of yesterdays sample + use

JSI 9/7/11

013-1646-011.900.01

these samples as confirmational samples to show if all potentially contaminated soil has been removed.

All soil from 5A trench will be separated pending analysis.

Eberlin Schwinn

1000 @ 5B - started digging PID = 0.0 ppm.
No odor or staining. PID Battery dead. - Collected bag of soil to test later.
Chris Von Bemmel onsite EHHS
Boeing looking into complaint about exhaust going into Building.

@ 3A, 3B - back filling, building concrete forms

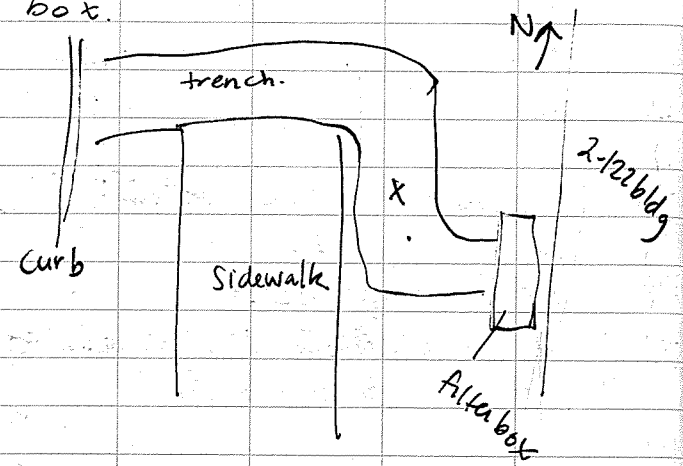
1020 @ 5A collected grab bag for PID @ 6ft bgs, 25ft E from curb. No odor, staining detected
PID = 40 ppm

JSI 9/7/11

(17) Sunny 75 NASWS Retrofit 9/7/2011

013-1646-011.900.01

1025 Collected grab bag of soil for PID @ 4ft bgs, 10ft from 2-122 Bldg wall, near filter box.



PID= 0.0 ppm.

1100 @5A - placing pipe + pea gravel for tie in
PID = 0.0ppm

@5B - ~~placin~~ finishing hole for filter box. No odor, staining ~~observed~~ observed. PID=0.0ppm

Red paint marks along edge - they told ~~me~~ me that they potholed

jsl 9/7/11

(18) Sunny 75 NASWS Retrofit 9/7/2011

013-1646-011.900.01

to 3ft but didn't find any power. They did find ground wire @ 4.6ft.

1100 J. Lambert's offsite to get ice
1130 onsite

1150 Collected sludge sample from MH #1 bottom for waste characterization:
VOC, RCRA Metals, TCLP Metals (HOLD)
PCBs, TPH-Dx to Bunker C.

~~PCBs~~ jsl - P21M-NASW-11-WC-S

Drum is labelled + stored on pallet with concrete slurry drums.

Sludge - oil, water, sheen, TPH smell, leaves + twigs.

1240 @ 5B - PID=0.0ppm. They have placed filter box + are back filling with pea gravel. Soil is going into dump truck

jsl 9/7/11

to be taken to Demo Area.

@ MH #1 - they are pumping out remaining water into the drum

@ 5A - they have placed pipe, backfilled with pea gravel, then are backfilling with IA soils (a mix from 3A, 3B, 5A) to 6" below grade, then filling with 5/8 crushed rock for appropriate compaction.

1315 Backfilling @ 5A. + grading

Checked soil piles in parking lot + staked pile of soil from 5A trench tie in. It is on hold pending characterization of the sample from 9/6/11.

Stake label:

GOLDER NASWS Retrofit
Placed 9/7/11
From 5A Roof Drain Tie in
HOLD FOR CHARACTERIZATION

JSI 9/7/11

1330 Digging tie in trench @ 5B

@ 5A - placing pipe + backfilling

1430 @ 5B digging trench to tie in PID = 0.0 ppm. No staining, no odor observed. Took photos.

@ 5A - back filling with pea gravel.

@ MH #1 - pumping out remaining water into drum.

Spoke w/ S Matthews: Put the 2 5A samples on hold pending analysis of sample from 9/6/11

Looking @ MH #6: ~900 Ga of water in MH @ mid-tide. There is data available of sludge from Catch basin sampling in 2010 Summer. It was not jetted or cleaned in Feb 2011. When working in CK, they can plug it downstream

JSI 9/7/11

(21) sunny 80F NASWS Retrofit

013-1646-011.900.01 9/7/11

to prevent tidal fluctuations. Need to determine where Water from MH will Go. Perhaps NBF.

1500. ~~Ches~~

@MH#1 - using shovel to put out remaining sludge

@ 5B - digging trench for tie in, PID=0.0ppm, no odor, staining

@ 5A - backfilling with pea gravel

1525 checked in MH#6 - 26" of water at nearly high tide of 10.3'. Let Scott know. We will be sampling the water in it in preparation for pumping it out + sending to NBF treatment system. Test for PCBs + Metals.

1535 J. Lamberts off site to lab

Crew covering soil piles with plastic and cleaning up. 13 yards to Demo Area

JSL 9/7/2011

101-287.

(22) NASWS Retrofit 9/8/2011

013-1646-011.900.01

0600 J. Lamberts onsite.

0615 H+S tailgate. See HASP

Attendees: J Lamberts - Golder

RC Wade
M. Huffman
K Ober
T Bersch
J. Dreke

} Anthony Construction

0700 Tasks for today:

- collect MH#6 water sample for disposal @ NBF
- clean up extra soil @ 5A and keep segregated pending lab analysis
- build tie in @ 5B
- concrete @ 3A/3B.
- weir @ MH#1

0720 Using a bailer + string, collected SW sample from MH#6

P2RM-NASW-11-WC-W.

For RCRA Metals + PCBs.

JSL 9/8/2011

(23) Sunny 70 NASWS Retrofit

013-1646-011.900.01 9/8/11

0730 Removing extra potentially contaminated soil @ 5A.

@ 3A/3B - pouring ~~cement~~ concrete

@ 5B - tearing up concrete sidewalk for tie in. PID = 0.0ppm. No odor.

0930 @ 3A/3B - pouring cement, removing extra soil

@ 5B - digging final stretch for tie in. PID = 0.0ppm. No odor or stains observed

@ 5A - backfilling

1030 @ 5A - backfilling

@ 3A/3B - cementing

@ 5B - digging to MH, PID = 0.0ppm. No odor or stains observed.

cal'd PID 2020, Sea 0250
100ppm isobutylene
0ppm air.

1130 E Schwinn on site. Red lines are to be

js 9/8/11

(24) Sunny 70 NASWS Retrofit

013-1646-011.900.01 9/8/11

painted white for edges of excavation, Awaiting data for drum + MH #6, Arranging parking for 3F, Target Excavation to happen today, pave @ 5A tomorrow.

@ 5A - backfilling, compacting

@ OWS area - building silt fence

@ 3A/B - concrete, building forms

@ 5B - digging tie in. PID = 0.0ppm. No staining, odors observed

1245 @ 5A - backfilling, compacting

@ 3A/B - building forms

@ 5B - drilling thru MH wall to put pipe in.

Soil from 5B is being taken to 5A as backfill around roof drain box.

1340 @ 5A - backfilling

@ 5B - drilling thru MH wall, placing pipe

@ 3A/B - concrete

@ OWS area - silt fencing

js 9/8/11

(25) Sunny 75 NASWS Retrofit

013-1646-011.900.01 9/8/11

1345 Gave logbook to T. Sager + PID. He will check on work while J. Lamberts offsite to another job.

1400 J. Lamberts offsite

T. Sager on site Antony's Construction Backfilling filter 5A with crushed rock. KC w/ Anthony Construction said there would not be any more excavation today.

1500

1510 T. Sager off site for the day.

Email from T. Norton + S Matthees re: potentially contaminated soil from 5A:

it is ok for reuse in Industrial Area. The data is in TL09. Extra samples are not going to be analyzed.

9/18/11

(26) Clear 65F NASWS Retrofit

013-1646-011.900.01 9/9/11

0600 J. Lamberts onsite

0630 H&S tailgate - see HASP.

Attendees: J. Lamberts - Golder

Arthur Martin
Mario
KC Wade
John Drake
Kyle Ober
Tim Bersch
Michael Huffman

} Anthony Construction

Plan:

- finishing backfill @ 5A
- silt fence along aws area
- Target Excavation
- finishing tie in @ 5B, backfilling
- starting @ 3C

0730 @ 5A - compacting, building concrete forms
@ 3A/3B - cleaning up
@ 5B - backfilling, cleaning up

Soil under plastic (5A soil) will be moved to IA today

JS 9/9/11

013-1646-011,900-01

0830 S Matthews onsite.

0900 Begin digging 10x10 @ Target excavation NA-DP-029. Digging to 11 ft bgs

Cal'd PID 2020, Sea 0250
100 ppm Isobutylene
0 ppm air

PID - 0.0 ppm. @ 1.5 ft bgs

Drawing TestPit Sheet - details of soil characteristics can be found on it.

0930 Using a demo hammer to break up concrete rubble @ 2 ft bgs

1000 Called T. Norton. He reminded me that we are digging to 11 ft bgs w/ 0 ft bgs being parking lot grade. The ground surface @ TE is ~ 1 ft above the parking lot so the sampling depths will be 1 ft deeper based on the

9/9/11 JSI

013-1646-011,900-01

ground level @ NA-DP-029.

	sample depth	actual (below grass sfc)
ie/	0-1	1-2
	4-5	5-6
	9-10	10-11
	11-12	12-13

1015 T. Sager onsite to walk around so he can cover on 9/10/11

Still digging @ T.A. ~ 6 ft bgs

1100 ~ 10 ft bgs (parking lot grade) at T.A.

3 truck loads of soil taken from NA-DP-029 to the Demo Area (IA). Staked, covered with plastic

1200 Finished digging @ TA, Collected Samples and wrote up soil pit log. Bagged + iced samples + placed in cooler.

JSI 9/9/11

(29) sunny 80F NASWS Retrofit

013-1646011.900.01 9/9/11

Samples:

1100 P21M-NASW-06-12-S - 11-12 ft @ bottom of pit confirmation

1110 P21M-NASW-03-10-S - 9-10 ft E side of pit MS/MSD volume.

1115 P21M-NASW-02-05-S - 4-5 ft E side of pit

1125 P21M-NASW-04-05-S - 4-5 ft N side confirmation

1135 P21M-NASW-05-05-S - 4-5 ft S side confirmation

1145 P21M-NASW-01-01-S 0-1 ft E side

1205 P21M-NASW-07-05-W - EB on spoon

1235 Cleaned up, checked locations
5A → concrete smoothing
5B → backfill complete
3A/3B → cleanup complete

1300 J. Lambert's offsite
Gave field book to T. Sager

JSL 9/9/11

(30) NASWS Retrofit

013-1646-011.900.01 9/9/2011

Back onsite to check on

1305 ~~Checked~~ soil piles @ Demo Area.
Placed stakes.

1315 J. Lambert's offsite. T. Sage has book.

1315-1600 : Backfilled @ Target Excavation with approved gravel barrow.

Pulled up sod @ OWS area.
These notes were from T. Sager (verbally)

Jill Lewell
9/12/2011

(31) overcast 55F NASWS Retrofit 9/12/11

013-1646-011. 900.01

0600 J. Lamberts onsite
Ht Stailgate - See HASP.
Attendees: J. Lamberts - Golder
K. Wade
M. Huffman
J. Dreke
K. Ober
T. Bersch
K. Wolle
M. Acosti
A. Martin
} Anthony Construction

Plan:
- Truck out soil from 5A to Demo Area
- Digging @ OWS
- Working on ~~3B~~ JSI 3D
- Finishing up concrete + final backfill @ 5A, 5B, 3A, 3B
- remove tree @ 3D

0700 Prepping equipment @ OWS
Cutting concrete @ 3D
Removing concrete forms @ 5A.

JS 9/12/11

(32) overcast 55F NASWS Retrofit 9/12/11

013-1646-011. 900.01

0730 @ OWS - digging up sod + placing on dump truck to take over to Demo Area

@ 3D - cutting down tree

0745 Truckload of sod from OWS to Demo Area

0800 Using water from fire system @ Demo Area to hose down excavation @ OWS for dust control. PID = 0.0ppm

0830 Cal'd PID 2020, Sea 0250
100ppm Isobutylene
0ppm air
Not working due to humidity. Will try later.
@ 3D - Taking down tree

0846 SMatthees onsite to check on things.
0855 SMatthees offsite

9/12/11

(33) overcast 60F NASWS Retrofit

013-1646-011.900.01 9/12/2011

0908 2nd load from OWS taken to demo area.

@ OWS - digging. No odor or staining observed

@ 3D - tree is down + chopped up.

OM (tree) got placed on grass near job trailer.

@ OWS - using water for dust control.

0948 3rd truck load from OWS taken to Demo Area

No staining, odors detected. No PID.

@ ~ 2ft bgs hit solid concrete rubble. Will need demo hammer to break through

1000 @ 3D - digging. No staining or odors observed. Soil being piled up for now on plastic, but will be reused in place or taken to demo area

1030 Removing soil piles from parking lot - to take to demo area.

1040 Beginning to fill 4th truck load

JS) 9/12/11

(34) overcast 65F NASWS Retrofit

9/12/11

013-1646-011.900.01

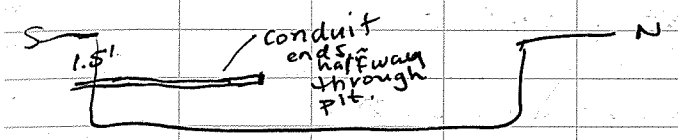
1055 Truck filled (4th load)

No odor or staining observed

1100 @ 3D: digging. No staining or odors observed. Soil being taken to Demo area.

Tried PID again - not working

Crew has uncovered a conduit. Appears to have been abandoned as it doesn't go beyond where they uncovered it.



Took photos.

Foy onsite - suggests it might be data or phone that was never used.

1115 Begin filling truck load #5 @ OWS

1132 5th load full @ OWS + being taken to demo area

JS) 9/12/11

overcast 65 NASWS Retrofit

013-1646-011.900.01 9/12/11

1200 @3D: Still digging. No odors or stains observed. Crew has cut off conduit pipe + covered it with tape @ S end of pit. They also have cut ground cable to get it out of the way. It will be repaired after work is done.

@OWS: almost down to concrete fill evenly. No odor or staining observed.

1210 @OWS- Filling 6th truck load

1220 @OWS- Finished filling 6th load, off to demo area

1230 Continuing to clean up soil pile in parking lot

1242 Breaking up concrete @ OWS
Truck back, ready for 7th load.

1300 Filling 7th load @ OWS.

1310 7th load, off to demo area.
Load of soil from 5A, 3D, reminants of 3A, 3B, 5B in 2nd dump truck, ready to go to demo area

JS 9/12/11

overcast 65F NASWS Retrofit

9/12/11

013-1646-011.900.01

1325 @OWS-Filling 8th load
No odor or staining observed

1340 Found 2" irrigation pipe through excavation @ OWS. Took Photos. No damage. May have to remove it. No odor or sheen or staining observed.

1350 Recal'd PID - working ok now.

1400 @3D - dug pit for drain box to correct depth. Getting ready to pull asphalt. PID=0.0ppm. No odor or staining

@OWS - mixing in hard concrete recon with soil from excavation. No odor or staining.

1415 8th load filled, @ OWS, off to demo area. PID=0.0ppm

1430 Soil from 3D being loaded up to take to demo area ~~[illegible]~~
Filter box is set, placing some pea gravel around it + planning where pipe will go to tie into MH

JS 9/12/11

(37) overcast 65 NASWS Retrofit

013-1646-011.900.01 9/12/11

1500 Cleaning up, securing OWS hole, putting plastic on soil piles, sweeping, etc.

Securing things @ 3D.

1530 J. Lamberts offsite.

9/12/11

(38) overcast 65 NASWS Retrofit

013-1646-011.900.01 9/13/11

0600 J. Lamberts onsite

0630 H+S tailgate - see HASP

Attendees: J Lamberts - Golder
KC Wade
M Huffman
K Oben
J Orehe
T Beisel
A. Martin
M. Acosta
} Anthony Construction

0700 @ 3D: pulling up concrete + asphalt for tie in

No PID today - not working.

No stains or odors observed @ 3D.

@ OWS: putting up safety fencing, starting to dig. Irrigation pipe busted, but water was off. KC Wade said he'd call Eberlin.

@ 5A: building forms for curbs.

JL 9/13/11

(39) overcast 65F NASWS Retrofit

013-1646-011.900.07 9/13/11

0730 @3D - removing asphalt
- digging out trench - no odor or staining observed -

@OWS - digging out around irrigation pipe - trying to find it so they can work around it or remove it temporarily.
No odor or staining observed

Taking photos

800 Construction Meeting
Ken Wolle, Samara Rose, Will Lumberto, J Ridgeway
OWS - Separator on site
3D - by Friday
MH 3+4 Sept 15, 16
3E - Tomorrow
3C - Next monday
Stormvault - Week of 28th.

Not excavation for vault yet.

Diversion of water if rains should fall?
Contingency for SW. Where is stopping point?
JSI 9/13/11

(40) overcast 65F NASWS Retrofit

013-1646-011.900.01 9/13/11

- 3D - Had to move 3D over to avoid equipment
- Tree @ MH #4 will need to be demolished
- OWS Irrigation lines
- crane Tmorrow to set OWS. - need gate opened

Soil Materials - sorting

Monday - MH#6.
Sept 20th - Tide Gate Valve
J. Ridgeway does walk around working with KC to separate materials + mitigate SW should there be rain!
900 Called E. Schuinatogue update on meeting
- concrete recycle from OWS area needs to be separated along w/ Asphalt
- OM - she will work w/ Andrew Baird
- moving forward on project for schedule.

@3D - trench is dug, drilling out MH for the in. No staining or odors observed
@OWS - continuing to dig. 10+ truck load over to demo area.
- They have removed irrigation pipe + capped it so they can fix it later
JSI 9/13/11

013-1646-011.900.01 9/13/2011

0950 Filling second load @ OWS.
No staining or odor observed.

Cutting tree down @ MH #4

T. Sager on site to take over

1000 J. Lumbert off site. T. Sager has book

2nd load from OWS taken to demo area

1020 Filling third load Soil at oil/water separator.

1040 Third load taken to 2-63 Slab demo area.
No Staining or odor observed.
Separating Soil/organics & Concrete as much as possible

1045 To 3D East Side of Building Anthony Crew installing pipe in trench to filter
No Soil removal.

013-1646-011.900.01 9/13/2011

1055 Back to OWS on west side

1115 Contractor loading Soil stockpiles in SW corner in parking lot into dump truck for removal to 2-63 slab out demo site to the South.

1145 Resume cutting tree at MH #4
1147 Tree Down

1st load of Stockpile Soil to 2-63 slab at demo site

1155 Back to demo Site

1355 Return to Site
Anthony Const. continuing to excavate for oil water separator.

Load of Soil to 2-63 Slab at demo site

1415 Continue excavation
Load of Soil to 2-63 slab
Finished piece of Concrete in excavator at about 7' below exist grade

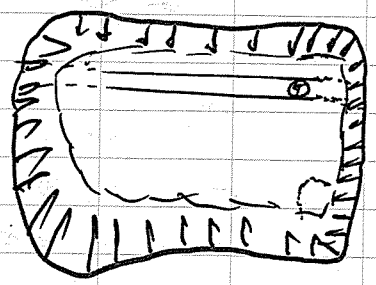
013-1646-011.900.01 NASWS Retrofit overcast ~65°F

Sept. 13, 2011 (43)

1425 Continue to load Next truck of Soil.

~12" Ø DI pipe encountered running plant E-W through North Section of excavation at ~ 11 ft below existing grade.

Plant North Plan View



OWS Ex.

1455 Continue Ex. Truckload to 2.63 Slab

1500 To Demo site

1515 Back on site

Contractor had removed DI pipe (abandoned) and exposed more of what appears to be and abandoned pile cap for isolated spread footing. Cap at least 2.5' thick and appears to be polygon of 5-6' sides

1600 Done & off site for day

(44) overcast 65 NASWS Retrofit

9/14/2011

013-1646-011.900.01

0600 J Lamberts onsite

H+S tailgate - see HASP

Attendees: J. Lamberts
K C Wade
K Wolle
J. Drake
M. Huffman
K Oben
T Bersel
A Martin

615 Called S Matthews - he says he will look into concrete disposal

J. Ridgeway (Boeing) onsite to look @ concrete pile cap in excavation @ OWS. He reccommends digging it out further + removing it.

0630 cleanup @ 3D, getting ready to pour concrete

setup @ 3E, getting ready to ~~cure~~ cut concrete but car in way.

0700 E Schwinn onsite. She stops work @ 3E because it is not scheduled

JS 9/14/11

to start for 2 weeks. No concrete cutting performed.

Crew cleaning up remaining soil piles in parking lot + taking to Demo Area, 263 slab.

1 load of soil from OWS taken over.

E. Schwinn + K. Wolle discussing plan for OWS + schedule. Some questions came up:
- MH #4 - can they use an existing MH, 9 ft to E?
- Concrete: Abaird says it can't (from OWS) go to demo. S. Matthews looking into why. E. Schwinn finding out about taking it to recyclers in Renton. Need to determine if testing is needed. No staining observed
- 12" pipe @ bottom of OWS excavation needs plugging b/c tide water coming into pit - E. Schwinn says ok
- OM (sod + trees) need

JS 9/14/11

to be kept separate. E. Schwinn to determine where it goes

0830 OWS - removed concrete piece. It is sitting on wood pilings 4.5' x 2.5' x 6.5' dimension with rebar

Need to remove wood piling to be able to install OWS.

Rest of crew cleaning up + trucking soil.

Water in bottom excavation receding with tide. Crew will plug pipe

Concrete piece has a little staining likely due to creosote. Put a piece in a ziplock in case sampling is needed.

900 Still digging @ OWS to expose wood piles no staining or odor observed.

JS 9/14/11

013-1646-011.900.01 9/14/2011

0905 2nd truck off to 2-63 slab of soil from OWS

0917 filling 2nd truck load of soil from OWS

Let E. Schwinn know that concrete was out of hole + need to determine where wood piles should go.

0930 2nd load of OWS soil to demo area

0932 Filling 3rd load of OWS soil

Need to check 2-63 slab to make sure they have enough room.

0944 cal'd PID 2020, Sea 0250
100 ppm isobutylene
0 ppm air

Checked soil piles from OWS + soil from bottom of pit. PID = 0.0 ppm

1000 3rd load offsite to demo area
4th filling
5th filling

JS 9/14/11

013-1646-011.900.01 9/14/2011

1015 4th + 5th load off site to demo area

M. Gleason onsite. Recommends plugging 12" pipe.

S. Matthews calls - need to sample pile cap concrete for PCBs. Need to sample concrete recon for PCBs, VOC, TCLP Metals, TPH-D.

PID = 0.0 ppm still on all soil from OWS.

1226 Filling 6th + 7th loads of OWS soil

1030 6th + 7th trucks to Demo area of OWS soil

1100 8th + 9th trucks to Demo area of OWS soil

1214 Plugged 12" pipe @ OWS with concrete mix.

JS 9/14/11

013-1646-011.900.01

Rest of crew working on a silt fence, by MH #1 fixing up excavation for OWS. It appears that the wood pilings can be left in place.

Concrete is piled up + covered with plastic. 2 piles - one of pile cap, one of rubble

Per Boeing instruction, sampled Pile cap concrete for PCBs. Grabbed a large chunk to be pulverized

1300 P21M-NASW-12-WC-C

Also grabbed several chunks of concrete rubble to be analyzed for PCBs, TCLP metals, RCRA metals, VOC, NWTPH-Dx to Bunker C, NWTPH-G. Sample has to be composited + pulverized.

1305 ~~P21M-NASW-13-WC-C~~ cancelled JSL.

Crew is also to pull up + segregate sod for disposal at a later date

JSL 9/14/17

013-1646-011.900.01

when Boeing determines what to do with it.

If wooden piles ~~caps~~ need to be removed, they should be wrapped in plastic and stored until Boeing determines what to do.

1340 Talked with S. Matthews re: rubble concrete - he says hold off on sampling until all rubble is stockpiled in order to get composite sample.

24hr tat on pile cap concrete.

1400 J. Lamberts offsite to lab
Crew is working on silt fence, cleaning up @ OWS, trucking soil

1445 J. Lamberts back onsite Crew has covered soil pile with plastic + is leaving for the day.

JSL 9/14/17

(51) overcast65F NASWS Retrofit

7/14/2011

013-1646-011-900.01

The soil pile on 2-63 slab in demo area is one giant pile of soil from all areas of NASWS ~~Demo~~ Area mixed together. Took photos + let Scott Matthees know.

Also, a GeoTech from Geo Engineers and the designers from Geosyntec are coming tomorrow to look @ OWS area to determine what to do @ MH #4 (which is on top of an existing MH) and to ~~make~~ decide on an appropriate substrate for the OWS to sit on in the excavation (currently there is GW + tidal water in bottom.

1500 J. Lamberts off site for the day

[signature]
9/14/11

(52) overcast65 NASWS Retrofit

9/15/2011

013-1646-011-900.01

0600 J. Lamberts onsite
H+S tailgate - see HASP.
Attendees:
J. Lamberts - Golder
M. Huffman
K. Wade
K. Ober
A. Martin
J. Dreke
} Anthony Construction

Plan - get ready for GeoEng + Geosyntec visit. Based on these responses a plan will be made for OWS.

0700 E. Schwinn onsite.
S. Rose onsite
Brent Miller - Geosyntec. onsite

Discussing options for MH #4, 5

Timothy Bailey - GeoEngineers

— out fuel A - Tide gate valve going in on monday

JSL 9/15/11

(53) overcast 65 NASWS Retrofit 9/15/11

013-1646-011.900.01

options - using MH#4? Putting weir in?
- getting rid of MH #5?
- better locations for MHs?
- structural stability for MHs

Structural stability of OWS excavation base:
- overexcavate, 1 ft
- separator fabric
- 1 ft 5/8 gravel, quarry spalls

3F: - leave as is - reroute?
- raise it up?
- blocks of concrete - what are they for? pile cap?

Geosyntec also checked out Bioswale A1 and will help guide plant selection ~~in~~ + planting in swales

0900 Digging in OWS to get to 1.5 ft below grade so they can put

JSI 9/15/11

(54) overcast 65 NASWS Retrofit 9/15/11

013-1646-011.900.01

quarry spalls in. There is about 1 ft of GW in hole that they are excavating in. The walls are also sluffing off into the pit. Took photos. No odor or staining observed.

1100 PID not working, won't cal. No odor or staining observed in soil from OWS. They are piling soil from bottom onto the sides of the excavation

Quarry spalls onsite - to be placed in bottom of OWS hole.

1230 Continuing to place quarry spall @ OWS. bottom.

1330 Continuing to place quarry spall. T. Sager on site to check. ~~They~~ He will be watching operations tomorrow.

JSI 9/15/11

(55) overcast 65 NASWS Retrofit

013-1646-011.900.07 9/15/2011

1400 Setting grade @ bottom of OWS excavation. Water in bottom w/ quarry spall. Taking photos.

Took photos of all roof drains

MH #6: although water is ok to take to NBF treatment system for disposal, it was suggested by Ken Wolle that water be pumped out in small increments onto the grass, over several days to allow for infiltration + not run over the curb onto the grass. Per earlier discussion with Ray Power, Golder recommended that this action is ok, BUT the outfall of the MH should be plugged to prevent tide waters from getting back into MH. In addition, this action can happen after the tide gate valve @ Outfall A is installed to ensure no tide water comes back into the MH #6.

JSL 9/15/11

(56) overcast 65F NASWS Retrofit

013-1646-011.900.07 9/15/2011

1430 Brent Miller back onsite measuring things out for design

OWS - crew is digging out a larger area to the south of where OWS will go. No staining or odors observed. ~~Sta~~ Excavation sides caving in a bit where the water is sitting. Took photos.

1500 Putting in more spall + cleaning up -

1530 J. Lambert's offsite T. Sager has book

[signature]

(57) Partly cloudy 65 NASWS Retrofit

013.1646.011.900.07 9/19/2011

0630 J. Lamberts onsite
H+S tailgate - see HASP
Attendees: J Lamberts Golder
J. Drake
KC Wade
M Huffman
A Martin
T. Bersel
K. Oben
} Anthony

Plan: - start @ 3C Roof Drain
- install tide valve @ out fall A.
- install OWS w/ Crane -

0730 - Trucking soil from OWS to Demo Area
0800 - Cutting concrete @ 3C
0830 - Digging soil out from around MH @ Outfall A (2.448)

Soil ~~should~~ is designated as Stormwater, but the Vol is <4 yards, so Matthew has suggested that the soil be reused in place

JSI 9/19/2011

(58) Sunny 66F NASWS Retrofit

013.1646.011.900.07 9/19/11

0900 S Matthews onsite to check out various work
@ 3C - still digging
@ Outfall A (2.448) - digging. They have valve ready to go. To photos.
@ OWS - removing soil to Demo Area, prepping for install of OWS.

Brent Miller onsite to measure ~~spot~~ MHs + to convey latest plan for the ins around OWS.

0920 Outfall A - digging - No staining or odors observed. They had to remove some irrigation pipe that will be replaced.
Soil will be reused in place

3C - Digging. No odor or staining observed.

0950 @ Outfall A (2.448) - Closed main valve. They have lid off of MH. They will be pumping water out onto the grass nearby.

JSI 9/19/2011

(per Ray Power prev. instruction).
S. Matthews confirmed.

Noted that small pipe on E side of MH (leading to Bioswale A1) is draining water. This pipe was to be plugged during Bioswale installation

KMAnglos is coming down to observe installation

0955 T. Norton on site

Called R. Power about water in MH by Outfall A – he says its ok to pump water onto grass

1000 R. Power called back + said b/c it is potentially salt water, we should pump down stream, into the next vault.

While watch @ Outfall A (2-448), T. Norton confirmed that soil can be reused in place.

JS 9/19/11

1015 M. Huffman came over to tell crew to stop work @ Outfall A and come help @ OWS ~~#~~ because the Teufl Landscaping had turned on the irrigation, causing water to run into the OWS excavation, filling it 1/3 full + the bank to slide into where they had been set up to install with the crane this morning.

We called Ekerlin to ask what to do with the water. She contacted Ray Power who said it was ok to pump the irrigation water out onto the grass, ensuring that the sediment filled water did not get into the storm system.

Crew pumped the water out to the N into the bushes, which headed down hill into a bioswale, infiltrating into the grass. Golden watched to make

JS 9/19/11

013-1646-011.900.01 9/19/11

sure the water didn't go towards the SW system.

1100 T. Norton off site

1130 @ 3C - continuing to dig. No odor or staining detected. They had to cut ground cable, which will be repaired later

@ Outfall A (2.448) - they put the lid back on and secured area.

@ OWS - continuing to pump out water, going to have to fix grade before the crane comes

KC Wade said that a Boeing employee told the Teufl crew to turn the water on for a photo opportunity and knew that water was going to run into the excavation

Soil from 3C is being placed in dump

JS 9/19/11

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truck to take to demo area

(2.448)

1212 @ outfall A - getting ready to pump water out of MH, downstream into the next vault. Have to take lid off first.

Let K Angelos + T. Norton know.

outfall A main valve causing water to back up in MH. The level is higher than before

1230 - 1600:

@ OWS: they set OWS with a crane - Ness Crane

- T. Norton, S. Matthews, K. Angelos onsite to see activities
- T. Norton expressed concern about safety of excavation to E. Schwinn + recommended Being HS come out + check on Anthony to ensure they are performing work safely
- OWS was set + area was fenced off for evening.
- Future excavations will have to

JS 9/19/11

have a trench box in place before people can enter to perform work.

@ Outfall A MH: (2-448)

- KArgolos check ed out tide valve.
- As they are pumping water from MH into down pipe vault, it takes 1 hr to go down 1 inch. so they stopped pumping
- The next plan is to wait until low tide, then try to pump water out. The next low is @ 4am tomorrow.
- Crew will be set up with lights, will pump water out, then install tide valve

@ 3C: - continuing to excavate
- removed concrete sidewalk
- Soil to demo area
- no staining or odors observed.

Took photos throughout day

JL 9/19/11

A few other notes/observations:

- 4" tile pipe below 30" pipe from outfall of Bioswale A1 needs to be plugged. Water is coming out of the 4" pipe
- PVC pipe in Bioswale A1 needs a cap.
- pumping out @ MH by outfall A will be in the dark.

1600 J. Lamberts off site for the day

JL 9/19/11

013.1646-011.900.01

0445 J. Lamberts onsite

H+S tailgate - see HASP

Scott

James

KCWade

MHuffman

Kober

@ Outfall A MH: 2-448

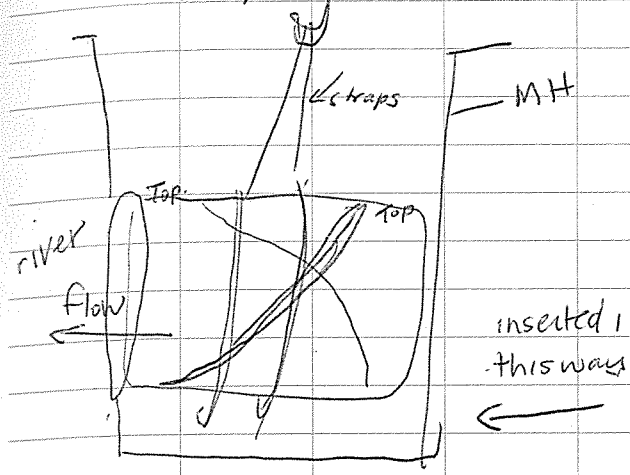
- Prior to my arrival crew has pumped water out onto the grass. There is no water in the MH except for water coming in thru the 4" pipe on E side of M.H. They put a cap on it but it is still leaking.
- They have air monitor in MH. Two guys are inside + getting ready to place the valve - Taking photos + videos.

The valve is oriented according to the flow arrows, Top labels are on top.

JS 9/20/11

013.1646.011.900.01

They are using straps + forklift to set ~~pipe~~ valve



0700 E. Schwinn onsite. They have about 6-8" left to go. They tried various methods to install the last few inches. First they used a 4x4 + it broke, then they used a larger piece of wood, It just broke + the ~~flex~~ rubber flexed. Then they used a hole packer + wood, + still had problems with flexion

(continued on p 68)

JS 9/20/11

013-1646-011.900.01 9/20/11

800 Construction Meeting
Samara Rose
E. Schwinn
J. Lamberts
J. Ridgeway

- OWS - in
- 3D - complete
- MH 3 - start excavating
- MH4 - put in well
- btwn MH2 + 3 - 15" pipe - start excavating
- organics stockpiling - ~~will~~ going to Columbia Ridge
- Tank - week of 26th Sept.
- Shoring, trenching
- 3C - ~~st~~ installing drain + tie in
- 3F - unsure what to do, considering a few other options
- 10/18 completion

Salinity - test @ MH6

- Final inspections - still needs to be done

- wetland seed mix? for Bioswale planting
- concrete - All concrete can go to Demo Area (per Eberlin).

JS 9/20/11

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Then they used hole patch again + made the valve more rigid by tieing straps around it.

0845 They started tightening metal rings to seal the valve to the SW pipe. They then bolted the rings to the SW pipe. In 4 ~~X~~ spots @ 90° angle

There is water flowing in from river - the valve does not appear to be working

Called Eberlin, S Matthees, T. Norton + K. Angelos to let them know. They are troubleshooting.

0900 @ 3C. excavating tie in. No odors or staining observed. They are working around the utilities.

JS 9/20/2011

013-1646-011.900.01 9/20/2011

Flow estimation of tide water coming into MH through the tideflex checkmate valve:

Diameter of MH = 96"

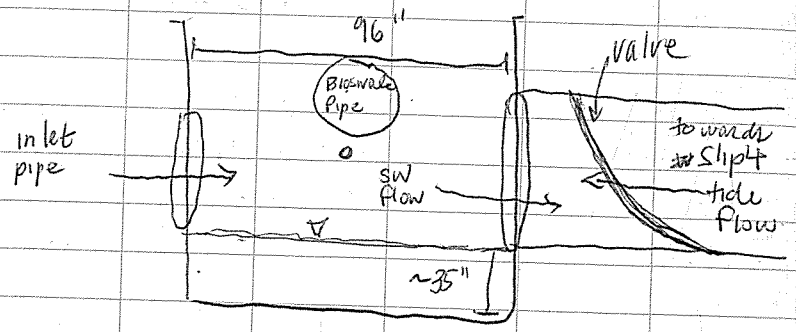
Depth of water from bottom to base of pipe = ~35"

$V = \pi \left(\frac{96}{2}\right)^2 \times 35$

= 253338 cu in

= 1096 gal / 60 min to fill

= 18 gpm.



1100 @ 3C - No staining observed. Still excavating tie in

JSL 9/20/2011

013-1646-011.900.01 9/20/11

@ OWS - they are removing remaining soil to Demo Area - 3 loads and starting to back fill with gravel barrow (approved fill by Eberlin)

Took lots of photos.

1200 @ 3C - digging tie in. No staining or odors observed.

1300 @ 3C - digging tie in. No staining or odors observed

1400 @ OWS - filling with gravel barrow - compacting, using water from hydrant to moisten barrow.

1500 @ 3C - still looking for tie in pipe. Called S Matthees to get better maps

@ OWS - backfilling

1520 J. Lambert's offsite for day

JSL 9/20/2011

013-1646-011.900.01 9/21/2011

0600 ~~H~~ J. Lambert onsite
H+S tailgate - see HASP
Attendees: J Lambertts
KC Wade
M Huffman
T. Bersch
K Ober
J. Dreke

0700 @ 3C - looking for tie in pipe
S Matthews sent maps but they don't show any better information

@ 3D - pouring concrete curb.

@ OWS - breaking up concrete from pile cap to take over to demo area crusher.

0800 @ 3C - looking for tie in pipe. No staining or odors noted. Taking photos

Pouring concrete curb @ 5A.

JSD 9/21/11

9/21/2011

013-1646-011.900.01

0830 @ 3C - cleaning up extra soil to take to demo area.

@ OWS - breaking up concrete
- backfilling + compacting with gravel barrow

@ 5A/3D - finishing concrete pour.

0900 S Matthews onsite. Checked on MH by outfall A - still leaking (2448)

0930 @ OWS - took load of concrete to demo area - all concrete types from this project can go to Demo Area (per Eberlin + Andrew)
- backfilling

@ 3C - looking for pipe for tie in. No staining observed.
- soil being ~~by~~ placed on grass in OWS area. It will be trucked over to demo area at a later date.

JSD 9/21/2011

(73) NASWS Retrofit

overcast 65

013-1646-011.900.01 9/21/2011

1100 @OWS - backfilling, compacting
@3C - looking for 6" pipe tie in
going to keep digging. No
staining or odors observed

1130 Cal'd PID - working: Sea 0250
100ppm - isobutylene
0ppm - air.

@3C - found 6" PVC pipe for tie in.
Checked soil - PID = 0.0ppm.
No staining or odors observed

1215 @OWS - backfilling + compacting
@3C - beginning to cut pipe for
tie in.

1230 @OWS - scraping top soil off + stockpiling
for proper disposal - this is
coming off the whole area btwn
MH#1 + filter ~~unit~~. unit.

1245 T. Sager onsite - He now has book.
J. Lamberts off site for day

JSL 9/21/2011

(74) Sunny 70 NASWS Retrofit

013-1646-011.900.01 9/21/11

1245 T Sager on site

1300 TO 3C Contractor excavating
South of PVC P to 3C ~4-6ft long
excavated no staing or odors at
fine silty sand material observed
PID = 0.0ppm ok.

1400 Anthony continuing to strip
Sod/Topsoil from ~~excavation~~
planned excavation South of
OWS toward line "B" structure
PID = 0.0 ppm No signs of stain or
odors observed below Sod.

1430 3C Continue ex. PID 0.0 ppm
No odors or stains

1440 Anthony ~~to~~ spend afternoon
cleaning up

1500 T Sager off site

JSL 9/21/11

(75) raining 60F NASWS Retrofit

013-1646-011.9000.01 9/22/11

0600 J. Lamberts onsite

H+S tailgate - see HASP

Attendees: J. Lamberts
KE Wade
T Bersch
K Oberg
M Huffman
J. Dreke

Plan: • finish 3C
• install MH 3
• clean up sod

0800 @ OWS - getting ready to install MH 3.
@ 3C - building tie in

~~1~~ 1100 @ 3C - building tie in
@ OWS - they have excavated soil for MH 3 (no odor or staining observed) getting prepared to install MH 3.
Soil is going to Demo Area.

@ 3C - Soil is going to Demo Area or used in place

JS 9/22/11

(76) overcast 65F NASWS Retrofit

9/22/11

013-1646-011.900.01

1200 Cleaning up organic matter debris, stumps + trees around OWS area.

1230 @ 3C - backfilling with pea gravel + left over soil.

1330 @ 3C - backfilling
@ MH #3 - is set in excavation they are going to start backfilling with gravel tomorrow

1430 @ 3C - backfilling
@ MH #3 - setting risers, placing pea gravel

1500 cleaning up.

1515 J. Lamberts offsite for day

JL 9/22/11

(77) Sunny 70 NASWS Retrofit

013-1646-011.900.01 9/23/2011

0700 J. Lamberts on site

H+S tailgate - see HASP

Attendees: J. Lamberts
KC Wade
M. Huffman

800 Cal'd PID 2020 Sea 0250
100 ppm isobutylene
0 ppm air

S Matthews onsite for H+S audit

Crew is cleaning up + piling up om for shipment off site

1030 Digging out soil hills near MH #2. PID=0.0ppm

Crew cleaning up piles in Demo Area

Performing dust control w/ fire hose + hydrant water

1200 2 Loads taken to Demo Area. PID= 0.0ppm. No staining or odors. Still digging near MH #2

JS 9/23/11

(78) Sunny 70 NASWS Retrofit 9/23/2011

013-1646-011.900.01

1230 Went + looked @ MH 2-448 by outfall A - @ mid tide. High is @ 3:30pm, Low was @ 8am. No apparent flow on tideflex valve into MH. WLs are the same in both the vault + the MH.

Spoke with William Nelson of Boeing. He said he had lubricated + fixed the outfall A valve.

There is a chemical sheen on the water in both the vault + in the MH. Called Eberlin to let her know

1300 Digging at MH #2 - PID= 0.0ppm. Had to break through concrete with Demo Hammer - PID= 0.0ppm

1330 Working on soil pile @ Demo Area to make sure it is covered in plastic

1400 J. Lamberts off site

JS 9/23/11

(79) raining 60F ~~013~~ NASWS Retrofit

013.1646-011.900.01 9/26/11

0600 J. Lamberts onsite

H&S Meeting - see HASP.

Attendees: J. Lamberts
K Ober
T Bersch
KC Wade
M Hoffman

0630 crew prepping for day.

Plan: - install MH2
- finish @ 3C
- begin 3E
- check on MH 2.448
- dig run btwn MH2 + 3.

0700 Crew fixing plastic on soil pile @ demo site.

0730 Continuing to prep. They grabbed a forklift bucket full of soil from near MH2 to place @ 3C for backfill. MH2 is SW Area soil + can be used in industrial Areas.

JSI 9/26/11

(80) raining 60F NASWS Retrofit

013.1646.011.900.01 9/26/11

930 S Matthews called - let him know the plan for the day.

1030 @ MH2 - cleaning up extra soil + trucking to demo area

@ 3C - backfilling with gravel + 3 yards of soil from MH2 area.

Pipe Fitter Scott onsite. They will be working on MH 2-448 valve this week.

1230 Checked out MH 2-448 - water in MH. Couldn't tell the direction of flow. There is work going on @ the shut off valve (gate) @ vault before outfall. Called S Matthews + E. Schwinn and found out that they are fixing the motor + ensuring the valve will close completely.

Also E. Schwinn said they are trying

JSI 9/26/11

(81) raining 60F NASWS Retrofit

013-1646-011.900.01 9/26/11

to determine where to put the organic materials + sod and it will have to wait until Wed. The pile will have to be covered with plastic in the mean time

@ 3E - digging. Soil is being placed into a dump truck immediately to reduce mess on pavement. Dump truck going to demo area. No staining or odors observed.

@ MH 2 → MH3 - most of topsoil removed. They are going to have to start breaking up concrete. No staining or odors observed. Soil going to demo area.

Email from E. Schwinn: KC Wade now site contact/foreman.

1330 Using Demo Hammer to break up concrete @ MH2. There is almost 4ft of concrete to go through. Took photos. No odor or staining observed

JS 9/26/11

(82) raining 60F NASWS Retrofit

9/26/11

013-1646-011.900.01

@ 3E - still digging. No staining or odor observed. Trying to work around a piece of concrete - possibly building footing

There was oil coming from the dump truck along pavement. They set up some soaker diapers to prevent it from getting into CB.

1500 @ 3E - Digging. Had to move over to get around concrete. No staining or odors.

@ MH2 - @ correct depth. setting grade, getting ready to set MH structure

1510 J. Lamberts offsite. Before leaving I asked them to cover our pile with plastic + clean up.

JS 9/26/11

(83) raining 55F NASWS Retrofit

9/27/11

013-1646-011.900.01

0600 J. Lamberts onsite

0630 H+S Tailgate - see HASP.

Attendees: J. Lamberts
KC Wade
M Huffman
K Ober
T Beisch

Plan: • Continue @ 3E
• Dig out line btwn MH2 + 3

After I left last night, they attempted to set the MH2 but the inverts were found to be facing the wrong way b/c when the design was shifted over 9ft, the angles of ~~that~~ the inverts + pipe runs also changed.

Also, they did not cover pile of OM at the end of the day. Asked them again to cover the pile.

0730 @ 3E: digging out area to set drain

@ MH2: digging out run btwn 2+3 + waiting to find out

JS 9/27/11

(84) raining 55F NASWS Retrofit

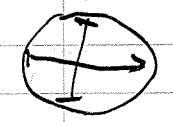
9/27/11

013-1646-011.900.01

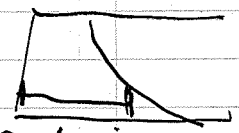
what to do about MH #2 inverts

0800 Construction Meeting
Samarah Rose
Eberlin Schwinn
Jill Lamberts

• Tideflex valve - Samarah said they are going to start backfilling b/c manufacturer said that 'a little' leakage is normal. Golder asked to hold off while Boeing goes to Geosyntec to determine if the leakage is acceptable. Called S Matthews + K Angelos to talk about it. They requested to get measurements of



top + bottom + side to side diameters and the distance to valve.



• Using Bioswale wetland seed mix on swales - ok'd by Boeing/Geosyntec
• Awaiting info on organics disposal
• awaiting info on MH5 + 4 - final decision to be made.

JS 9/27/11

013-1646-011.900.01 9/27/11

- stormfilter CB + vault going in this week
- new MH2 is being delivered today

0900 E ~~Sch~~ Schwinn asks for more BMPs @ 3E in case of rain. Anthony construction placed plastic + straw wattles

Also @ 3E: Drain is set. Backfilling with native material + pea gravel No staining or odors observed.

MH 2: Removed incorrect structure, prepping for new structure to arrive

OWS Area: Covered OM with plastic.

MH 2.448: no backfilling until action is determined about leakage.

1000 Boeing Team Mtg: talked about ~~Fl~~ Tideflex valve + suggested trying to open + close valve and get measurements. Asked KC Wade to go in, but they can't unless requested by Geosyntec.

JSI 9/27/11

013-1646-011.900.01 9/27/11

1100 3E - concrete cutting for tie in

MH2 - all set up + ready for installation of new structure
- breaking up recon along run btwn MH2 + 3. Removing recon + taking to demo area for crushing
- removing soil + taking to demo area
- No staining

1200 Spoke w/ T. Norton. Measurements + testing can be performed @ MH 2.448 if AC goes into MH again

1300 @ 3E - breaking up concrete + asphalt for tie in. No staining or odor observed. Concrete + asphalt being separated to take to demo area.

@ MH2 to MH3. continuing to dig along run. Breaking up concrete. No staining or odors observed

JSI 9/27/11

Sunny 65 breezy

NASWS Retrofit

013.6646-011.900.01

9/27/11

1400 @ 3E - pulling up asphalt + concrete
No staining or odors observed

@ MH2 → MH3 - breaking up recon, digging trench. No staining or odors observed. Soil to demo. Concrete to demo crusher.

1500 @ 3E starting to dig trench to 4½ in.
No staining or odors noted.
Soil going to 2.63 slab in Demo Area

@ MH2 - New structure has arrived.
They placed it immediately + started backfilling w/ pea gravel + gravel barrow to set it.
No staining or odor observed in soil.

1515 Cleaning up, getting ready to go.
Crew going to cover ~~plast~~ soil pile with plastic.

1520 KC Wade noted creosote odor in soil along MH2→3 trench.

1530 J. Lambats offsite. Left field book in Golden Trailer for T. Norton.

(see next page)

9/27/11

Sunny 65 breezy

NASWS Retrofit

013-6646-011.900.01

9/27/11

Creosote odor in MH2→3 trench noted.
Could be another pile cap in area.

Need to investigate further tomorrow.
Could smell it in soil around MH2 and ~~NEAT~~ to N of target excavation.

9/27/11

013 1646 11A 900.01 9/28/2011
NASWS Retrofit T. Norton
clear cool ~52°F

545 on site pick up file and PID @ trailer

calibrate PID PhotoVac ED H8332 with 100ppm C_4H_8 Lot# GAK-248-100-16 meter reads 100ppm.

555 at NA SWS.

605 H&S meeting with anthony const
Topic - Excavation safety
- traffic safety
- pedestrians

Attendees
K.C. Wade anthony
Mike Hoffman "
Tim Bersch "
Kyle Ober "
T. Norton GAI

POD - excavation for filter vault - fix pipe at roof drain E3.

(89)

9/28/2011

013-1646-11A-900.01 9/28/11
NASWS Retrofit T. Norton

615 Anthony will conduct equip. maintenance and make at trip to their yard prior to starting exc.

845 Crew @ E3 are excavating N of CB Box to make connection to existing 10-inch line PID 0.0 ppm No odor No staining - moved two bucket loads to soil ~~stock pile~~ Truck area for transport to Dems. Area/or reuse → street fill/load in single truck. no pop.

945 Mike Gleason was on site to check on const. for ~10 mins Just left. KC's crew setting up to exc for treatment vault T.ms crew has exc ~5 yds looking for 10inch line. encountered column foundation N & E of roof drain CB PID 0.0 No staining No odor

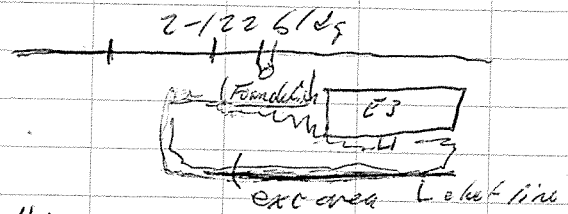
9/28/2011

(90)

013-1646.11A 900.01
NASWS Retrofit
Sunny lt breeze

9/28/2011
T. Norton

E3



fill > crushed rock and sand 8 inches
fine sand ~ to 5 ft

1015 leave NA and go to Job Shack

1040 back @ NA - starting to exc
for treatment vault removing
~~poured~~ FN concrete cdf 1.5 ft
below surface. Concrete may
not be poured but crushed
and reset by moisture

1115 Excavate treatment vault
area to ~3 ft bgs stockpile
soil in center, loaded concrete
for transport to crusher. No
activity @ E3

1140 Anthony driving concrete to
crusher

(91)

9/28/2011

013-1646.11A.900.01
NASWS Retrofit
Sunny Mild ~60°F

9/28/2011
T. Norton

1145 Treatment vault exc. PID 0.0
No odor No staining observed
while screening exc.

1205 excavated down ~1.5 ft further
PID 0.0 No Staining No odor

0-0.5 — Topsoil
0.5-1 — loose, dark yellowish brown
1-2.5 — unstratified fine sand little
silt little roots Fill
Recycled concrete
same sand (minus roots

Anthony drives soil to Southend
for reuse

1215 go down to south end Job
Shack - to check oil stained
foundations with Lumpkin

1250 return to NA - West
wall of exc down to ~9 ft
bgs. take PID reading of
soil on sloped E wall (0.0 ppm)
No odor or staining observed
with exposed soils

(92)

9/28/2011

013-1646.114.900.01
NASWS Retrofit

9/28/2011
T. Norton

1330 excavating bottom center found E Wall -> check soil in bucket PID 0.0 ppm No odor or staining
soil loose, dark yellowish brown, fine sand little silt ~~moist~~ unstratified moist (fill?).

1340 hit pile cap at N end of Excavation continue exc.

1430 cont. exc of pit PID from bucket/stockpile in pit 0.0 ppm No odor No staining

1515 working on over excavating to remove pile cap.
PID from stockpile 0.0 ppm
No odor No Staining
Water in exc Near pile cap
~1 ft below bottom of concrete

Tony Norton
9/28/2011

013-1646.114.900.01
NASWS Retrofit

9/28/2011
T. Norton

1545 clear soil off of pile cap - done excavating for the day

1605 EOD PID cal check 88 ppm.

files and logbook left on job shack for J. Lamberts

Tony Norton
9/28/2011

(95) clear 55F J. Lamberts

NASWS Retrofit 09/29/11

013-1646-011.900.01

0600 J. Lamberts onsite @ NASWS

H+S tailgate - see HASP

Attendees - J Lamberts - Golder

K Wade

M Huffman } Anthony

T Beisch

K Ober

Plan for day: - Tie in @ 3E

- Remove pile caps + work on excavation for media filter vault.

- Get Harper to come with demo hammer to break up caps

Yesterday after T. Norton left, they had a piece of equipment break + spilled a little oil (1 quart) on the soil. Crew will dig up soil today + place in a ~~bar~~ drum for waste Characterization

0800 Some crew offsite to gather supplies @ 3E - digging out tie in. Moving soil away from site into dump truck to take to demo area.

JL 9/29/2011

(96) clear 53F J. Lamberts

NASWS Retrofit 09/29/11

013-1646-011.900.01

at about 6ft bgs, they found some sheet rock + CDF. They are progressing carefully to find tie in.

CDF: Controlled density fill.

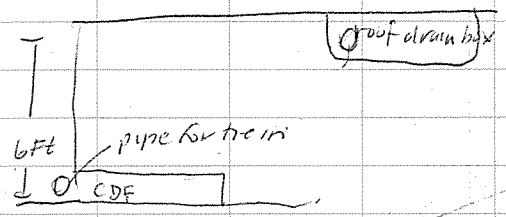
cal'd PID 2020 with 100ppm Isobutylene, zeroed with air.

PID = 0.0ppm on soil pile from 3E, No staining or odors.

Took photos.

Crew is going to borrow concrete breaker from Harper @ Demo Area to break up soil caps

3E Roof Drain Excavation



JL 9/29/11

(97)

NASWS Retrofit
013-1646-011.900.01

Sunny 60F
clear.

J Lambuts
9/29/2011

0900 3E continuing to work + dig out excavation.
called E Schwinn to find out if
she can get some better utility
dwgs. They are trying to
work around CDF.
PID = 0.0ppm. No stains or odors observed.

Also contacted E Schwinn regarding drum
of sludge @ MH#1. It needs to be
removed.

1000 AC Crew back onsite, moving gear,
prepping for work @ filter box.
Harper to remove concrete tomorrow

@ 3E continuing to dig. Cannot find
the pipe. Going to use grade lazer
to find it. PID = 0.0ppm. No staining
or odors noted.

1100 3E - still digging - not finding pipe

1130 Perform confined space entry in
MH to determine location of
pipe.

JSL
9/29/11

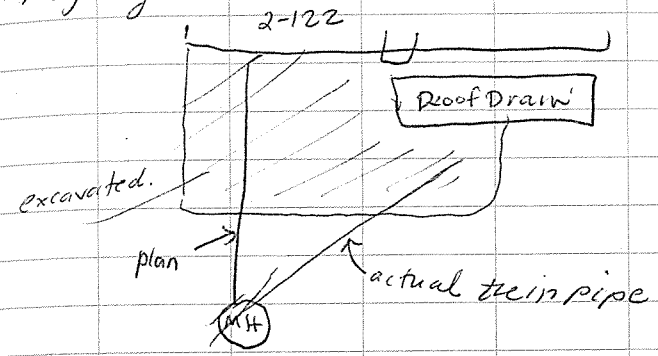
(98)

NASWS Retrofit
013-1646-011.900.01

Sunny 60F
clear.

J. Lambuts
9/29/2011

1200 Started removing more concrete to
find pipe. Backfilling in area where
they dug in error.



1230 Crew used a shovel + dug up
spilled hydraulic oil + soil &
placed it in a drum, Labelled
it with a DOT Label:
Profile: C0024B0E
Contents: Absorbent Items + debris contaminated
with oils, coolants, fuels, hydraulic
fluids, etc.
(They had obtained drum + label from Boeing
Haz Waste.
Golden
Checked soil for sheen + smell. It
appears to have been dug up.
No sheen or smell detected. PID = 0.0ppm

JSL
9/29/2011

(99) sunny, clear 65F J. Lamberts

NASWS Retrofit 9/29/11

03-1646-011.900.01

@ Filter Unit area: digging up remaining soil to take to Demo Area.
No staining or odor noted. PID=0.0ppm.

1200 3E – backfilling and compacting.
- cutting concrete to attempt to dig again + find pipe
- backfill material is soil from 3E.

1400 Spoke with E Schwinn about
- Valve – it may be faulty. A product rep may be coming out to check it out
- Organics. can be shipped off site to a recycler.
- Hydraulic spill – she had not been notified and may require an incident form filled out. Going to work with KC to determine proper response

1410 J. Kratzer (Harper) onsite to figure out how to get pile cap out of filter box

They begin clearing out more soil to get ready. PID=0.0 ppm. No staining or odors.

jsl 9/29/11

(100) sunny, clear 65F J. Lamberts

NASWS Retrofit 9/29/2011

03-1646-011.900.01

1500 T Sager onsite – take PID to Demo area.

1515 @ 3E – digging in new area. No staining or odors. Getting close to correct depth.

@ Filter Unit Area – cleaning up, getting ready for tomorrow

1530 starting to clean up, getting ready to go home. Covering piles, securing excavations.

J. Lamberts offsite

Jill Lamberts 9/29/11

(101)

NASWS Retrofit — Sunny/clear 65 — J. Lamberts

013-1646-011.900.01 — 9/30/11

0600 J. Lamberts onsite

0605 H+S tailgate - see HASP.

Attendees: J. Lamberts
KC Wade
M Huffman
K Oberl
T. Bersch

0610-730 Getting prepped for day, fueling, moving equipment, paperwork.

Cal'd PID 2020, Sea 0250
100ppm isobutylene
0ppm air

0730 @ 3E - digging to pipe, getting ready for tie in
PID=0.0ppm. No odor, staining

@ MH2 → MH 3 - digging trench for pipe tie in. PID=0.0ppm. No odor, staining

@ Filter Box area - GW in bottom of excavation.

0830 Harper onsite w/ large Sk 350 Concrete Breaker to pull out concrete pile cap in filter unit ~~ex~~ excavation

0900 S. Matthews onsite for visit

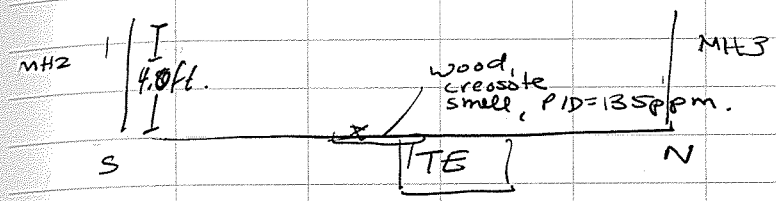
JSl 9/30/11

(102)

NASWS Retrofit — sunny clear 65F — J. Lamberts

013-1646-011.900.01 — 9/30/2011

0930 Digging trench along MH2 → 3, smelling creosote to S ~~the~~ of target excavation area. Saw wood called S Matthews + T. Norton. They will work with E Schwinn to determine plan of action.



They will likely have to over excavate + stockpile soil for WC. one sample will be taken @ bottom of exc to see if all soil was removed

@ 3E - building tie in, cutting pipe.

@ Filter exc: done breaking up concrete.
PID=0.0ppm.

1000 T. Norton to call E. Schwinn

JSl 9/30/11

(103)
NASWS Retrofit
013.1646.011.900.01

sunny calm
65

J. Lamberts
9/30/11

1100 M. Lumpkin ~~to break up~~ onsite to look @ creosote log + soil. AC. took one more scoop of soil + log was quite small (1'x2') M. Lumpkin recommended that since the amt was so small it could be just removed to the demo area with the other soil. Called T. Norton + he recommended that the logs be kept separate + disposed of at a later date. T Norton to call E. Schwinn.

M. Lumpkin also suggested the MH2 → MH3 trench was greater than 4ft deep and recommended that a trench box be placed if work is to be performed. J Lamberts let AC know They said ok + will stay out of trench

JSL 9/30/11

(104)
NASWS Retrofit
013.1646.011.900.01

sunny, calm
65F

J. Lamberts
9/30/11

@ 3E - they installed a trench box in order to perform the in. Exc. is ~6ft deep.

M. Lumpkin also suggested estimating total soil vol. taken to demo area: ~1100 yards to date has be taken over. ~100-200 yards are left.

1200 Digging up concrete chunks @ media filter vault, taking to demo area crusher

@ 3E - building the in

1240 once concrete is out, it was determined that wood piles will have to be cut off in order to get to grade. They may have to work tomorrow.

1350 @ 3E - pipe is in. Going to start backfilling soon

JSL 9/30/11

(105)

NASWS Retrofit — Cloudy 65 — J. Lamberts

013-1646-011.900.01 — a few light showers — 9/30/11

1350 @ Media Filter Vault (MFV): removing concrete + soil from exc. PID = 0.0ppm. No staining or odor, other than mound wood pilings which smell like creosote. They will have to remove up to 2ft of wood in order to get to correct grade to set the box. Soil doesn't require separation.

They mixed some soil in with some concrete so they have to dump it back out + separate it.

1440 @ 3E - backfilling with pea gravel, soil from Media Filter Vault, and soil from 3E.

@ MFV: digging out soil to grade. PID: 0.00 ppm. No stain or odor.

1530 @ 3E - cleaning up, securing hole
@ MFV: digging out soil. PID = 0.0ppm. Soil going to Demo Area.

JS 9/30/11

(106)

cloudy 65 — J. Lamberts

013-1646-011.900.01 — 9/30/2011

1530 Crew brought in a load of pea gravel.

KC Wade prepping exc. to install shoring so they can enter + dig out around wood pilings so they can cut off pilings. Wood should be wrapped up in plastic + placed in a roll off.

1540 cal check on PID = 87ppm w/ 100ppm isobutylene

1545 J. Lamberts off site

Jill Lamberts

9/30/2011

(107) overcast 60 J. Lamberts

NASW Retrofit 10/1/2011

013-1646 011 900.01

0600 J. Lamberts onsite

0700 HES tailgate - see HASP

Attendees - J Lamberts

RC Wade

M Huffman

T. Bersch

Plan of Day:

Clearing out soil from MFV exc.

Taking to Demo Area

Working on covering pile with plastic

Setting exc. box in order to clear around wood pilings in order to cut them of

0730 There is some GW in bottom of exc. Told them it couldn't be pumped onto grass. It either has to be containerized or left in exc.

Cal'd PID 2020 - Sea0250

100 ppm isobutylene

0 ppm air

JL 10/1/2011

(108) overcast 60F J. Lamberts

013-1646-011-900.01 10/1/2011

0800 Road along River in front of Demo Area is closed off. I called Boeing Security 206 655-8800 to find out why. Also emailed E. Schwinn + J. Ridgeway. Security directed me to call Matthew Steinbrier (not exactly sure of last name), Plant 2 SSO @ 206 930-2101. The Road is closed indefinitely because of pot holes. Notified E. Schwinn, T Sager, M Lumpkin, J. Ridgeway

0830 J. Ridgeway onsite to check out work. Offsite right away.

Crew is removing remaining soil to take to demo area and getting ready to set trench box.

Taking photos

PID = 0.0 ppm. No staining or odors

JL 10/1/2011

(109)
NASWS Retrofit
013-1646-011.900.01

overcast 60F

J. Lamberts
10/1/2011

There is about 1' of GW in bottom of exc.

900. PID=0.0ppm @ MFV soils. They are still prepping to put trench box in

0930 K. Chambers onsite, gave book to him, J. Lamberts offsite.

1045 Excavated (1-2cy) soil from south of oil-water separater. Preping excavation for trench shoring.

1136 Preparing trench shoring for installation into excavation for filter system vault

1239 Continuing to prepare trench shoring

1353 Trench shoring assembled

1430 Crew took lunch

1500 K Chambers offsite. Left book for J. Lamberts in Ke Wade's vehicle

10/1/11

(110)
NASWS Retrofit
013-1646-011.900.01

overcast 60F

K. Chambers
J. Lamberts
10/1/2011

1545 J. Lamberts onsite.
Crew has shoring in ground, starting to dig out by hand around wood pilings

1615 Digging + cutting wood pilings.
Crew tried to get rolloff box but no one is available to get one. I instructed them to wrap logs in plastic + leave in exc. area until monday when they can get a rolloff from Shirley @ Haz Mat.

1650 Working on removing wood piles PID=0.0ppm. Slight creosote odor, No staining.

1700 S. Matthews called. Gave him update

Checked soil from bottom of MFV exc. from around soil, in bucket: 0.0ppm. No odor.

10/1/2011

(111)
NASWS Retrofit
013-1646-011.900.01

Overcast 60F
scattered showers

J. Lamberts
10/1/2011

1730 Still digging, removing wood
PID = 0.0ppm. No odor or staining

1815 Still digging, removing wood.
PID = 0.0 ppm No odor or staining

1830 Still approx 6 more wood piles to come out but crew is starting clean up.

1900 Crew covering soil piles with plastic @ demo area

1930 J. Lamberts off site for the day

Jill Lambert

(112)
NASWS Retrofit
013-1646-011.900.01

overcast 50F

J. Lamberts
10/3/2011

0600 J. Lamberts onsite

0605 H+S briefing/tailgate - see HASP
Attendees. J. Lamberts - Golder
KC Wade
K Ober
T Bersch
M Huffman
} Anthony

0610 → 730 : P

- Unloading soil @ demo area
- Getting a load of gravel barrow for back fill
- Digging out wood pilings in MFV, cutting them off, wrapping in plastic. No staining or odor.

T. Bersch went to talk to Shirley at HazMat to arrange a tub skid or container. She is going to get one once she gets the appropriate shipping label.

- 0800 Ness Cranes onsite, getting set up to place MFV.

JSL
10/3/2011

NASWS Retrofit raining 60F J. Lamberts
013-1646-011.90001 10/3/2011

0830 Prepping exc for grade, lifting trench box to be level, wrapping up wood piling pieces

S Matthees onsite to check out progress.

0915 D. Crawford onsite, offsite again

Pipe fitters prepping pipe for tie ins at MH #2

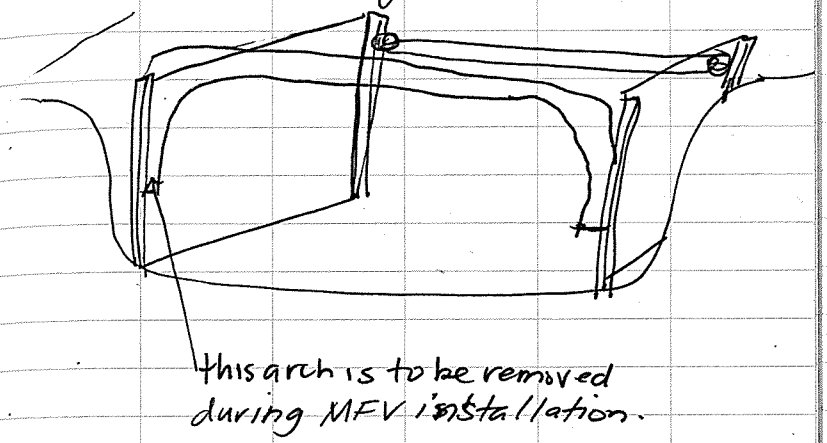
0945 Ness Crane people onsite to get ready to set MFU.

KC Wade (superintendent) said that they have to remove a piece of the trench box in order to get the concrete pieces into the exc. Golder encouraged them to have a safe box ~~but~~ but there does not appear to be a way to fit the concrete in without removing the archway

JSl
10/3/11

NASWS Retrofit raining 60F J. Lamberts
013-1646-011.900.01 10/3/2011

for a short period of time. The trench box will be supported on one side only:



1000 - 1130: Prepping for MFV installation:
- put down fabric on bottom of excavation
- backfilled to grade with gravel barrow, tamped ~~and~~ down with plate compactor.

Working on tie in for MH #3 to OWS.

1130 Ness Cranes onsite to start installation of MFU.

JSl
10/3/2017

NASWS Retrofit
013-1646-011.900.01

overcast 65

J. Lamberts
10/3/2011

1200 Placing ~~pea~~ gravel to get to grade in MFV

1233 Placing pea gravel

1300 Crew removed arch in trench box.
Crew is staying out of excavation currently

Crane setting up to place box (MFV)

1348 Getting ready to set bottom of MFV
Oldcastle reps onsite (poured MFV)

1405 Bottom is set.

1411 Placing tape gasket, setting S facing wall.

1415 - 1700:
Crew measured + remeasured MFV base + found that bottom was set 10" too high. Survey points were based on inside dimensions of MFV and therefore didn't account for width of concrete. Everything will have

JSL 10/3/2011

NASWS Retrofit
013-1646-011.900.01

overcast 65

J. Lamberts
10/3/2011

to come out, they will have to dig down deeper, ~~rase~~ cut off more wood piling, reset bottom grade with gravel + pea gravel, and reset box at a later date

Eberlin Schwinn onsite to see how things are going. Addressed various safety issues:

- better fencing around excavation
- trench box in MH2 → 3 where depth is > 4 ft deep
- trench box in excavation not set properly
- housekeeping, garbage
-

J. Krauzer called (Harper) - to ask that they don't drive along road by Duwamish for soil trucking

1700 Cleaning up, offsite for the day.

JSL 10/3/2011

(117)
NASWS Retrofit
013-1646-011-900.01

overcast 55

K. Chambers
J. Camberts
10/4/2011

0600 K. Chambers on site

0700 Preparing equipment & materials for the day

0730 Wrapped excavated timbers into plastic & loaded into tub skids

timbers tub skids moved to south end of demo area near oil-water seperator

(118)
NASWS Retrofit
013-1646-011-900.01

overcast 55

K. Chambers
J. Camberts
10/4/2011

0800 Construction Meeting
S. Rose
E. Schwinn
J. Camberts
K. Chambers.

H+S issues:
- fencing
- trenching
- housekeeping
- stop, clean up.

- All parts + pieces onsite for construction of MFV

- Utility vault lids may not be correct specification, new lids on the way. They need to be replaced so they can be driven on

- Tubskids onsite for wood pilings. Wrapped in plastic. They need labels

jsl
10/4/2011

(119)

NASWS Retrofit — overcast 60F — K. Chambers, J. Lambert

013-1646-011900.01 — 10/4/2011

- Continuing on MH2 → 3
- Need to check on MH6 invert elevation
- Installing weirs, in MH4, 1 this week or next.
- MH6: install tie in – done from inside out or outside in?
- Tideflex valve: could be faulty valve. Need a rep on site to check out valve.
- Bioswales to be hydroseeded today
- Completion pushed back to first week of November E Schwinn to find out if there is a problem with this
- Concrete forms on Roof Drains:
  - 5A fencing?
  - 5B - need curb
  - 3A/B - curbs
  - 3C - slab + curb
  - 3D - ~~curb + slab~~ curb
  - 3E - slab + curb
- Potentially working Saturdays, working Fridays for sure
- Water from MH #6 - potential to NBF.
- Sludge from MH #1, drum

JSL 10/4/11

(120)

NASWS Retrofit — K. Chambers, J. Lambert

013-1646-011-900.01 — 10/4/2011

0900 gave book to Kyle Chambers

0915 J. Lambert off site

0855 Excavating pea gravel from over timbers (piles) under media filter vault

0957 Excavating pea gravel from under media-filter vault pit, loading into dump truck

1015 Calibrating PID

Span	Peak
100ppm	256ppm

1038 Soil excavated ~6" below previously excavated base of pit for media filter vault

← soil a sandy-silt, no staining or odor, PID ~1.4ppm (PID drifting)

1042 Recalibrated PID

Span	Peak	Checked w/100ppm
100ppm	0.0	200ppm ← read

1045 Excavated south half of Media filter pit ~6" deeper, preparing to cut timber piles

KC

NASWS Retrofit 10/4/11
013-1646-011900.01 K. Chambers

1110 Anthony crew left excavation to pick up trash around site

1215 Cutting timber piles in media filter pit

1304 Excavating soil from bottom of media filter pit, Piles were removed
↳ PID 0.0 ppm, wet sandy-silt no stains, no odor

1308 Three photos taken of excavation site (media filter vault)

1315 Walked site. No sign of hydroseeding of swales or concrete poured @ downspout media filter boxes

1415 Delivered excavated soil to 2-40 demo area stock pile. (one truck load of soil removed)
Preparing to place metal fencing around media filter vault excavation

1430 Kyle off-site. Anthony finished for the day

KC

NASWS Retrofit 10/5/11
013-1646-01.900.01 K. Chambers

50°F Cloudy, rain

0700 K. Chambers + Anthony crew on-site

0715 Discuss supply run to pick up materials to finish forms around down-spout media filter basins

0750 Took 5 photos of hydro-seeded swales (hydroseeded yesterday)

0815 Anthony Construction is planning to work on forms for down-spout media filters and cleaning up the site. Not expecting to dig today, KC has K. Chambers business card and will call if they decide to dig today

0830 K. Chambers off-site

KC

NASWS Retrofit
013-1646-011.900.01 K. Chambers

50°F Cloudy

0700 K. Chambers on-site, Anthony Co. on-site
Took two pictures of MFV pit. Shoring was removed yesterday.

0800 Preparing site for work - removed fencing

0820 System Co. arrived to pick up shoring

0905 Took pictures of MFV fillers, and fencing around construction site
Somara on-site

1000 Organizing supplies in Con EX

1020 Calibrating PhotoVac 2020 PRO
Span 100 ppm
zero to ambient air

1030 Ness crane arrived, and Ness flat bed truck ~~w/new shoring~~ correction, the materials are associated w/the crane

1130 Pay Dirt Co arrived w/ new longer trench shoring

KC

NASWS
013-1646-011.900.01 K. Chambers

1130 Took pictures (2) of crane & longer shoring

Calibrate PE PhotoVac 2020
Zeroed in ambient air
Span 100
Peak 0.0

1200 Assembling trench shoring
↳ took several pictures

1235 Trench shoring set into MFV excavation

1250 Roof Drain 5B drainage basin curb cement poured (photo)
Roof Drain 3A curb cement poured (photo)
Roof Drain 3C slab being poured (photo)
Repairing irrigation line in swale A4 (photo)
Roof Drain 3B curb cement poured (photo)

1330 Replacing fencing around excavation site (photo)

KC

NASWS Retrofit (125) 10/6/11

013-1646-011.900.01 K Chambers

1345 Sweeping parking lot adjacent job site.

1430 No construction activity

1445 Excavating gravel from north end of MFV pit, ~~to level~~

1530 Continuing installation of irrigation tubing in Swale A4
- Working on form at 3D
- Placed cement slab at 3C and two of three adjacent sidewalk tiles (photo)
- Working on touching up curb cement at 3A

Call Kelly Bottem (ARI) 206-695-6211

1600 TCLP for creosote ← NWT PHDx and chloropenta
↳ how much to collect? 2-8oz jars
↳ 5 day turnaround
P.
↳ from utility pile

-phenol 8270 ↑ (and creosol)

1550 T. Norton on site

KC

NASWS Retrofit (126) 10/6/11

013-1646-011.900.01 K Chambers

1630 No Construction activity
- Completed installation of irrigation tubing in Swale A4 (took photos)

1645 Roof Drain curb form in progress (photo)

1700 Anthony is placing in the bottom of MFV
Kyle Chambers off-site

KC

NASWS Retrofit (127) 10/7/11
013-11646-011.900.01 K. Chambers

0700 On-site. Tim discussed safety & crew signed Anthony H+S form
- Yesterday, after 5pm MFV excavation was backfilled w/a layer of quarry spalls (~~4" to 8" thick~~) KC correction (~8" thick)
- Prepping site for work

0800 Mike arrived w/truck of pea gravel (photo)
- Ken I. on-site, Somara on-site

0840 Tim starting backfilling w/pea gravel the base of MFV excavation, atop the quarry spalls (photos

0915 Antek (Matt) inspected gate (tide gate) and a gap on the left side which is wide enough to stick an arm into.
↳ Matt will return to inspect leak at 3-4pm today during high tide
↳ also tide gate was rotated off its designed axis

0930 Tim & Mike raking pea gravel to grade in MFV excavation (photo)

1000 Ness Crane employees arrive on-site

1015 Preparing crane

KC

NASWS Retrofit (128) K. Chambers
013-11646-011.900.01 Overcast 60°F 10/7/11

1030 Placing MFV base into excavated site

1052 Placing south face of MFV

1120 West wall of MFV placed

1135 East wall of MFV placed

1150 North wall of MFV placed
Grouting seams between walls

1230 Left site to get ice
- installing filters into MFV

1300 Left to Golder trailer to prepare supplies for sampling timber piles

1400 MFV top slab placed. Filters stacked (stored) inside MFV but not arrayed & completely installed

Sampling timber pilings
Sampling time 1430
P21M-NASW-13-WC-WD
WD = wood
creosote
chloro pentophenol
sample drilled shavings from ~ 0.0-1.5" depth into timber pile from outside ~~(photo)~~ KC bag resealed, unphotoed

1615 Anthony Co is off-site

1620 Anthony Co is on-site

1730 K. Chambers offsite

KC

NASWS Retrofit
073.1646.011900.01

overcast 60F

J. Lamberts
10/10/11

0600 J. Lamberts onsite. No one around, found out crew is starting @ 7am.

0700 AC crew onsite.
Ats tailgate - see HASP.
Attendees: J. Lamberts
KC Wade
T. Bersch
K. Ober
M. Huffman
R. Romero.

PoD:
- grout sides of MFV
- backfill around MFV
- set concrete forms for roof drains
- work on tideflex valve - remove rings + bolts, set it straight up + down, try to seat it better. Doing work @ low tide (10 am).

7-10 - grouting seams in MFV, backfilling

10-12 filled in small 4" pipe in MH 2-448 (outfall A) with concrete

JSL 10/10/11

NASWS Retrofit
073.1646.011900.01

overcast 60F

J. Lamberts
10/10/11

loosened metal ring + bolts in hopes that the tide pushing back will help reset valve.

900 - Brent Miller @ Geosyntec onsite. Did a site walk to look @ Bioswales. They need to determine if the gravel-perelite mixture should be seeded in addition to the dirt berms + sidewalls

Checked out Roof Drains.
5B - curb + slab complete
3A/3B - curb + slab complete
3C - slab complete, need curb + sidewalk
3D - needs curb
3E - need curb
3F - needs curb + slab

He will be onsite tomorrow to discuss location of MH5.

JSL 10/10/11

(131)

NASWS Retrofit raining 55F J. Lamberts 10/10/2011

013-1646-011.900.01

12 J. Lamberts offsite to Redmond office

1345 J. Lamberts back onsite

Crew is grouting in MFV + setting filter units, Backfilling with pit run along sides of vault, Moving pea gravel along the side of the run from MH2 → MH3 in preparation for backfilling

1400-1530 continuing - more of the same

1530 J. Lamberts offsite
Called S. Matthees

[signature]
10/10/2011

(132)

NASWS Retrofit raining 55F J. Lamberts 10/11/11

013-1646-011.900.01

0700 J. Lamberts onsite

0705 H+S tailgate: see HASP.
Attendees - J. Lamberts - Golden
T. Bush
K. Wade
K. Ober
M. Huffman
R. Romero.
Scott.
} AC

0745 Ken L. onsite (owner of AC)

Looked @ MH-2-448 - tide to high to see anything.
Wait until low tide @ 1100 am

POD: · backfill @ MFV
· grouting, placing filters @ MFV
· building forms for Roof Drains
· working on 2-448.

0800 cleaning up, grouting, placing filters in MFV.

JSL 10/11/11

NASWS Retrofit rainy 50F J. Lamberts
OB-1646-011.900.01 10/11/2011

0800 Construction Meeting
S Rose
E. Schwinn
Ken I.
J Lamberts
B Miller

Concrete @ Roof Drains - pour Thurs.
Working Saturdays
Finishing off - sod, dirt, replenish.
MH 2-3, then 5-6.
Figuring out where to put MH #5,
Figuring out what to do with
Roof Drain 3F.

Summary of day's events.

7-4: grouting @ MFV, backfilling,
building tee in btwn OWS + MFV,
placing filter units in MFV.

1100: checked on MH 2-448 tide flex
valve. WL still too high to
see anything, but tide flex valve

JSL 10/11/11

NASWS Retrofit rainy 50F J. Lamberts
OB-1646-011.900.01 10/11/2011

hasn't moved so far. Likely will have
to remove it completely + reinstall.

1400 Starting to place pipe btwn
MH 2+3, getting trench to
correct grade, placing
pipe, back filling with pea
gravel.

1530 Continuing to place pipe
btwn MH 2+3 ~~to~~ getting
to correct grade. No
excavating.

J Lamberts off site

JL Lamberts 10/11/11

NASWS Retrofit mostly Clear 50°F K. Chambers
013-1646-011.900.01 (135) 10/12/11

0700 On-site: K. Chambers ; Anthony Construction

0730 Backfilling pea gravel over pipe (photo) that runs plant-north from storm water manhole towards Oil/Water separator

0836 K. Chambers off-site

0915 K. Chambers on-site
Backfilling pea gravel over pipe (continued) pinched

0950 PID calibration (PE Photovac)
zeroed in ambient air
span 100ppm Peak 707ppm

0955 Ness Crane on-site

1026 Ness Crane preparing rig for use

1130 Ness Crane pulled shoring from MFV trench (photo)
Anthony Co. desembled shoring
S. Matthews on-site (left 1126)

KC

NASWS Retrofit (136) 10/12/11
013-1646011.900.01 Cloudy 55°F K. Chambers

1230 Pay dirt Co. arrives w/ smaller trench boxes (photo)
Backfilling manhole vault w/ crushed rock (photo)

1330 Continued backfill of manhole vault
Dropped filters into MFV for future install

1430 Continued back filling of manhole vault
Dropped filters into MFV for future install

1530 Continuing to backfill around manhole vault

1630 No new progress
Compacting crushed rock backfill around manhole vault (photo)

1635 Kyle off-site
Anthony Co. cleaning up site in preparation to leave

Kyle Chambers KC
10/12/2011

NASWS Retrofit Sunny 65F J. Lamberts
013-1646-011.900.01 10/13/2011

0700 J. Lamberts onsite
H&S tailgate - see HASP.
Attendees - J. Lamberts
KC Wade
K Ober
T Bersch
M Huffman
R. Romero
S. Chambers
Michael - ?

0700 - 0800
MFU - grouting + placing filter units
MH2 → MH3 run: digging out trench, placing pipe, bedding with pea gravel, backfilling with pit run.

0730 Cal'd PID: Sea025D
100ppm isobutylene
0ppm air

Soil from trench MH2 - MH3
PID=0.0ppm.

JS 10/13/11

NASWS Retrofit Sunny 65 J. Lamberts
013-1646-011.900.01 10/13/11

800 - 1030 - More of the same. Soil from MH2 - MH3 is being trucked over to Demo Area + placed into a hole. See notes from Demo for location.
So far - 4 truckloads today
0.5 truckloads yesterday

PID=0.0ppm.
Taking photos.

Also walked around buildings to look @ Roof Drains - 3C - ready for curb + sidewalk, 3D - ready for slab, 3E - ready for curb, 5F ready for ~~curb~~ slab.

900 United rentals onsite to take last of large trench box pieces away.

@ MH 2-448 (Tideflex valve): they are trying to help push it out by applying some tension to the valve.

JS 10/13/11

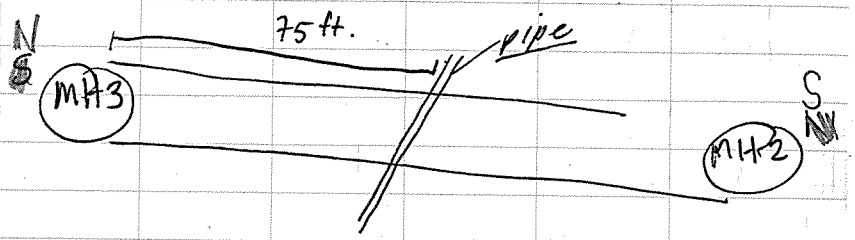
NASWS Retrofit sunny 65F J. Lamberts
013-1646-011.900.01 10/13/2011

1040 MH2-MH3: PID=0.0ppm

1135 Pouring concrete @ 3C, 3D, 3E
Ira from Mayes onsite to do testing

Digging trench run, 5th truckload to demo. btwn MH 2+3, 50ft left to go until MH3. PID=0.0ppm.

Found an old tile pipe crossing trench at 4ft deep. Broke it, plugged both sides with concrete. Location is ~75ft NW of MH3, 6" clay pipe, running at an angle towards Duwamish River



Took photos.

JS 10/13/11

J. Lamberts sunny 65F NASWS Retrofit
10/13/2011 013-1646-011.900.01

1240 Pumping out @ MH 2-448 to work on valve

Digging trench, laying pipe, backfilling with pea gravel @ MH 2→3

Pouring concrete.

At MH 2→3, they encountered another pipe, 12", 50ft S of MH3. Metal pipe, 2' bgs.

Took photos

1320 Filling 6th truckload

1430 emptying out MH 2-448 putting water on grass.

Digging MH 2→3 trench, PID=0.0ppm
Filling 7th truck load.

JS 10/13/11

(141)

NASWS Retrofit sunny 60 J. Lamberts
013-1646-011.900.01 10/13/11

1500 ~~Rankinton~~ Came across a piece of concrete ~~[illegible]~~ @ ~30ft from MH3. Broke concrete off + exposed metal conduit. I called M. Lumpken, he came over + look + determined it was power. The power had been decomissioned + the pipes were filled with dirt. The surrounding concrete was tinted red.

5ft further S, the crew broke a piece of PVC 6" pipe which appears + smells like sewer. Flow appears to be from the Duwamish. Called KC Wade to look. He will call Eberlin.

1530 Tried to get a hold of Eberlin but could not get thru. Crew proceeded to start putting in a new piece of piping ~~with~~ after placing a trench box.

JSL 10/13/11

NASWS Retrofit sunny 60F (142)
013-1646-011.900.01 J. Lamberts 10/13/11

I called S Mathees + he said to fix it too.

1545 J. Lamberts offsite. Repair not complete yet.

Jill Lamberts 10/13/11

NASWS Retrofit — overcast 50F — J. Lamberts
013-1646-011.900.01 — 10/14/11

0700 J. Lamberts onsite
HHS tailgate - see HASP
Attendees
- J. Lamberts
- KC Wade
- M. Huffman
- M. He?
- R. Romero
- T. Beisel

0705 E. Schwinn called. She said she told them to repair. Suggested I call Scott to find out what to do with soil

Called S. Matthews. He says to segregate it into a drum and sample for Metals, but Eberlin needs to check with Mary Jo Donnelly to find out if other sampling is necessary

Called Eberlin to let her know. Let KC Wade know as well.

NASWS Retrofit — overcast 50F — J. Lamberts
013-1646-011.900.01 — 10/14/2011

Crew is gassing up, getting ready to get to work.

Crew had repaired sewer line last evening. Took photos

Two new crew members onsite
Steve — Mitch
Jim Lumas — Scott.

0730 Packing/Compacting @ MH1.

Getting drum for soil with sewer water on it.

0750 Filling first truck load to take to demo area.

Cal PID 2020 Scan 0250
100 ppm isobutylene
0 ppm air

0800 M. Huffman went + spoke w/ Shirley @ Haz Mat. She called about sewer soil

NASWS Retrofit overcast 50F J. Lambetts
013-1646-011.900.01 10/14/11

her bosses + they determined that it could be mixed in with all the other Demo (IA) soils + trucked to demo site. Called Scott to let him know. RC called Eberlin to let her know.

0805 First truck to Demo area offsite

0830 Filling 2nd truck

Backfilling with 'Pit run' in trench.

Compacting in trench.

Setting filters in MFV.

For MH 2-448. Low tide is @ 1pm, so they will start pumping out at 12pm + perform work this afternoon to get valve out + reset.

0900 Things are stalled in MH2→3

JSl 10/14/11

NASWS Retrofit overcast 50F J. Lambetts
013-1646-011.900.01 10/14/11

trench because it was determined that the 12" metal pipe is in the way of the SW pipe run btwn MH2-3 Crew is measuring and trying to figure out what to do.

Eberlin called + said she is going to try to find out what to do, + determine what the pipe is for, to see if it can be cut + plugged.

She also said she was going to verify with Mary Jo about the sewer-soil + what can be done about it. I also called Ted Norton to find out but there was no answer.

1000 K. Isenhut onsite to look at MH2-3 run + see if anything can be done.

Crew is still compacting also along MH2-3 run.

JSl 10/14/11

NASWS Retrofit — overcast 55F — J. Lamberts
013-1646-011.900.01 — 10/14/2011

1030 J. Lamberts offsite
1100 J. Lamberts onsite

Crew has reexcavated one length of SW pipe back towards MH2 and will adjust the slope of the pipe down a little in order to clear below the 12" metal pipe. They also had to cut a portion of MH3 in order for it to accept the pipe at the correct angle.

1140 Still filling ~~3rd~~ 2nd truck load.

E. Schwinn called. She is still trying to find out about sewer soils.

1200 Talked to Ted Norton. He said he will call Marybe Donnelly to confirm, but the leave in place or mix with soils going to Demo option is most likely ok.

1205 2nd truck load filled.

JSl 10/14/11

NASWS Retrofit — overcast 55F — J. Lamberts
013-1646-011.900.01 — 10/14/2011

Let E. Schwinn know ~~the~~ what Ted said.

1330 MH2-448 (Tideflex) - pumping out, going to attempt to pull it out

MH2 → 3 grading along trench, placing pipe, backfilling

3D → pouring curb (Ira from Mayes onsite)
3E → pouring curb

3rd truck load over to Demo area

B. Miller - Geosyntec onsite to deliver plans for SF.

Got an email from MJ Donnelly about sewer line. She is looking into it.

1400 J. Lamberts offsite, gave Kyle Chambers the book.

JSl 10/14/11

NASWS Retrofit — Sunny 55F — J. Lambert, K. Chambers
013-1646-011.900.01 — 10/14/2011

1520 K. Chambers on-site
@ 1500 Anthony Construction truck delivered load of soil to 2-40 demo (~~ta~~ quantity unknown)
• Tension placed on tide gate to assist its being pushed out by the high tide
1530 K. Chambers off-site.

Kyle Chambers
10/14/2011

NASWS Retrofit — Sunny 55F — K. Chambers
013-1646-011.900.01 — 10/15/2011

0700 K. Chambers on-site
Anthony Co. starting equipment
0800 • Compacting backfill around MFV
• Working on form at Roof Drain ~~E3~~ 3E
• Anthony put new tension on tide gate, tide came in and unable to get a harness around it to attempt to pull it out w/a gradall
0900 Got steel cable choker around tide gate & pulling out w/gradall (photo)
1000 Completely removed tide gate (photo)
~~7~~ 1100 Beginning excavation south of manhole to stormgate manhole
• Continuing to backfill MFV w/gravel
PID reading of soil between stormgate manhole and next manhole north
↳ 0.0 ppm continuous PID readings in soil in excavator bucket
↳ no staining, or odor from soil
1200 Anthony Co. dumped load of soil at 2-40 demo area at designated location
1230 Anthony Co. dumped load of soil at 2-40 demo area at designated location

NASWS Retrofit (157) sunny 55F K Chambers
013-1646-011.900.07 10/15/11

1245 Took PID readings inside trench from manhole, south 25'; continuous readings 0-4' bsg
↳ 0-0ppm, no stains or odor
Took PID reading from excavator bucket scooped ~30' south of manhole 1-2' bsg
↳ 0.0ppm, no stains or odor

1300 Tide gate valve placed behind construction fencing (photo) & lid replaced on drain vault.

1400 Installed first length of pipe south of manhole (photo) & backfilling w/gravel
• Anthony Co delivered two more trucks of soil to 2-40 demo site at designated location.

1430 K. Chambers off-site
Anthony Co. to backfill around roof drain basins and leave at ~15:00

Jill Lemmler
10/17/11

NASWS Retrofit clear 50F (152)
013-1646-011.900.07 10/17/11

0700 J. Lamberts onsite
H+S tailgate - see HASP
Attendees - J. Lamberts - Golder
- D Cassell
T Bersch
S. Messingale
K C Wade
S. Chambers
J. Siregar
R Romero
M. Huffman
K.O. ?

0730 J. Lamberts offsite
0900 J. Lamberts onsite

@ MH#1 - finished digging trench from MH 1 → MH 2, placing pipe, & cutting concrete of MH1 to build tie in

Cal PID 2020 Sea 0250
100ppm isobutylene
0ppm air

Soil btwn MH#1 + 2 : PID=0.0ppm, no staining or odor. Soil going directly into dump truck, then to demo site.

@ MFV → MH #2 tie in : digging trench, cutting thru roots, trimmed trees. Checked soil pile : PID=0.0ppm, No staining or odor. Piling soil up beside trench.

0930 Concrete truck onsite.

Taking photos.

@MFV: placing filters

@Roof Drains. landscaping, cleaning up concrete forms, taking down barricades

@ MH 2-448 (Tideflex): Valve is out, a rep is to come onsite to check it out. Possibly today.

JS 10/17/2011

1040 MH 1 - sawing thru concrete for tie in.

Loading soil @ MH5.

1st load to demo area.

Setting trench box @ MH5

Spoke with M. Lumpkin. He is coming over to bring charger + new field book.

1100 Filling 2nd load of soil from MH5.

MH#1 - setting pipe + tie in to MH2.

Ken I. (Anthony owner) onsite

1130 M Lumpkin onsite. Dropped off PID charger + new field book.

2nd load of soil to demo area

Ray Power came thru to inspect site.

JS 10/17/11

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NASWS Retrofit
October 2011 – November 2011
Book 4

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

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Project NASWS Retrofit
Boeing Plant 2
013-1646-01A

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cell · 206 384 · 7078

Alt Boeing contact: Jon Ridgeway
cell · 206 618 8686

Anthony Construction
KC Wade 206 793 3345

GeoTech (compaction testing)
Mayes Testing
Ira Sisson ~~425~~ 206-859-3075

NASWS Retrofit
013-1646-11A

Sunny 60F

J. Lamberts
10/17/2011

1130 Filling 3rd truckload of soil from MH5 Area to Demo Area.

Taking photos.

1200 3rd truck load full, heading to demo area
Continuing to dig out MH5 trench.
PID=0.0ppm. No staining or odor.

@MH 1- cementing pipe tie in to MH.
PID=0.0ppm. No staining or odor

1220 @MH1 - placing pipe, pea gravel, set shut off valve for redirect of Line B into Line A

Checking inverts for MH4, 5 tie ins.

1300 J. Lamberts offsite
1345 J. Lamberts onsite.
@MH1 : finished tie in, backfilling
@MH5: trench box in, digging along tie in, PID=0.0ppm. No odor or stains.
3rd truck over to demo area

JSL
10/17/11

NASWS Retrofit
013-1646-11A.900.01

Sunny 60F

J. Lamberts
10/17/2011

Crew has trucked in 4 loads of gravel pit run for backfill.

At various roof drains, crew is cleaning up forms, landscaping, raking

1415 Talked to KC - estimates approx 12 loads left to go to Demo Area

@MH#1: ~~BMH~~ placing pipe, pea gravel

1430 @MH#1: backfilling
MH#5: excavating - PID=0.0ppm, no staining or odor. Crew working in trench box

1510 MH#5 - finished excavating for day. Filling 4th truck load.
PID=0.0ppm. No staining or odor.

Confined space entry @ MH4 to figure out elevations & pipe diameters

JSL
10/17/11

NASWS Retrofit
013-1646-11A.900.01
Sunny 60F
J. Lamberts
10/17/11

MH #1 : cleaning up, finishing backfilling

MH 2.448 (tideflex): plan is to install tomorrow morning @ 3am + try to get it in correctly.

MH#5 : cleaning up oil + debris, making site safe.

Called Smathers + M. Lumpkin to let them know plan for tomorrow. Also called Eberlin to confirm

There is atleast one more load to be taken to demo area.

1530 J. Lamberts packing up.
PID cal check: 90 ppm.

1545 J Lamberts offsite

(58th load sent to demo area)

J Lamberts 10/17/2011

NASWS Retrofit
013-1646-11A.900.01
Clear 50F
J Lamberts
10/18/11

0240 J. Lamberts onsite.
AC crew already onsite + setting up lights, lid is off of MH 2.448

0300-700 Installing tideflex valve.
Low tide @ 3:19 am (-0.2 ft)

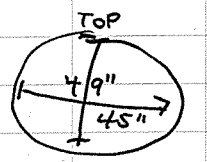
Crew attempted to push it in for ¼ of the way, then entered the vault + set up to pull it through with a come along. A forklift was used to keep it level + the top @ 12 o'clock.

By 700 am, the tide was coming in fast so the crew cleaned up + secured the valve for tomorrow. They got the valve in about ½ way. It is still not preventing water from entering the vault

JS 10/18/11

Called S Matthees to let him know + give updates.

They also measured the valve



Tide water is still flowing through the valve into the MH. at half-way installed.

Took photos..

0700 Rest of crew onsite.
H+S Tailgate - see HASP.
Same attendees as yesterday.

0800 Digging @ tie in btwn MFV and MH5, looking for pipe that exists btwn MH4+5.
They found it. PID not calibrating because of dew, but no odor + staining observed.

JSL 10/18/11

Soil is getting piled up for now. It will be trucked to demo area.

Crew is cutting brush + trees + piling on our pile.

~~08~~0900 @ MH5 - found pipe. Exposing it more, getting ready to place tie in. Soil has no staining or odors. They are piling soil up nearby excavation. There is a trench box over where the pipes are connected together.

0946 Cleaning up soil from MH5 tie in - 1st dump truck load ready to go to demo area.

PID calibration: Sea 0250
100ppm isobutylene
0ppm air

PID of soil from MH5 = 0.0ppm. No odor or staining. continuous readings

JSL 10/18/11

0950 1st load to demo area

Crew is bringing in load after load of pit run gravel for back fill.

1000 Filling 2nd truck load of MH5 soil

1044 2nd truck offsite to demo area of MH5 soil
PID = 0.0ppm on soils

Tom is landscaping gravel btwn MH 2+3 to bring back up to grade.

One of Anthony crew is escorted offsite by Boeing Security. (Donald Cassell)

They are getting close to excavation depth @ MH5.

Called M. Lumpkin to check in.

1100 Begin filling 3rd load of MH5 soil

JSL 10/18/11

1130 3rd load of soil from MH5 area full + ready to go to demo area - offsite

Notes from MH5 tie in excavation:
- @ ~12ft there is GW seeping into bottom of pit.
- @ ~5 ft bgs they found 30" handcore pipe that will be tied into MH4 → MH5 → MH6
- @ ~10 ft bgs they found + broke 15" pipe run that will be closed off btwn MH 2-375 (that will be destroyed and 2.373 (MH6)
- MH 2-374 = MH4. MH5 is new
- MH 2-456 will also be plugged as well as CB 2-455
- PID = 0.0ppm. No staining or odor observed. Continuous readings

1144 Starting to fill 4th load.

MH #5 concrete pieces on site. (starting to be unloaded)

JSL 10/18/2011

NASWS Retrofit
013-1646-11A.900.01

Sunny 50F

J. Lamberts
10/18/2011

1200 Still Landscaping btwn MH2+3 with gravel barrow.

1246 4th load full + ready to go.

Setting trench box in order to place MH5. + the in pipes

1315 Still Landscaping btwn MH2+3

@MH5 - box is set, crew is setting some more pipe, backfilling, measuring + cleaning up. No more digging to be performed today. Called M Lumpkin to do a drive by at some point to double check.

4 Loads of soil to demo today.

PID bump check 89.7 ppm w/ 100 ppm isobutylene

1330 J. Lamberts offsite

JS | 10/18/11

NASWS Retrofit
013-1646-11A.900.01

Sunny 50F

J. Lamberts
10/19/2011

0600 J Lamberts onsite @ MH2-448

Crew has already set tideflex valve and are waiting for the tide to come in. They have secured both ends of the valve with bands and have it seated in more deeply than before. Also, before they installed, they spent some time grinding the walls of the pipe to get them more smooth + round. High tide is at 1147, so we will check back @ 9 am. or so.

0700 Rest of crew onsite
HTS tailgate: see HASP.
Attendees: J Lamberts - Golder
T. Bersch
KC Wade
J. Siregar
S Missingale
J. Looms.
M. Huffman.
D. Phelp.
} Anthony

JS | 10/19/11

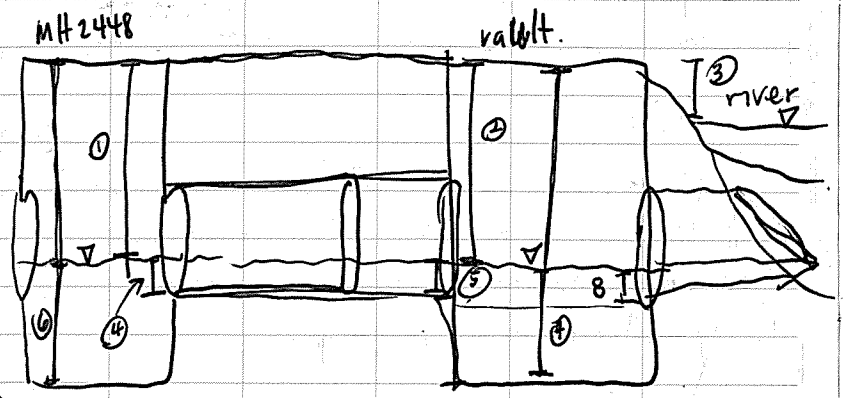
NASWS Retrofit
013-1646-11A.900.01

clear 50F

J. Lembertz
10/19/11

POD: - Set MH5
- clean up OM in berm
- clean up irrigation
- check tide valve

0830 Checked tideflex. There is about 12" of water in the pipe + rising. It is not holding back tide water. Contacted K Angelos + S Matthews. K Angelos asked to find out the 'head' of water on the valve. I asked KC to help get measurements: at high tide.



@ 12 noon:
① MH 2-448 rim to WL in MH 2-448
② MH 2-448 rim to WL in vault.
③ MH 2-448 rim to river WL.

JSl 10/19/11

NASWS Retrofit
013-1646-11A.900.01

clear 50F

J. Lembertz
10/19/2011

④ Depth of water from rim of pipe in MH 2-448
⑤ Depth of water from rim of pipe in vault.
⑥ Depth ~~of water in~~ of MH 2-448 - 14.55 ft to inside bottom rim
⑦ Depth ~~of water in~~ to bottom of vault from rim of 2-448.
⑧ Depth of water in outfall pipe of vault.

Crew is hoe packing materials around OWS + MFV

Also they are uncovering MH#1 lid in order to prepare to set the weir. No odor or staining observed. Material is gravel barrow. This MH was ~~on~~ installed last spring.

Crew is stalled at MH5 tie in because tide valve is not working. They can't tie in until they can prevent tide water from entering system.

0940 Crew is cleaning up OM pile + sending over to dump site. - Allied Waste on 4th + Lander.

JSl 10/19/11

NASWS Retrofit
013-1646-11A.900.01
Sunny 55F
J. Lamberts
10/19/11

1000 APS onsite to do utility check on area near MH 5+6

1030 Crew is prepping, cutting asphalt around MH6 to start to dig tie in.
call'd PID sea 0250
100ppm isobutylene
0ppm air
Soil in small test digs: No staining or odor
PID=0.0ppm.

1040 Looked @ Tideflex @ MH 2-448. Nearly at high tide. Appears to be holding water now. Will get measurements @ 1147 (high tide).

Compacting around MH3.

Cutting concrete @ MH6. - Took photos.

1st load of OM offsite

1115 filling 2nd load of OM.
Kangelos called about valve. Wants us to test valve by closing shut off at low tide, then

JSl 10/19/11

NASWS Retrofit
013-1646-11A.900.01
Sunny 55F
J. Lamberts
10/19/11

opening once the tide has changed to see what happens in pipe

1120 2nd load of OM offsite.

Breaking up concrete + asphalt along MH6
PID=0.0ppm. They are keeping it separated so it can go to recycling at Demo Area.

1200 measuring Tideflex valve + WLs @ MH2-448: (at high tide 10.2')
① 4.61 ft height of instrument measuring point @ rim of 2-448
② 15.46 ft to water (height of instrument.
② - ① = rim to water in 2-448
11.76 ft waters edge
11.76 ft in vault to water
18.98 ft bottom of vault.
17.18 ft to bottom of pipe

Getting info on MH6

0.120 ft	15.46	15.46	15.46
4.88	4.61	4.61	0.12
5.00 ft	10.85	10.85	15.68
	15.85		
	4.61		
	11.24		

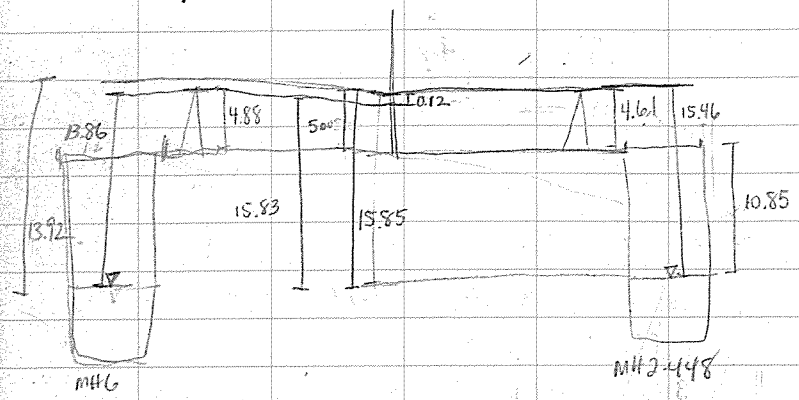
JSl 10/19/11

NASWS Retrofit — Sunny 55F — J. Lamberts
013-1646-011.900.01 — 10/19/11

1300 Digging out @ MH6.
1st load to demo area PID=0.0ppm

1330 2 more loads (4th) of OM to Transfer Station

1400 Filling 2nd Load from MH6 - offsite to demo area
PID=0.0ppm, measured from bucket.



15.46 − 13.92 = 1.54'
17.18 − 13.92 = 3.26
2.17 + 13.86 + 4.88 = 8.98

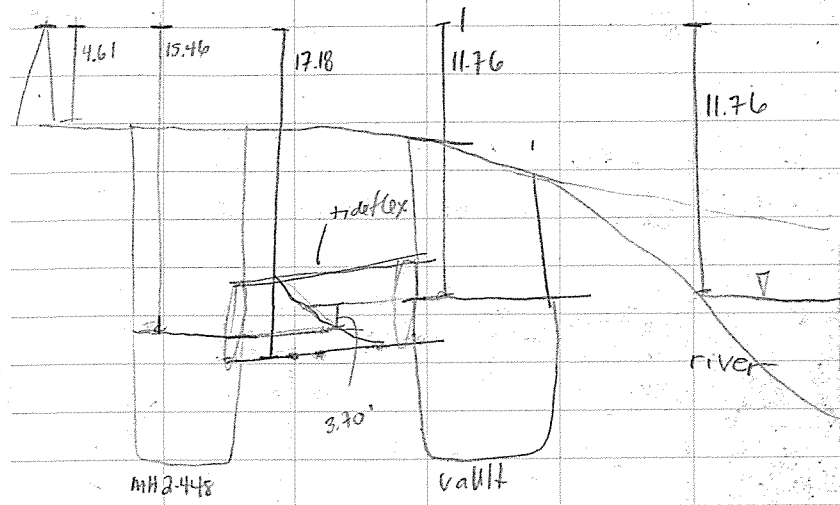
1.54' diff in WL btwn MH6 + 2.448.

1500 Filling 3rd load from MH6. - offsite to demo. PID-0.0ppm, no staining or odor. measured from bucket.

JSL 10/19/11

NASWS Retrofit — Sunny 55F — J. Lamberts
013-1646-011A.900.01 — 10/19/11

1510 OM is all gone - 4 loads total. Now crew is doing landscaping work near Roof Drain 3D and 5A.



15.46
11.76
3.70' − of water difference btwn weir and MH 2.448.

Readings taken @ 1300, 10.1' tide.

1530 @ ~ 8ft bgs around MH6.
They found "15" pipe tie in that will be demoed.

Filling 4th load from MH6. to demo area

JSL 10/19/11

NASWS Retrofit — Sunny 55°F — J. Lamberts
013-1646.11A.900.07 — 10/19/11

1400 Crew is setting trench box by MH6, starting to clean up + put up fencing

1415 J Lamberts offsite.

Jill Lamberts
10/19/2011

8
19.16
4.61
14.55

12.5

18.98
12.5
6.48

14.55
4.61
19.16
15.46
11.76
3.70

NASWS Retrofit — Overcast 50°F — J. Lamberts
013-1646.11A 900.01 — 10/20/11

0655 J. Lamberts onsite

0700 Construction Mtg.
J. Lamberts, E. Schwinn, B. Miller, S. Rose, J. Loomis

Tideflex - working @ high tide. Need to determine "how much is coming in"

Schedule - next friday finish
- core MH 6
- weirs @ MH1 + 4
- going on roof - switch drains
- pipe runs MH 5-6 - tomorrow
- tieing + plugging rest of lines
- Drain 3F - still working on it.
- Hydroseeding in Bioswale
- fix filter material in A1.

6
19.18
15.46
3.72

0800 dtw MH-2-488 rim : 11'9"
dtw vault rim : 11'6"
MH6 rim to water : 8'5"

0900 dtw MH2.488 rim : 11'5" — can see water flowing into MH!
dtw vault rim : 10'4"

1000 MH-2.488 10'0" — cannot see flow
vault 8'5"

JS 10/20/11

0700 – 1000 @ MH5 → MH6 : .
- cored MH5 for correct pipe dimensions
- cored 30" concrete core into MH6. No water from MH spilled out.
- excavated @ bottom of MH5 to get to grade. No staining or odor observed
- placed pea gravel.
- placed MH5 in excavation
- There is water in bottom of MH5 excavation. Golder instructed that they could not pump it out.

Also - cleaned up concrete forms @ Drain 3D.
- ABS (Mark) onsite to perform utility check

1030 MH 2-448 10'
Vault 7'
1130 MH 2-448 10'
Vault 6'3"
Vault rim to bottom 12'6"

11.7 / 2.3 / 14.0 — 11.0 / 2.7 / 13.7
18.98 / 6.48 / 12.50 — 18.98 / 13.70 / 5.28

1230 MH 2-448 10'
Vault. 5'10"

JSl 10/20/11

1300 MH6 rim to water 8'5" - no change

1000-1300 : • 2 truck loads of soil from MH5 → 6 area taken to demo area - No staining or odor observed.
- Crew went to demo area to clean up soil piles
- Crew setting MH5 + pipe tie ins from MFU + MH3 to MH5
- checking elevations + grades
- Crew mudding up tie in from MH4 to MH5.
- In trench btwn MH5 + 6 there is a water line in the way of the pipe tie in. KC Wade called Eberlin to find out what to do.

1330 MH2-448 9'10"
Vault 6'2"

1430 MH 2.448 9'10"
Vault. 6'11"

JSl 10/20/11

NASWS Retrofit overcast 55F J. Lamberts
013-1646-11A, 901.01 10/20/11

1300 - 1530

- Crew putting in pipe from MH3 + MFV to MH5
- Removed lid of MH1 to get measurements for weir
- Removed soil + lid of MH4 to get measurements for weir. Soil to go to demo area. No staining or odor observed.
- Getting ready to pave @ Roof Drain 3E, compacting smoothing edges of asphalt.

1530 MH 2-448 9'10"
Vault. 7'9"

1600 Crew is starting to clean up, taking 2nd load of soil to demo, prep for tomorrow.

J. Lamberts off site - gave books + notes to Ted Sager

10/20/2011

NASWS Retrofit overcast ~55
013-1646-11A, 900.01 Oct 21, 2011

0715 Anthony excavating in clean fill
Sand and gravel soil

Time	MH (ft)	Vault (ft)
0830	11'10"	11'7"
0935	11'4"	10'3"
1045	10'2"	7'5"
1145	10'1"	6'7"
1245	10'0"	5'6"
	9'11"	5'8"

013-1646-11A.900.01 Oct. 22,11 T. Sage
NASWB Retrofit Drizzle 55°F Oct 22, 2011

0700 on site
0710 Met with Jim - Anthony Const.

0730 Demo Const. Site Locked
unscrewed fence to get in

0830 Load of Asphalt to 2-65 slab
staging/processing pile.

0900 1st Load of Dry trench Soil.

Ex Total 4 loads Soil
2 loads Asphalt
Asphalt remover

0.4' x 110' x 3.5' = 154' = 6cy
Asphalt

Soil 4 Loads
42 yards Soil to Demo Area

013-1646-11A.900.01
Oct 22, 11 TLS
Outfall A" MH & Vault

Time	MH ft	VAult ft
0920 AM	11'8"	11'7"
1035 AM	10'11"	10'5"
1200	8.2	7.5

1400 off site

013-1646-011A.900.01 TED
oct. 24, 2011 [signature]

0700 Anthony & Golder onsite

Contractor plans to excavate for the final 10 feet of pipe install in parking Area 118" inches at S. end of run

0730 will be a while till ready to excavate to

Total soil removed 8 yard 1 load.

206-418-1301 3 way topsoil @ Pacific

013-1646-011.900.01 J. Lamberts
NASWS Retrofit clear 45F 10/25/11

0700 J. Lamberts onsite
H+S Tailgate: T Bersch
J Lamberts
S. Missingale
M Huffman
D. Phelp
J. Loomis
J. Siregar.

0700-800 · Compacting @ 2.389 to 2.455 run, prepping for asphalt

0800-0830 Construction Meeting
S. Rose, J. Loomis, E. Schwinn, B Miller.
Notes:
· Tideflex: going to remove + try to put in a new one after getting better readings of pipe size, grinding to more round, etc. Manufacturer + rep to talk w/ Geosyntec.
· MH5→MH6 water line in the way: FDep out, says it is off and can be cut + capped
· Roof Drains: switch on roof on Wednesday
· Asked if CBs should be cleaned before going online

JSI 10/25

013-1646-011.900.01 / Cloudy 50F
NASWS Retrofit

J. Cambers
10/25/11

3F: working on plan/design

0830 - 900 Cleaning out sludge @ MH #1 and MH#4. Some of MH#1 sludge went into an existing drum that was sampled before for MH#1 (P21M-NASW-11-WC-S)

A new drum was ~~sampled~~ started for remaining MH#1 and #4 sludge. This will be sampled for VOC, TCLP Metals, RCRA Metals, PCBs, TPH-D to Bunker C.
P21M-NASW-14-WC-S @ 1240

0900 - 1255
- Backfilling around MFV
- cleaned out sludge in MH #1 and, MH#4 into a drum, sampled.
- asphalt poured thru MH 2-389 to 2-455.
- building rebar for weir in MH 1 + 4
- brought in 3way topsoil from Pacific Topsoils to landscape @ MH 2 & 3.
- fixing irrigation.

JSI
10/25/11

013-1646-011.900.01
NASWS Retrofit

Cloudy 50F

J. Cambers
10/25/11

1300 - 1600
- Backfilling around OWS + MFV
- placed risers on OWS to get to grade
- poured concrete bottoms in MH 1 and MH4
- fixed irrigation piping
- backfilled + landscaped around MFV + OWS.

After concrete pour, driver wanted to know where to wash chutes. I asked Eberlin + she said they go offsite to wash. Driver said no + decided to wash into a drum. I called Eberlin + she said Boeing policy was to have contractors take care of concrete wash. Jim Loomis (Anthony) said he would take the drum to the yard + ~~take~~ dewater it + get rid of concrete. I called Matthews to confirm this was ok.

1600 Signed COC over to Tsaga to take to lab. offsite

JSI
10/25/11

0700 J. Lamberts onsite
0730 H&S Tailgate - see HASP
J. Lamberts
T. Beisch
S. Missingale
M. Huffman
J Siregas
J. Loomis

· megalug
· bell restrained
· double restrained

POD: - cut + cap water line that crosses btwn MH5 + MH6
- build weirs for MH1 + 4.
- place risers on OWS
- backfill + landscape
- turn on roof drains

0800 - 1430:
Crew performed the following tasks:
• worked on switching roof drains over - took photos
• exposed water line pipe, cut it, drained water into stormline, (@ MH6) capped it with a megalug, bell restraint. Took photos. They also started backfilling with gravel + pea gravel

JSI

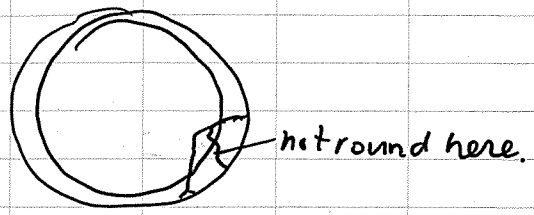
• built weir forms in MH4 and 1
• backfilled + landscaped
• set risers on OWS + MH5.
• took photos of Tideflex

Crew had to pump water out of MH 1 in order to install weir form. They pumped it into CB _____ while I was away from the area observing the tideflex valve operation. The water then flowed into MH4, which they had to pump out onto the grass. I directed them to pump onto the grass per earlier instructions from Boeing (Ray Power). Some water kept draining into MH1, so they kept pumping it onto the grass.

Photos of tideflex were taken looking upstream from the vault. I sent these photos ~~to~~ to Samarah @ Anthony.

JSI 10/26/11

Eberlin, ~~and~~ Geosyntec, and
Kent Angelos + S Matthees.
Eberlin commented on
a 'bump' in the seam @
approximately 4 o'clock.



She will bring it up with
Anthony.

Also, ARI called about sludge
sample from yesterday
+ said it was very wet. I
checked the drum and
found that the sludge had
separated into two phases.
I sent a message to Mary Jo
Donnelly, Eberlin, and Ted
asking if I should resample
the separate phases. Mary Jo

JSl
10/26/11

Said to wait until we get the
solid phase data.

as of 1430, there was a partial
dump truck load of soil from
around the water line btwn
MH5 and MH6. They are
going to excavate some more
around the water line to the
south + cut + plug it.
Soil is going to go to demo area

No staining or odor observed (no PID
available b/c battery is drained)

1430-1600
Digging out along water line
btwn MH5+6 to expose line
so it can be cut + plugged.
No staining or odors Noted.
Soil going to demo area.

Total 2 truck loads.

JSl
10/26/11

NASWS Retrofit Clear 50F J. Lamberts
013-1646-11A 900.01 10/26/11

Crew is cleaning up.

Crew set forms @ MH1, getting ready to pour concrete weirs

Crew is also switching over roof drains. -6 total finished

J Lamberts offsite.

J Lamberts
10/26/2011

NASWS Retrofit Clear 40F J. Lamberts
013-1646 11A.900.01 10/27/11

0710 J. Lamberts onsite
H+S Tailgate - trench safety, slips trips falls.
After I left last evening, Crew had finished excavating around water line pipe + cut a 17ft piece off + filled it with concrete. They took 2 loads of soil to the demo area.

Today's plan:
- finish forms in MH1+4 for weirs
- pour concrete weirs
- backfill with gravel barrow in trench btwn MH 5+6, place pipe, finish digging remaining 5ft x 8ft x 6ft trench for tie in btwn MH 5+6.
- Switch over roof drains
- Work with Tideflex valve to see if they can get the bump smoothed out + make it seat better.
- Landscaping

JCL
10/27/2011

0940 1 Load of soil from MH5-6 taken to demo area

Teufel Landscaping onsite to fix irrigation wiring

Foy Electrical onsite to fix electrical lines near MFW

1000 - 1400:

Crew performed following tasks:

- switching over roof drains
- Poured concrete wells in MH# 4. Ira Sisson (Meyers) was onsite to test concrete
- Landscaping
- Digging in MH5→6 trench to get to grade - 2 loads of soil to Demo Area. No staining or odor observed
- Backfilling in MH5→6 trench + compacting in lifts
- Cutting MH6 concrete wall large in order to have @ correct

JSI 10/27/11

grade for pipe

- Crew brought in an eco pan to rinse off concrete mixer chutes. There is still a drum of concrete mix wash water that is unlabelled. Told Jim Loomis to check into it.
- Crew had to use fire hydrant water to keep equipment cool, when cutting concrete the water was sprayed into MH6.

1430 3rd Load of soil to demo. No staining or odor observed in excavation

Crew is cleaning up.

1500 Crew poured concrete wash drum into eco pan

Crew placed pipe @ MH6 and are starting to backfill

1515 J. Lamberts offsite

JSI 10/27/11

 NASW SRetrofit overcast 45F J. Lamberts 10/28/2011

013-1646-11A.900.01

0730 J. Lamberts onsite

HHS tailgate. - Heavy equipment, trenches. slips trips falls.

0730-1000 · Crew is digging btwn MH5+6.

Cal'd PID 2020, sea 0250

0ppm air, 100ppm isobutylene

PID = 0.0ppm, continuous, soil from 10ft deep, no staining or odor.

Crew has filled up two dump trucks for demo area.

Crew set another length of pipe + backfilled with gravel. They compacted and are getting ready to dig last 6ft stretch to MH5.

1000-1200 At South Park Bridge:

JS 10/28/11

~~NA~~ SP Bridge overcast 45F J. Lamberts 10/26/11

013-1646-11A.

SPU broke up concrete + digging a 5'x12'x4' excavation ~~on~~ near the SE corner of 2-15 Bldg on Boeing property. Two dump truck loads of soil, concrete + asphalt were taken to demo area. PID readings were taken every 5-10mins from the excavator bucket. All were 0.0ppm. No staining or odor was observed. Soil is sand (brown, med, dry) with some pea gravel mixed in. Took photos. This excavation is for a water line tie in from a vault on 16th ave to a waterline on Boeing property.

Conor Foley 2062853373 from Argus Pacific was onsite for SPU doing air monitoring. He also got 0.0ppm readings for VOCs, ~~an~~ no detections for dust, and for metals.

Richard E. Averill is SPU contact. 2065108013

JS 10/26/11

NASWS Retrofit
013-1646-11A.900.01

overcast 45F

J. Lambeets
10/28/11

1230 Anthony construction digging final 6ft stretch of soil for MH5 → 6 tie in.

PID readings from bucket were 0.0ppm. No staining or odor observed.

S Matthees called to check in

1300 Finished digging. Crew is starting to put down pea gravel and place pipe for tie in.

PID Reading 0.0ppm.

Bump check - 90.3ppm for PID.

1315 J Lambeets offsite

10/

NASWS Retrofit
013-1646-11A.900.01

overcast 45F

J Lambeets
10/31/11
T. Sager

0700 J Lamberts onsite
H+S tailgate: PPE, slips trips falls, trench safety, heavy equipment.

Crew has pulled out extra MH 2-375 + plugged pipes up. They have mostly backfilled run btwn 5+6, but there needs to be a couple of lifts placed + grouted on MH5 to get to grade. All the roof drains are done except for two that require a scissor lift. Tideflex is being worked on end of this week or early next, depending on tides. No action @ 3F yet.

POD:
- Plug pipe runs btwn MH4 and 2-375.
- Replace lids on MFV, MH5
- Prep to remove tideflex
- Finish final 2 roof drains
- Backfilling, landscaping

0800 Cons. Mtg: E. Schwinn, S Rose, J. Lamberts, J. Loomis:

JSL 11/01/2011

- Tideflex will be pulled, grind pipe + replaced again to try to get it to work. It will happen this week
- Trying to schedule days to do work at 3F. It will be a pipe line to CB2-369
- Finishing work up this week around MH+ MFV
- Bioswale A4 - needs some planting + erosion control. B Miller to come out + explain
- Waste char + disposal of drums
  - need to get rid of creosote logs, 2 drums
- MH 2-375 structure concrete disposal. S Matthews will look @ data + T. Norton to determine if ok to take to demo area for crushing

900-1000 - Plugged pipe @ MH 2-375. Cleaning up. Starting to backfill. CW
Cal'd PID 2020, sea 0250. 100ppm isobutylene, 0ppm Air. MH 2-375 pit PID=0.0ppm.
0945 @ SPU work @ Bridge - excavation is larger now. Checked soil from sides: PID=0.0ppm continuous. Took photos.

JSL 11/1/11

NASWS Retrofit
013-1646-11A. 900.01
Sunny 45F
J. Lambert
11/1/2011

1000-1230:
Backfilling @ MH 2-375: structure can go to Demo Area but needs to be broken up first.

1230 J. Lambert off site. Giving book to Demo Crew (M Lumpkin, T. Sager)

1230 @ SPU - excavation covered up with boards.

Q-15 Bldg - BMA - Greyhawk performing remediation + repainting of concrete walls

NASWS Retrofit
013-1646-11A. 900.01
Partly Sunny ~40°F
T. Sager
11/2/2011

0930 Arrived on site to dsp. Drums
1st drum dated Oct 25, 2011
33% Sludge 67% Water
Second drum dated Sept 2011
20% Sludge / 80% Water.

Information emailed to Jill Lambert & Ms. Donnelly at Boeing.

NASWS Retrofit
Thursday, November 10, 2011

Clear ~50°F
T. Sager

0915 Recived call from Jill Lamber ts she requested water level readings at outfall "A" tide flex. 2-3 by 11 AM
Water level below lid lip.

	Time	MH (ft)	Vault ft
0915	~~11.9~~ ft	11.9 ft	9.2

0930 off Site
1015 Return to site.
Spoke to Tim & Jim w/ Anthony Construction plug still in tide flex outlet. Will not be removed until 1040 pm Tonight at next Low tide.

Anthony Excavating to replace Hydrant 9 west of Z-123 Bldg in Grass landscape area about one load excavated & Ready to haul to Demo Site for on site disposal.

11/10/11 [signature]

NASWS Retrofit
Thurs., November 10, 2011

Clear ~53°F

1230 PID Reading of Excavation 0.0 ppm No Sign of Staining odors in excavation Around Hydrant 9. 3 loads Soil to Demo Area

Told Anthony that side walls of excavation Laid Back or trench Box.

1525 Back to site 4 loads total today had exed around valve to east 2 5' x 5' x 2' pid = 0.0 No sign of Stain or odors.

Anthony to use trench Box in excavation.

Tide flex in place but will have seal inserted tomorrow.

1530 off Site

11/10/11 [signature]

48 NASWS Retrofit cloudy 50F J. Lamberts
013164611A900.01 11/11/11

0630 J. Lamberts onsite to check out vault.

	MH(in)	Vault(in)	Tideflex
0645	128	65	(High was @604) (11.0')
0700	128	68	
0725	128	70	
0855	128	88	
1100	127	110	
1345	7.4'	8.2'	
1445	6.2'	8.0'	
1115	136"	139" low	11/11/11
0645	93"	70" high	11/12/11
0701	108"	57" high	11/13/11

Kent Angelos + J. Lamberts toured site. Roof Drain 3C needs a pipe extension. We'll need power @ Line A outlet.

Will Ernst onsite viewing Roof Drains + work. There is nobody from Anthony Construction working. Eberlin Schwinn notified about tide levels in vault

112
20
92

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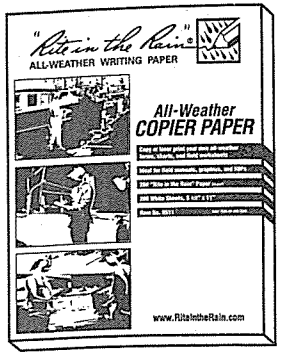

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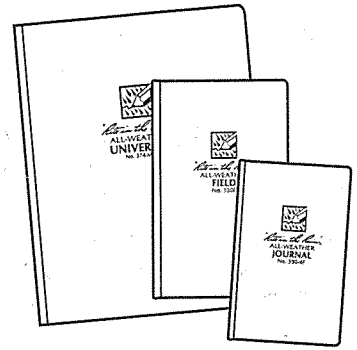
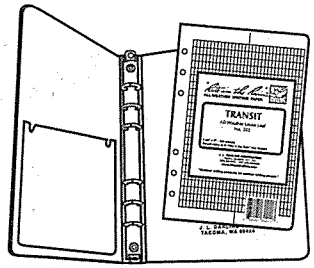
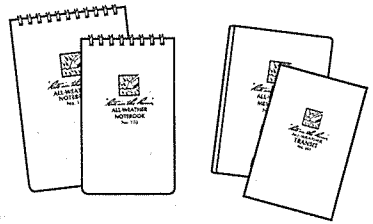

Bound Books



Loose Leaf / Ring Binders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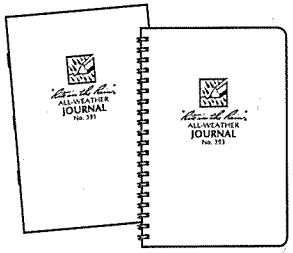

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Book 5

November 2011

T. Sager

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PAGE	REFERENCE	DATE

013-1646-11A.900.01 NASWSRetrofit Clear
NASWSRetrofit ~44
Tuesday, November 15 2011

0935 Calibrate Photovac 2020RBS

Anthony pulling fire Hydrant 9 one yard sand to demo site for fill.
PID reading of soil 0.0ppm.
No sign of staining, oil sheen or odors. Brown silty fine sand to bottom of excavation. Anthony to use trench box during install of Hydrant tomorrow

1000 Back to Demo site

Nov. 15, 2011

013-1646-11A.900.01 NASWSRetrofit
Wednesday, Nov. 16 2011

1515 Anthony off site: Hydrant 9 install complete & excavation backfilled using crushed minus fill that appeared compacted firmly into place.

1530

11/16/11

[signature]

(5) 013-164611A → 900.01
NASWS Retrofit

Rarty Clearly
To clearing
~45-48°F

Monday November 28, 2011

0900 Anthony on site saw cutting asphalt for 70' drain run from door S5 ~70' to SW at drain in parking No concrete being sawcut

Should begin breaking ground in hour or two.

0915 off site

11 30 Back To Site cutting complete Asphalt not yet pulled up will check in again after lunch time

1150 Back To Demo Site

1300 – 1 load of Asphalt from 2-122 west inside corner Roof Drain SW to CB- Exstin to SW ~70'. TAKEN to crusher AREA 2-65 Slab.

1420 Back on site to observe excavation Contractor had removed ~ 15 x 3' x 2' of Soil Continuous

1455 PID at Surface = 0.0 ppm No Sign of staining or odors. [signature] 11, 28, 11

Load of Soil 1623

013-11646-HA.900.01 NASWS Retrofit
NASWS Retrofit
Tuesday, November 29, 2011

Cloudy
41°F

0940 AT 2-122 Bldg Drain re-route
E of Door S.4, trench excavated
To Drain ~ 80' to SW (site direction) BSG
Trench 2' wide & 3-3.5' deep
over length Asphalt 0.5'
Not included in measurements above

Jim of Anthony said 1 truck
load this AM and one finishing
up excavation Now

Truck off site to Demo site
for use as backfill in industrial
site of demo restoration

0945 CAL PID PRO 2020 OK
PID Readings 0.0 ppm Continue
readings over side walls & bottom
of trench Signs of staining
or odors from soil in trench

1015 Back to demo site to assess
Location of Anthony stockpile
from trench

11-29-11

013-11646-HA.900.01
NASWS Retrofit
Wednesday, Nov. 30, 2011 T-Sagr

0715 2-122 reroute trench backfilled
using concrete. Took photo of
completed install. Anthony
to patch with Asphalt today.

0725 To Demo site

11/30/11

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Book 6

7/20/2011,
2/26/2012
3/30/2012

7/20/2011 013-1646-300-02
T. Norton Boeing PL2 demo
Mild ~65°F ptly cld calm

800 on site to support demo activities as needed

815 reviewing rd 5 SC report

930 talk to T. Sager - he said Andrew Baird wanted to talk about Hazardous and CID soil volumes - prep spread sheet and map.

1000 Talk to Andrew - est ~40 to 50k tons of CID and 2.5-5k tons Hazardous

1045 walk site check with personnel.

1115 resume rd 5 report review

1310 walk site talk to T. Sager - put sample of CN underflow tunnel area back in roll off

[signature]

7/20/2011
T. Norton

013-1646 300.02
Boeing PL2 demo Support

1400 resume rd 5 report review

1515 prep for sampling NA swales
inspect area - assemble containers

1550 at Bioswale A4 in NA

1600 composite 0-8 inches of soil
in bioswale A4 in place after
removing leaf litter. between plants
loose, Dark gray
soil in - silty fine SAND some
rounded to angular gravel moist
trace roots.

place grab sample in 2-8oz
glass jars and 1-2oz with
~~sample~~ dedicated plastic spoon

WC Sample ID PL2C-NABS-WC-01-S
analysis for WC PCBs Diesel to Bunker
RCRA metals (Hold on TCLP)
and VOA in 2oz jar

[signature]

7/20/2011
T. Norton

013 1646 300.02
Boeing PL2 demo Support

1600 cont. Sample location
12 ft plant NWest of SE
storm grate in center of
Bioswale A4. between plants

→ charge time and anal
to Phase/task 900-01

1625 composite 0-6 inches of soil
in bioswale A4 in place
after removing leaf litter

loose-Dark gray-silty fine
SAND little rd gravel trace
roots moist

place grab sample in ~~5m~~ TN jars
same as 1600 entry

WC Sample ID PL2C-NABS-WC-02S
Same analysis as 1600 entry
Sample collect 12 ft plant NW
of foot bridge

[signature]

7/20/2011
T. Norton

0131646011.300.02
Boeing PL2 const.

1645 @ NA Bioswale A1 – sticks & debris in dicate water pond at plant west end by outlet

composite Soil 0-6 inches after moving organic debris (sticks) composite in place no planted plants like A4
loose med brown to dark gray Sandy Silt, some organics moist to wet

use plastic scoop to composite soil and place in jars as described in 1600 entry and requesting same analysis
location is 20 ft East of West outlet
WC sample ID PL2C-NABS-WC-03-S

1705 @ NA Bioswale A1 8 ft West of East inlet. No litter cover
soil is moist to wet.

7/20/2011
T. Norton

0131646011.300.02
Boeing Plant 2 const

1705 cont. composite 0-6 inches in place with disposable plastic ~~spoon~~ scoop.

loose - dark gray SILT and to some organics little to some fine sand moist to wet

Soil placed in Jars as 1600 entry requested some analysis

WC Sample ID PL2C-NABS-WC-04-S

samples placed on ice in ice chest.

1749 relinquish samples at ARI on flush.

T Norton

2/29/2012

J. Lamberts
NASWS Retrofit

1400 @ Plant 2, MH 2-448
Anthony Construction has
cleaned up soil around MH
+ secured it for use for
Sampling.

Took photos

1405 offsite

3/30/2012
J. Lamberts

1250 J. Lamberts onsite @ MH2-449.

Anthony Construction has removed
solid sludge from bottom of MH
and placed into 4 tubskids.
Volume ~ 2 yards
4 samples taken for VOC, RCRA8
Metals, TCLP Metals on HOLD, TPH-G,
TPH-Dx to Bunker C, PCBs.

		tubskid#:
1210	PL2SC-NASW-15-WC-S -	B1006
1215	PL2SC-NASW-16-WC-S -	C354
1220	PL2SC-NASW-17-WC-S -	Z266
1230	PL2SC-NASW-18-WC-S -	I655

1330 took samples to chop off in Bldg 3-353
on North Boeing Field.
called Lab 253-657-0400 to
let them know to pick up samples.
EAL Lab

1400 offsite

3/30/2012

North Area Stormwater System Retrofit
Sample Tracking Form

Page 1

013-1646-011.300

Sample Number	Sample ID	Sample Date	Time	Media Type[1]	QA/QC Sample[2]	Samplers Initials	Analyses	Comment
1	P21M-NASW-01-01-S	9/9/11	1145	S	FS	JSL	VOC, SVOC, PAH, PCB, metal, TPH	Supplemental NA-DP-08 0-1 ft E side
2	P21M-NASW-02-05-S	↓	1115	S	FS	↓	↓	4-5 ft E side
3	P21M-NASW-03-10-S	↓	1110	S	FS MS/MSD	↓	↓	9-10 ft E side
4	P21M-NASW-04-05-S	↓	1125	S	FS	↓	SVOC, PAH, metals	Confirmation N side 4-5 ft
5	P21M-NASW-05-05-S	↓	1135	S	FS	↓	↓	Confirmation S side 4-5 ft
6	P21M-NASW-06-12-S	↓	1100	S	FS	↓	↓	Confirmation Bottom 11-12 ft.
7	P21M-NASW-07-05-W	↓	1205	DI	EB	↓	VOC, SVOC, PAH, PCB, metal, TPH	Equipment Blank on Spoon.
8	Trip Blank	↓	—	DI	TB	↓	VOC TPH	
9	P2CS-NABS-01-S	8/25/11	1200	gravel (3/8")	FS	JSL	Metals	Data Gaps List. 3/8 washed gravel
10	P2CS-NABS-02-S	↓	1205	Filter material	FS	↓	↓	Filter Material - crush (3/8) gravel perelite, sand.
11	P2CS-NABS-03-S	↓	1210	GAC	FS	↓	↓	carbon + perelite.
12	P2CS-NABS-04-S	8/26/11	0538	Soil	FS	JSL	Metals	Soil berm material
13	P21M-NASW-08-04-S	9/6/11	1545	Soil	FS	↓	VOC metals	Soil from SA, 18ft E of curb, @4ft bgs in tie/in trench.
14	Trip Blank	↓	—	DI	TB	↓	VOC	

a-448

1 - Soil, Water, DI
2 - FS, MS/MSD, TB, EB, WC

Golder Associates

North Area Stormwater System Retrofit
Sample Tracking Form

Page 2

013-1646-011.300

Sample Number	Sample ID	Sample Date	Time	Media Type[1]	QA/QC Sample[2]	Samplers Initials	Analyses	Comment
15	Trip Blank	9/7/11	–	DI	TB	JSI	VOC	
16	P21M-NASW-09-055-S		0845	S	–		VOC metals	Soil from 5A, 15 ft E of curb @ 5.5 ft bgs. HOLD
17	P21M-NASW-10-055-S		0855	S	–			Soil from 5A, 25 ft E of curb @ 5.5 ft bgs HOLD
18	P21M-NASW-11-WC-S ~~P26S-NABS-05-WC-S~~		1150	Sludge	–	JSI	VOC, RCRA metals TCLP (HOLD) PCBs Bunker C TPH-D	Sludge from MH#1 Waste Char
19	P21M-NASW-11-WC-W	9/8/11	720	Water	–	JSI	PCBs + Metals	MH#6 WC Sample.
20	P21M-NASW-12-WC-C	9/14/11	1300	Concrete	–	JSI	PCBs	Pile Cap → concrete
DNS 21	~~P21M-NASW-13-WC-C~~	~~9/14/11~~	~~1305~~	~~Concrete~~	~~–~~	~~JSI~~	~~PCB, VOC, TCLP RCRA metals, TPH~~	~~Recycled Concrete Rubble Layer~~
~~22~~ 21	P21M-NASW-13-WC-WD	10/7/11	1430	Wood	–	KC	Creosote chlorophenophend	wood pilings for waste char
~~23~~ 22	P21M-NASW-14-WC-S	10/25/11	1240	Sludge	–	JSI	VOC, RCRA metals, TCLP metals, PCB, Bunker C, TPH-D.	Sludge from MH#1 + #4 Waste Char.
~~24~~ 23	P21M-NASW-15-WC-S	3/30/2012	1210	SW Sludge	–	JSI	VOC RCRA metals; TCLP on HOLD PCB, TPH-D, Bunker C	Sludge from MH 2-449 Box ~~Rolloff~~ # B1006
~~25~~ 24	P21M-NASW-16-WC-S		1215		–		TPH-GX	Box ~~Rolloff~~ # C354
25	P21M-NASW-17-WC-S		1220		–			Box ~~Rolloff~~ # Z266
26	P21M-NASW-18-WC-S		1230		–			Box ~~Rolloff~~ # I655
~~27~~	~~P26 NABS-05 P26D S~~			~~GAC~~		~~JSI~~	~~Metals Leach Test~~	Skid Tubs ~~GAC/CSE~~

1 - Soil, Water, DI C- Concrete
2 - FS, MS/MSD, TB, EB, WC

Golder Associates

Golder Associates

Copy: see Field HASP @ Plant 2

This Site-Specific Health and Safety Plan is a supplement to Golder's Health and Safety Orientation Manual and Injury and Illness Prevention Program.

Project Name:	Boeing Plant 2 – Support Services	***Project #:***	**0131646.010**
Location of Project:	Seattle/Tukwila, WA	***Date:***	**May 26, 2010**
Golder Subcontractor on Project?	☐ Yes ☐ No		
Project Start Date:	**June, 2010**	***Expected Project Duration:***	**3 years**

Health & Safety Coordinator	**Amanda Cote**		
	Name	***Signature***	***Date***
Project Manager:	**Ted Norton**		
	Name	***Signature***	***Date***
Project Director:	**Kent Angelos**		
	Name	***Signature***	***Date***

This signature indicates that the above project manager and project director are aware of the potential hazards at this site, has reviewed this Plan, and will communicate these hazards and appropriate controls to Golder staff prior to their deployment on site.

There are three major categories of emergencies that could occur during any project:

- Illness and/or physical injury;
- Catastrophic event (fire, explosion, earthquake, chemical, or radioactive); and
- Safety equipment failure.

Although a catastrophic event, severe medical emergency, or safety equipment failure are unlikely to occur during work activity at the Site, an emergency action plan is outlined on the following page.

EMERGENCY ACTION PLAN
Emergency Contact & Services

Title	*Name*	*Contact #'s*
Site Safety Officer	Michael Lumpkin	425-883-0777 206-419-7688 Cell
First Aid/CPR	Michael Lumpkin	425-883-0777 206-419-7688 Cell
Project Manager	Ted Norton	425-883-0777 206-755-4970 Cell
Office H&S Coordinator	Amanda Cote	425-883-0777 425-417-2218 Cell
Client Contact	Will Ernst	425-891-7724 Cell

Title	*Name*	*Contact #'s*
Boeing Emergencies	Boeing Fire Dept, Police, Ambulance	206-655-2222
Hospital	Harborview Medical Center	206-731-3000
Fire Dept.	Boeing	206-655-2222
Ambulance	Boeing	206-655-2222
Golder National H&S Leader	Jane Mills	206-295-7002 cell
Injury Intervention Support	WorkCare	888-449-7787

Catastrophic Event or other Emergencies Requiring Evacuation:

In the event of a catastrophic event such as fire or explosion, if the situation can be readily controlled with available resources without jeopardizing your health and safety or the health and safety of others, take immediate action to do so, otherwise follow these steps:

1. Notify Emergency Personnel by calling: 206-655-2222 (Boeing Emergencies)
2. Isolate the fire to prevent spread.
3. Evacuate the area.
4. Assemble at the Muster Station: Office trailer on 2-66 slab

5. Perform head count to ensure complete evacuation.
6. Inform Emergency Personnel of any missing team members.

First Aid Resources

Method of communication	Cell Phone
Channel or phone number	**206-655-2222** (Boeing Emergencies)
Location of First Aid at the project site	Site office trailer on 2-66 slab
Location of nearest telephone if outside assistance is required	Cell phones. Land lines are located in occupied building around the site.

Medical Emergencies

Medical emergencies can be described as situations that present a significant threat to the health of individual personnel. These can result from a variety of hazardous incidents including chemical and radioactive exposures, heat stress, cold stress, poisonous insect or snakebites, and accidents involving vehicles or heavy equipment. In the event of a medical emergency, implement the following guidelines:

1. Assure that the environment is safe;
2. Administer appropriate emergency first aid to all injured individuals, only if it is safe to do so, and only by a qualified individual trained in first aid;
3. Notify emergency personnel and follow their instructions;
4. If emergency personnel cannot be contacted, severely injured personnel shall be transported to Harborview Medical Center the designated hospital/ trauma center mapped directions are provided on the following page.

HOSPITAL INFORMATION AND DIRECTIONS

Name: Harborview Medical Center

Phone Number: 206-731-3000

Address 325 9th Avenue

Seattle, WA 98104

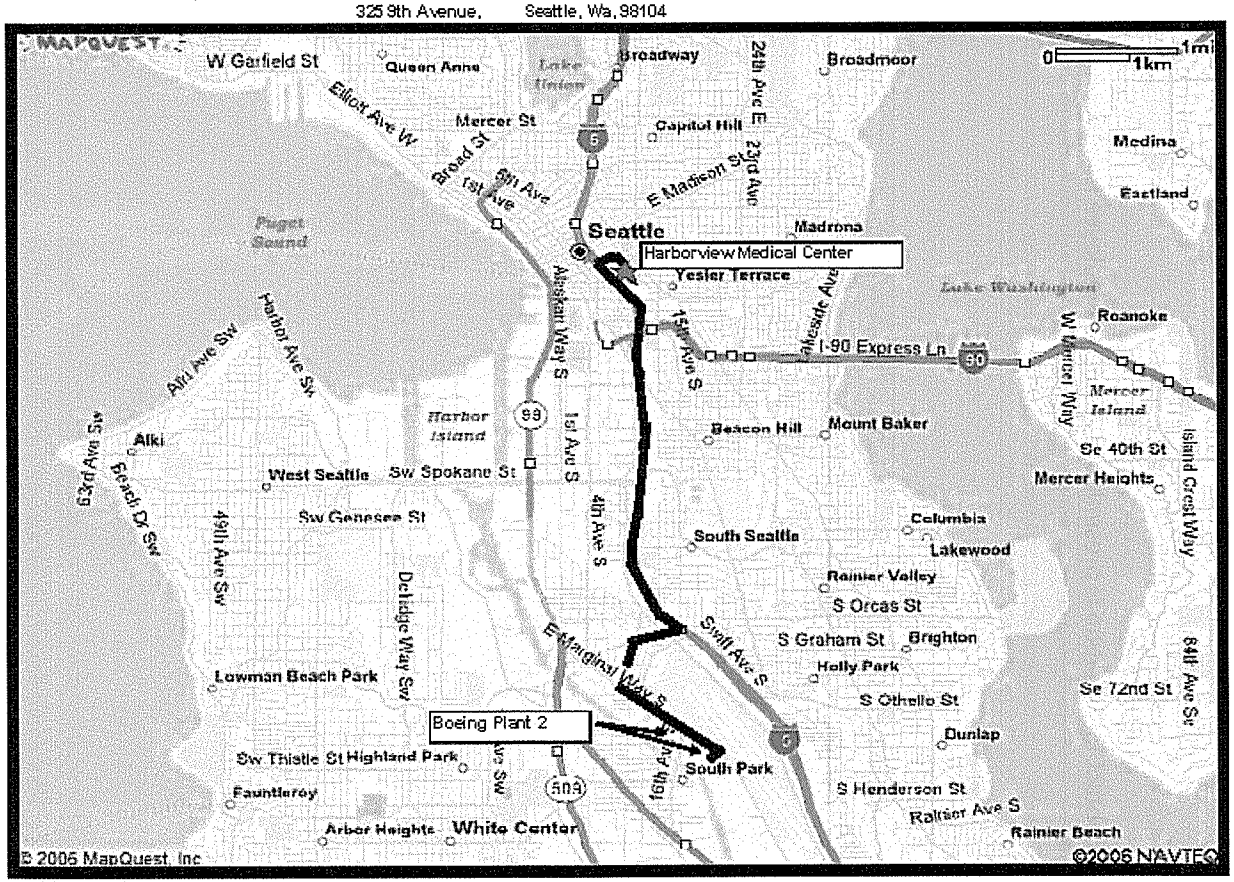
Emergency Room: Yes ☒ or No ☐

5. Contact WorkCare at the earliest possible time to report the work-related injury.

   888-449-7787

   Additional Workcare contact information is presented in Golder's employee handbook Page 44, Section 10.

Directions from Boeing Plant 2 to Harborview Medical Center
325 9th Avenue, Seattle, Wa, 98104



Driving Directions:

1 From Boeing Plant 2, turn left onto East Marginal Way S and drive northwest 1.1 miles to Corson Avenue.
2 Turn right onto Corson Avenue S and proceed north 0.4 miles to S Bailey Street.
3 Turn right on S Bailey Street and proceed east 0.2 miles to the I-5 freeway entrance.
4 Turn left to the I-5 freeway ramp, get in the left hand lane, and proceed to northbound I-5
5 Continue on I-5 northbound 2.8 miles to exit 164A
6 Turn right onto the ramp for exit 164 A and proceed north 0.1 miles
7 Get in the left hand lane to stay on the exit ramp, and proceed north 0.2 miles
8 Get in the left hand lane to stay on the exit ramp, and proceed north 0.5 miles
9 Get in the right hand lane to stay on the exit ramp and proceed 0.2 miles to the James Street exit.
10 Turn right onto James Street and proceed 0.1 miles east to 9th Street
11 Turn right on 9th Street and proceed 0.1 miles south to Harborview Medical Center

PRE – DEPARTURE

IMPORTANT THINGS TO CHECK & REMEMBER

1. Ensure that the Project Manager, Health and Safety Coordinator, and Project Director have approved this HASP.
2. Ensure that your Project Manager, Site Safety Officer or Health and Safety Coordinator has discussed the contents of the HASP in detail, gone through the Hazard Assessment with you and explained the hazards associated with the work that you will be performing.
3. Ensure that you have all the required PPE and are trained in the areas which are indicated in this HASP.
4. Familiarize yourself with the Emergency Action Plan for the site prior to site arrival.
5. Check the weather in the immediate area of the project site to ensure that the current weather conditions do not create additional hazards that have not been evaluated.
6. Inquire about cell phone coverage (satellite communications may be the ONLY option in some locations) and physically test all of your means of communication to ensure that they function, and you are familiar with the controls.
7. If you are going to a site where activities are in progress, do not begin work until you have been given an orientation from the Site Safety Officer and have reviewed any existing Site Health & Safety Manual.
8. Review subcontractor's site-specific HASP, as applicable.
9. **You have the right to refuse any work that you feel is unsafe, or that you are not trained to do. Please discuss your concerns immediately with the Project Manager, Site Safety Officer and Health and Safety Coordinator.**

FIELDWORK HEALTH & SAFETY PLAN

Project Personnel							
Team Member	Function	Cell Ph. #	Other Ph. #	Allergies	Emergency Contact		Init. *
					Name	Phone #	
Michael Lumpkin	Site Lead - Safety Officer	206-419-7688	425-883-0777 Ext 2207	None	Jill Lumpkin	281-650-4260 425- 271-3939	
Ted Sager	Engineer	425-245-3284	425-883-0777 Ext 2236	None	Laurel Sager	425-345-1276 425-317-0176	
Eric Holliday	Technician	425-260-5291	425-883-0777 Ext 2251	None	Teresa Holliday	425-232-0870	
Liz Shea	Engineer	Not disclosed	206-267-1166 Ext 5002	None	Redmond Office	425-883-0777	
Jill Lamberts	Engineer	206-465-2163	425-883-0777 Ext 2231	None	Chad Siefert	206-334-8605	JSL
Kate McPeek	Engineer	206-713-2832	425-883-0777 Ext 2215	None	Lesley McPeek	435-674-9493	
Diane Crawford	Engineer	206-713-5878	425-883-0777 Ext 2211	Not disclosed	Redmond Office	425-883-0777	
Ted Norton	Project Manager	206-755-4970	425-216-2461	None	Dawn Norton	360-802-0789	
Scott Matthees	Field Coordinator	253-228-6305	none	None	Mary Matthees	253-473-3555	

***All Golder Project Personnel must initial in this column beside their name to indicate that they have read & understood the project Health & Safety Plan**

Special Instructions

1.	This HASP will be updated if, and when additional health and safety issues are identified.
2.	Determine any additional H&S requirements from Site Personnel prior to starting work.

Project-Specific Check-in Procedure

If you are in the field alone, or if you are the only Golder person on-site, you must check in with the PM or a designee a minimum of twice each day, preferably once in the mid-morning and once in the mid -afternoon. A designated contact will be assigned at the start of each project. Document check-in times below and add any relevant notes.

☒ A.M. Time: 0900 The PM to start the contacting/search process if the field person did not check in after an agreed amount of time. Field personnel need to maintain a record of their calls to their PM in their field notebook.

☒ P.M. Time: 1400

If check-in does not occur at the pre-scheduled time, the PM will follow these steps:

1. Call field personnel cell phone to make contact.
2. Call cell phone of other colleagues on the project site.
3. Call client contact if present on site.
4. Call field personnel home telephone number.
5. Call emergency search services.

Contact telephone numbers are listed on Page 2 of this HASP.

PROJECT-SPECIFIC HAZARD ASSESSMENT

Date:	April 12, 2010
Assessment Conducted By:	Michael Lumpkin, Scott Matthees
Project Location:	Boeing Plant 2, Seattle/Tukwila, Washington.
Description of Site:	Plant 2 is a former aircraft manufacturing facility located on 107 acres between the Duwamish Waterway and East Marginal Way South in Seattle and Tukwila. With the exception of small landscaped areas, the ground surface at Plant 2 is either paved or covered by buildings. The 2-40s Area of Plant 2 was constructed approximately during 1940/1941 and the 2-60s/2-66 Area was constructed approximately during 1942. Historical chemicals of concern at the site include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals. A more complete list is presented in the attached Chemical Exposure table. The site is presently used primarily for administration and machining.
Work to be Accomplished	Activities to be conducted by Golder personnel: 1. Visual monitoring of contractors' work for compliance with the intent of the design. 2. Visual monitoring of the installation of foundations or below ground structures. 3. Visual monitoring of concrete slab removals, below ground foundation and structure removals. 4. Visual and PID monitoring of exposed soil and excavations. 5. Sampling soil, groundwater, concrete, caulk, coatings, sump or catch basin contents, construction materials. 6. Project schedule – Golder personnel will be involved in several projects at the site during the year. The majority of the projects will be during normal working hours. At times, schedules may include extended hours, week-ends and evening and night shifts. 7. Activities to be conducted by contractors or subcontractors (if any): Confined Space Entry, as necessary.

For each general category of hazard identified below, all project-specific hazards/conditions must be defined, and the control measures for each hazard must be identified.

Hazard	Identification of Project-Specific Conditions		Necessary Controls	Standard Work Procedure Attached (see appendix)
Travel to site				
Aircraft	☐			
Helicopter	☐			
Boat	☐			☐Working on or over water
Public or Private Roads/Driving	☒	Site personnel will be driving on public and site roads.	Employees will obey all rules and regulations on both public and site roads. Seat belts are to be worn while driving.	☒Motor Vehicles and Driving on Company Business
All Terrain Vehicles	☐			☐All Terrain Vehicle Safety
Snowmobiles	☐			☐Snowmobile Safety
Other	☐			
Site Terrain/Conditions				
Shafts/Trenches/Slopes	☒	Site employees will be working around excavations and trenches.	Employees shall not enter trenches or excavations deeper than 4 feet that are not properly shored, laid back at an appropriate angle, or where trench-boxes are not in place. Means of ingress and egress must be at appropriate intervals. Hard hats are to be worn when working in an excavation.	☒Trenching and Shoring
Overhead Hazards	☒	Site workers may occasionally work where overhead hazardous exist,	When working around overhead hazards workers shall look up and be alert for	☒Overhead Hazards

Hazard	Identification of Project-Specific Conditions		Necessary Controls	Standard Work Procedure Attached (see appendix)
		such as drill rigs, excavators, cranes during demolition.	lifting or overhead operations. When working below the ground surface workers should be alert to activities above the work area. Materials, tools, and equipment should be placed well back from the edge of the trench or excavation. Hard hats shall be worn when working around overhead hazards.	
High Altitude Location	☐			
Water Hazards	☐			☐Working on or over water
Underground Utilities	☒	Underground utilities are located throughout the site.	When involved in subsurface work, the site personnel shall confirm that all subsurface utilities have been located and properly marked. Boeing requires that both public and private utility locates are performed prior to beginning work.	☒Underground Utilities
Confined Space	☐	Confined space entry, if required, will be performed by a Golder sub-contractor that is trained and qualified for confined space entry.	Golder personnel will not enter confined space without specific training and authorization.	☒Work in Confined Spaces
Slips, Trips, Fall Hazards	☒	Site contains uneven and broken surfaces and wide-spread tripping hazards.	Site personnel will wear steel toe boots that provides ankle support. Site personnel will be observant of potential slipping and tripping hazards. Never jump over or across	☒Slips, Trips and Falls

Hazard	Identification of Project-Specific Conditions		Necessary Controls	Standard Work Procedure Attached (see appendix)
			obstacles.	
Other	☐			
Work at Heights				
Ladders/ Scaffolds	☐			
Work Platforms	☐			
Shafts	☐			
Fall Protection	☐			☐Fall Protection
General Work Environment				
Heat Stress	☒	Site employees may be doing strenuous physical work during hot weather and while wearing Tyvek and other PPE.	Remain well hydrated, take breaks in shade or out of direct sunlight, monitor co-workers for signs of heat stress. Golder employees working in Washington State will have completed WS L&I heat stress training.	☒Heat Stress
Cold Stress	☒	Site workers may be working outdoors during wet, cold and windy weather.	Wear layered clothing, gloves and hat, stay dry and monitor co-workers for symptoms of cold stress. Take breaks in warm locations.	☒Cold Stress
Severe Weather	☐			☐Inclement Weather
Remote Site	☐			☐Remote Isolated Surveys
Noise Levels	☒	Site workers will frequently work in noisy environments.	Employees will be advised of the potentially harmful effects of excessive noise. Hearing protection shall be worn while working in noisy environments. Work away from excessive noise when	☒Hearing Protection

Hazard	Identification of Project-Specific Conditions		Necessary Controls	Standard Work Procedure Attached (see appendix)
			possible.	
Insects (e.g., ticks)/Plants	☐			☐ Biological Exposure Risks
Wild Animal Habitat	☐			☐ Biological Exposure Risks
Housekeeping	☐			☐ Housekeeping
Poor Lighting	☐			
Extended work hours	☒	Site workers may work extended hours, nights, and weekend shifts.	Worker fatigue can contribute to accidents and injury. Personnel should manage fatigue by taking regular breaks, resting during breaks, and getting adequate sleep.	☒ Fatigue Management
Working Alone	☐			
Proximity to Traffic	☒	Site personnel will, at times, be working around site traffic and heavy equipment.	Site personnel to become familiar with work areas and observed established construction traffic routes and patterns. Traffic cones shall be used when working on or near traffic lanes. Where possible a vehicle should be positioned between the work area and traffic.	☒ Traffic Safety
Other	☒	Building slabs at Boeing Plant 2 are commonly impacted with PCB containing oil stains.	Site personnel will wear steel toe rubber boots that provides when working in and around oil stained building slabs.	
	☒	Driving through Boeing buildings presents risks to pedestrians and building workers.	Speed driving inside buildings is limited to 5 MPH, head lights must be on and no private vehicles are allowed.	
	☒	Boeing buildings have large	When entering buildings	

Hazard	Identification of Project-Specific Conditions		Necessary Controls	Standard Work Procedure Attached (see appendix)
		overhead door entries for vehicle access that present potential crushing hazards.	personnel shall use only personnel entries and are not to use vehicle entries.	
	☒	Upon entry many Boeing buildings require protective eye wear.	Personnel shall comply with Building entry eye wear requirements.	
Mechanical and Electrical Process				
Unstable Structures	☐			
Moving Parts/Heavy Equipment	☒	Site employees will frequently work around a variety of heavy and construction equipment.	Each type of heavy equipment poses differing potential hazards. Site personnel will be made aware of the particular hazards the types of heavy equipment working on the site. Make eye contact with the operator when approaching. Stay clear of the swing radius. Avoid working behind equipment. Be alert for back-up alarms. Wear high-visibility clothing and hard hat when working around construction equipment.	☒Working Around Heavy Equipment
Drilling / Pile Driving	☐			☐Drilling
Excavation	☒	Site employees will be working around excavations and trenches.	Presented under "Shafts/Trenches/Slopes" above.	☒Trenching and Shoring
Working on energized sources	☐			☐Lockout/Tagout
Welding, cutting, brazing	☐			☐Welding/Cutting/Hot Work Safety

Hazard	Identification of Project-Specific Conditions		Necessary Controls	Standard Work Procedure Attached (see appendix)
Portable generators	☐			☐
Other	☐			☐
Chemical/Biological Radiological				
Dust	☒	Site personnel may work in dusty environments and where potentially hazardous vapors may be present.	When working in dusty environments site workers shall wear NIOSH approved N95 dust masks. Air purifying respirators with the appropriate cartridges shall be worn when working around potentially hazardous vapors.	☒Respiratory Protection
Chemical contaminants including carcinogens	☒	Generally low levels of chemical contaminants are present throughout the site. Potentially hazardous chemicals can be in solid, liquid, or gaseous form.	Site workers wear the appropriate PPE when working around or when in contact with soils, groundwater, or potentially contaminated materials. PPE is addressed below.	☒ Chemical Exposure Risks. **A list of chemicals of concern is attached.** ☒Respiratory Protection
Radioactive Particles	☐			
Oxygen deficient	☐			
Asbestos	☒	Asbestos Containing Materials are present onsite and locations have been, and are continuing to be identified by the client. Abatement activities by a third-party subcontractor have begun and will periodically continue in, or near areas of Golder field projects.	Golder personnel will not disturb or handle ACMs when present in or near work areas. Golder personnel will not enter areas where ACM abatement activities are being performed without appropriate training and authorization.	☐Respiratory Protection ☒Asbestos Awareness Program
Explosive atmosphere	☐			

Hazard	Identification of Project-Specific Conditions		Necessary Controls	Standard Work Procedure Attached (see appendix)
Mold	☐			
Other contaminants	☐			
Fire	☒	Workers will be working around combustible and flammable materials.	Site personnel shall carry a Type ABC fire extinguisher in field vehicles. Inspections shall be performed monthly. Mechanical equipment shall be shut down and allowed to cool before fueling.	☒ Fire Prevention
Chemical Storage	☐			
Compressed Gas	☐			☐ Compressed Gas Cylinders
Explosives (storage)	☐			
Explosives (transport)	☐			
Nuclear Densometer	☐			
Other	☐			
Other Site Issues				
Landfill CQA	☐			☐Landfill CQA
Landfill Gas	☐			☐Landfill Gas Sampling
Hand and Power Tools	☒	Project work may occasionally involve the use of hand and power tools.	Prior to use site personnel shall become familiar with the proper use of the tools and all safety precautions. Power tools shall be in good working order, with factory guards in place, and with no damaged parts or power cords. A GCFI is to be used when working in damp or wet environments. Disconnect power tools when not in use. Use the right tool for the job. Wear proper PPE for the tool being used	☒Hand and Portable Power Tools

Hazard	Identification of Project-Specific Conditions		Necessary Controls	Standard Work Procedure Attached (see appendix)
			including eye and hearing protection. Clearly label damaged or inoperable equipment as 'out of service'.	
GOLDER Hired Subcontractors	☒	Golder may hire subcontractors to perform specific tasks.	Subcontractor HASP must be attached to the Golder HASP and reviewed by Golder personnel.	
Possible exposure to violence from general public	☐			
Cellular Phone Usage	☒	Cell phones will be used for communications.	Cell phones are not to be used while driving or operating equipment. Cell phones should be used well away from active construction areas.	☒Cellular Telephone Use
Projectiles / Sharps	☐			☐Bloodborne Pathogens
Soil Sampling	☒	Soil sampling will be frequently performed, often around heavy equipment, or in shallow trenches or excavations.	Site workers shall use precautions when working around heavy equipment, when working near or in excavations, and be aware of potentially hazardous chemical contaminants. Soil sampling may involve heavy lifting, proper lifting techniques shall be used. Proper PPE shall be worn when sampling soil.	☒Soil Sampling
Groundwater Sampling	☐			☐Groundwater Sampling
Surface Water Sampling	☐			☐Working on or over water
Other	☐			

Hazard	Identification of Project-Specific Conditions		Necessary Controls	Standard Work Procedure Attached (see appendix)
Work near open manholes	☒	Golder personnel will occasionally perform work around open manholes. Open manholes present a risk of falling into confined spaces.	Traffic delineators (cones, pylons, barricades) shall be placed around manholes to establish a work area. Manhole guard rails will be made available for use when working around open manholes.	
	☐			

MATERIAL SAFETY DATA SHEETS

Under the Hazard Communication regulations, OSHA requires that Material Safety Data Sheets (MSDS) be available to employees for potentially harmful substances handled in the workplace. An MSDS documents information about the properties of a particular substance, such as physical data (e.g., melting point, boiling point, solubility, etc.), toxicity, health effects, first aid, and handling procedures. The purpose of the MSDS is to provide employees with procedures for working with a substance in a safe manner.

If potentially harmful substances will be handled during this project, the appropriate MSDS must be maintained at the project site. MSDS's are maintained in a binder located onsite inside the job trailer on the 2-66 Building Slab. . MSDS's are added to the binder as new, potentially harmful substances are used.

PERSONAL SAFETY EQUIPMENT & TRAINING REQUIREMENT SUMMARY

Personal Protective Equipment (PPE) & Additional Equipment Required

PPE/ Equipment	Required	Notes:
Hard Hat	X	When working around construction equipment
Eye Protection	X	
Steel Toe Boots	X	
Hearing Protection	X	When working in noisy environments
Hi-Vis Vest	X	
Face Protection	☐	
TYVEK Suit	X	When contacting potentially contaminated soils
Gloves	X	When contacting soils or other potentially contaminated materials
Fall Protection	☐	
Life Preserver (PFD)	☐	
Cold Weather Gear	X	As needed during winter
Self Rescuer	☐	
Dosimeter (Badge)	☐	
Headlamp	☐	
Boots (other)	☐	
Bear Spray	☐	
Air Monitoring Equipment	X	PID to monitor soils
Fire Extinguisher	X	Carried in vehicles, located

Training Requirements

Training Program	Required	Staff Requiring Training
Golder Health & Safety Orientation	X	All Golder Field Staff
OSHA 10-hr Construction Safety	X	All Golder Field Staff
First Aid/CPR	X	All Golder Field Staff
OSHA HAZWOPER (40 Hr)	X	All Golder Field Staff
MSHA Part 48 - Surface	☐	
MSHA Part 48 - Underground	☐	
MSHA Part 46 - Surface	☐	
Confined Space Entry	☐	Awareness
Fall Protection	☐	
Respirator Fit Testing	X	Annually
Transporting Hazardous Materials and Dangerous Goods	☐	
Client-specific Emergency Procedures	☐	
Boat Safety	☐	
Helicopter Safety	☐	
Fall Protection	☐	
Nuclear Gauge	☐	
Client Specific	☐	
WA L&I Outdoor Heat Exposure	X	Annually

		in site trailer and connex
First Aid Supplies	X	Carried in vehicle
Washing Facilities	X	Available in occupied buildings
Drinking Water	X	Must have available during fieldwork
Additional Communication	X	Cell phone
Wheel Chocks	☐	
Sunblock	X	As needed
Other	☐	

	☐	

ACTION LEVELS FOR CONTAMINANT MONITORING

Not Applicable for This Project: ☐

Site workers must notify the site health and safety coordinator immediately in the event of any injury, or if signs or symptoms of overexposure to hazardous substances are exhibited. Specific hazardous substances expected at the site and action levels are identified and listed below.

	Parameter	Monitoring Instrument	Monitoring Frequency	Action Level/Criteria	Specific Action
☐	Oxygen	Oxygen meter or tri/quad gas meter with oxygen sensor	Continuously[1]	>25%	Fire hazard potential. Discontinue investigation. Consult the H&S Officer.
				19.5%-25%	Continue investigation with caution. Deviation from normal level (21-22%) may be due to presence of other substances.
				<19.5%	Cease work and evacuate area. Contact PM and office HSC for further options. Upgrade PPE to Level B if investigation is authorized to continue. **NOTE: Combustible gas readings are not valid in atmospheres with <19.5% oxygen**
☐	Combustible Gas or Vapor	Combustible gas meter – % LEL	Continuously	<10% LEL	Continue investigation.
				10%-25% LEL	Continue on-site monitoring with extreme caution as higher levels are encountered.
				>25% LEL	Explosion hazard. Withdraw from area immediately.
☒	Volatile Organic compounds	PID/FID	Specific requirements are presented in project work plans.	If the PID reading is greater than 10 ppm in breathing zone[2] If the PID reading is greater than 25 ppm in breathing zone[2]	Cease work, move upwind and allow vapors to dissipate. Cease work and evacuate area. Contact designated Health and Safety personnel. Evaluate if mechanical ventilation is feasible.
☐	Particulate	Real-time Dust Meter	Continuously	If the Dust Meter is _____ (in breathing zone)[3]	Specific action levels are presented in project work plans.

[1] This means at least four times an hour or whenever conditions change.

[2] The action level are established on each project site based on the contaminants present and should be set at one-half of the lowest published standard. Be careful that the PID will measure the contaminant and compensate for how well the contaminant is measured (see manufacturer data). Specific action is required if four consecutive readings reach the action level. Breathing zone is defined as the hemisphere forward of the shoulders with a radius of six to nine inches.

Because the site action level for VOCs is set and 10 ppm and the PEL for vinyl chloride is 1.0 ppm it will be important to determine if the total VOCs detected in the air contain greater than 1.0 ppm vinyl chloride. This determination will be made using colorimetric tubes specifically designed to detect and quantify vinyl chloride concentrations in the air. If total VOC concentrations are greater than 1.0 ppm over background (sustained for >15 minutes) Golder field personnel will use colorimetric tubes to evaluate the vinyl chloride concentration. If vinyl chloride is detected at concentrations greater than 1.0 ppm in the breathing zone engineering controls will be implemented and the breathing zone will be re-tested. Work will not be resumed until vinyl chloride concentrations are below 1.0 ppm in the breathing zone.

[3] These thresholds can be established by extrapolation from soil concentrations and should be the lesser of 5 mg/m^3 as respirable dust or the extrapolated threshold. Specific action is required if four consecutive readings reach the action level.

☒ **Chemical Exposure Information attached.**

FIELD SAFETY PROCEDURES CHANGE AUTHORIZATION

This Safety Procedures Change Authorization Form will be completed and signed before any safety procedures identified in this Site Safety Plan can be modified by the Field Team. All revisions to safety procedures must be approved by the Project Manager.

Change Number:

Date:

Duration of Task to be changed:

Description of Procedures modification:

Justification:

Person Requesting Change:

Name:

Verbal Authorization Received From:

Name:

Title:	Title:
Signature	Approved by: (Signature of person named above to be obtained within 48 hours of verbal authorization)

INCIDENT REPORT FORM

This report is to be completed by someone familiar with the incident. It should be completed and returned to the Health and Safety Officer whenever an incident occurs. If in doubt, fill it out.

Incident: any expected or unexpected happening that interrupts the work sequence or process and that may result in injury, illness, or property damage to the extent that it causes loss.

Project Title/Number: _____

Completed by: _____

Date of Incident: _____ Date of Report: _____

PERSONNEL INVOLVED

List of all personnel involved in the incident:

_____

_____

_____

_____

TYPE OF INCIDENT

Describe the incident:

_____

_____

_____

INJURIES

List injured personnel and the injuries:

PREVAILING CONDITIONS

Describe the prevailing weather, surface, equipment conditions which may have had a factor in the incident:

PERSONNEL PROTECTIVE EQUIPMENT

List PPE used prior to and during the incident:

SITE MONITORING

Describe any real time monitoring that took place prior to, during and/or after the incident:

ACTIONS

List personnel and outside agencies that responded:

NOTIFICATIONS

Were the following notified? Police☐ Fire☐ EMS☐ OSHA ☐ Other ☐

RECOMMENDATIONS

List recommendations to avoid/correct the incident:

COMMENTS

REVIEWED BY:

	Site Health and Safety Coordinator
	Project Manager
	Project Director

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Site Orientation /Tailgate	J. Lamberts	jsl	8/10/11
	J. Lamberts	jsl	8/11/11
	Ken Wolk	KW	8-10-11
	K.C. WADE	KW	8-11-11
	Arthur L. Martin		8/11/11

Topics of Discussion

- Heavy Equipment.
- Traffic
- Noise
- Eye contact
- Communicate changes.
- Keep area clean. housekeeping

*Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	8/16/11
	[illegible]		
	Ken Wade	KW	8-16-11
	K.C. WADE	KC	8-16
Tailgate	J. Lamberts	JSL	8/24/2011
	K WADE		
	Mike Huffman	[illegible]	8-24-11

Topics of Discussion

Heavy equipment. - Pinch Points
PPE
Traffic
Slips, Trips, Falls.
Eye Contact

*Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	K.C.	KCV	8-17-11
	Jill Lamberts	JSL	8/17/2011
	Ken Wolin	KW	8/17/11
Tailgate	Jill Lamberts	JSL	8/18/2011
	Dave Johnson	[illegible]	8-18-11
	K.C. WADE	KCV	8-18

Topics of Discussion

Fence building
Bioswale - narrow, careful of plants, rock wall.
Traffic.
Heavy equipment
Trenching / shoring
Confined space entry
contaminated soils
overhead hazards.

*Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	Jill Lamberts	jsl	8/25/2011
	[illegible]	[illegible]	8/25/2011
	[illegible] Huffman	[illegible]	8-25-11
	Ken Wade	KW	8-25-11
	K.C. WADE	KW	8-25-11

Topics of Discussion

Dust Control
Heavy Equipment
Pinch Points
Slips, Trips, Falls

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	Jill Lamberts	JSL	8/26/11
	Tim BERSCH	TWB	8/26/11
	Arthur Martin	ALM	8/26/11
	K.C. WADE	KCW	8-26-11
	Ken Waller	Ken W.	8-26-11
	Michael Hoffman	[illegible]	8-26-11
	Jason Gregoire	[illegible]	8-26-11

Topics of Discussion

PPE
Hearing Protection
Traffic
Slips Trips Falls
Heavy Equipment

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J H Lamberts	JSL	8/29/11
	[illegible]		
	K.C. NADE	[illegible]	8-29-11
	Michael Huffman	[illegible]	8-29-11
	[illegible]	TB	8-29-11
	Ken Wolle	KW	8-29-11

Topics of Discussion

PPE
Cover Soil Piles
Zone of Exclusion.
Heavy Equipment
Spill kit
Eye Contact.
Emerg. #.

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	Jill Lamberts	JSL	8/30/2011
	K.C. WADE	KCW	
	Michael Hightower	[illegible]	8 30 11
	[illegible]		
	[illegible]	TWB	8-30-11
	KYLE OBER	KWO	8/30/11
	Ken Weller	KW	8/30/11

Topics of Discussion

Heavy Equipment.
Heat Safety
Slips Trips Falls.
Eye Contact

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	8/31/2011
" "	T. Berrick	TB	8/31/11
	[illegible]		
	K. Ch	KO	8/31/11
	K. C. WADE	KW	
	[illegible]	Mike	8-31-11

Topics of Discussion

shoring
PPE
heavy equipment
housekeeping
zone of exclusion
foot traffic
fencing
traffic

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	9/1/2011
" "	T. BERSCH	TB	9/1/11
	KYLE ODER	KO	9/1/11
	Michael Huffman	[illegible]	9-1-11
	[illegible] WADE	KW	
	[illegible]		

Topics of Discussion

safety zone, keep people out, fencing
tool safety
slips trips falls
heavy equipment
trenching, shoring

*Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
	[illegible]	KO	9/2/11
	KG WADE	KW	9-2-11
	Ken Wolk	KW	
	[illegible]	TB	9-2-11
	[illegible]	JD	9-2-11
	Jill Lamberts	JSL	9/2/11
	Michael Huffman	MHH	9-2-11

Topics of Discussion

plastic soil piles
speed in phy lot
keeping people out of construction zones
painted lines - red = electrical
trucking materials, covered loads
eye contact.

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	jsl	9/3/2011
	K.C. WADE	KCW	9-3-11
	Mike Huffman	[illegible]	9-3-11

Topics of Discussion

hearing protection
fatigue management
heat safety
underground utilities, paint colors.
trenching, shoring

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	9/6/2011
" "	T. BERSCH	TB	9/6/11
	KYLE OBER	KO	9/6/11
" "	Michael Huffman	MRH	9 6 11
	[illegible]	SD	9-6-11
	K.C. WADE	KW	9-6-11
	J. Mario Acosta	J.A	9-6-11
	Arthur Martin	ALM	9-6-11

Topics of Discussion

People - be aware

Speed - 10mph or less

Watch your step - slips trips falls

Heat safety

Spills.

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JL	9/7/11
" "	T. BERSCH	TB	9/7/11
	J. Dreke	JD	9/7/11
	Mike Huffman	[illegible]	9-7-11
	Ken WADE	KW	9-7-11
	KYLE OBER	KO	9/7/11
	Arthur Martin	ALM	9/7/11
	J. Acosta	JA	9/7/11

Topics of Discussion

- Breathing zone safety
- confined space entry
- contaminated soils, PID readings
- keep people out
- trip hazards.
- overhead loads / hazards
- heat safety
- heavy lifting
- look around

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	9/8/2011
" "	T. BERSCH	TB	9/8/11
" "	J Drake	JD	9/8/11
	K.C.	KW	9-8-11
" "	Mike Hutchison		9 8 11
	KYLE OTSER	KO	9/8/11
	Arthur Martin	ALM	9/8/11
	J. Mario Acosta	A.	9/8/11

Topics of Discussion

exhaust around buildings
people
overhead loads.
speed.
noise complaints
look around vehicles before backing out.

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lambert	JSL	9/9/11
	T. BERECH	TB	9/9/11
	KYLE OTER	KO	9/9/11
	Mike Huffman	MH	9 9 11
	K.C. WADE	KW	9-9-11
	JD Drake	JD	9-9-11
	Mario Acosta	M-A	9/9/11
	Arthur Martin	ALM	9/9/11

Topics of Discussion

Beaware of surroundings
Traffic
carefull with machines
exhaust
Pre excavation safety checklist

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	9/12/11
" "	T. BERSCH	TB	9/12/11
	KYLE OBER	KO	9/12/11
	Michael Huffman	[illegible]	9-12-11
	T.C. WADLE	[illegible]	9-12-11
	[illegible]	[illegible]	[illegible]
	[illegible]	SD	9/12/11
	J. Mario Acosta	J.D	
			9/12/11

Topics of Discussion

Heavy trucks
Foot traffic
Cutting trees
Zone of exclusion
Safe Holes, shoring trenching - must be within 6-10 ft of an open hole.
Dust control
Drive slowly, blinkers

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	9/13/11
	Mike Huffman	[illegible]	9/13/11
	Arthur Martin	AJM	9/13/11
	J. Mario Acosta	J.A	9/13/11
	K.C. Wade	[illegible]	9-13-11
	J Drake	[illegible]	9-13-11
	KYLE OBER	KO	9/13/11
" "	Tim Bersch	TB	9/13/11

Topics of Discussion

Watch people, backing up
slips trips falls
cleanup/ housekeeping
hole safety
safety fencing
overhead hazards

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J Lamberts	JL	9/14/2011
	S Drake	SD	9/14/11
	KYLE OBER	KO	9/14/11
" "	T. Bernh	TB	9/14/11

Topics of Discussion

excavations
traffic
people
housekeeping
slips trips falls

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J Lamberts	JSL	9/15/11
	Mike Huffman	[illegible]	9/15/11
	[illegible]	[illegible]	
	KYLE OBER	KO	9/15/11
	[illegible]	[illegible]	

Topics of Discussion

Be aware of surrounding
slips trips falls
heavy lifting
Stretching

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	9/19/2011
	S-Drake	[illegible]	"
	[illegible]	[illegible]	9-19-11
	[illegible]	K.C.W.	9-19-11
" "	T. Bensell	TWB	9-19-11
	KYLE OBER	KO	9/19/11

Topics of Discussion

Excavation safety
confined space entry
trench safety
heavy lifting
traffic

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lambert	JL	9/20/2011
	Mike Huffman	[illegible]	9-20-11
	KYLE OBER	KO	9/20/11
" "	T. BERSCH	TB	9/20/11

Topics of Discussion

proper lighting
excavation safety
heavy equipment
confined space entry
pinch points

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lambeets	JSL	9/21/2011
" "	T. BERSCH	TB	9/21/11
	[illegible]	[illegible]	9-21-11
	[illegible]	SD	9-20-11
	[illegible]	[illegible]	9-20-11
	KYLE OBER	KO	9/21/11
	[illegible]	TLS	9/21/11

Topics of Discussion

Keep people out
heavy equipment
pinch points
PPE
excavations

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JL	9/22/2011
	Mike Huffman	[illegible]	9-22-11
" "	KYLE OBER	KO	9/22/11
" "	T. BERSCH	TB	9/22/11
" "	S. Drake	AD	9/22/11
	K.C. WALK	[illegible]	9-22-11

Topics of Discussion

Public
Traffic
Heavy Equipment
Pinch Points
Slips Trips Falls
Overhead Loads
Exhaust Fumes
Slippery Surfaces
Fire Drill

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
	J. Lamberts	JSL	9/26/11
	Mike Huffman	[illegible]	9-26-11
	KYLE OBER	KO	9/26/11
	TIM BERSCH	TB	9/26/11
	K.C. WADE	K.C.	9-26-11

Topics of Discussion

Pedestrians
Cover Plastic
Traffic
Excavations
Heavy Equipment

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	Mike Huffman	[illegible]	9-27-11
	J. Lamberts	JSL	9/27/11
	K.C. WADE	KCW	9-27-11
	T. BERSEA	TB	9/27/11
	KYLE OBER	KO	9/27/11

Topics of Discussion

keep people out
Trench
Cover soil piles
Traffic
Bad Weather

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

9/28/2011

Golder Associates

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	K.C. WADE	KCW	9-28-11
	Mike Huffman	[illegible]	9-28-11
	Tim Bersch	TB	9-28-11
	KYLE OBER	KO	9/28/11
	Ted Norton	TN	9/28/2011

Topics of Discussion

POD – exc. for large storm filter
– fix pipe in front.

Excavation Safety
Traffic in parking lots

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lambert	JSL	9/29/2011
" "	T. BERSCH	TB	9/29/11
	K.C WADLE	KCW	9-29-11
	KYLE OPER	KO	9/29/11
	Mike Huffman	[illegible]	9-29-11

Topics of Discussion

PPE
excavation safety
heavy equipment
keeping people out.

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lambents	JSL	9/30/2011
" "	T. BERSCH	TB	9/30/2011
	Mike Huffman	MH	9 30 2011
	KYLE OBER	KO	9/30/11
	K.C. WADE	KCW	9-30-11

Topics of Discussion

Working around sheets - stay clear
traffic
heavy equipment
PPE

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	[illegible]	~~10/1/11~~ JS	10/1/2011
" "	[illegible]	TB	10/1/11
	[illegible]	[illegible]	10/1/11
	K.C. WADE	KCW	10-1-11
	Kyle R Chambers	KC	10-1-11

Topics of Discussion

Placing a trench box
Keep people out of construction area
Spills
Slips trips falls

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ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts.	JL	10/3/2011
" "	T. BERSCH	TB	10/3/2011
	K. WADE	KW	10-3-11
	Mike Huffman	[illegible]	10 3 11
	KYLE OBER	KO	10/3/11

Topics of Discussion

Excavation safety
Keep People out
PPE
Heavy Equip

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ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	10/10/11
" "	T. Bersch	TB	10/10/11
	Kyle Obor	KO	10/10/11
	K.C. Wade	KCW	10-10-11
	Mike Huffman	[illegible]	10-10-11
	Robert Romer	[illegible]	10-10-4

Topics of Discussion

confined space
Heavy lifting
Safety fencing
trench. safety
PPE
Slips trips falls
overhead loads.

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ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lambert	jl	10/11/2011
" "	T. BERSCH	TB	10/11/11
	KYLE OTSER	KO	10/11/11
Tailgate	[illegible]	SC	10/11/11
TAILGATE	Robert Romo	[illegible]	10-11-11
	K.C. WADE	KCW	10-11-11

Topics of Discussion

Confined space entry
Trench safety
Overhead hazards
PPE
Heavy equipment

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ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	Jill Lamberts	JSL	10/13/11
" "	Jim BERSCH	T.B	10/13/11
" "	[illegible]	[illegible]	10/13/11
	[illegible]	[illegible]	10/13/11
	K.C. WADE	KCW	10-13-11
	Robert Roman	[illegible]	10-13-11
	KYLE OTSER	KO	10/13/11

Topics of Discussion

Heavy Equipment
Traffic
PPE
Ladder safety

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Golder Associates

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
TAILGATE	[illegible]	TP	10/14/11
	J.L. Lamberts	JSL	10/14/11
	[illegible]		
	Mike Hutton	[illegible]	10/14
	Ke Wade	[illegible]	10-14-11
	Jim Loomis	[illegible]	10-14-2011
	Robert Romer	[illegible]	10-16-11

Topics of Discussion

PPE
Heavy Equipment
Trench safety

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ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
TAILGATE	D. CASSELL SR.	D.C.	10/17/11
Tailgate	J. Lamberto	JSL	10/17/11
" "	T. BERSCH	TB	10/17/11
" "	Steve Messingale	[illegible]	10/17/11
	[illegible] WADE	KCW	10-17-11
" "	[illegible]	[illegible]	10-17-11
" "	JAMES SIREGAR	JS	10/17/11
" "	Robert Romar	[illegible]	10-17-11
" "	KO	KO	10-17-11
" "	Mike Heaton	[illegible]	10-17-11

Topics of Discussion

Heavy Equipment
Watch Speed
Trenchsafety
Traffic

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ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate.	J. lamberts	JSL	10/18/11
" "	T. BERSCIT	TB	10/18/11
" "	J. SIREGAR	JS	10/18/11
" "	Darren PHelp	DP	10-18-11
" "	K.C. WADE	KCW	10-18-11
" "	DONALD CASSELL SR.	DC.	10/18/11
" "	Steve massingale	SM	10/18/11

Topics of Discussion

***Ensure that all workers (including Golder sub-contractors) attending the safety meeting, initial the column beside their name.**

ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	10/19/2011
" "	T. BERSCH	T.B	10/19/2011
" "	J. SIREGAR	JS	10/19/2011
" "	J massingale	SM	10/19/11
" "	K.C WADE	KCW	10-19-11
" "	Jim Loomis	JL	"

Topics of Discussion

Trench safety
traffic
Heavy equipment
Heavy lifting
Slips Trips Falls
PPE.
Eye contact.
Confined space entry

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ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	JSL	10/25/11
" "	T. BERSCH	TB	10/25/11
" "	S. Messinger	[illegible]	10/25/11
" "	Mike Huffman	[illegible]	10/25/11
" "	KO	KO	10-25-11

Topics of Discussion

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ON SITE SAFETY BRIEFING TRACKING FORM

Meeting Type- Site Orientation or Tailgate Talk	Meeting Attendee	Initials*	Date
Tailgate	J. Lamberts	jsl	10/26/11
" "	T. BERSCH	TB	10/26/11
" "	S Massingale	SM	10/26/11

Topics of Discussion

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APPENDIX D

PHOTOGRAPHS

(ELECTRONIC COPIES ONLY, PROVIDED ON DVD)