

**Topsoil Management Plan  
Borrow Area 4  
Sea-Tac International Airport  
City of Seatac, Washington**



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**Prepared for  
Port of Seattle**

**September 21, 2001  
4978-54**

1285

**AR 051217**

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**TOPSOIL MANAGEMENT PLAN  
BORROW AREA 4  
SEA-TAC INTERNATIONAL AIRPORT  
CITY OF SEATAC, WASHINGTON**

**EXECUTIVE SUMMARY**

The Port of Seattle (Port) has identified Borrow Area 4 as a source of earth fill material for the third runway embankment construction project at the Seattle-Tacoma International Airport (STIA). Borrow material excavation is planned to occur in 2002. Site reclamation would begin during the same year. Topsoil materials will be removed from the borrow area for temporary stockpiling and subsequent replacement as a planting medium during reclamation of the borrow area. None of the topsoil will be used as fill material for the third runway embankment.

Borrow Area 4 lies within part of the Puget Sound region impacted by fallout of arsenic-bearing airborne emissions. The fallout originated from historical ASARCO copper smelter operations in Tacoma. Chemical testing of topsoil from Borrow Area 4 detected mean arsenic concentrations comparable to those commonly present in undisturbed surficial soils elsewhere within the footprint of the smelter plume. Maximum arsenic concentrations detected in Borrow Area 4 topsoil are significantly lower than those detected at other locations, including Maury and Vashon Islands, and the City of University Place near Tacoma. Sample analytical testing results from the Maury-Vashon Island and University Place studies are presented for comparison.

There is no indication that the presence of arsenic in Borrow Area 4 topsoil poses a long-term environmental health threat. However, because of the low concentrations of arsenic present, it is recommended that a number of best management practices (BMPs) be used for topsoil removal, stockpiling, and replacement. Applicable BMPs will be implemented to limit potential contact and off-site tracking by minimizing dust generation during topsoil handling and by controlling contact stormwater runoff. BMP measures will also include covering temporary topsoil stockpiles to eliminate precipitation contact. BMPs to be implemented are consistent with the Temporary Erosion Sediment Control (TESC) Plan (in-progress) and National Pollutant Discharge Elimination System (NPDES) Sand and Gravel General Permit requirements for the project (Ecology 1999). Specific elements of the topsoil management strategy and health and safety considerations are described in subsequent sections of this document.

## **1.0 INTRODUCTION**

Borrow Area 4 has been designated as a source of on-site fill material to be used in the construction of a third runway at STIA (Figure 1). An estimated 1.2 million cubic yards (cy) of silty sand and gravel are available for excavation from Borrow Area 4.

This Topsoil Management Plan presents the Port's conceptual plan for managing topsoil for reuse as a planting medium in Borrow Area 4 following completion of fill material excavation activities. This document was prepared on behalf of the Port to summarize planned borrow area development, present topsoil chemical testing data, and describe stockpiling and reuse of topsoil during site reclamation.

### ***1.1 Site Location and Setting***

The borrow area is located north of South 200th Street, south of South 196th Street, west of 18th Avenue South and the Tye Valley Golf Course, and east of the Maywood Elementary School (Figure 1). The borrow area property includes land owned by the Port of Seattle (the Port) and the Washington State Department of Transportation (WSDOT). The existing WSDOT right of way forms a northwest-southeast zone along the northern part of Borrow Area 4.

## **2.0 BORROW AREA SITE DEVELOPMENT**

Borrow Area 4 development will occur in three distinct phases—site preparation, fill material excavation, and site reclamation as summarized below. The entire process is planned to occur over a single construction season.

### ***2.1 Planned Excavation Activities***

The Port is coordinating the excavation of Borrow Area 4 with WSDOT to ensure that the final grade and configuration will facilitate the future extension of SR 509. The final excavation shape and finished elevations are constrained by a number of factors including the final WSDOT alignment and grade.

Borrow material development will begin with developing site access and the installation of approved TESC measures as necessary. The borrow area excavation sequence consists of harvesting merchantable timber, clearing the remaining vegetation, removing and temporary stockpiling of topsoil for reuse during reclamation, and excavating native glacial soils for use as common fill in

the runway embankment. Topsoil and borrow excavation will likely utilize dozer and wheeled bucket loader methods, but tracked excavators or other types of equipment could be used based on contractor equipment selection.

During development of Borrow Area 4, topsoil materials will be removed to an approximate depth of 1 foot below the existing ground surface to access underlying soil. The topsoil removal thickness will vary somewhat depending on a number of factors including the soil type, vegetation cover, moisture conditions, and slope angle. The total amount of topsoil from Borrow Area 4 is estimated to be 45,000 cy.

Excavation will generally progress in a series of benched cuts down to a planned minimum elevation of approximately 305 feet (Port of Seattle Datum). This strategy will create final excavation elevations that result in a minimum 10-foot buffer of intact, native soils above a zone of perched groundwater that occurs in the area. In June 2001, groundwater elevations in the perched zone were measured at a maximum elevation of 293 feet near the lowest point of the planned floor of the excavation. The finished excavation grade of the borrow area also lies more than 70 feet above a deeper regional aquifer system, and is separated from this regional system by an aquitard consisting of glacial till soils.

Stormwater runoff control measures and related BMPs will be implemented during excavation based on the project TESC Plan. The temporary erosion and sediment control features will be placed around borrow, staging, and stockpiling areas. Pertinent erosion control measures and other BMPs for topsoil management are described in Section 4.0. Site reclamation will consist of those activities discussed below.

## **2.2 Reclamation**

The Port will manage borrow activities and reclaim surface disturbances in a manner consistent with the approaches set forth in the Master Plan Update (Federal Aviation Administration [FAA] 1997) and supporting EIS documents (FAA and Port of Seattle 1996 and 1997). The Port and its contractor will use appropriate reclamation procedures and technologies to reclaim borrow area-related disturbances to a productive land use that is consistent with the Aviation Commercial and Operations Zones.

Reclamation goals and objectives are contained in the Port's Final Draft Conceptual Borrow Material Development and Reclamation Plan, Borrow Areas 3 and 4 (Hart Crowser 2001). These goals and objectives include:

- Establishing stable surfaces, topography, drainage, and water quality conditions;
- Re-establishing suitable soil conditions to support viable populations of vegetation necessary to control erosion and meet landscaping requirements; and
- Revegetation of disturbed areas to prevent erosion in a manner consistent with the Master Plan Update, EIS, and applicable landscaping plans.

Site reclamation is intended to mitigate physical hazards created by excavation and establish permanent, stable landforms and drainage features. Reclamation efforts are designed to restore soil conditions for revegetation, prevent erosion, and create suitable habitat compatible with long-term land use. Topsoil revegetation will help stabilize exposed slopes, and stormwater control structures and associated BMPs will be phased out when no longer needed.

The reclamation process involves regrading finished slopes and benches for topsoil replacement, followed by revegetation and landscaping. Regrading will create contoured surfaces that blend into the surrounding slopes to minimize potential for erosion and provide a suitable environment for topsoil replacement.

On-site reuse of topsoil is a key focus of the reclamation strategy and requires appropriate management and stockpiling. Topsoil removed from Borrow Area 4 will be reused during reclamation of this site; however, supplementary topsoil may also be imported from elsewhere on the airfield and/or off-site sources if needed to achieve adequate coverage and thickness.

Hydroseeding with a bonded fiber matrix will be used where appropriate as part of topsoil reseeding and revegetation efforts. Additional plantings as part of reclamation will be compatible with the approved STIA landscaping plan. Reclamation monitoring locations will be established to document soil conditions and track succession rates for replanted or reseeded species.

### **2.3 Schedule**

Soil material excavation in Borrow Area 4 is currently planned to be completed over one construction season in 2002. Materials from Borrow Area 4 are sensitive to the amount of moisture contained in the soil for fill construction. Thus excavation will be limited to the dry summer months, from approximately June to October 2002. Subsequent reclamation, revegetation, and monitoring will be underway at the end of the construction season.

### **3.0 TOPSOIL SAMPLING AND CHEMICAL ANALYSIS RESULTS**

Borrow Area 4 lies within part of the Puget Sound region impacted by fallout of arsenic-bearing airborne emissions from historical ASARCO copper smelter operations in Tacoma. The location of the borrow area within the reported footprint of the aerial plume prompted collection and analysis of topsoil samples in June 2000 and June 2001.

This section presents the chemical analytical results of soil samples collected from Borrow Area 4 and compares the results to those of soil samples at other locations within the smelter plume footprint in the Puget Sound region. The current status of studies by the Washington State Department of Ecology (Ecology) and others within the plume area is also summarized for comparative purposes.

#### **3.1 Chemical Analysis Results**

Topsoil sampling locations were selected where there was no visual evidence of previous physical disturbance or soil erosion. Chemical analytical results for each sampling event are summarized in Table 1 and discussed below. Sampling locations are identified on Figure 2.

During the June 2000 sampling event, topsoil samples were obtained from four locations in Borrow Area 4 as identified on Figure 2. At each location samples were collected at depth intervals of 0 to 2, 2 to 6, and 12 to 18 inches below ground surface to evaluate changes in arsenic concentration with depth (Table 1). Arsenic concentrations in the 0- to 2-inch samples ranged from 27.2 to 49.1 milligrams per kilogram (mg/kg), with a mean concentration of 35.6 mg/kg. Concentrations decreased rapidly with depth to mean values of 11.4 and 5.0 mg/kg for the 2- to 6- and 12- to 18-inch-depth intervals, respectively. Additional sampling was completed in June 2001 to collect samples over the 0- to 12-inch topsoil removal depth at locations S-1 through S-4 and at six other locations representative of undisturbed topsoil in Borrow Area 4 (Figure 2). Arsenic concentrations in the June 2001 samples ranged from 11 to 45 mg/kg, with a mean concentration of 27.3 mg/kg.

#### **3.2 Comparison to Regional Arsenic Soil Concentrations**

The mean arsenic concentrations from the Borrow Area 4 samples are similar to those detected in shallow soils collected at other undisturbed locations within the footprint of the ASARCO smelter plume. For comparison, near-surface soil samples were collected by Ecology during a 2000 study of arsenic in residential area soils from the City of University Place near Tacoma (Ecology 2001a). The

mean arsenic concentrations in the University Place samples were 28.1 mg/kg (0- to 2-inch depth), 27.1 mg/kg (2- to 6-inch depth), and 26.4 mg/kg (0- to 12-inch depth). The University Place samples had higher maximum concentrations than those from Borrow Area 4, ranging up to 113.3 mg/kg for 0- to 2-inch depth and 70.3 mg/kg for 0- to 12-inch depth.

Borrow Area 4 arsenic concentrations are lower than those detected in shallow soil samples collected for Glacier Northwest's proposed expansion of sand and gravel operation mining operations on Maury Island. Potential arsenic impacts were considered during mine planning because of the project's location within the footprint of the ASARCO smelter plume. Detected arsenic concentrations at Maury Island ranged up to 477 mg/kg but decreased in deeper soils to concentrations representative of natural background conditions. Analytical results are reported by King County in the July 1999 Draft EIS and June 2000 Final EIS for the proposed mining project, and in a study conducted by the Seattle-King County Health Department and Glass in 2000. Background arsenic concentrations for the Puget Sound region are presented in Ecology Publication No. 94-115 (Ecology 1994).

### **3.3 Arsenic Mobility is Limited**

Available data indicate that arsenic associated with the ASARCO smelter plume binds tightly to soil materials and does not migrate or leach to groundwater. This finding is based on review of arsenic sampling and analysis data reported in the EIS for the proposed Maury Island mining project.

Arsenic soil concentrations ranged up to 477 mg/kg at Maury Island, but decreased to background levels in deeper soils (King County 2000). Groundwater samples collected from wells screened in the deeper soils contained a maximum arsenic concentration of 4 micrograms per liter (ug/L). This detected concentration is typical of background arsenic levels in the Puget Sound region. Based on review of the soil and groundwater sampling and analysis results, the Final EIS for the Maury Island mining project concluded that there was "relatively little danger" to potential off-site receptors from arsenic in undisturbed topsoil (King County 2000). This conclusion was based on the observation that there was no indication of arsenic migration to groundwater or surface water during site groundwater monitoring.

In comparison to Maury Island, arsenic concentrations in topsoil at the Port borrow areas are substantially lower, and decrease to background levels at a shallower depth (e.g., 5.0 mg/kg for 12- to 18-inch-depth interval). Therefore, no groundwater impacts above background are indicated by these data.



### **3.4 Ecology's ASARCO Plume Investigation Status**

Arsenic concentrations in shallow soils within the footprint of the ASARCO smelter plume represent a regional condition that is being studied by Ecology. Ecology describes the background and status of on-going studies for the ASARCO smelter plume in King and Pierce Counties in a March 6, 2001, "Focus" document (Ecology 2001b) and in a June 2001 Fact Sheet (Ecology 2001c). These discussions included findings from studies at Vashon-Maury Island and City of University Place. For each of these study sites Ecology concluded that arsenic is not present at concentrations that immediately threaten public health or indicate immediate health hazards to residents and workers. The maximum arsenic concentrations for University Place and Vashon-Maury Island are significantly higher than those in Borrow Area 4 topsoil.

Ecology also issued a news release on June 12, 2001, stating that no immediate cleanup actions are needed for "child-use" properties located within areas affected by plume fallout on Vashon and Maury Islands (Ecology 2001d). The basis for this determination was a risk-based interim action level of 100 mg/kg established by Ecology for average arsenic concentrations. The interim action level for parks, beaches, and less-frequented areas was listed in the news release as 200 mg/kg. Averaged arsenic concentrations at Maury and Vashon Island ranged upward to 50 mg/kg, well below the interim action levels, and significantly above the mean Borrow Area 4 concentration of 27.3 mg/kg. Ecology also listed a number of common sense practices to minimize potential exposure to dust in residential portions of the Maury-Vashon Island plume area. These practices include covering areas of exposed soil in child-use areas, hand washing when coming indoors, and avoiding eating and drinking in affected areas.

For comparative purposes, the mean arsenic concentration of 27.3 mg/kg in Borrow Area 4 topsoil (0- to 12-inch depth) only slightly exceeds the Washington State Model Toxics Control Act (MTCA) Method A cleanup level of 20 mg/kg (Chapter 173-340 WAC). Slight exceedences are also common for other parts of the ASARCO Smelter plume footprint. Also, arsenic concentrations in deeper soil at Borrow Area 4 decrease rapidly to background concentrations. In addition, the topsoil removal process will tend to rework and homogenize the material, resulting in bulk arsenic concentrations that are expected to be significantly lower than those in the existing undisturbed topsoil. Therefore, no impacts to surface water or underlying groundwater are expected relative to regional background levels.

## **4.0 TOPSOIL MANAGEMENT STRATEGY**

The topsoil management strategy for Borrow Area 4 presents handling and BMP protocols for material affected by low concentrations of arsenic from the Asarco plume. These protocols are intended to guide construction activities and contractor requirements and to be consistent with the TESC Plan and other relevant provisions of the Port's NPDES Sand and Gravel General Permit (Ecology 1999). The TESC Plan and Sand and Gravel General Permit describe BMPs for site stormwater management. As mentioned in Section 2.1, borrow material development will begin with developing site access and the installation of approved TESC measures as necessary. These erosion control measures are consistent with provisions of the Sand and Gravel General Permit, and the King County Surface Water Design Manual (King County 1998). Topsoil management protocols are also consistent with a Storm Water Pollution Prevention Plan (SWPPP, Parametrix 2001) being developed pursuant to requirements of the Sand and Gravel General Permit.

The following sections describe specific task activities supporting the topsoil management strategy.

### **4.1 Clearing and Grubbing**

Following cutting of merchantable timber, stumps and root balls must be removed from the ground to facilitate topsoil removal. The preferred option is to reincorporate the wood material as part of on-site reclamation. This may be accomplished by chipping the stumps and spreading or incorporating with the topsoil during reclamation. This may also be accomplished by grinding the stumps in-place and reincorporating the material into topsoil. Any alternate management of this material must be approved by the Port.

Equipment traffic and debris handling during clearing and grubbing could promote tracking of topsoil. The following BMPs are presented to minimize off-site tracking potential and dust generation:

- Burning of slash and woody material from the root zone will be prohibited.
- Water spraying will be used in work areas and along access roads during grinding and chipping of stumps and root balls as necessary to control dust.
- A vehicle wheel wash should be established at access road egress points from Borrow Area 4 during timber salvage and clearing operations.

Discharge water from washing activities will be managed separately from site stormwater, which will be collected in detention ponds and infiltrated.

#### **4.2 Topsoil Removal**

Once trees and other vegetation are cleared from one or more segments, topsoil removal will require a nominal excavation depth of about 1 foot. A thinner topsoil removal section is not likely to be practical because of variation in topography and the presence of roots and other plant material. This removal depth will produce an estimated topsoil volume of 45,000 cy for Borrow Area 4.

Topsoil removal is planned within the limits of the borrow area excavation in one more-or-less continuous process using graders, dozers, front-end loaders, haul trucks, and other equipment as deemed necessary by the contractor. Dust suppression and tracking BMPs include:

- Dust control and vehicle/equipment spray washing at egress points as discussed above.
- Discharge water management and on-site infiltration as discussed above.
- Covering loaded haul trucks if necessary to control dust during transport of topsoil to temporary off-site stockpiling areas planned at the Tyee Valley Golf Course.

#### **4.3 Stockpiling**

Topsoil removed from Borrow Area 4 will be stored in temporary stockpiles within the stockpile and staging area boundary in the upland portion of the Tyee Valley Golf Course. Stumps and root balls for reclamation may also be temporarily stockpiled prior to grinding. Stockpiles for stumps and roots will be managed in the same manner as that described for topsoil.

Stockpile locations will be located outside of wetland protection areas and may be modified as necessary to accommodate storage volume needs for reclamation. Stockpiles may also be located in the borrow permit area outside of areas utilized for excavation and wetland protection areas. Topsoil stockpile volumes will decrease proportionally as reclamation commences in the fall of 2002.

Topsoil stockpiles will be maintained and managed in accordance with the following:

- Topsoil stockpiles will be constructed no higher than 20 feet and with slopes no steeper than two horizontal to one vertical (2H:1V). The height of the soil stockpiles may vary according to their duration of use to maintain adequate levels of bioorganic activity necessary to facilitate revegetation growth.
- The stockpiles will be covered with plastic sheeting to prevent contact with precipitation.
- Diversion ditches and conveyance structures will be installed to channel runoff away from stockpile areas. Silt fences will be constructed as an additional erosion control measure around each stockpile.
- Additional BMPs include check dams, hay bales, silt fences, etc. to guide and control runoff in conveyance structures to sediment catchment ponds.

#### **4.4 Topsoil Replacement during Reclamation**

Beginning in the fall of 2002, topsoil will be reused to facilitate revegetation of areas disturbed by Borrow Area 4 development operations. The topsoil removed from this area will be replaced and spread evenly within the limits of the excavation using conventional loading, dozing, and grading equipment. Thickness of the replaced topsoil will be approximately 1 foot. To the extent necessary, additional topsoil may be obtained from other areas to supplement the stockpiled topsoil volume.

As discussed above, the final borrow excavation contours will maintain a minimum 10-foot vertical separation from the water table. Therefore, all topsoil in Borrow Area 4 will be replaced over a 10-foot buffer of intact, native soil material above the water table. Alternatively, the topsoil may be preferentially placed at higher elevations in Borrow Area 4 as the sequencing of reclamation, hillside slope angle, and drainage/erosion control allow. This will further increase the separation from the water table.

Before revegetation of the recontoured and topsoiled areas begin, topsoil amendments and fertilizers may be applied to enhance plant growth and maintain proper soil moisture levels. Should soil amendments be used, the topsoil areas will also be tilled and machine-raked in-place to mix in soil amendments and prevent erosion.

Other erosion control measures include stormwater conveyance channels and sedimentation ponds established before topsoil replacement begins. The stormwater conveyances and ponds will be down-sized as revegetation takes

root. Additional disturbance to topsoiled areas is not expected to be necessary apart from potential localized erosion repair if noted during post-reclamation monitoring. BMPs and handling protocols governing topsoil replacement will be essentially the same as during topsoil removal.

Any alternate uses or management strategies for topsoil would require approval by the Port prior to implementation.

## **5.0 HEALTH AND SAFETY**

Contractors and other on-site personnel are responsible for identifying and implementing health and safety measures as necessary to protect workers during handling of topsoil from Borrow Area 4. These measures are precautionary in nature and include, but are not limited to:

- Use of outerwear protective garments to minimize potential skin contact;
- Washdown of boots and other reusable clothing; and
- Dust mask protection respiratory protection if needed to augment engineering dust control measures.

The contractor will comply with applicable WISHA and OSHA health and safety standards. This will include health and safety training and medical monitoring, and personnel protection as may be required in Chapter 296-62 WAC (General Occupational Health Standards). The contractor will also prepare and submit a site-specific Contractor Health and Safety Plan (CHASP) at least two weeks prior to the start of construction. The CHASP will acknowledge the potential to encounter arsenic-containing soil. The Port or designate will review the CHASP for completeness only and will not approve it.

## **6.0 RECOMMENDATIONS FOR CONTRACT SPECIFICATIONS**

Specifications for Borrow Area 4 soil extraction and reclamation will include provisions for the handling and management of topsoil and vegetation.

These specifications should include the following items:

- The upper foot of topsoil should be removed from Borrow Area 4 and temporarily stockpiled for on-site topsoil replacement during reclamation.

- Borrow Area 4 topsoil should be managed separately and kept segregated from the underlying soils and other materials.
- Stump and root balls should be ground in-place or chipped on site for reincorporation with topsoil during reclamation as described in Section 4.1.
- Management and handling protocols for topsoil removal should be implemented as described in Section 4.2.
- Topsoil stockpiles should be managed as described in Section 4.3.
- Management and handling protocols for topsoil replacement during Borrow Area 4 reclamation should be implemented as described in Section 4.4.
- BMPS to minimize potential for off-site tracking and dust control should be implemented as described in Section 4.1 for stump and root ball handling, and in Section 4.2 for topsoil removal.
- Available topsoil chemical characterization data for Borrow Area 4 should be provided with the contract specification.
- An as-built drawing of topsoil replacement locations should be prepared during reclamation.
- Worker health and safety measures should be implemented as described in Section 5.0.

Any management and handling strategies for stumps, root balls, and topsoil that differ from those described in this Topsoil Management Plan should be approved by the Port prior to implementation.

## 7.0 REFERENCES

Ecology 1994. Natural Background Soil Metals Concentrations in Washington State, Ecology Publication 94-115. October 1994.

Ecology 1999. Sand and Gravel General Permit (NPDES General Permit). August 6, 1999.

Ecology 2001a. Survey of Typical Soils Arsenic Concentrations in Residential Area of the City of University Place, Ecology Publication No. 01-03-008. March 2001.

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Ecology 2001c. Ecology Fact Sheet: Vashon-Maury Island Annual Review of Soil Contamination Studies. June 2001. Ecology Publication No. 01-09-036.

Ecology 2001d. Ecology News Release – No Immediate Cleanup Actions Needed for Child-Use Properties on Vashon and Maury Islands. Ecology Publication No. 01-096. June 12, 2001.

FAA 1997. Record of Decision of the Master Plan Update Development Actions, Sea-Tac International Airport. U.S. Department of Transportation Federal Aviation Administration northwest Mountain Region.

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King County 1998. Department of Natural Resources, 1998. King County, Washington, Surface Water Design Manual. September 1998.

King County 1999. Department of Development and Environmental Services, 2000. Maury Island Gravel Mine Draft EIS. July 1999.

King County 2000. Department of Development and Environmental Services, 2000. Maury Island Gravel Mine Final EIS. June 2000.

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Seattle-King County Health Dept. Environmental Health Division and Gregory L. Glass 2000. Final Report: Vashon/Maury Island Soil Study 1999-2000. July 2000.

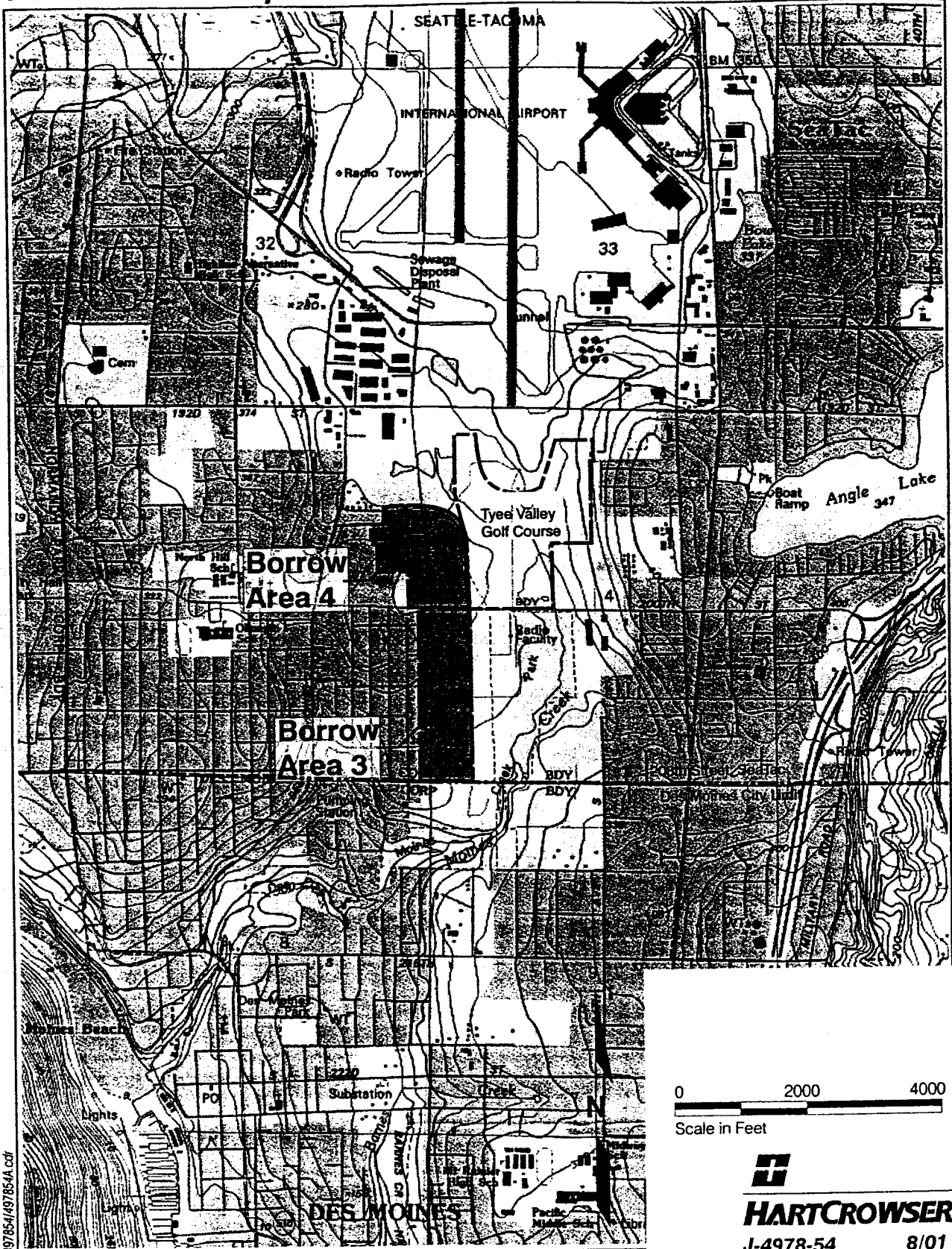
F:\docs\jobs\497854\DraftTMPReport.doc

**Table 1 - Arsenic Concentrations in Borrow Area 4 Soils**

<b>Sample ID and Depth below Ground Surface in Inches</b>	<b>Arsenic Concentration in mg/kg</b>
<b>Borrow Area 4 (June 2000)</b>	
BA-4-S1 0 to 2	38.7
BA-4-S2 0 to 2	49.1
BA-4-S3 0 to 2	27.2
BA-4-S4 0 to 2	27.3
<b>0 to 2 mean</b>	<b>35.6</b>
BA-4-S1 2 to 6	5.6
BA-4-S2 2 to 6	18.3
BA-4-S3 2 to 6	10.9
BA-4-S4 2 to 6	10.6
<b>2 to 6 mean</b>	<b>11.4</b>
BA-4-S1 12 to 18	2.1
BA-4-S2 12 to 18	9.8
BA-4-S3 12 to 18	3.2
BA-4-S4 12 to 18	4.8
<b>12 to 18 mean</b>	<b>5.0</b>
<b>Borrow Area 4 (June 2001)</b>	
BA-4-S1 0 to 12	24
BA-4-S2 0 to 12	34
BA-4-S3 0 to 12	23
BA-4-S4 0 to 12	38
BA-4-S5 0 to 12	25
BA-4-S6 0 to 12	12
BA-4-S7 0 to 12	30
BA-4-S8 0 to 12	45
BA-4-S9 0 to 12	11
BA-4-S10 0 to 12	31
<b>0 to 12 Mean</b>	<b>27.3</b>



# Site Location Map



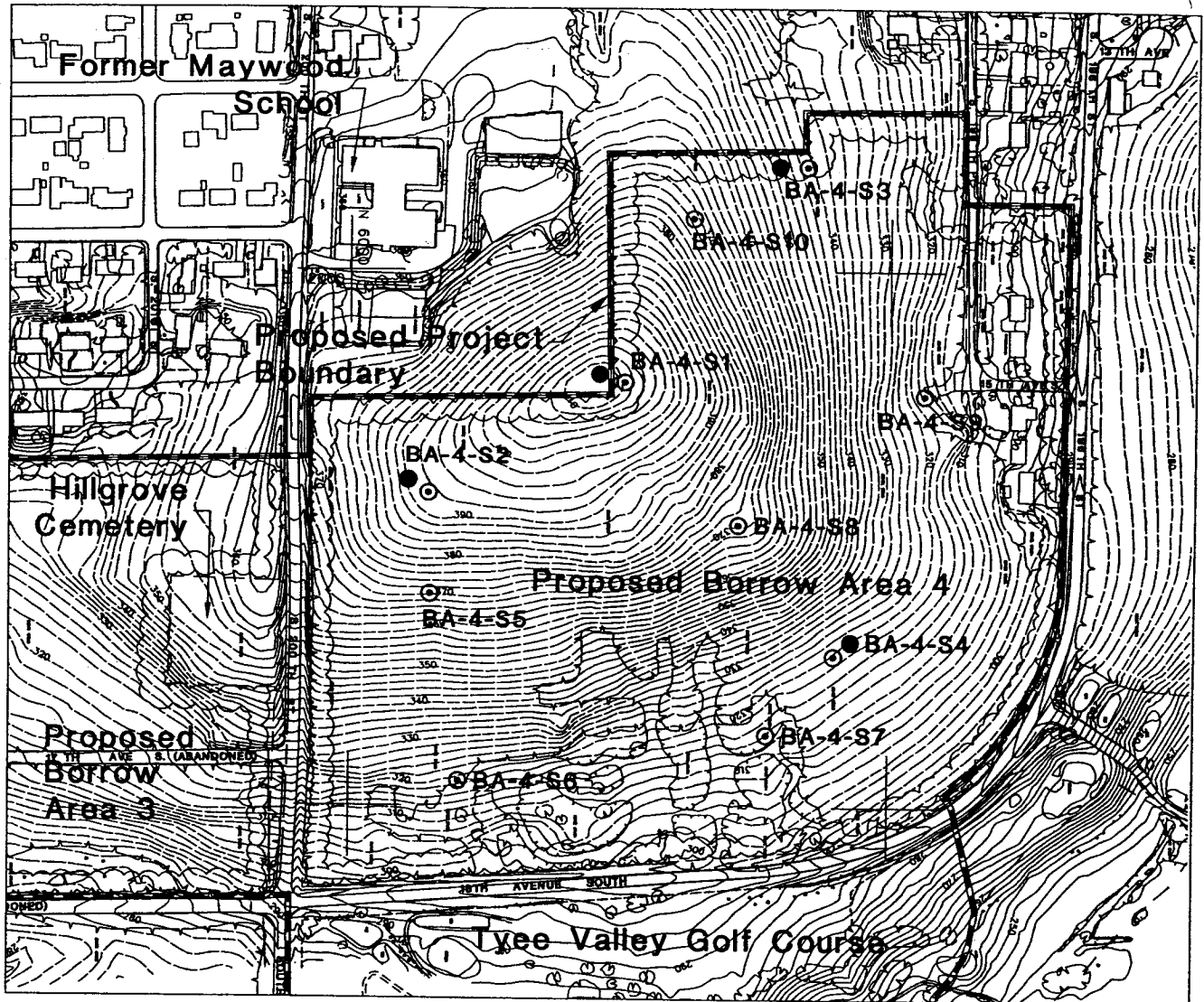
497854/497854A.cdr

Note: Base map prepared from USGS 7.5 minute quadrangle maps of Seattle South, Washington, revised 1995.

  
**HARTCROWSER**  
 J-4978-54      8/01  
 Figure 1

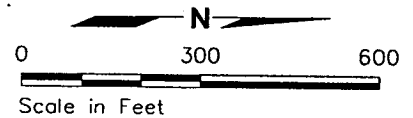
AR 051233

# Borrow Area 4 Topsoil Sample Location Map



Note:

- 1) Base map based on drawing provided by HNTB entitled "Borrow Areas 3 & 4 Grading Plan", dated April 13, 1998.
- 2) Wetland delineation prepared from drawing provided by Parametrix entitled, "W\_022001.dwg", dated February 20, 2001.



- BA-4-S1 June 2000 Topsoil Sampling Location and Number
- BA-4-S3 June 2001 Topsoil Sampling Location and Number



**HARTCROWSER**

J-4978-54 8/01

Figure 2

AR 051234

**APPENDIX A  
LABORATORY ANALYTICAL DOCUMENTATION  
NORTH CREEK, ANALYTICAL, INC.  
AND ONSITE ENVIRONMENTAL, INC.**



Seattle 11720 North Creek Pkwy N, Suite 400, Bothell, WA 98011-8244  
425.420.9200 fax 425.420.9210  
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776  
509.924.9200 fax 509.924.9290  
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132  
503.906.9200 fax 503.906.9210  
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711  
541.383.9310 fax 541.382.7588

20 September 2001

Mike Bailey  
Hart Crowser, Inc. - WA  
1910 Fairview Ave. E.  
Seattle, WA 98102

RE: Seatac/3rd. Runway

Enclosed are amended results of analyses for samples received by the laboratory on 06/23/00 14:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Scott A. Woerman For Jeanne Thompson  
Project Manager

AR 051236



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Hart Crowser, Inc. - WA  
1910 Fairview Ave. E.  
Seattle WA, 98102

Project: Seatac/3rd. Runway  
Project Number: 100876  
Project Manager: Mike Bailey

Amended Report  
Issued: 09/20/01 16:24

ANALYTICAL REPORT FOR SAMPLES - Amended

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BA-1-S1 (1'-1.5')	B0F0558-01	Soil	06/22/00 14:40	06/23/00 14:15
BA-1-S2 (1'-1.5')	B0F0558-02	Soil	06/22/00 15:25	06/23/00 14:15
BA-3-S1 (1'-1.5')	B0F0558-03	Soil	06/22/00 12:25	06/23/00 14:15
BA-3-S2 (1'-1.5')	B0F0558-04	Soil	06/22/00 13:50	06/23/00 14:15
BA-4-S1 (1'-1.5')	B0F0558-05	Soil	06/22/00 09:30	06/23/00 14:15
BA-4-S2 (1'-1.5')	B0F0558-06	Soil	06/22/00 10:15	06/23/00 14:15
BA-4-S3 (1'-1.5')	B0F0558-07	Soil	06/22/00 10:52	06/23/00 14:15
BA-4-S4 (1'-1.5')	B0F0558-08	Soil	06/22/00 11:20	06/23/00 14:15

North Creek Analytical - Bothell

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

Scott A. Woerman For Jeanne Thompson, Project Manager

North Creek Analytical, Inc.  
Environmental Laboratory Network

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AR 051237



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Hart Crowser, Inc. - WA  
 1910 Fairview Ave. E.  
 Seattle WA, 98102

Project: Seatac/3rd. Runway  
 Project Number: 100876  
 Project Manager: Mike Bailey

Amended Report  
 Issued: 09/20/01 16:24

**Total Metals by EPA 6000/7000 Series Methods  
 North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>BA-1-S1 (1'-1.5') (B0F0558-01) Soil</b> Sampled: 06/22/00 14:40 Received: 06/23/00 14:15									
Arsenic	2.45	0.500	mg/kg dry	1	0G05047	07/05/00	07/09/00	EPA 6020	
<b>BA-1-S2 (1'-1.5') (B0F0558-02) Soil</b> Sampled: 06/22/00 15:25 Received: 06/23/00 14:15									
Arsenic	10.6	0.500	mg/kg dry	1	0G05047	07/05/00	07/09/00	EPA 6020	
<b>BA-3-S1 (1'-1.5') (B0F0558-03) Soil</b> Sampled: 06/22/00 12:25 Received: 06/23/00 14:15									
Arsenic	10.2	0.500	mg/kg dry	1	0G05047	07/05/00	07/09/00	EPA 6020	
<b>BA-3-S2 (1'-1.5') (B0F0558-04) Soil</b> Sampled: 06/22/00 13:50 Received: 06/23/00 14:15									
Arsenic	5.04	0.500	mg/kg dry	1	0G05047	07/05/00	07/09/00	EPA 6020	
<b>BA-4-S1 (1'-1.5') (B0F0558-05) Soil</b> Sampled: 06/22/00 09:30 Received: 06/23/00 14:15									
Arsenic	2.52	0.500	mg/kg dry	1	0G05047	07/05/00	07/09/00	EPA 6020	
<b>BA-4-S2 (1'-1.5') (B0F0558-06) Soil</b> Sampled: 06/22/00 10:15 Received: 06/23/00 14:15									
Arsenic	13.7	0.500	mg/kg dry	1	0G05047	07/05/00	07/09/00	EPA 6020	
<b>BA-4-S3 (1'-1.5') (B0F0558-07) Soil</b> Sampled: 06/22/00 10:52 Received: 06/23/00 14:15									
Arsenic	3.04	0.500	mg/kg dry	1	0G05047	07/05/00	07/09/00	EPA 6020	
<b>BA-4-S4 (1'-1.5') (B0F0558-08) Soil</b> Sampled: 06/22/00 11:20 Received: 06/23/00 14:15									
Arsenic	5.69	0.500	mg/kg dry	1	0G05047	07/05/00	07/09/00	EPA 6020	

North Creek Analytical - Bothell

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AR 051238



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Hart Crowser, Inc. - WA  
 1910 Fairview Ave. E.  
 Seattle WA, 98102

Project: Seatac/3rd. Runway  
 Project Number: 100876  
 Project Manager: Mike Bailey

Amended Report  
 Issued: 09/20/01 16:24

**Physical Parameters by APHA/ASTM/EPA Methods**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
<b>BA-1-S1 (1'-1.5') (B0F0558-01) Soil Sampled: 06/22/00 14:40 Received: 06/23/00 14:15</b>										
Dry Weight	91.5	1.00	%		1	0F26002	06/26/00	06/27/00	BSOPSPL003R07	
<b>BA-1-S2 (1'-1.5') (B0F0558-02) Soil Sampled: 06/22/00 15:25 Received: 06/23/00 14:15</b>										
Dry Weight	86.5	1.00	%		1	0F26002	06/26/00	06/27/00	BSOPSPL003R07	
<b>BA-3-S1 (1'-1.5') (B0F0558-03) Soil Sampled: 06/22/00 12:25 Received: 06/23/00 14:15</b>										
Dry Weight	84.4	1.00	%		1	0F26002	06/26/00	06/27/00	BSOPSPL003R07	
<b>BA-3-S2 (1'-1.5') (B0F0558-04) Soil Sampled: 06/22/00 13:50 Received: 06/23/00 14:15</b>										
Dry Weight	84.1	1.00	%		1	0F26002	06/26/00	06/27/00	BSOPSPL003R07	
<b>BA-4-S1 (1'-1.5') (B0F0558-05) Soil Sampled: 06/22/00 09:30 Received: 06/23/00 14:15</b>										
Dry Weight	89.8	1.00	%		1	0F26002	06/26/00	06/27/00	BSOPSPL003R07	
<b>BA-4-S2 (1'-1.5') (B0F0558-06) Soil Sampled: 06/22/00 10:15 Received: 06/23/00 14:15</b>										
Dry Weight	84.7	1.00	%		1	0F26002	06/26/00	06/27/00	BSOPSPL003R07	
<b>BA-4-S3 (1'-1.5') (B0F0558-07) Soil Sampled: 06/22/00 10:52 Received: 06/23/00 14:15</b>										
Dry Weight	87.8	1.00	%		1	0F26002	06/26/00	06/27/00	BSOPSPL003R07	
<b>BA-4-S4 (1'-1.5') (B0F0558-08) Soil Sampled: 06/22/00 11:20 Received: 06/23/00 14:15</b>										
Dry Weight	90.1	1.00	%		1	0F26002	06/26/00	06/27/00	BSOPSPL003R07	

North Creek Analytical - Bothell

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AR 051239



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Hart Crowser, Inc. - WA  
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Project: Seatac/3rd. Runway  
 Project Number: 100876  
 Project Manager: Mike Bailey

Amended Report  
 Issued: 09/20/01 16:24

**Total Metals by EPA 6000/7000 Series Methods - Quality Control**  
**North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 0G05047: Prepared 07/05/00 Using EPA 3050B</b>										
<b>Blank (0G05047-BLK1)</b>										
Arsenic	ND	0.500	mg/kg							
<b>LCS (0G05047-BS1)</b>										
Arsenic	25.6	0.500	mg/kg	25.0		102	70-130			
<b>Matrix Spike (0G05047-MS1) Source: B0F0396-01</b>										
Arsenic	25.0	0.500	mg/kg dry	20.6	340	-1530	70-130			Q-15
<b>Matrix Spike Dup (0G05047-MSD1) Source: B0F0396-01</b>										
Arsenic	24.9	0.500	mg/kg dry	20.2	340	-1560	70-130	0.401	20	Q-15

North Creek Analytical - Bothell

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 Environmental Laboratory Network

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AR 051240





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Hart Crowser, Inc. - WA 1910 Fairview Ave. E. Seattle WA, 98102	Project: Seatac/3rd. Runway Project Number: 100876 Project Manager: Mike Bailey	Amended Report Issued: 09/20/01 16:24
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**Physical Parameters by APHA/ASTM/EPA Methods - Quality Control  
 North Creek Analytical - Bothell**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 0F26002: Prepared 06/26/00 Using Dry Weight</b>										
<b>Blank (0F26002-BLK1)</b>										
Dry Weight	99.8	1.00	%							
<b>Blank (0F26002-BLK2)</b>										
Dry Weight	100	1.00	%							
<b>Blank (0F26002-BLK3)</b>										
Dry Weight	100	1.00	%							
<b>Blank (0F26002-BLK4)</b>										
Dry Weight	100	1.00	%							
<b>Blank (0F26002-BLK5)</b>										
Dry Weight	100	1.00	%							
<b>Blank (0F26002-BLK6)</b>										
Dry Weight	100	1.00	%							
<b>Blank (0F26002-BLK7)</b>										
Dry Weight	100	1.00	%							

North Creek Analytical - Bothell

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 Scott A. Woerman For Jeanne Thompson, Project Manager

North Creek Analytical, Inc.  
 Environmental Laboratory Network Page 5 of 6

AR 051241



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Hart Crowser, Inc. - WA  
 1910 Fairview Ave. E.  
 Seattle WA, 98102

Project: Seatac/3rd. Runway  
 Project Number: 100876  
 Project Manager: Mike Bailey

Amended Report  
 Issued: 09/20/01 16:24

**Notes and Definitions**

- Q-14 Visual examination indicates the RPD and/or matrix spike recovery is outside the control limit due to a non-homogeneous sample matrix.
- Q-15 Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

North Creek Analytical - Bothell

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Scott A. Woerman For Jeanne Thompson, Project Manager

North Creek Analytical, Inc.  
 Environmental Laboratory Network

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AR 051242



**NORTH CREEK ANALYTICAL**  
Environmental Laboratory Services

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(503) 906-9200 FAX 906-9210

**CHAIN OF CUSTODY REPORT**

Work Order # **80F0558**

REPORT TO:		INVOICE TO:		ATTENTION:		ADDRESS:		P.O. NUMBER:		NCA QUOTE #:	
ATTENTION: <b>BERT CLARK</b>		ATTENTION:		ATTENTION:		ADDRESS:		P.O. NUMBER:		NCA QUOTE #:	
ADDRESS: <b>PORT OF SEATTLE</b>		ADDRESS:		ADDRESS:		ADDRESS:		P.O. NUMBER:		NCA QUOTE #:	
PHONE: <b>(206) 431-4918</b>		PHONE:		PHONE:		PHONE:		P.O. NUMBER:		NCA QUOTE #:	
PROJECT NAME: <b>SEATTLE / 3RD DISTRICT</b>		PROJECT NAME:		PROJECT NAME:		PROJECT NAME:		P.O. NUMBER:		NCA QUOTE #:	
PROJECT NUMBER: <b>100876</b>		PROJECT NUMBER:		PROJECT NUMBER:		PROJECT NUMBER:		P.O. NUMBER:		NCA QUOTE #:	
SAMPLED BY: <b>WILLIAM DAVENPORT</b>		SAMPLED BY:		SAMPLED BY:		SAMPLED BY:		P.O. NUMBER:		NCA QUOTE #:	
CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	ANALYSIS REQUEST	MATRIX (W.S.A.O)	# OF CONTAINERS	COMMENTS	TURNAROUND REQUEST IN BUSINESS DAYS*				
1. BA-1-51 (1'-1.5')	11/10/00 1440	80F0558-01		S	1		5				
2. BA-1-52 (1'-1.5')	1225	02			1		1				
3. BA-3-51 (1'-1.5')	1225	03			1		1				
4. BA-3-52 (1'-1.5')	1350	04			1		1				
5. BA-4-51 (1'-1.5')	0930	05			1		1				
6. BA-4-52 (1'-1.5')	1015	06			1		1				
7. BA-4-53 (1'-1.5')	1052	07			1		1				
8. BA-4-54 (1'-1.5')	1120	08			1		1				
RELINQUISHED BY: <b>William Davenport</b>		DATE: <b>6/28/01</b>		RECEIVED BY: <b>Cathy Nichols</b>		DATE: <b>6/29/01</b>					
PROJECT NAME: <b>WILLIAM DAVENPORT</b>		FIRM: <b>HAVER</b>		PRINT NAME: <b>C. Nichols</b>		TIME: <b>14:15</b>					
RELINQUISHED BY:		DATE:		RECEIVED BY:		DATE:					
PROJECT NAME:		FIRM:		PRINT NAME:		TIME:					
ADDITIONAL REMARKS:		DATE:		PRINT NAME:		TIME:					

2.2.2/0

PAGE 1 OF 1



**TRANSMITTAL MEMORANDUM**

From: OnSite Environmental Inc.  
To: Rick Moore, Hart Crowser, Inc.

Date: June 15, 2001  
Project #: Supplemental Agreement #158, 4978-70  
Reference: Third Runway/Borrow Area #4 Project # 100876  
Lab Traveler #: 0106-035  
Subject: Tier 3 Data Deliverables

Description: Results of Total Arsenic EPA 6020.

Date of Report: June 15, 2001  
Samples Submitted: June 6, 2001  
Lab Traveler: 06-035  
Project: Supplemental Agreement #158, 4978-70; Borrow Areas

#### **Case Narrative**

Samples were collected on June 5, 2001 and were received in one cooler packed in ice. Samples were maintained at the laboratory at 4°C and followed SW846 analysis and extraction methods.

#### **Total Arsenic by EPA 6020 Analysis:**

Any QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

LAB REPORT

AR 051246



June 15, 2001

Rick Moore  
Hart Crowser, Inc.  
1910 Fairview Avenue E  
Seattle, WA 98102-3699

Re: Analytical Data for Project Supplemental Agreement #158, 4978-70; Borrow Areas  
Laboratory Reference No. 0106-035

Dear Rick:

Enclosed are the analytical results and associated quality control data for samples submitted on June 6, 2001.

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

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

Sincerely,



David Baumeister  
Project Manager

Enclosures

Date of Report: June 15, 2001  
Samples Submitted: June 6, 2001  
Lab Traveler: 06-035  
Project: Supplemental Agreement #158, 4978-70; Borrow Areas

**TOTAL ARSENIC  
EPA 6020**

Date Extracted: 6-6-01  
Date Analyzed: 6-11-01  
  
Matrix: Soil  
Units: mg/kg (ppm)

Client ID	Lab ID	Result	PQL
HC01-BA4-S1	06-035-01	24	0.57
HC01-BA4-S2	06-035-02	34	0.67
HC01-BA4-S3	06-035-03	23	0.60
HC01-BA4-S4	06-035-04	38	0.68
HC01-BA4-S5	06-035-05	25	0.63
HC01-BA4-S6	06-035-06	12	0.61
HC01-BA4-S7	06-035-07	30	0.58
HC01-BA4-S8	06-035-08	45	0.68
HC01-BA4-S9	06-035-09	11	0.59
HC01-BA4-S10	06-035-10	31	0.60

**AR 051248**



Date of Report: June 15, 2001  
Samples Submitted: June 6, 2001  
Lab Traveler: 06-035  
Project: Supplemental Agreement #158, 4978-70; Borrow Areas

**TOTAL ARSENIC**  
**EPA 6020**  
**METHOD BLANK QUALITY CONTROL**

Date Extracted: 6-6-01  
Date Analyzed: 6-11-01  
  
Matrix: Soil  
Units: mg/kg (ppm)  
  
Lab ID: MB0606S1

Analyte	Method	Result	PQL
Arsenic	6020	ND	0.50

AR 051249

Date of Report: June 15, 2001  
Samples Submitted: June 6, 2001  
Lab Traveler: 06-035  
Project: Supplemental Agreement #158, 4978-70; Borrow Areas

**TOTAL ARSENIC  
EPA 6020  
DUPLICATE QUALITY CONTROL**

Date Extracted: 6-6-01  
Date Analyzed: 6-11-01

Matrix: Soil  
Units: mg/kg (ppm)

Lab ID: 06-035-01

Analyte	Sample Result	Duplicate Result	RPD	Flags	PQL
Arsenic	20.9	22.5	7.6		0.50

**AR 051250**

Date of Report: June 15, 2001  
Samples Submitted: June 6, 2001  
Lab Traveler: 06-035  
Project: Supplemental Agreement #158, 4978-70; Borrow Areas

**TOTAL ARSENIC  
EPA 6020  
MS/MSD QUALITY CONTROL**

Date Extracted: 6-6-01  
Date Analyzed: 6-11-01

Matrix: Soil  
Units: mg/kg (ppm)

Lab ID: 06-035-01

Analyte	Spike Level	MS	Percent Recovery	MSD	Percent Recovery	RPD	Flags
Arsenic	100	109	88	109	88	0	

AR 051251

Date of Report: June 15, 2001  
Samples Submitted: June 6, 2001  
Lab Traveler: 06-035  
Project: Supplemental Agreement #158, 4978-70; Borrow Areas

**TOTAL ARSENIC  
EPA 6020  
CONTINUING CALIBRATION SUMMARY**

<b>Analyte</b>	<b>Lab ID</b>	<b>True Value (ppm)</b>	<b>Calc. Value</b>	<b>Percent Recovery</b>	<b>Control Limits</b>
Arsenic	ICV	0.0500	0.0501	100%	90%-110%
Arsenic	CCV1	0.0400	0.0400	100%	90%-110%
Arsenic	CCV2	0.0400	0.0406	102%	90%-110%
Arsenic	CCV3	0.0400	0.0405	101%	90%-110%

**AR 051252**

Date of Report: June 15, 2001  
Samples Submitted: June 6, 2001  
Lab Traveler: 06-035  
Project: Supplemental Agreement #158, 4978-70; Borrow Areas

**% MOISTURE**

Date Analyzed: 6-6-01

Client ID	Lab ID	% Moisture
HC01-BA4-S1	06-035-01	13
HC01-BA4-S2	06-035-02	25
HC01-BA4-S3	06-035-03	17
HC01-BA4-S4	06-035-04	27
HC01-BA4-S5	06-035-05	21
HC01-BA4-S6	06-035-06	18
HC01-BA4-S7	06-035-07	14
HC01-BA4-S8	06-035-08	26
HC01-BA4-S9	06-035-09	15
HC01-BA4-S10	06-035-10	16

**DATA QUALIFIERS AND ABBREVIATIONS**

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

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

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

D - Data from 1: \_\_\_\_\_ dilution.

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

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

G - Insufficient sample quantity for duplicate analysis.

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

I - Compound recovery is outside of the control limits.

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

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

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

O - Hydrocarbons outside the defined gasoline range are present in the sample; NWTPH-Dx recommended.

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

Q - Surrogate recovery is outside of the control limits.

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

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

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

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

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

X - Sample extract treated with a silica gel cleanup procedure.

Y - Sample extract treated with an acid cleanup procedure.

Z -

ND - Not Detected at PQL

MRL - Method Reporting Limit

PQL - Practical Quantitation Limit

RPD - Relative Percent Difference

TOTAL ARSENIC  
EPA 6020  
RAW DATA

AR 051255



**OnSite Environmental Inc.**  
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# Chain of Custody

<b>Turnaround Request</b> (in working days)		<b>Project Chemist:</b> A. S. [Signature]		<b>Laboratory No. 06-035</b>									
(Check One)		<input type="checkbox"/> Same Day <input type="checkbox"/> 1 Day		<b>Requested Analysis</b>									
<input type="checkbox"/> 2 Day		<input type="checkbox"/> 3 Day		<input checked="" type="checkbox"/> <b>Standard</b>									
<input type="checkbox"/> Standard		(Hydrocarbon analyses: 5 days, All other analyses: 7 days)		<input checked="" type="checkbox"/> <b>Moisture</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>TOC</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>PAHs by 8270C</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>Volatiles by 8260B</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>Semivolatiles by 8270C</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>Halogenated Volatiles by 8260B</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>PAHs by 8270C</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>Pesticides by 8081</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>PCBs by 8082</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>Total RCRA Metals (8)</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>TCLP Metals</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>VPH</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>EPH</b>									
<input type="checkbox"/> (other)		(other)		<input checked="" type="checkbox"/> <b>% Moisture</b>									

Relinquished By	Date	Time	Received By	Date	Time
Handwritten Signature	6/6/11		Handwritten Signature	6/6/11	
FIRM			FIRM		
Relinquished By			Received By		
Handwritten Signature			Handwritten Signature		
FIRM			FIRM		
Relinquished By			Received By		
Handwritten Signature			Handwritten Signature		
FIRM			FIRM		
Reviewed By			Date Reviewed		

Lab #	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Botts	NWTFH-HCID	NWTFH-G/BTEX	NWTFH-DX	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCBs by 8082	Pesticides by 8081	Total RCRA Metals (8)	TCLP Metals	VPH	EPH	% Moisture	
1	HCF1-BA4-51	6/5/11	1400	soil	2															
2	HCF1-BA4-52		1420		1															
3	HCF1-BA4-53		1345		2															
4	HCF1-BA4-54		1540		1															
5	HCF1-PA4-55		1640		1															
6	HCF1-BA4-56		1610		1															
7	HCF1-BA4-57		1600		1															
8	HCF1-BA4-58		1435		1															
9	HCF1-BA4-59		1500		1															
10	HCF1-BA4-510		1325	V	2															

**COMMENTS:**  
 Resources by  
 MONYVA (6/11/11)