Year 0 (2004)
Baseline Monitoring Report
Middle Waterway Problem Area C
Sediment Management Units 51a and 51b
Commencement Bay Nearshore/
Tideflats Superfund Site
Tacoma, Washington

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YEAR 0 (2004) BASELINE MONITORING REPORT
MIDDLE WATERWAY PROBLEM AREA C
SEDIMENT MANAGEMENT UNITS 51a AND 51b
COMMENCEMENT BAY NEARSHORE/TIDEFLATS SUPERFUND SITE
TACOMA, WASHINGTON

1.0 INTRODUCTION

Between July and October 2004, the Washington Department of Natural Resources (DNR) completed removal and capping of contaminated intertidal marine sediments near the head of the Middle Waterway (Figures 1 and 2). The Remedial Action included sediment management units (SMUs) 51a and 51b of Middle Waterway Problem Area C that were contaminated with metals and heavy-end organic constituents from historical waste disposal and industrial activities. Remedial activities involved excavation of more than 3,125 cubic yards of contaminated sediment from SMU 51a, backfilling of the SMU 51a excavation areas, and placement of a thin-layer cap on SMU 51b. In addition to removing and capping a substantial volume of contaminated sediments, the Remedial Action enhanced intertidal and upland habitat to restore one of the last original tideflats in Commencement Bay. Additional project details are described in the Remedial Action Construction Report (RACR, Hart Crowser 2005a).

This document presents results of Year 0 (2004) monitoring completed to establish initial baseline conditions following construction. Monitoring activities for the Year 0 baseline event were completed by the DNR in accordance with the project Operations, Maintenance, and Monitoring Plan (OMMP, Hart Crowser 2005b). The OMMP describes post-construction monitoring activities being implemented to ensure that the long-term performance objectives of the project are met.

The OMMP and Year 0 monitoring comply with the conditions and requirements of the Remedial Design/Remedial Action (RD/RA) Consent Decree (Civil Action No. CO3-5331 (RJB) FDB), dated August 14, 2003, U.S. Environmental Protection Agency (EPA 2003b). The Consent Decree was issued by the EPA to the DNR, City of Tacoma (City), and other parties. The OMMP and Year 0 monitoring also address requirements of EPA's Statement of Work (SOW)-Remedial Design, Remedial Action, and Long-Term Monitoring, dated April 10, 2003 (EPA 2003a). A Vicinity Map and Site Plan for the Middle Waterway Area C are presented on Figures 1 and 2, respectively.

This Year 0 Monitoring Report is now being finalized following results of the Year 1 monitoring conducted in 2005. The Year 1 monitoring results corroborated the Year 0 conclusions and demonstrated that the current performance objectives of the Remedial Action have been achieved. Results of Year 1 monitoring are summarized in a separate report.

1.1 Objectives and Scope

The overall objective of post-construction monitoring is to confirm that the Remedial Action is achieving the project performance objectives listed in the Consent Decree and SOW. These objectives include confirmation that:

- Performance standards are achieved through the Remedial Action;
- Exposure of potential contaminants has not occurred through physical processes; and
- Natural recovery in SMU 51b has occurred within 10 years following completion of construction for the Remedial Action.

Monitoring is targeted for a minimum of 5 years following completion of sediment remediation activities in 2004. The need for potential additional monitoring will be evaluated following completion of the Year 5 (2009) monitoring event, with revisions made to the monitoring strategy if necessary. The frequency and years for long-term monitoring coincide with planned monitoring for Middle Waterway Area A and Area B being conducted by others.

Year 0 Baseline Monitoring

Monitoring for the Year 0 baseline includes sampling, and physical and chemical analysis of the restored sediment surface:

- Sampling and chemical testing of surface sediments (0 to 10 centimeters [cm]) in SMU 51a and SMU 51b;
- Sampling and chemical testing of a sediment core obtained in an area of SMU 51a with suspect residual contamination; and
- Initial documentation of the physical characteristics of the restored tideflat for future evaluation of potential erosion, sediment deposition, and extent of intermixing with underlying sediments.

Observations related to the tideflat are focused on ensuring that the backfill function and thickness are not compromised where residual contamination remains in the central portion of SMU 51a. This area is described in the RACR and OMMP, and includes oily material that was unavoidably deposited on the bottom of the excavation during removal of an overlying contaminated sediment layer. The residual material was covered with a minimum 2-foot thickness of sandy backfill and is probably present as a thin, discontinuous film (i.e., less than one-quarter inch thick). A contaminated sediment layer also remains on the King Salmon Marine bank, outside of and adjacent to the southwestern edge boundary of SMU 51a. Erosion observations in the channel and bank areas of SMU 51a provide data to ensure that the contaminated layer is not exposed in the future.

Monitoring also included documentation of upland and tideflat habitat restoration efforts and qualitative evaluation of biological activity on the tideflat. These activities are conducted separately from the CERCLA requirements for the project, but are included herein for continuity with other monitoring activities and documentation purposes. In addition, recolonization and recruitment of benthic organisms on the restored tideflat surface demonstrate the overall success of capping and backfilling as a key objective of the SOW. Intertidal and upland replanting efforts are also helping to maintain the overall physical stability and integrity of the SMU 51a backfill. It should be noted that EPA's review and approval of this Year 0 Baseline Monitoring Report does not include habitat restoration elements.

1.2 Performance Standards

Performance standards for chemical and physical monitoring are described in the OMMP. Chemical performance standards are applicable to both SMU 51a and SMU 51b, while physical performance standards are applicable to portions of SMU 51a to ensure the integrity of backfilled areas overlying residual contamination. Applicable performance standards for Year 0 baseline monitoring activities are presented in context of subsequent text discussions.

1.3 Elements of the Year 0 Baseline Monitoring Report

The remainder of this report contains the following sections:

- Section 2.0 Results of Physical Monitoring;
- Section 3.0 Sediment Chemical Quality Monitoring;
- Section 4.0 Habitat Restoration; and
- Section 5.0 References.

2.0 RESULTS OF PHYSICAL MONITORING

Initial physical monitoring for the Year 0 baseline was completed between October 14 and 20, 2005. The work coincided with collection of surface sediment samples for chemical analysis (see Section 3.0). Physical monitoring included visual inspections to document the post-construction condition of the tideflat in SMU 51a and SMU 51b. Monitoring was conducted during low tide periods when the tideflat was exposed. Observations from several subsequent site visits are also incorporated for baseline documentation purposes, including:

- December 15, 2005 (Observe Completed Upland Restoration and Planting);
- February 22, 2005 (Observe Bank Erosion);
- March 7, 2005 (Assist Replanting of Shrubs and Trees from Bank Erosion); and
- May 23, 2005 (Observe Saltmarsh Planting in Intertidal Zone).

2.1 Visual Inspection

The visual inspection included general observations of the restored tideflat surface, including surface sediment sampling locations. Locations of referenced photographs are identified on Figure 3.

General Appearance

The extent of material placed for near-surface backfill in SMU 51a and capping material in SMU 51b was easily distinguishable compared to the surrounding area following construction (Photographs 1 and 2). The visual appearance of the backfill and capping materials rapidly blended with the surrounding tideflat and surface became more even. Footprints on the tideflats nearly disappeared by May 2005 and minor erosion features in the discharge channel for Outfall No. 200 became more sinuous, as discussed below (Photograph 3). Small depressions roughly 1 to 2 feet in diameter and several inches deep formed on the tideflat surface following backfill and capping material placement, but are likely due to localized subsidence and are expected to further blend over time. In addition, a thin, brown algal layer formed over the tideflat in the fall of 2004 and became more greenish in color by the spring of 2005 (Photographs 3 and 4).

A relatively small, shallow depression formed following placement and/or settling of the surficial backfill in the southern part of SMU 51b (Figure 4). This

depression formed in a relatively low-relief part of the tideflat where localized pockets of standing water were noted prior to construction. This low-relief area may have promoted formation of the shallow depression and associated ponding on the post-backfill surface. The depression retains water when ebb tide elevations fall below about 8 feet. Since the completion of construction, additional drainage channels developed near the depression, further limiting the area of ponding to less than about 1,000 square feet as of May 2005.

Surface Sediment Thickness and Composition

Surficial sediment for the restored tideflat area consisted of brown silty sand placed during thin-layer capping and backfilling. The depth to the interface with underlying sandy backfill in SMU 51a and underlying native sediments in SMU 51b varied from about 6 to 12 inches. Surficial cap and backfill thickness at sediment sampling locations are summarized in Table 1. Observations during visual monitoring and sediment sampling confirmed that the silty sand was generally placed to the maximum design thickness of 12 inches, or slightly thicker in some locations. As noted in the RACR, local exceedances of the design thickness were considered acceptable given the risks/difficulty of the placement method, limited tidal windows, and undesirability of a second round of placement in any areas of inadequate coverage. Also, no adverse effects from the slightly thicker cap were identified. To the contrary, worm tubes and other burrows were identified on the surficial backfill/cap surface within days to weeks of placement, indicating reoccupation of the new near-surface sediments by the benthic community (Photographs 5 and 6).

As expected, there was a sharp interface between the surficial backfill/capping material placed during construction and the underlying sediments (Photograph 7). Intermixing was minimal although the contact with underlying sediments was somewhat irregular. The irregular contact resulted from placement of the surficial backfill and capping material over a local “dimples” in the underlying sediments surface, or settlement of the overlying surficial material. In SMU 51a, the surficial sediment overlies coarser sandy gravel backfill, and in SMU 51b the surficial sediment overlies native sandy silts in SMU 51b as a thin-layer cap.

Erosion

As detailed below, erosion areas of note were limited to minor slope raveling in the upper portion of the SMU 51a outfall channel, gullying near the head of the outfall channel, and bank erosion at the southeastern edge of SMU 51a. Little or no erosion has been observed throughout the remaining tideflat areas of SMU 51a and SMU 51b. Virtually no lateral migration of the main portion of the outfall channel has occurred since October 2004. It should be stressed that the

sediment sampling stations were not located in the areas of erosion, nor were the sampling stations affected by erosion in any way. No erosion was noted in capped areas of SMU 51b or where minor residual contamination remains in and adjacent to SMU 51a, as described in the RACR (Hart Crowser 2005a), the OMMP (Hart Crowser 2005b), and in Section 3.1, below.

Outfall Channel Erosion

Following completion of backfilling of the SMU 51a tideflat and outfall channel areas in October 2004, a series of broad, parallel cuts and shallow arcuate gullies formed on the eastern side slope of the channel (Photographs 8 and 9). The cuts were shallow and typically 2 to 5 feet in length to the top of the channel side slope. Erosion was less than about a foot deep in the side slope gullies and quickly disappeared as the side slope stabilized and adjusted with tidal exchange. These observations demonstrate that the minor erosion features were transient in nature, and had no affect on the physical performance of the channel or SMU 51a backfill. These features are typical of newly constructed channel, and were no longer visible as of May 2005 (Photograph 3).

A shallow side gully formed above and within the southeastern part of the outfall channel in October 2004 (Photograph 10). This side gully formed roughly perpendicular to the main outfall channel and drained runoff from the bank and upland area of the East 11th Street construction access corridor. Although the channel is still present as of through May 2005, the upland area to the south has been planted and stabilized, and the channel does not appear to constitute a major erosion concern (Photograph 11).

Two other prominent channel gullies formed through the bank area just east of the outfall at the head of SMU 51a and have remained entrenched since the fall of 2004 (Photographs 12 and 13). The gullies were up to about 1 foot wide and 1 foot deep. The gullies were filled with rocks and soil in March 2005 during other site activities, and are continuing to be visually monitored. As part of upland restoration activities, the City of Tacoma constructed a concrete berm next to East 11th Street and King Salmon Marine to retain runoff. Along with upland planting, and placement of jute mats over the bank area, these measures should continue to decrease runoff and mitigate gullying.

As discussed above, the shallow side channel and bank gullies were not in areas of sediment sampling, nor did they adversely affect the thickness of backfill material in SMU 51a. These features will continue to be monitored closely and their appearance and configuration described in the Year 1 Monitoring Report for 2005. A map of the location of these features will also be included with the Year 1 Monitoring Report and in subsequent monitoring reports, as necessary.

Wave Undercutting of Upland Bank

Wave undercutting of the upland bank at the southeastern boundary of the SMU 51 was observed following several storm cycles between December 2004 and February 2005 (Photographs 14 and 15). A number of the shrubs and trees along the bank were partially washed out or were in danger of being washed out. These shrubs and trees were replanted on March 7, 2005, by a work party organized by DNR and the site steward. No additional erosion was noted as of May 2005 and the bank slope appeared stable (Photographs 16 and 17). Growing vegetation and relatively coarse bank materials are expected to prevent additional shoreward erosion or channeling. Jute mats were also installed along the bank in May 2005. The current bank slope and condition are similar to the pre-construction bank condition.

Debris

Site visits in October 2004 noted logs, wood, bark and organic matter, and a small amount of litter washed up near the head of SMU 51a and bank areas. The debris did not appear to adversely impact the channel, outfall, and backfill materials in SMU 51a. The debris washed out again during fall and winter storms and appears to be transient. Some of the logs may have been manually removed by others, as well. More recent logs have become lodged at the outfall discharge (Photograph 18) and have been deposited within the upper tideflat replanting area completed in May 2005. Transient log debris is expected to be an on-going condition.

2.2. Baseline Surveys

A post-construction bathymetric survey was completed following completion of tideflat backfilling and thin-layer capping in SMU 51a and SMU 51b, respectively. A baseline bathymetry map is presented on Figure 4. This bathymetric survey documents the configuration of the restored outfall channel and provides comparative baseline elevation data for future elevation surveys. In accordance with OMMP requirements, the survey for the outfall channel was completed at 10-foot intervals from the outfall discharge to the channel exit point from SMU 51a.

In conjunction with the baseline bathymetric survey, grade stakes were established in SMU 51a at the locations identified on Figure 5. Elevation surveys for these locations are planned to begin in August 2005 to compare with the initial baseline elevation readings.

3.0 SEDIMENT CHEMICAL QUALITY MONITORING

Year 0 baseline sampling of the backfilled surface of SMU 51a and capped surface of SMU 51b was conducted in October 2004 at the locations shown on Figures 6 and 7, respectively. Sixteen discrete samples were collected from the upper 10 cm of the tideflat surface by hand during low-tide periods when the tideflat was exposed. Sampling including two blind field duplicates of SMU 51a sample B-2 and SMU 51b sample K. A sample from the A-1-5 grid could not be obtained because of the presence of coarse, rocky backfill.

In SMU 51a, the area of each grid for post-construction sampling covers several separate cells that were excavated individually during removal of contaminated sediment. The sampling grid was also determined based on results of numerous historical sediment characterization efforts supporting remedial design. The SMU 51b sampling grid was developed based on results of historical sediment characterization and for general coverage. Additional details regarding the development of the Year 0 sampling grid are discussed in the OMMP. The SMU 51a sampling grid areas for the Year 1 (2005) and subsequent sampling events were further modified based on the results of the Year 0 baseline event.

Except as noted, sample collection and laboratory chemical analysis conform with procedures described in the EPA-approved Sampling and Analysis Plan (Foster Wheeler 1998a), and Quality Assurance Project Plan (Foster Wheeler 1998b) for the Middle Waterway Problem Area.

3.1 Additional SMU 51a Sediment Core Sample

An additional sediment core sample was collected in the southern portion of SMU 51a as a result of encountering a contaminated sediment layer during the excavation. The contaminated sediment layer exhibited sheen and petroleum hydrocarbon-like odors and became a focus for removal during excavation in SMU 51a. Although excavation completely removed this layer from the limits of SMU 51a, residual contaminants were suspected at the bottom of the excavation near sampling grid B-2 (Figure 6). The affected area was lined with a geomembrane as a further measure to isolate residual contamination before backfilling. The liner was also extended along the bank area next to King Salmon Marine where the contaminated layer remains isolated beneath the bank outside of SMU 51a.

As an early warning indicator of potential contamination entering the SMU 51a cell backfill in grid B-2, Year 0 baseline monitoring included a sediment core collected at the B-2 sampling location. The core was collected via hand auger through a 3-foot thickness of sandy gravel backfill and was subdivided into three,

1-foot-long sample sections: B-2-Ca (0- to 1-foot depth), B-2-Cb (1- to 2-foot depth), and B-2-Cc (2- to 3-foot depth). The lowermost core section B-2-Cc-2004) was submitted for chemical analysis as an assumed "worst case" indicator of potential contamination entering the backfill.

3.2 Chemical Analyses Results

Sediment samples from the Year 0 baseline event were submitted to the Washington State Department of Ecology's (Ecology's) Manchester Laboratory for chemical analysis of constituents listed in Tables 2 and 3 for SMU 51a and SMU 51b, respectively. Selected constituents for analysis were based on exceedances of Commencement Bay Sediment Quality Objectives (SQOs – Table 4) from historical sampling in SMU 51a and SMU 51b. Analytical results from the historical sampling define indicator constituents for each sampling grid in the SMUs. Constituents that were historically not detected, but that had analytical detection limits above their respective SQOs were not analyzed.

Analytical results of Year 0 baseline samples are presented in Tables 5 through 7. It should be noted that additional constituents were analyzed in comparison with the minimum listed in Tables 2 and 3.

There were no exceedances of SQOs. It should also be noted that elevated benzoic acid concentrations were detected in every sample including laboratory blanks. The laboratory report narrative indicates that calibration criteria for the semivolatile organic analyses exceeded QA control limits, i.e. low continuing calibration responses. The benzoic acid exceedances, therefore, are interpreted as an artifact of the testing method. With few exceptions, other detected constituents or laboratory reporting limits for undetected constituents were less than one-half their respective SQOs. The Year 0 baseline data indicate a relatively pristine post-backfilling/capping surface for SMU 51a and SMU 51b.

Analytical results for SMU 51a core sample B-2-Cc were comparable to those for surface sediments samples, with few detected constituents. Sample B-2-Cc was the deepest sample obtained from the core and, therefore, most likely to be contaminated. The upper core sections B-2-Ca (1- to 2-foot depth) and B-2-Cb (2- to 3-foot depth), therefore, were not submitted for analysis, as required if SQOs had been exceeded in the B-2-Cc sample.

As discussed below, results for VOC analyses were rejected based on problems with hold time and temperature exceedances. Based on the noted QA/QC concerns, an initial detection of xylenes in one sample (A-2-M-2004) at a very low, estimated concentration of 1.2 micrograms per kilogram is considered suspect. Although results from VOC analysis are rejected, it is unlikely that

capping and backfill materials were affected by VOCs during the Year 1 sampling. Further confirmation sampling and testing for VOCs completed as part of Year 1 monitoring conducted in August 2005 did not detect VOCs at the A-2-M-2004. Low-level detections of xylenes and perchloroethene at other sampling locations during Year 1 monitoring are attributed to ambient background sources in the water column (see Year 1 report for further discussion).

It should also be noted that sample cleanup was implemented for PCB analyses only. As a modification to the general Foster Wheeler QAPP (1998b), cleanup included Florisil Column Method 3620, v1.2, and Sulfur Removal Method 3660B with tetrabutylammonium sulfite treatment, v1.2. Cleanup was completed in accordance with SW 846 protocols.

3.3 Data Quality Review

The analytical data were subject to a data quality review at Ecology's Manchester Laboratory to assess whether the data met the specified QC acceptance criteria for the project. The data quality review also underwent an independent peer review at Ecology's Manchester Laboratory. The review is based on quality control requirements described in the project Quality Assurance Project Plan (QAPP) and related EPA guidelines:

- EPA National Functional Guidelines for Organic Data Review (EPA 1999); and

- EPA National Functional Guidelines for Inorganic Data Review (EPA 2004).

Specific QC objectives are listed in the QAPP and include data validation qualifier flags, field quality control parameters, and laboratory quality control parameters (precision, accuracy, representativeness, comparability, and completeness). Ecology's Manchester Laboratory evaluated the objectives based on analytical methods, holding times, instrument tuning, calibration, blanks, surrogates, matrix spikes, replicates, and laboratory control samples. Hart Crowser completed an additional summary review of the Manchester QA narratives. We further qualified the VOC data and some SVOC data as rejected following further data review and discussions with EPA and the US Army Corps of Engineers.

The data obtained are of acceptable quality and suitability for their intended use, with the minor qualifications noted below. Data validation reports and related documentation are provided in Appendix A.

Metals

No qualifications were noted with regard to holding times, calibration, method blanks, spikes, replicates, and laboratory control samples for samples other than antimony and silver. As reported by the Manchester lab, samples for metals analyses were analyzed in two batches. During analysis of the initial batch in November 2004, analyses of silver, nickel, antimony, and copper were inadvertently omitted for samples G-M-2004, A-2-M-2004, B-2-M-2004, B-2-Cc-2004, and X-M-2004 (duplicate of B-2-M-2004). These samples were subsequently reanalyzed for the constituents noted in March 2005. The Manchester lab case narrative indicates that the initial extracts from the October 2004 testing were not spiked with silver and antimony, and that the laboratory control sample and matrix spikes could not be analyzed during the March 2005 testing. Results for the latter analytes, therefore, are flagged as estimates for the applicable samples.

Polychlorinated Biphenyls (PCBs)

No qualifications were noted with regard to holding times, calibration, instrument DDT degradation control samples, blanks, surrogates, duplicate samples, duplicate matrix spiked samples, and laboratory control samples.

Semivolatile Organic Compounds (SVOCs)

The initial and continuing calibration checks for several compounds identified on the laboratory narrative were beyond the laboratory control limits and, therefore, were flagged as rejected. These compounds included benzoic acid, hexachlorocyclopentadiene, 2,4-dinitrophenol, pentachlorophenol, benzidine, and 3B-coprostanol.

Several target phenol and phthalate compounds, and phenanthrene were detected in the laboratory blank samples. These compounds were considered as real detections if concentrations in the samples were greater than or equal to five times the area counts in the method blanks. In other samples, these compounds were detected at concentrations less than 5 times the concentrations in the associated lab blank. In these cases the detections were qualified by the Manchester lab as UJ:

- **Phenanthrene:** EF-M-2004 qualified as UJ;
- **Diethylphthalate:** All samples qualified as UJ except A-2-M-2004 (no qualifiers); and A-2-M-2004, HIJ-M-2004, and O-M-2004 qualified as U;

- **Di-N-Butylphthalate:** All samples qualified as UJ except X-2-M-2004 (blind field duplicate of B-2-M-2004) qualified as U; and

- **Bis(2-Ethylhexyl)Phthalate:** All samples qualified as UJ except B-2-Cc-2004 (no qualifiers), and O-M-2004 (no qualifiers)

Matrix spikes for several compounds exceeded acceptable limits and are qualified as estimates. Results for several other compounds were rejected because they were not recovered in the matrix spikes.

Several compounds are flagged as estimated because of laboratory fortified blank recoveries beyond acceptable limits. Several other compounds had high recoveries and were qualified where detected in the samples.

Volatile Organic Compounds (VOCs)

Samples for VOC analysis were shipped from the Manchester lab to Analytical Resources, Inc. (ARI) lab in Seattle on October 28, 2005. The sample cooler received by ARI had a reported temperature of 13.0 degrees C. This temperature is outside acceptable control limits, and data are rejected as possibly low-biased. Qualifications based on other QA review parameters are included below for completeness.

Initial and continuing calibration checks were within control limits with several exceptions that did not affect the results. Analytes with high recoveries indicating a possible high bias were not detected in the samples; results, therefore, were unaffected and not qualified based on calibration parameters.

Sample A-2-M-2004 was sampled on October 15, 2004, rather than on October 19 as indicated on the sample custody form. The analyses for VOCs were completed on November 2, 2004, 4 days past the holding time. Results may be biased low. The VOC data for this sample, therefore, were rejected based on the exceedance of the holding time.

4.0 HABITAT RESTORATION

Restoration of the upland access corridor for SMU 51a was completed in accordance with requirements of the contract design, plans, and specifications in September and October 2004. As noted above, habitat restoration and related monitoring are being conducted separately from the CERCLA requirements for the project. A brief summary of habitat restoration efforts is provided herein for documentation purposes and to provide continuity with discussion of

construction activities, bank stabilization, erosion control measures, and other monitoring efforts.

The upland area was replanted between November 22 and 24, 2004. During site visits in December 2004 and February and March 2005, plants in the restored upland area were observed to be in apparent good condition (Photographs 12). Limited growth during the winter season made more conclusive evaluation of the overall health of individual species difficult. As noted above, plants along the eroded bank edge identified in February 2005 were relocated slightly farther up the bank, with apparent loss of only a few individual shrubs from erosion. Significant growth and greening were apparent by May 2005 in the replanted upland area (Photographs 19 and 20).

On May 23, 2005, the upper saltmarsh zone of SMU 51a (elevation 11.4 to 13.4 feet U.S. Army Corps of Engineers Mean Lower Low Water datum) was planted with tufted hairgrass *(Deschampsia cespitosa)* and saltgrass *(Distichlis spicata)*. The lower saltmarsh zone (elevation 9.9 to 11.4 feet) was planted with pickleweed *(Salicornia virginica)*. The supplying nursery mistakenly provided brass buttons *(Cotula coronopifolia)* rather than fleshy jaumea *(Jaumea carnosa)* as required for the lower saltmarsh zone. The latter species is not available for planting this season, and will be evaluated further for future consideration. The decision to maintain or remove the brass buttons is also under consideration. The saltmarsh planting zone was protected with a goose exclusion structure (Photograph 21), but a log and other floating debris have since been deposited in the planting area.

5.0 REFERENCES

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Table 1 - Surficial Backfill and Cap Thicknesses at Sediment Sampling Locations

Sample Location	Silty Sand Thickness in Inches
SMU 51a (Surficial Backfill)	
AB	6
A-2	6
B-2	6
CD	6
EF	6
G	6
HIJ	6
SMU51b (Surficial Cap)	
K	5.5
L	12
M	13
N	12
O	11
P	10
Q	10
R	12
S	10

Table 2 - SMU 51a Surface Sediment Monitoring Sampling Grids and Constituents (Year 0 Baseline)

	Year 0 Baseline Sampling Grid							
	AB	A-2	B-2[b]	CD	EF	G	HIJ	X[3]
Historical Explorations[a]	MID-10 STORMDRAIN		MID-10	MW-144 MID-08 MID-09 HC-1	TF-23 MID-04 MID-07	MID-05 MID-06 MW-143 TF-22 MD-11 MWHEAD1	MID-03 MID-02 TF-21 MID-01	
Surface Sediment Quality Sample No.	AB-M-2004	A-2-M-2004	B-2-M-2004	CD-M-2004	E-M-2004 and F-2-M-2004	G-M-2004	HIJ-M-2004	X-M-2004
Constituents for Analysis								
Antimony		X	X					X
Arsenic		X	X			X		X
Cadmium		X	X			X	X	X
Chromium						X		
Copper		X	X		X	X		X
Lead		X	X			X		X
Mercury	X	X	X	X	X	X	X	X
Nickel		X	X					X
Silver		X	X					X
Zinc		X	X			X	X	X
SQO LPAHs	X	X	X	X	X	X	X	X
SQO HPAHs	X	X	X	X	X	X	X	X
SQO Chlorinated Hydrocarbons		X	X					X
1,2-dichlorobenzene				X		X		
1,4-dichlorobenzene				X		X		
Bis(2-ethylhexyl)phthalate				X		X	X	
SQO Misc. Extractables		X	X					X
Dibenzofuran						X		
PCBs		X	X		X			X
SQO Phenols		X	X					X
Phenol				X		X		
2-methylphenol						X		
2,4-dimethylphenol						X		
Pentachlorophenol						X		
Benzyl Alcohol						X		
SQO Phthalates		X	X					X
SQO Pesticides		X	X					X
SQO Volatile Organic Compounds		X	X					X

Notes

LPAHs Low-molecular weight polycyclic aromatic hydrocarbons

HPAHs High-molecular weight polycyclic aromatic hydrocarbons

[a] See Design Analysis Report (Hart Crowser 2004) for description and discussion of historical explorations.

[b] Location B-2 also includes sediment core sample B-2-C. Core intervals: B-2-Ca (0 to 1 foot depth below mudline), B-2-Cb (1 to 2 feet depth), and B-2-Cc (2 to 3 feet depth). Sample B-2-Cc (2 to 3 feet depth analyzed for same constitunets as surface sample B-2.

[c] Blind field duplicate of sample B-2-M-2004.

Table 3 - SMU 51b Surface Sediment Samples and Constituents (Year 0 Baseline)

	Year 0 Baseline and Long-Term Sediment Monitoring Sampling Grid										
	K	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**		**Y[b]**
Historical Explorations	**MW-142**	**TF-20**	**MW-141**	**MW-052**	**MW-139**	**MW-051**	**MW-050**	**MW-135**	**MW-132**	**MW-008-SP**	
Surface Sample	X	X	X	X	X	X		X	X	X	
Subsurface Samples			X		X		X	X			
Surface Sediment Quality Monitoring Sample No.	K-M-2004	L-M-2004	M-M-2004	N-M-2004	O-M-2004	P-M-2004	Q-M-2004	R-M-2004	S-M-2004		X-M-2004
Constituents for Analysis											
Mercury	X		X		X	X		X	X		X
Zinc											
LPAHs	X		X			X	X	X			
HPAHs	X		X		X	X	X	X			
Bis(2-ethylhexyl)phthalate	X	X									
Dibenzofuran						X	X				
N-Nitrosodiphenylamine			X	X							
Total PCBs									X		X
Phenol											
2-methylphenol						X		X			
2,4-dimethylphenol			X		X	X	X	X			
Benzyl Alcohol											
Benzoic Acid									X		
4,4' - DDE									X		X
4,4' - DDT									X		X

Notes

LPAHs Low-molecular weight polycyclic aromatic hydrocarbons

HPAHs High-molecular weight polycyclic aromatic hydrocarbons

[a] See Design Analysis Report (Hart Crowser 2004) for description and discussion of historical explorations.

[b] Blind field duplicate of sample S-M-2004.

Table 4 - Commencement Bay Sediment Quality Objectives (SQOs)

Constituents	SQO
Metals in mg/kg	
Antimony	150
Arsenic	57
Cadmium	5.1
Copper	390
Lead	450
Mercury	0.59
Nickel	140
Silver	6.1
Zinc	410
Phenolics (Acids) in ug/kg	
Phenol	420
2-Methylphenol	63
4-Methylphenol	670
2,4-Dimethylphenol	29
Pentachlorophenol	360
Benzyl alcohol	73
Benzoic acid	650
LPAHs in ug/kg	
Naphthalene	2,100
2-Methylnaphthalene	670
Acenaphthylene	1,300
Acenaphthene	500
Fluorene	540
Phenanthrene	1,500
Anthracene	960
Total LPAHs	5,200
HPAHs in ug/kg	
Fluoranthene	2,500
Pyrene	3,300
Benz(a)anthracene	1,600
Chrysene	2,800
Total benzofluoranthenes	3,600
Benzo(a)pyrene	1,600
Indeno(1,2,3-cd)pyrene	690
Dibenz(a,h)anthracene	230
Benzo(g,h,i)perylene	720
Total HPAHs	17,000
Chlorinated Hydrocarbons in ug/kg	
1,3-Dichlorobenzene	170
1,4-Dichlorobenzene	110
1,2-Dichlorobenzene	50
1,2,4-Trichlorobenzene	51
Hexachlorobenzene	22
Phthalates in ug/kg	
Dimethyl phthalate	160
Diethyl phthalate	200
Di-n-butyl phthalate	1,400
Butyl benzyl phthalate	900
Bis(2-ethylhexyl)phthalate	1,300
Di-n-octyl phthalate	6,200

Table 4 - Commencement Bay Sediment Quality Objectives (SQOs)

Constituents	SQO
Misc. Extractables in ug/kg	
Dibenzofuran	540
Hexachlorobutadiene	11
N-Nitrosodiphenylamine	28
Pesticides/PCBs in ug/kg	
Total PCBs	300
4,4'-DDE	9
4,4'-DDD	16
4,4'-DDT	34
VOCs in ug/kg	
Ethylbenzene	10
Tetrachloroethene	57
Total xylenes	40

Table 5 - Analytical Results for Year 0 Sediment Samples - Metals

Sample ID	Sampling Date	Concentration in mg/kg									
		Antimony	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Zinc
	SQO:		57	5.1		390	450	0.59			410
SMU 51											
A-2-M-2004	10/19/2004	0.20 UJ	2.21	0.10 U			6.49	0.031		0.10 UJ	31
AB-M-2004	10/15/2004							0.032			
B-2-M-2004	10/19/2004	0.20 UJ	2.31	0.10 U			7.18	0.023	30.4	0.10 UJ	30
B-2-Cc-2004	10/20/2004	0.20 UJ	3.26	0.10 U			4.22	0.021	25.7	0.10 UJ	37
CD-M-2004	10/15/2004							0.028			
EF-M-2004	10/15/2004					13.5		0.022			
G-M-2004	10/15/2004		2.84	0.10 U	27.5	12.8	6.74	0.023			31
HIJ-M-2004	10/15/2004			0.10 U				0.028			31
X-M-2004[a]	10/19/2004	0.20 UJ	2.58	0.10 U			9.15	0.035	32.7	0.10 UJ	32
SMU 51b											
K-M-2004	10/20/2005							0.026			
M-M-2004	10/14/2005							0.027			
O-M-2004	10/14/2005							0.035			
P-M-2004	10/14/2005							0.029			
R-M-2004	10/14/2005	0.20 UJ						0.024			
S-M-2004	10/14/2005							0.029			
Y-M-2004[b]	10/15/2005							0.024			

Notes:

[a] Duplicate of sample B-2-M-2004.

[b] Duplicate sample located 20 feet east and 5 feet north of sample K-M-2004.

U = Not detected at reporting limit (RL) indicated.

J = Estimate value.

Blank indicates sample not analyzed or no SQO established for specific analyte.

Table 6 - Analytical Results for Year 0 Sediment Samples - Organochlorine Pesticides and Polychlorinated Biphenyls (PCBs)

		SMU 51a					SMU 51b
Sample ID:	SQO	A-2-M-2004	B-2-M-2004	EF-M-2004	B-2-Cc-2004	X-M-2004[a]	S-M-2004
Sampling Date:		10/19/2004	10/19/2004	10/15/2004	10/20/2004	10/19/2004	10/14/2004
Pesticide/PCBs in µg/kg							
4,4'-DDE	9	0.58 U	0.60 U		0.57 U	0.57 U	0.59 U
4,4'-DDD	16	0.58 U	0.60 U		0.57 U	0.57 U	0.59 U
4,4'-DDT	34	0.58 U	0.60 U		0.57 U	0.57 U	0.59 U
Aroclor 1016		7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U
Aroclor 1221		7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U
Aroclor 1232		7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U
Aroclor 1242		7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U
Aroclor 1248		7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U
Aroclor 1254		7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U
Aroclor 1260		7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U
Aroclor 1262		7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U
Aroclor 1268		7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U
Total PCBs	300	7.3 U	7.5 U	7.1 U	7.1 U	7.2 U	7.3 U

Notes:

[a] Duplicate of sample B-2-M-2004.

U = Not detected at reporting limit (RL) indicated.

Blank indicates sample not analyzed or no SQO established for specific analyte.

Table 7 - Analytical Results for Year 0 Sediment Samples - Semivolatile Organic Compounds (SVOCs)

		SMU 51a						
Sample ID	SQO	A-2-M-2004	AB-M-2004	EF-M-2004	B-2-Cc-2004	B-2-M-2004	CD-M-2004	G-M-2004
Sampling Date		10/19/2004	10/15/2004	10/15/2004	10/20/2004	10/19/2004	10/15/2004	10/15/2004
LPAHs in µg/kg								
2-Methylnaphthalene	670	5.8 U	6.9 J	4.9 J	5.7 U	6.1	5.9 U	6
Acenaphthene	500	5.8 U	6.9 J	12 U	5.7 U	5.7 U	5.9 U	5 U
Acenaphthylene	1300	5.8 U	6.9 J	12 U	5.7 U	7.9	5.9 U	5 U
Anthracene	960	5.1 J	8.8 J	3.3 J	5.7 U	6.7	5.9 U	5 U
Fluorene	540	5.8 U	7.7 J	3.4 J	5.7 U	5.7 U	5.9 U	5 U
Naphthalene	2100	5.8 U	15	5.9 J	5.7 U	14	6.9	6.4
Phenanthrene	1500	20	35	12 UJ	11	24	14	8.1
Total LPAHs	5200	25.1	87.2	17.5	11	58.7	20.9	20.5
HPAHs in µg/kg								
Benzo(a)anthracene	1600	14	22	7.2 J	5.7 U	21	7.6	5 U
Benzo(a)pyrene	1600	19	12	0.81 J	5.7 U	21	5.9 U	5 U
Benzo(ghi)perylene	720	7.8	22	12 J	5.7 U	10	5.9 U	5 U
Chrysene	2800	20	33	17	6.8	34	10	8.3
Dibenzo(a,h)anthracene	230	5.8 U	12 U	12 U	5.7 U	5.7 U	5.9 U	5 U
Fluoranthene	2500	29	56	15	8.5	58	18	11
Indeno(1,2,3-cd)pyrene	690	6.7	13	7.9 J	5.7 U	9.7	5.9 U	5 U
Pyrene	3300	40	60	23	9.1	66	28	14
Benzo(b)fluoranthene		19 J	23 U	24 U	5.7 UJ	32 J	7.4 J	7.3 J
Benzo(k)fluoranthene		18 J	23 U	24 U	5.7 UJ	36 J	8.3 J	9.5 J
Total Benzofluoranthenes	3600	37 J	23 U	24 U	5.7 UJ	68 J	15.7 J	16.8 J
Total HPAHs	17000	173.5	218	82.91	24.4	287.7	79.3	50.1
Chlorinated Hydrocarbons in µg/kg								
1,2,4-Trichlorobenzene	51	5.8 U			5.7 U	5.7 U	5.9 U	5 U
1,2-Dichlorobenzene	50	5.8 U			5.7 U	5.7 U	5.9 U	5 U
1,3-Dichlorobenzene	170	5.8 U			5.7 U	5.7 U	5.9 U	5 U
1,4-Dichlorobenzene	110	5.8 U			5.7 U	5.7 U	5.9 U	5 U
Hexachlorobenzene	22	5.8 U			5.7 U	5.7 U	5.9 U	5 U
Phthalates in µg/kg								
Bis(2-Ethylhexyl)Phthalate	1300	59 UJ			64	69 UJ	73 UJ	38 UJ
Butylbenzylphthalate	900	5.8 U			5.7 U	5.7 U	5.9 U	5 U
Diethylphthalate	200	11			9.6 UJ	10 UJ	9 UJ	12 UJ
Dimethylphthalate	160	5.8 U			5.7 U	5.7 U	5.9 U	5 U
Di-N-Butylphthalate	1400	13 UJ			10 UJ	10 UJ	7.6 UJ	10 UJ
Di-N-Octyl Phthalate	6200	5.8 U			5.7 U	5.7 U	5.9 U	5 U

Table 7 - Analytical Results for Year 0 Sediment Samples - Semivolatile Organic Compounds (SVOCs)

Sample ID Sampling Date	SQO	A-2-M-2004 10/19/2004	AB-M-2004 10/15/2004	EF-M-2004 10/15/2004	B-2-Cc-2004 10/20/2004	B-2-M-2004 10/19/2004	CD-M-2004 10/15/2004	G-M-2004 10/15/2004
Phenolics (Acids) in µg/kg								
2,4,5-Trichlorophenol		5.8 UJ			5.7 UJ	5.7 UJ	5.9 UJ	5 UJ
2,4,6-Trichlorophenol		5.8 UJ			5.7 UJ	5.7 UJ	5.9 UJ	5 UJ
2,4-Dichlorophenol		5.8 U			5.7 U	5.7 U	5.9 U	5 U
2,4-Dimethylphenol	29	5.8 U			5.7 U	5.7 U	5.9 U	5 U
2,4-Dinitrophenol		REJ			REJ	REJ	REJ	REJ
2-Chlorophenol		5.8 U			5.7 U	5.7 U	5.9 U	5 U
2-Methylphenol	63	5.8 U			5.7 U	5.7 U	5.9 U	5 U
2-Nitrophenol		5.8 U			5.7 U	5.7 U	5.9 U	5 U
4,6-Dinitro-2-Methylphenol		232 UJ			228 UJ	228 UJ	234 UJ	202 UJ
4-Chloro-3-Methylphenol		5.8 U			5.7 U	5.7 U	5.9 U	5 U
4-Methylphenol	670	5.8 U			5.7 U	5.7 U	13	5 U
4-Nitrophenol		58 UJ			57 UJ	57 UJ	59 UJ	50 UJ
Benzoic Acid	650	REJ			REJ	REJ	REJ	REJ
Benzyl Alcohol	73	5.8 UJ			5.7 UJ	5.7 UJ	5.9 UJ	5 UJ
Pentachlorophenol	360	REJ			REJ	REJ	REJ	REJ
Phenol	420	5.8 U			5.7 U	5.7 U	5.9 U	5 U
Misc. Extractables in µg/kg								
1,2-Diphenylhydrazine		5.8 U			5.7 U	5.7 U	5.9 U	5 U
1-Methylnaphthalene		5.8 U	4.8 J	2.7 J	5.7 U	6.1 U	5.9 U	6 U
2,2'-Oxybis(1-Chloropropane)		5.8 U			5.7 U	5.7 U	5.9 U	5 U
2,4-Dinitrotoluene		5.8 U			5.7 U	5.7 U	5.9 U	5 U
2,6-Dinitrotoluene		5.8 U			5.7 U	5.7 U	5.9 U	5 U
2-Chloronaphthalene		5.8 U	12 U	12 U	5.7 U	5.7 U	5.9 U	5 U
2-Nitroaniline		5.8 U			5.7 U	5.7 U	5.9 U	5 U
3,3'-Dichlorobenzidiene		5.8 UJ			5.7 UJ	5.7 UJ	5.9 UJ	5 UJ
3B-Coprostanol		REJ			REJ	REJ	REJ	REJ
3-Nitroaniline		5.8 U			5.7 U	5.7 U	5.9 U	5 U
4-Bromophenyl-Phenylether		5.8 U			5.7 U	5.7 U	5.9 U	5 U
4-Chloroaniline		5.8 UJ			5.7 UJ	5.7 UJ	5.9 UJ	5 UJ
4-Chlorophenyl-Phenylether		5.8 U			5.7 U	5.7 U	5.9 U	5 U
4-Nitroaniline		12 U			11 U	11 U	12 U	10 U
Aniline		5.8 UJ			5.7 UJ	5.7 UJ	5.9 UJ	5 UJ
Benzidine		REJ			REJ	REJ	REJ	REJ
Bis(2-Chloroethoxy)Methane		5.8 U			5.7 U	5.7 U	5.9 U	5 U

Table 7 - Analytical Results for Year 0 Sediment Samples - Semivolatile Organic Compounds (SVOCs)

Sample ID Sampling Date	SQO	A-2-M-2004 10/19/2004	AB-M-2004 10/15/2004	EF-M-2004 10/15/2004	B-2-Cc-2004 10/20/2004	B-2-M-2004 10/19/2004	CD-M-2004 10/15/2004	G-M-2004 10/15/2004
Bis(2-Chloroethyl)Ether		5.8 U			5.7 U	5.7 U	5.9 U	5 U
Caffeine		5.8 U			5.7 U	5.7 U	5.9 U	5 U
Carbazole		5.8 U	12 U	12 U	5.7 U	5.7 U	5.9 U	5 U
Dibenzofuran	540	5.8 U	5.3 J	2.3 J	5.7 U	4.4 J	5.9 U	5 U
Hexachlorobutadiene	11	5.8 U			5.7 U	5.7 U	5.9 U	5 U
Hexachlorocyclopentadiene		REJ			REJ	REJ	REJ	REJ
Hexachloroethane		5.8 U			5.7 U	5.7 U	5.9 U	5 U
Isophorone		5.8 U			5.7 U	5.7 U	5.9 U	5 U
Nitrobenzene		5.8 U			5.7 U	5.7 U	5.9 U	5 U
N-Nitrosodimethylamine		12 U			11 U	11 U	12 U	10 U
N-Nitroso-Di-N-Propylamine		5.8 U			5.7 U	5.7 U	5.9 U	5 U
N-Nitrosodiphenylamine	28	5.8 U			5.7 U	5.7 U	5.9 U	5 U
Pyridine		12 U			11 U	11 U	12 U	10 U
Retene		20	58	19 J	3.6 J	25	17	20

Table 7 - Analytical Results for Year 0 Sediment Samples - Semivolatile Organic Compounds (SVOCs)

Sample ID Sampling Date	SQO	HIJ-M-2004 10/15/2004	X-M-2004[a] 10/19/2004	K-M-2004 10/20/2004	L-M-2004 10/20/2004	M-M-2004 10/14/2004	N-M-2004 10/14/2004	O-M-2004 10/14/2004
LPAHs in µg/kg								
2-Methylnaphthalene	670	5.3 U	13	5.9 U	4.4 J	3.2 J	6.2 U	5.1 U
Acenaphthene	500	5.3 U	7.5	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Acenaphthylene	1300	5.3 U	7	5.9 U	6.2 U	3.4 J	6.2 U	5.1 U
Anthracene	960	5.3 U	10	5.9 U	5.1 J	5.8 U	6.2 U	5.1 U
Fluorene	540	5.3 U	6.7	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Naphthalene	2100	5.3 U	28	5.9 U	6.8	5.8 U	6.2 J	5.1 U
Phenanthrene	1500	9.7	44	5.6 J	13	12	8	8.1
Total LPAHs	5200	9.7	116.2	5.6 J	29.3	18.6	14.2	8.1
HPAHs in µg/kg								
Benzo(a)anthracene	1600	6.5	21	5.9 U	8.9	10	3.5 J	5.1 U
Benzo(a)pyrene	1600	5.3 U	21	5.9 U	7.6	10	6.2 U	5.1 U
Benzo(ghi)perylene	720	5.3 U	11	5.9 U	8.3	13	6.2 U	5.1 U
Chrysene	2800	14	40	5.9 U	15	21	8	5.4
Dibenzo(a,h)anthracene	230	5.3 U	6 U	5.9 U	5.7 U	5.8 U	6.2 U	5.1 U
Fluoranthene	2500	12	69	6.7	21	20	9.9	12
Indeno(1,2,3-cd)pyrene	690	5.3 U	7.9	59 U	5.7 J	8.8	6.2 U	5.1 U
Pyrene	3300	19	94	9.5	27	28	10	10
Benzo(b)fluoranthene		12 J	43 J	5.9 UJ	10 J	12 J	6.2 UJ	5.1 UJ
Benzo(k)fluoranthene		9.8 J	41 J	5.9 UJ	12 J	19 J	6.2 UJ	5.1 UJ
Total Benzofluoranthenes	3600	21.8 J	84 J	5.9 UJ	22 J	31 J	6.2 UJ	5.1 UJ
Total HPAHs	17000	73.3	347.9	16.2	115.5	141.8	31.4	27.4
Chlorinated Hydrocarbons in µg/kg								
1,2,4-Trichlorobenzene	51	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
1,2-Dichlorobenzene	50	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
1,3-Dichlorobenzene	170	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
1,4-Dichlorobenzene	110	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Hexachlorobenzene	22	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Phthalates in µg/kg								
Bis(2-Ethylhexyl)Phthalate	1300	43 UJ	62 UJ	65 UJ	35 UJ	46 UJ	49 UJ	52
Butylbenzylphthalate	900	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Diethylphthalate	200	5.3 U	10 UJ	26 UJ	24 UJ	26 UJ	9.9 UJ	5.1 U
Dimethylphthalate	160	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Di-N-Butylphthalate	1400	10 UJ	6 U	27 UJ	27 UJ	17 UJ	22 UJ	10 UJ
Di-N-Octyl Phthalate	6200	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U

Table 7 - Analytical Results for Year 0 Sediment Samples - Semivolatile Organic Compounds (SVOCs)

Sample ID Sampling Date	SQO	HIJ-M-2004 10/15/2004	X-M-2004[a] 10/19/2004	K-M-2004 10/20/2004	L-M-2004 10/20/2004	M-M-2004 10/14/2004	N-M-2004 10/14/2004	O-M-2004 10/14/2004
Phenolics (Acids) in µg/kg								
2,4,5-Trichlorophenol		5.3 UJ	6 UJ	5.9 UJ	6.2 U	5.8 U	6.2 U	5.1 U
2,4,6-Trichlorophenol		5.3 UJ	6 UJ	5.9 UJ	6.2 U	5.8 U	6.2 U	5.1 U
2,4-Dichlorophenol		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
2,4-Dimethylphenol	29	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
2,4-Dinitrophenol		REJ	REJ	REJ	REJ	REJ	REJ	REJ
2-Chlorophenol		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
2-Methylphenol	63	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
2-Nitrophenol		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
4,6-Dinitro-2-Methylphenol		213 UJ	239 UJ	235 UJ	247 UJ	230 UJ	246 UJ	202 UJ
4-Chloro-3-Methylphenol		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
4-Methylphenol	670	5.3 U	6 U	5.9 U	6.2 U	42	6.2 U	5.1 U
4-Nitrophenol		53 U	60 UJ	59 UJ	62 U	58 U	62 U	50 U
Benzoic Acid	650	REJ	REJ	REJ	REJ	REJ	REJ	REJ
Benzyl Alcohol	73	5.3 UJ	6 UJ	5.9 UJ	6.2 U	5.8 U	6.2 U	5.1 U
Pentachlorophenol	360	REJ	REJ	REJ	REJ	REJ	REJ	REJ
Phenol	420	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Misc. Extractables in µg/kg								
1,2-Diphenylhydrazine		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
1-Methylnaphthalene		5.3 U	7.8	5.9 U	3.5 J	1.6 J	6.2 U	5.1 U
2,2'-Oxybis(1-Chloropropane)		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
2,4-Dinitrotoluene		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
2,6-Dinitrotoluene		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
2-Chloronaphthalene		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
2-Nitroaniline		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
3,3'-Dichlorobenzidiene		5.3 UJ	6 UJ	5.9 UJ	6.2 U	5.8 U	6.2 U	5.1 U
3B-Coprostanol		REJ	REJ	REJ	REJ	REJ	REJ	REJ
3-Nitroaniline		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
4-Bromophenyl-Phenylether		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
4-Chloroaniline		5.3 U	6 UJ	5.9 UJ	6.2 U	5.8 U	6.2 U	5.1 U
4-Chlorophenyl-Phenylether		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
4-Nitroaniline		11 U	12 U	12 U	12 U	12 U	12 U	10 U
Aniline		5.3 UJ	6 UJ	5.9 UJ	6.2 U	5.8 U	6.2 U	5.1 U
Benzidine		REJ	REJ	REJ	REJ	REJ	REJ	REJ
Bis(2-Chloroethoxy)Methane		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U

Table 7 - Analytical Results for Year 0 Sediment Samples - Semivolatile Organic Compounds (SVOCs)

Sample ID Sampling Date	SQO	HIJ-M-2004 10/15/2004	X-M-2004[a] 10/19/2004	K-M-2004 10/20/2004	L-M-2004 10/20/2004	M-M-2004 10/14/2004	N-M-2004 10/14/2004	O-M-2004 10/14/2004
Bis(2-Chloroethyl)Ether		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Caffeine		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Carbazole		5.3 U	6 U	5.9 U	6.2 UJ	5.8 UJ	6.2 UJ	5.1 UJ
Dibenzofuran	540	5.3 U	6.9	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Hexachlorobutadiene	11	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Hexachlorocyclopentadiene		REJ	REJ	REJ	REJ	REJ	25 REJ	REJ
Hexachloroethane		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Isophorone		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Nitrobenzene		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
N-Nitrosodimethylamine		11 U	12 U	12 U	12 U	12 U	12 U	10 U
N-Nitroso-Di-N-Propylamine		5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
N-Nitrosodiphenylamine	28	5.3 U	6 U	5.9 U	6.2 U	5.8 U	6.2 U	5.1 U
Pyridine		11 U	12 U	12 U	12 U	12 U	12 U	10 U
Retene		33	37	31	30	27	5.3 J	5.1 U

Table 7 - Analytical Results for Year 0 Sediment Samples - Semivolatile Organic Compounds (SVOCs)

		SMU 51b				
Sample ID	SQO	P-M-2004	Q-M-2004	R-M-2004	S-M-2004	Y-M-2004[b]
Sampling Date		10/14/2004	10/14/2004	10/14/2004	10/14/2004	10/15/2004
LPAHs in µg/kg						
2-Methylnaphthalene	670	6.1 U	6 U	5.9 U	6.1 U	7.8
Acenaphthene	500	6.1 U	6 U	5.9 U	6.1 U	5.9 U
Acenaphthylene	1300	6.1 U	6 U	5.9 U	4.6 J	5 J
Anthracene	960	6.1 U	6 U	5.9 U	4.9 J	5.7 J
Fluorene	540	6.1 U	6 U	5.9 U	6.1 U	5.9 U
Naphthalene	2100	6.1 U	3.8 J	5.9 J	3.2 J	16 J
Phenanthrene	1500	6.6	8.2	8.7	10	28
Total LPAHs	5200	6.6	12	14.6	22.7	62.5
HPAHs in µg/kg						
Benzo(a)anthracene	1600	6.1 U	3.5 J	5.9 U	42	17
Benzo(a)pyrene	1600	6.1 U	3.1 J	5.9 U	39	20
Benzo(ghi)perylene	720	6.1 U	3.3 J	5.9 U	30	12
Chrysene	2800	4.9 J	6.1	5.9 U	126	27
Dibenzo(a,h)anthracene	230	6.1 U	6 U	5.9 U	9.3	4 J
Fluoranthene	2500	8.6	11	6.1	168 J	38
Indeno(1,2,3-cd)pyrene	690	6.1 U	6 U	5.9 U	27	9.6
Pyrene	3300	7.9	11	5.2 J	127	53
Benzo(b)fluoranthene		6.1 UJ	4.4 J	5.9 UJ	79 J	22 J
Benzo(k)fluoranthene		6.1 UJ	4.7 J	5.9 UJ	85 J	25 J
Total Benzofluoranthenes	3600	6.1 UJ	9.1 J	5.9 UJ	164 J	47 J
Total HPAHs	17000	21.4	47.1	11.3	732.3	227.6
Chlorinated Hydrocarbons in µg/kg						
1,2,4-Trichlorobenzene	51	6.1 U	6 U	5.9 U	6.1 U	5.9 U
1,2-Dichlorobenzene	50	6.1 U	6 U	5.9 U	6.1 U	5.9 U
1,3-Dichlorobenzene	170	6.1 U	6 U	5.9 U	6.1 U	5.9 U
1,4-Dichlorobenzene	110	6.1 U	6 U	5.9 U	6.1 U	5.9 U
Hexachlorobenzene	22	6.1 U	6 U	5.9 U	6.1 U	5.9 U
Phthalates in µg/kg						
Bis(2-Ethylhexyl)Phthalate	1300	34 UJ	48 UJ	33 UJ	42 UJ	55 UJ
Butylbenzylphthalate	900	6.1 U	6 U	5.9 U	6.1 U	5.9 U
Diethylphthalate	200	7.6 UJ	6.9 UJ	8 UJ	9.6 UJ	16 UJ
Dimethylphthalate	160	6.1 U	6 U	5.9 U	6.1 U	5.9 U
Di-N-Butylphthalate	1400	16 UJ	35 UJ	5.9 UJ	10 UJ	14 UJ
Di-N-Octyl Phthalate	6200	6.1 U	6 U	5.9 U	6.1 U	5.9 U

Table 7 - Analytical Results for Year 0 Sediment Samples - Semivolatile Organic Compounds (SVOCs)

Sample ID Sampling Date	SQO	P-M-2004 10/14/2004	Q-M-2004 10/14/2004	R-M-2004 10/14/2004	S-M-2004 10/14/2004	Y-M-2004[b] 10/15/2004
Phenolics (Acids) in µg/kg						
2,4,5-Trichlorophenol		6.1 U	6 U	5.9 U	6.1 U	5.9 UJ
2,4,6-Trichlorophenol		6.1 U	6 U	5.9 U	6.1 U	5.9 UJ
2,4-Dichlorophenol		6.1 U	6 U	5.9 U	6.1 U	5.9 U
2,4-Dimethylphenol	29	6.1 U	6 U	5.9 U	6.1 U	5.9 U
2,4-Dinitrophenol		REJ	REJ	REJ	REJ	REJ
2-Chlorophenol		6.1 U	6 U	5.9 U	6.1 U	5.9 U
2-Methylphenol	63	6.1 U	6 U	5.9 U	6.1 U	5.9 U
2-Nitrophenol		6.1 U	6 U	5.9 U	6.1 U	5.9 U
4,6-Dinitro-2-Methylphenol		243 UJ	240 UJ	237 UJ	245 UJ	238 UJ
4-Chloro-3-Methylphenol		6.1 U	6 U	5.9 U	6.1 U	5.9 U
4-Methylphenol	670	6.1 U	6 U	5.9 U	4.4 J	5.9 U
4-Nitrophenol		61 U	60 U	59 U	REJ	59 UJ
Benzoic Acid	650	REJ	REJ	REJ	REJ	REJ
Benzyl Alcohol	73	6.1 U	6 U	5.9 U	6.1 U	5.9 UJ
Pentachlorophenol	360	REJ	REJ	REJ	REJ	REJ
Phenol	420	6.1 U	6 U	5.9 U	6.1 U	5.9 U
Misc. Extractables in µg/kg						
1,2-Diphenylhydrazine		6.1 U	6 U	5.9 U	6.1 U	5.9 U
1-Methylnaphthalene		6.1 U	6 U	5.9 U	6.1 U	4.9 J
2,2'-Oxybis(1-Chloropropane)		6.1 U	6 U	5.9 U	6.1 U	5.9 U
2,4-Dinitrotoluene		6.1 U	6 U	5.9 U	6.1 U	5.9 U
2,6-Dinitrotoluene		6.1 U	6 U	5.9 U	6.1 U	5.9 U
2-Chloronaphthalene		6.1 U	6 U	5.9 U	6.1 U	5.9 U
2-Nitroaniline		6.1 U	6 U	5.9 U	6.1 U	5.9 U
3,3'-Dichlorobenzidiene		6.1 U	6 U	5.9 U	REJ	5.9 UJ
3B-Coprostanol		REJ	REJ	REJ	REJ	REJ
3-Nitroaniline		6.1 U	6 U	5.9 U	6.1 U	5.9 U
4-Bromophenyl-Phenylether		6.1 U	6 U	5.9 U	6.1 U	5.9 U
4-Chloroaniline		6.1 U	6 U	5.9 U	REJ	5.9 UJ
4-Chlorophenyl-Phenylether		6.1 U	6 U	5.9 U	6.1 U	5.9 U
4-Nitroaniline		12 U	12 U	12 U	12 U	12 U
Aniline		6.1 U	6 U	5.9 U	6.1 U	5.9 UJ
Benzidine		REJ	REJ	REJ	REJ	REJ
Bis(2-Chloroethoxy)Methane		6.1 U	6 U	5.9 U	6.1 U	5.9 U

Table 7 - Analytical Results for Year 0 Sediment Samples - Semivolatile Organic Compounds (SVOCs)

Sample ID Sampling Date	SQO	P-M-2004 10/14/2004	Q-M-2004 10/14/2004	R-M-2004 10/14/2004	S-M-2004 10/14/2004	Y-M-2004[b] 10/15/2004
Bis(2-Chloroethyl)Ether		6.1 U	6 U	5.9 U	6.1 U	5.9 U
Caffeine		6.1 U	6 U	5.9 U	6.1 U	5.9 U
Carbazole		6.1 UJ	6 UJ	5.9 UJ	3 J	6.1 UJ
Dibenzofuran	540	6.1 U	6 U	5.9 U	1.5 J	5.9 U
Hexachlorobutadiene	11	6.1 U	6 U	5.9 U	6.1 U	5.9 U
Hexachlorocyclopentadiene		REJ	REJ	REJ	REJ	REJ
Hexachloroethane		6.1 U	6 U	5.9 U	6.1 UJ	5.9 U
Isophorone		6.1 U	6 U	5.9 U	6.1 U	5.9 U
Nitrobenzene		6.1 U	6 U	5.9 U	6.1 U	5.9 U
N-Nitrosodimethylamine		12 U	12 U	12 U	12 U	12 U
N-Nitroso-Di-N-Propylamine		6.1 U	6 U	5.9 U	6.1 U	5.9 U
N-Nitrosodiphenylamine	28	6.1 U	6 U	5.9 U	6.1 U	5.9 U
Pyridine		12 U	12 U	12 U	12 U	12 U
Retene		6.1 U	3.3 J	5.9 U	6.1 U	30

Notes:

[a] Duplicate of sample B-2-M-2004.

[b] Duplicate sample located 20 feet east and 5 feet north of sample K-M-2004.

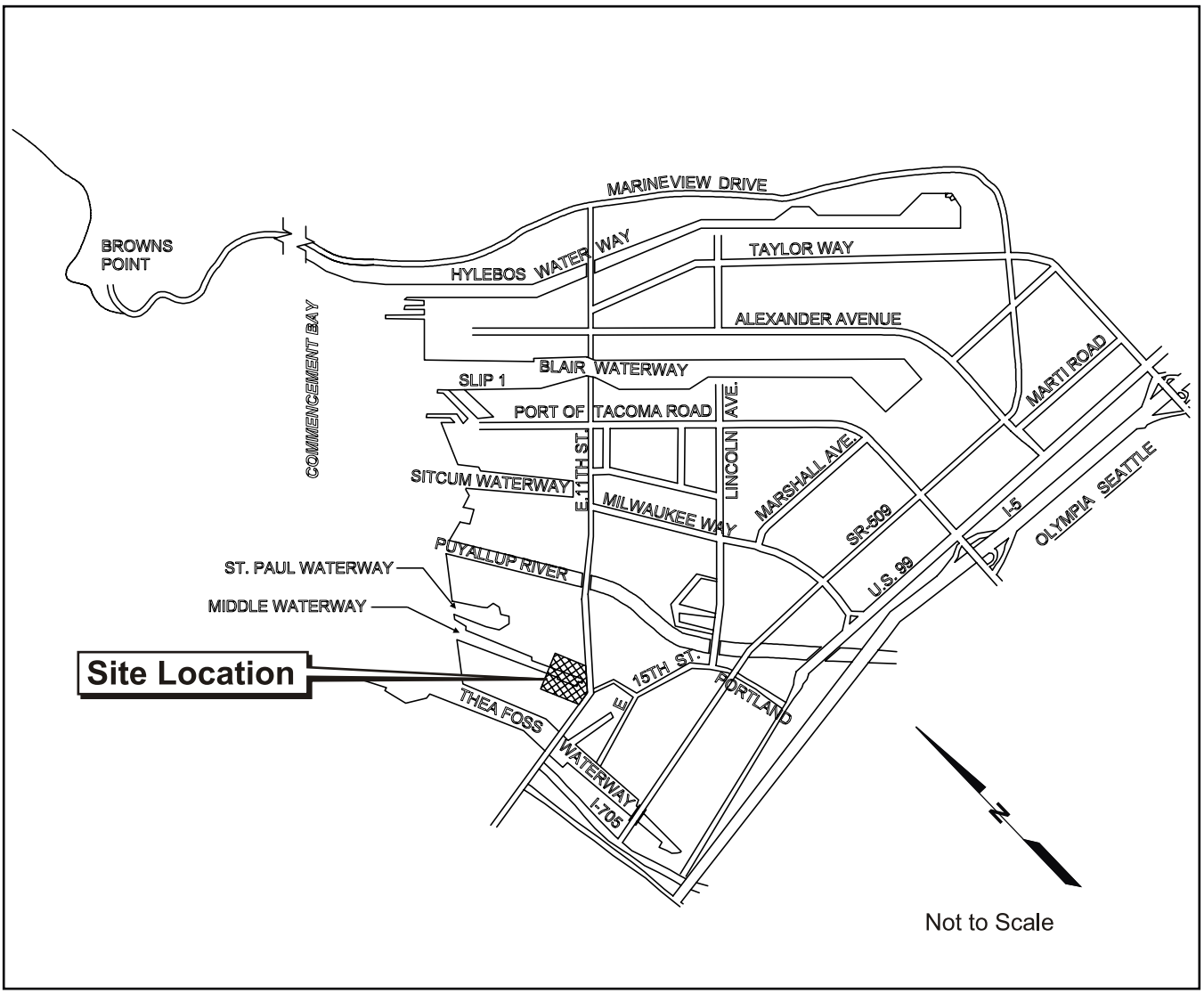
U = Not detected at reporting limit (RL) indicated.

J = Estimated value.

REJ - Rejected.

Blank indicates sample not analyzed or no SQO established for specific analyte.

Vicinity Map
Middle Waterway Problem Area C



794601AA.cdr HEL 6/16/05

Note: Base map prepared from Microsoft Streets and Trips 2002.

WASHINGTON

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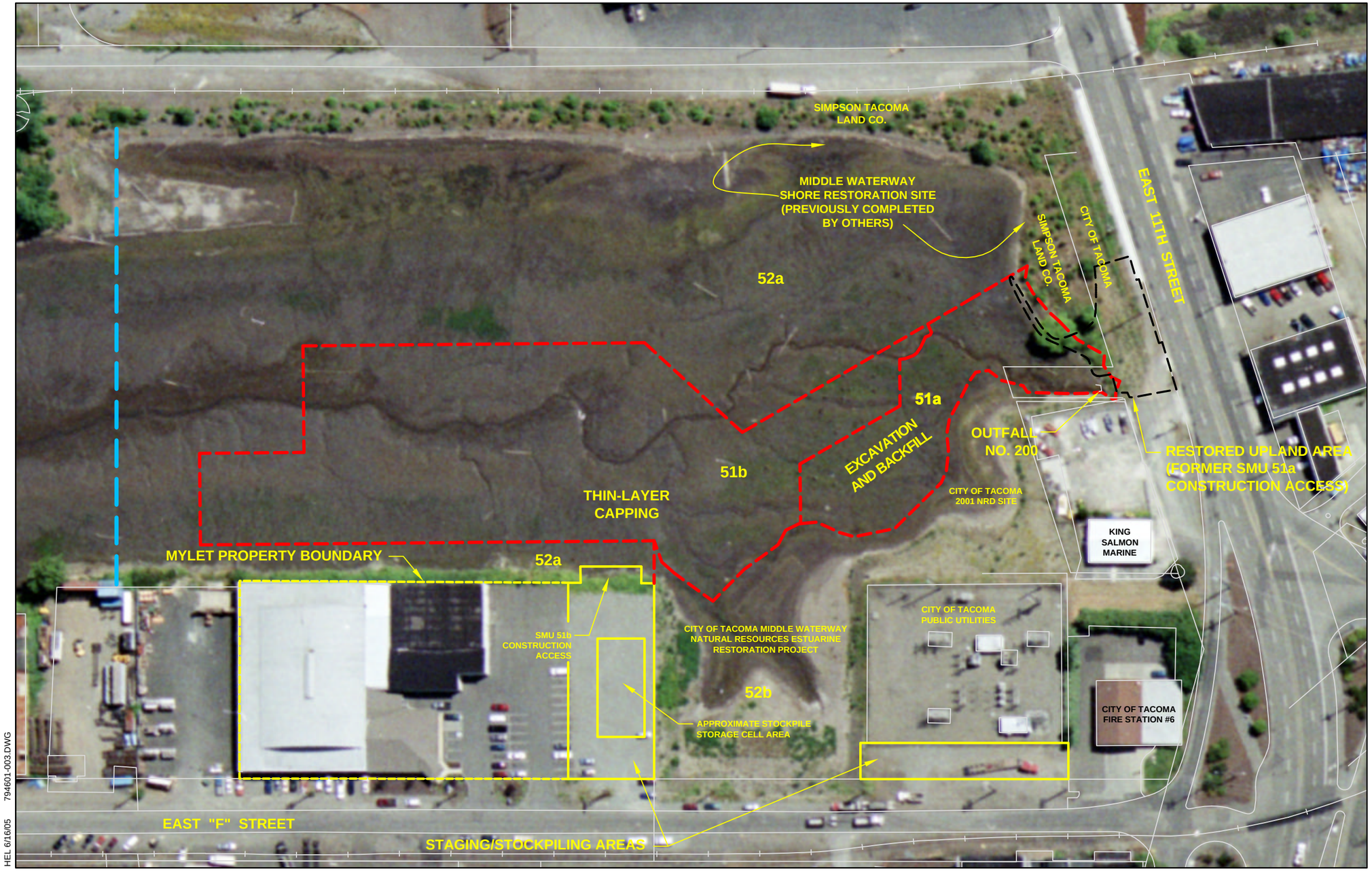
7946-01 ***6/05***

Figure 1

Site Plan
Middle Waterway Problem Area C



794601-003.DWG

HEL 6/16/05

51b SMU Number

SMU Boundary (Within Area C)

Northern Extent of Area C

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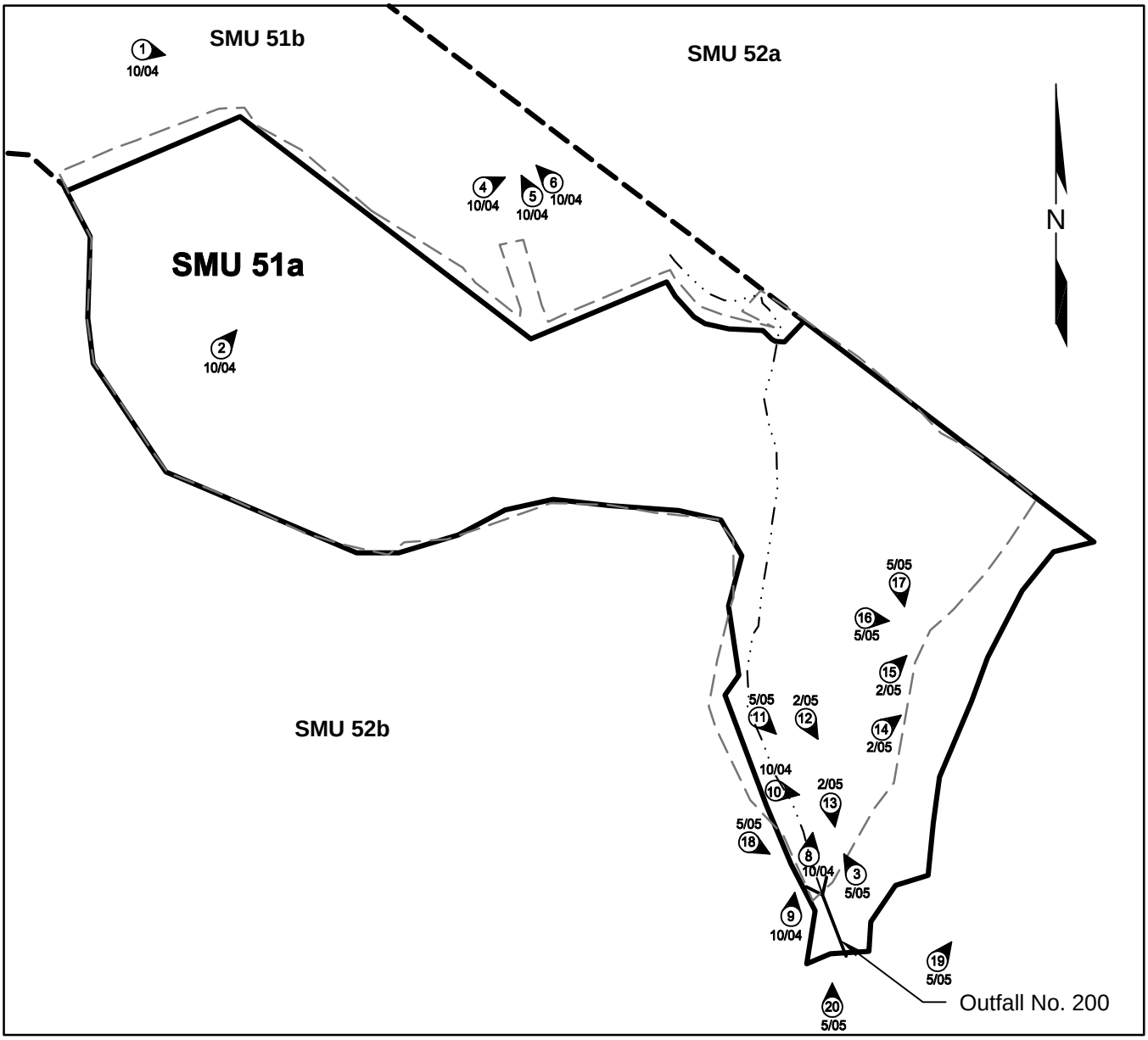
7946-01 *6/05*

Figure 2

Photograph Location Plan
Middle Waterway Problem Area C SMU 51a



HEL 6/16/05 794601-023.dwg

SMU 51a Boundary

SMU 51b Boundary

SMU 51a Excavation Limit

Outfall No. 200
Drainage Channel Centerline

1 10/04 Photograph Location, Number, Direction, and Month/Year

0 50 100
Scale in Feet

Note: Photograph 7 (10/04) at SMU 51b sediment sampling location is not shown.

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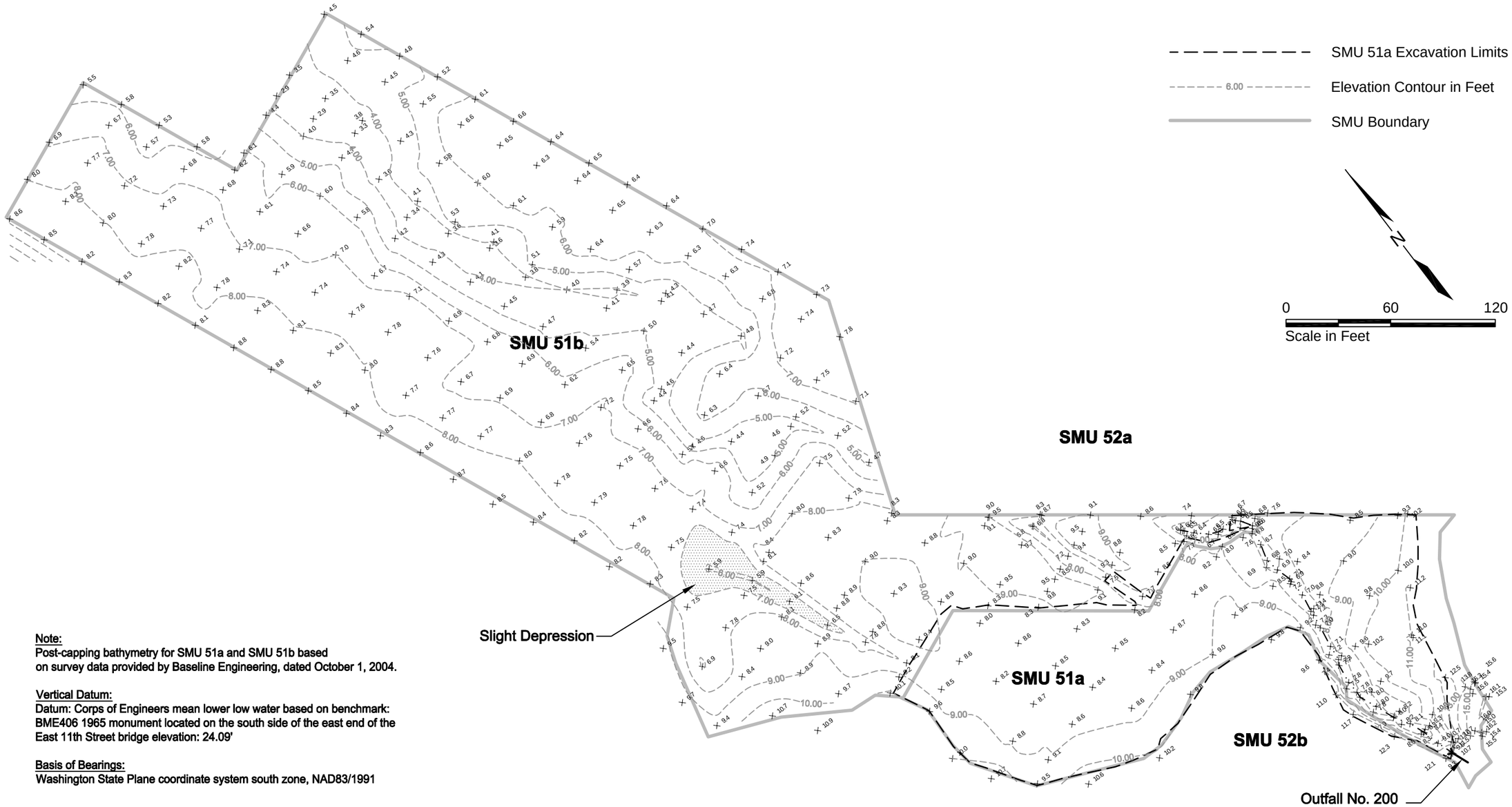
7946-01 *6/05*

Figure 3

Post-Construction Bathymetry
SMU 51a and SMU 51b



Note:
Post-capping bathymetry for SMU 51a and SMU 51b based on survey data provided by Baseline Engineering, dated October 1, 2004.

Vertical Datum:
Datum: Corps of Engineers mean lower low water based on benchmark: BME406 1965 monument located on the south side of the east end of the East 11th Street bridge elevation: 24.09'

Basis of Bearings:
Washington State Plane coordinate system south zone, NAD83/1991

HEL 6/15/05 7946-01-024.dwg

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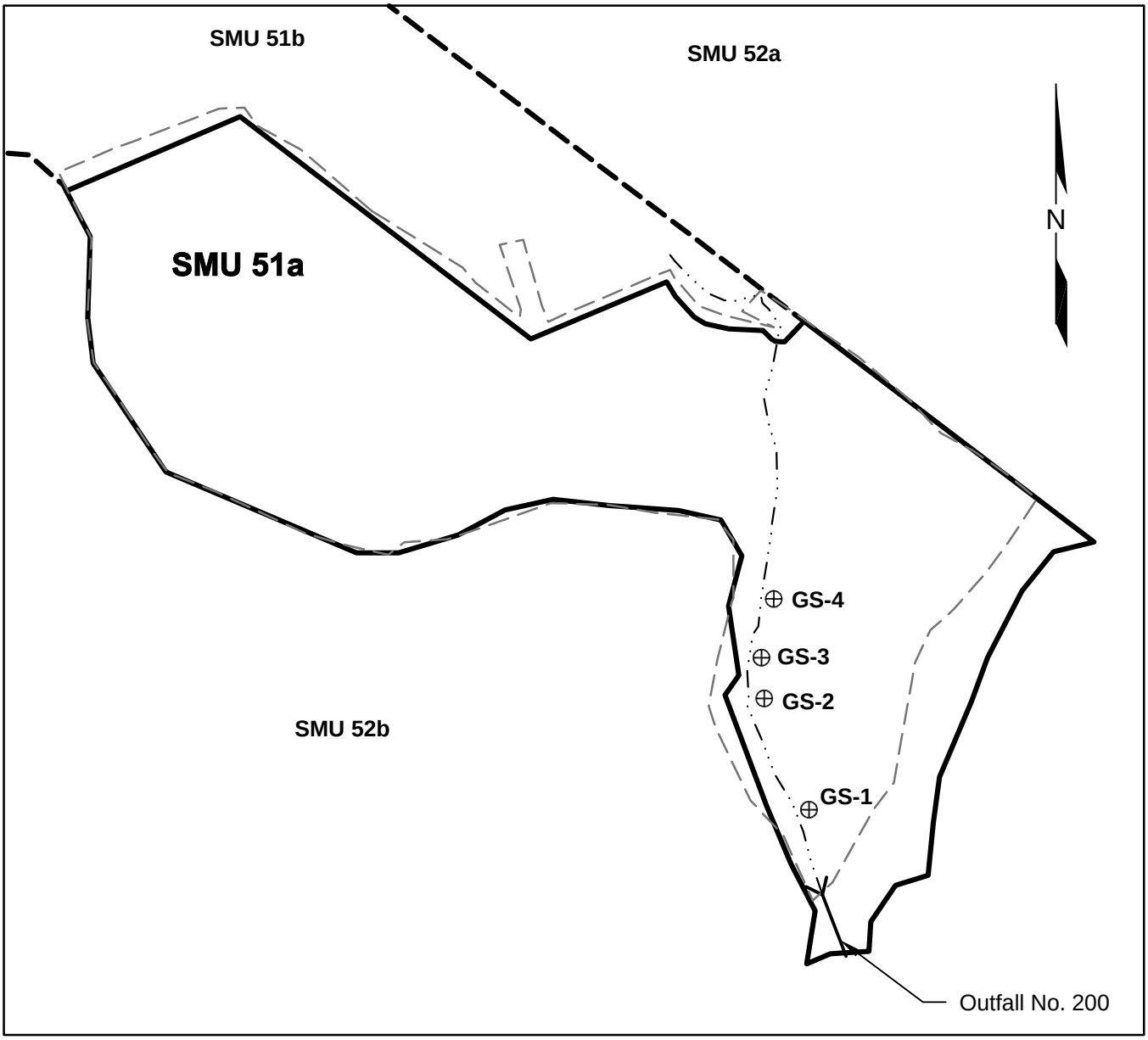
Figure 4

Long-Term Grade Monitoring Location Plan
Middle Waterway Problem Area C SMU 51a



HEL 6/16/05 794601-019(OMMP).DWG

SMU 51a Boundary

SMU 51b Boundary

SMU 51a Excavation Limit

Outfall No. 200 Drainage Channel Centerline

GS-1 ⊕ Elevation Monitoring Grade Stake Location and Number

0 50 100
Scale in Feet

Note: Grade stakes were established in October 2004.

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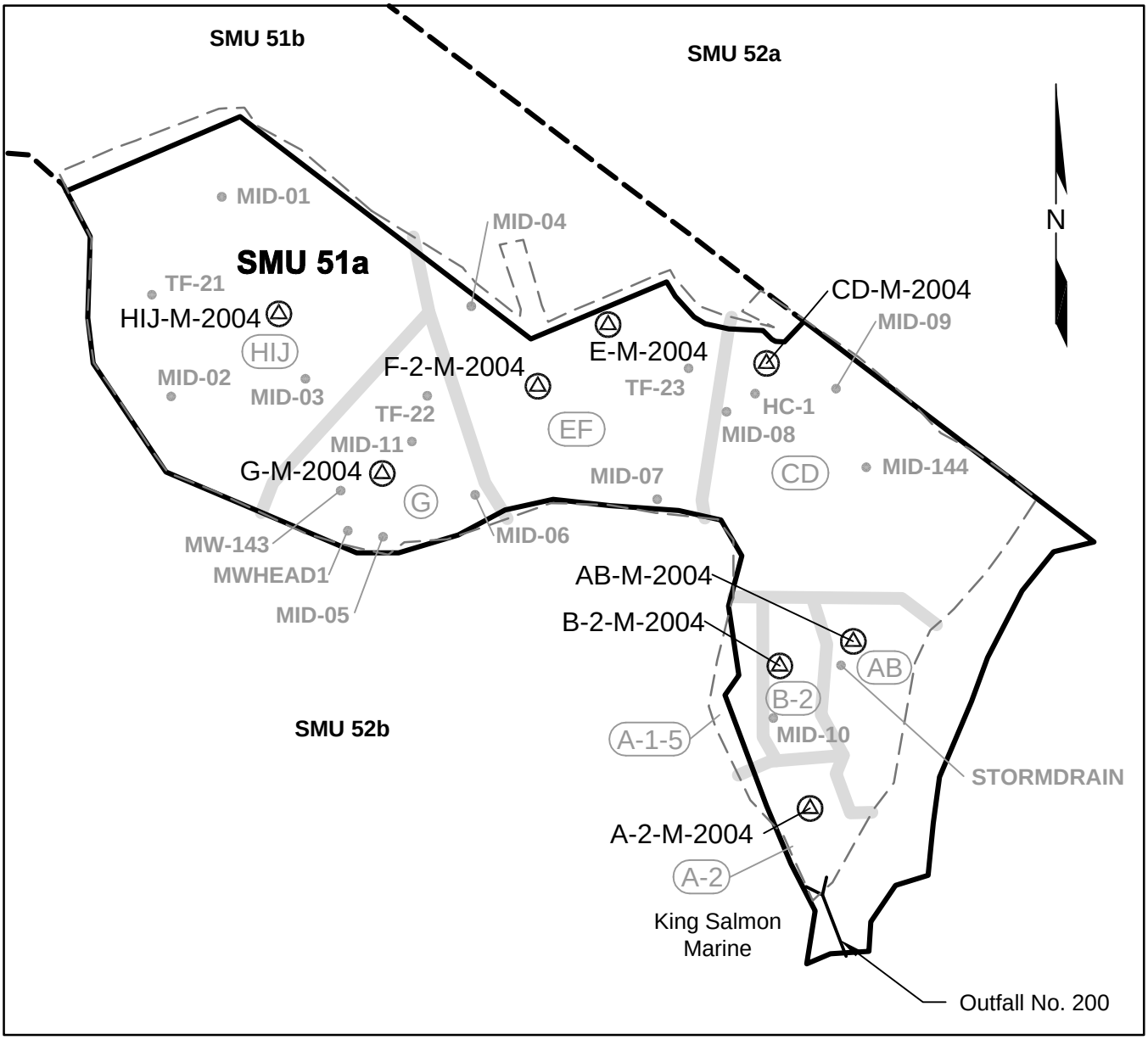
7946-01 ***6/05***

Figure 5

Year 0 Baseline Sediment Monitoring Sampling Grids
Middle Waterway Problem Area C SMU 51a



794601-017(OMMP).DWG

HEL 6/16/05

Note: Sediment core B-2-C collected at the B-2 surface sediment sampling location.

SMU 51a Boundary

SMU 51b Boundary

SMU 51a Excavation Limit

AB — Sediment Verification Sampling Grid and Designation

A-2-M-2004 — Year 0 Discrete Surface Sample Location and Number

MID-01 — Historical Surface and/or Subsurface Sediment Sampling Location and Number

0 50 100
Scale in Feet

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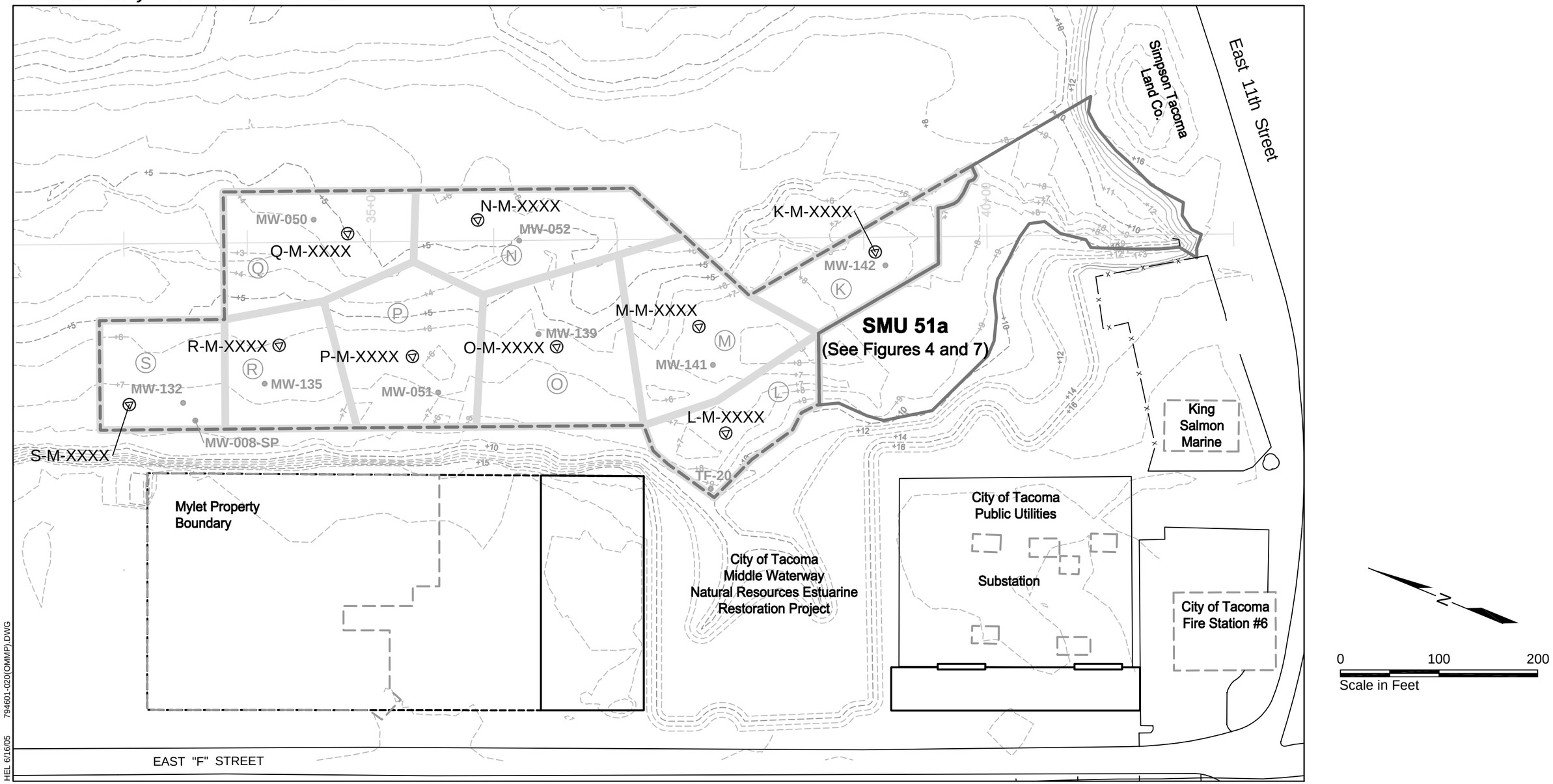
Figure 6

Year 0 Baseline Sediment Monitoring Sampling Grids
Middle Waterway Problem Area C SMU 51b



SMU 51a Boundary

SMU 51b Boundary

O-M-XXXX — Discrete Surface Sample Location and Number (XXXX Designates Monitoring Year)

K — Sediment Sampling Grid and Designation

MID-142 — Historical Surface and/or Subsurface Sediment Sampling Location and Number

Notes:
1. Elevation contours outside SMU 51a and SMU 51b from Foster Wheeler and Blue Water Engineering Survey, 1998.
2. Elevation contours within SMU 51a and SMU 51b from Baseline Engineering Survey, October 2004.

Vertical Datum:
Datum: Corps of Engineers mean lower low water based on benchmark: BME406 1965 monument located on the south side of the east end of the East 11th Street bridge elevation: 24.09'

Basis of Bearings:
Washington State Plane coordinate system south zone, NAD83/1991

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7946-01 *6/05*

Figure 7

APPENDIX A
POST-CONSTRUCTION PHOTOGRAPHS

Photograph 1 - SMU 51b thin-layer capping material (foreground) and adjacent tideflat beyond.

Photograph 2 - SMU 51a surficial backfill and SMU 51b thin-layer capping material during post-construction sediment sampling.

Photograph 3 - Outfall discharge channel and goose exclusion structure for replanted upper intertidal area (May 23, 2005). Note smooth side slope profile of channel and greenish algal growth on tideflat.

Photograph 4 - Brownish algal surface on tideflat during post-construction sediment sampling.

Photograph 5 - Abundant burrows from near-surface biological recruitment. Note fecal material.

Photograph 6 - Additional surface burrows. ←Up

Photograph 7 - Surface sediment sampling location S (SMU 51b). Note sharp transition between thin-layer capping material and darker, underlying native sediments.

Photograph 8 - Minor erosion features along east side slope of outfall drainage channel.

Photograph 9 - Additional view of minor erosion features on drainage channel side slope.

Photograph 10 - Minor erosion gully along east bank of outfall channel. ←Up

Photograph 11 - Outfall channel and minor erosion gully on east bank of channel (May 23, 2005).

Photograph 12 - Replanted upland restoration area and erosion gullies near head of outfall channel (February 22, 2005).

Photograph 13 - Bank erosion gullies near head of outfall channel (February 22, 2005).

Photograph 14 - Wave-eroded bank at edge of SMU 51a (February 22, 2005).

Photograph 15 - Plants to be relocated along eroded SMU 51a bank (February 22, 2005).

Photograph 16 - Restored bank area with jute mat protection (May 23, 2005).

Photograph 17 - Restored bank area with jute mat protection (May 23, 2005).

Photograph 18 - Lodged log in Outfall No. 200 at south end of SMU 51a.

Photograph 19 - Spring growth in upland planting area.

Photograph 20 - Spring growth in upland planting area.

Photograph 21 - View of goose exclusion structure along replanted upper intertidal area.

APPENDIX B
LABORATORY ANALYTICAL DOCUMENTATION

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366 '04 DEC 22 11:00

Case Narrative

December 17, 2004

Subject: Middle Waterway -43

Sample(s): 04-434512 and -434514

Officer(s): Russ McMillan

By: Dickey Huntamer

Semivolatiles
PAH

Analytical Method(s)

The sediment samples were prepared by Soxhlet extraction with acetone following the Manchester modification of the EPA SW 846 8270 with capillary GC/MS analysis of the sample extracts. Normal QA/QC was performed with the sample analysis.

Holding Times

All samples extracts were analyzed within the method holding times.

Instrument Tuning

Calibration against DFTPP is acceptable for the initial calibration, continuing calibration and all associated sample analyses.

Calibration

The average relative response factors for target analytes were above the minimums and % Relative Standard Deviations were within the maximum of 15% for all target compounds in the initial calibration.

The December 13th relative response factors for target analytes were above the minimums and % Relative Standard Deviations were within the maximum of 20% for all target compounds.

Blanks

One target compound was detected in the laboratory blanks, phenanthrene. The phenanthrene detected in sample -434512 was less than five times the amounts found in the blank and the results for phenanthrene was qualified as UJ at the level detected. The amount of phenanthrene found in sample -434514 was greater than five times the blank and no results were qualified.

Surrogates

All surrogate recoveries were acceptable and within the QC limits of 18% to 137% for d14-terphenyl, 50% to 150% for d10-pyrene and 30% to 115% for 2-fluorobiphenyl.

Matrix Spikes

Two matrix spikes were analyzed with the samples but one was lost during sample preparation. The recovery of the target compounds in the remaining matrix spike was acceptable.

Replicates

Not applicable

Laboratory Control Samples

One fortified laboratory blank was analyzed with the sample. All recoveries were within the acceptable limits except benzo(b)fluoranthene (106%) and benzo(k)fluoranthene (94%) which were 5% and 3% high respectively. No qualifiers were added for the high recoveries.

Comments

The data is usable as qualified.

ASB
6/30/05

Data Qualifier Codes

U	-	The analyte was not detected at or above the reported result.
J	-	The analyte was positively identified. The associated numerical result is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are unusable for all purposes.
NAF	-	Not analyzed for.
N	-	For organic analytes there is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
NC	-	Not Calculated
E	-	The concentration exceeds the known calibration range.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polyaromatic Hydrocarbons (PNA's)

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434512 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: EF-M-2004 | **Date Prepared:** 12/08/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
Naphthalene	**5.9**	**J**
2-Methylnaphthalene	**4.9**	**J**
1-Methylnaphthalene	**2.7**	**J**
2-Chloronaphthalene	12	U
Acenaphthylene	12	U
Acenaphthene	12	U
Dibenzofuran	**2.3**	**J**
Fluorene	**3.4**	**J**
Phenanthrene	12	UJ
Anthracene	**3.3**	**J**
Carbazole	12	U
Fluoranthene	**15**	
Pyrene	**23**	
Retene	**19**	**J**
Benzo(a)anthracene	**7.2**	**J**
Chrysene	**17**	
Benzo(b)fluoranthene	24	U
Benzo(k)fluoranthene	24	U
Benzo(a)pyrene	**.81**	**J**
Indeno(1,2,3-cd)pyrene	**7.9**	**J**
Dibenzo(a,h)anthracene	12	U
Benzo(ghi)perylene	**12**	**J**

Surrogate Recoveries

2-Fluorobiphenyl	**85**	**%**
Pyrene-D10	**93**	**%**
Terphenyl-D14	**93**	**%**

Authorized By: _____ Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polyaromatic Hydrocarbons (PNA's)

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434514 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: AB-M-2004 | **Date Prepared:** 12/08/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
Naphthalene	15	
2-Methylnaphthalene	6.9	J
1-Methylnaphthalene	4.8	J
2-Chloronaphthalene	12	U
Acenaphthylene	6.9	J
Acenaphthene	6.9	J
Dibenzofuran	5.3	J
Fluorene	7.7	J
Phenanthrene	35	
Anthracene	8.8	J
Carbazole	12	U
Fluoranthene	56	
Pyrene	60	
Retene	58	
Benzo(a)anthracene	22	
Chrysene	33	
Benzo(b)fluoranthene	23	U
Benzo(k)fluoranthene	23	U
Benzo(a)pyrene	12	
Indeno(1,2,3-cd)pyrene	13	
Dibenzo(a,h)anthracene	12	U
Benzo(ghi)perylene	22	

Surrogate Recoveries

2-Fluorobiphenyl	84	%
Pyrene-D10	89	%
Terphenyl-D14	88	%

Authorized By: _____ Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polyaromatic Hydrocarbons (PNA's)

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434514 (matrix spike - LMX1) | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: AB-M-2004 | **Date Prepared:** 12/08/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** % Recovery

Analyte	Result	Qualifier
Naphthalene	80	
2-Methylnaphthalene	84	
1-Methylnaphthalene		NAF
2-Chloronaphthalene	91	
Acenaphthylene	65	
Acenaphthene	88	
Dibenzofuran	88	
Fluorene	90	
Phenanthrene	88	
Anthracene	65	
Carbazole	106	
Fluoranthene	90	
Pyrene	90	
Retene		NAF
Benzo(a)anthracene	88	
Chrysene	90	
Benzo(b)fluoranthene	103	
Benzo(k)fluoranthene	111	
Benzo(a)pyrene	76	
Indeno(1,2,3-cd)pyrene	91	
Dibenzo(a,h)anthracene	98	
Benzo(ghi)perylene	90	

Surrogate Recoveries

2-Fluorobiphenyl	85	%
Pyrene-D10	86	%
Terphenyl-D14	90	%

Authorized By: _____ Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polyaromatic Hydrocarbons (PNA's)

Project Name: Middle Waterway - 43
LIMS Project ID: 1861-04
Lab ID: OBW4343A1
Method: SW8270
QC Type: Laboratory Method Blank
Date Prepared: 12/08/04
Matrix: Frozen Sediment/soil
Project Officer: Russ McMillan
Date Analyzed: 12/13/04
Units: ug/Kg dw

Analyte	Result	Qualifier
Naphthalene	12	U
2-Methylnaphthalene	12	U
1-Methylnaphthalene	12	U
2-Chloronaphthalene	12	U
Acenaphthylene	12	U
Acenaphthene	12	U
Dibenzofuran	12	U
Fluorene	12	U
Phenanthrene	**3**	**J**
Anthracene	12	U
Carbazole	12	U
Fluoranthene	12	U
Pyrene	12	U
Retene	12	U
Benzo(a)anthracene	12	U
Chrysene	12	U
Benzo(b)fluoranthene	23	U
Benzo(k)fluoranthene	23	U
Benzo(a)pyrene	12	U
Indeno(1,2,3-cd)pyrene	12	U
Dibenzo(a,h)anthracene	12	U
Benzo(ghi)perylene	12	U

Surrogate Recoveries

2-Fluorobiphenyl	**84**	**%**
Pyrene-D10	**86**	**%**
Terphenyl-D14	**89**	**%**

Authorized By: _____ Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polyaromatic Hydrocarbons (PNA's)

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBW4343A2 | **Method:** SW8270

QC Type: Laboratory Method Blank | **Date Prepared:** 12/08/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
Naphthalene	12	U
2-Methylnaphthalene	12	U
1-Methylnaphthalene	12	U
2-Chloronaphthalene	12	U
Acenaphthylene	12	U
Acenaphthene	12	U
Dibenzofuran	12	U
Fluorene	12	U
Phenanthrene	**2.8**	**J**
Anthracene	12	U
Carbazole	12	U
Fluoranthene	12	U
Pyrene	12	U
Retene	23	U
Benzo(a)anthracene	12	U
Chrysene	12	U
Benzo(b)fluoranthene	23	U
Benzo(k)fluoranthene	23	U
Benzo(a)pyrene	12	U
Indeno(1,2,3-cd)pyrene	12	U
Dibenzo(a,h)anthracene	12	U
Benzo(ghi)perylene	12	U

Surrogate Recoveries

2-Fluorobiphenyl	**77**	**%**
Pyrene-D10	**87**	**%**
Terphenyl-D14	**87**	**%**

Authorized By: _____ Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polyaromatic Hydrocarbons (PNA's)

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OCS4343A1 | **Method:** SW8270

QC Type: Laboratory Control Sample | **Date Prepared:** 12/08/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** %

Analyte	Result	Qualifier
Naphthalene	82	
2-Methylnaphthalene	84	
1-Methylnaphthalene		NAF
2-Chloronaphthalene	89	
Acenaphthylene	43	
Acenaphthene	85	
Dibenzofuran	87	
Fluorene	89	
Phenanthrene	89	
Anthracene	52	
Carbazole	122	
Fluoranthene	92	
Pyrene	93	
Retene		NAF
Benzo(a)anthracene	86	
Chrysene	89	
Benzo(b)fluoranthene	106	
Benzo(k)fluoranthene	94	
Benzo(a)pyrene	59	
Indeno(1,2,3-cd)pyrene	88	
Dibenzo(a,h)anthracene	98	
Benzo(ghi)perylene	99	

Surrogate Recoveries

2-Fluorobiphenyl	83	%
Pyrene-D10	88	%
Terphenyl-D14	92	%

Authorized By: _____ Release Date: 12/17/04

Sample Custody Record

Sheet 1

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

Samples Shipped to:

JOB 7946-01 LAB NUMBER

PROJECT NAME Middle Waterway Area C

HART CROWSER CONTACT Rick Moore

SAMPLED BY: Abby Bazin

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	Hg (EPA 7471A)	Zn (EPA 6020)	LPAH (EPA 8270C-LL)	HPAH (EPA 8270C-LL)	Bis(2-ethylhexyl) phthalate (EPA 8270C-LL)	Dibenzofuran (EPA 8270C-LL)	2-Nitroaniline	Total PCBs, Phenol (EPA 8082-LL)	(EPA 8270C-LL) 2-methylphenol	(EPA 8270C-LL) 2,4-dimethylphenol	(EPA 8270C-LL) Benzyl Alcohol	(EPA 8270C-LL) Benzoic Acid	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
																			x BNA
	S-M-2004		10/14/04	1025	SED	X							X				X	3	BNA
	P-M-2004			1050		X		X	X		X			X	X			3	BNA
	Q-M-2004			1120				X	X		X				X			3	BNA
	N-M-2004			1200								X						3	BNA
	R-M-2004			1225		X		X	X					X	X			3	BNA
	O-M-2004			1305		X			X						X			3	BNA
	M-M-2004			1330		X		X	X			X			X			3	BNA
	L-M-2004		10/20/04	~~0700~~ 0700						X								4	BNA
	K-M-2004		10/20/04	~~1215~~ 0745		X		X	X	X								4	BNA
	~~HH-M-2004~~			~~1235~~															
	~~G-M-2004~~			~~1300~~															
	~~EF-M-2004~~			~~1350~~															

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RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE Abby Bazin	10/20	SIGNATURE P Curley	10/20/04
PRINT NAME Abby Bazin	TIME 1110	PRINT NAME	TIME 14:30
COMPANY Hart Crowser		COMPANY Sealed cooler < 4°C	

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE	TIME	SIGNATURE	TIME
PRINT NAME		PRINT NAME	
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS: Target Detection Levels are 1/2 SQO concentrations for applicable compounds

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. for Other Contract Requirements

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION: ☐YES ☐NO
TEMPERATURE
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

Samples Shipped to: _____

Sheet 3

HARTCROWSER

Hart Crowser
1910 Fairview Avenue
Seattle, Washington 98102-
Phone: 206-324-9530 FAX: 206-328-

JOB 7946-01 LAB NUMBER _____

PROJECT NAME Middle Waterway Area C

HART CROWSER CONTACT Rick Moore

SAMPLED BY: Abby Bazin

REQUESTED ANALYSIS: 4,4'-DDE; 4,4'-DDT; pesticides

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	4,4'-DDE	4,4'-DDT	pesticides	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
)	S-M-2004		10/14/04	1025	SED	X	X		3	434.500
	P-M-2004			1050					3	01
	Q-M-2004			1120					3	02
	N-M-2004			1200					3	03
	R-M-2004			1225					3	04
	O-M-2004			1305					3	05
	M-M-2004			1330					3	06
	L-M-2004		ASB 10/20/04	~~1400~~ 0700					4	07
	K-M-2004		ASB 10/15/04 10/20/04	~~1307~~ 0745					4	08
	~~X-M-2004~~ ASB									
)	Y-M-2004		10/15/04	1210	SED				3	09

TOTAL NUMBER OF CONTAINERS

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE: Abby Bazin	10/20	SIGNATURE: Pam Cuey	10/20/04
PRINT NAME: Abby Bazin	TIME	PRINT NAME	TIME
COMPANY: Hart Crowser	1110	~~COMPANY~~ Sealed cooler	17:30 <4°C

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

Target Detection limits are 1/2 SQO concentrations for applicable compounds

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

SAMPLE RECEIPT INFORMATION

CUSTODY SEALS: ☐ YES ☐ NO ☐ N/A

GOOD CONDITION: ☐ YES ☐ NO

TEMPERATURE

SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

TURNAROUND TIME:

☐ 24 HOURS ☐ 1 WEEK

☐ 48 HOURS ☐ STANDARD

☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

Samples Shipped to: _____

Sheet Ba 4

HARTCROWSER

Hart Crowser, Inc.
1910 Fairview Avenue East
Seattle, Washington 98102-3699
Phone: 206-324-9530 FAX: 206-328-5581

JOB 7946-01 LAB NUMBER _____

PROJECT NAME Middle Waterway Area C

HART CROWSER CONTACT Rick Moore

SAMPLED BY: Abby Bazin

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	As (EPA 6020)	Cd (EPA 6020)	Cr (EPA 6020)	Cu (EPA 6020)	Pb (EPA 6020)	Hg (EPA 7471A)	Zn (EPA 6020)	LPAH (EPA 8270C-LL)	HPAH (EPA 8270C-LL)	1,2-Dichlorobenzene (EPA 8270C-LL)	1,4-Dichlorobenzene (EPA 8270C-LL)	Bis(2-ethylhexyl) phthalate (EPA 8270C-LL)	Dibenzofuran (EPA 8270C-LL)	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	HIJ-M-2004		10/5/04	1235	SED		X				X	X	X	X			X		3	BM
	G-M-2004			1328		X	X	X	X	X	X	X	X	X	X	X	X	X	3	BM
	EF-M-2004			1350					X		X		X	X					3	PAM
	CD-M-2004			1427							X		X	X	X	X	X		3	BM
	AB-M-2004			1435							X		X	X					3	PAM

434510
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RELINQUISHED BY	DATE	RECEIVED BY	DATE
Abby Bazin (SIGNATURE)	10/20	P Corey (SIGNATURE)	10/20/04
Abby Bazin (PRINT NAME)	TIME	PRINT NAME	TIME
Hart Crowser (COMPANY)	1110	COMPANY Sealed coolers	14:30 <4°C

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:

Target Detection Levels are 1/2 SQO Concentrations for applicable Compounds

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS ☐ YES ☐ NO ☐ N/A
GOOD CONDITION ☐ YES ☐ NO
TEMPERATURE
SHIPMENT METHOD: ☐ HAND ☐ COURIER ☐ OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER _____

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Sample Custody Record

Sheet 4 of 5

HARTCROWSER

Ha ows
1910 Fairview Avenue
Seattle, Washington 98102-
Phone: 206-324-9530 FAX: 206-328-

Samples Shipped to:

JOB 7946-01 LAB NUMBER

PROJECT NAME Middle Waterway Area C

HART CROWSER CONTACT Rick Moore

SAMPLED BY: Abby Bazin

REQUESTED ANALYSIS

LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX	SQO Metals (EPA 6020)	SQO Phenols (EPA 8270C-LL)	SQO PAHs (EPA 8270C-LL)	SQO Chlorinated Hydrocarbons (EPA 8270C-LL)	SQO Phthalates (EPA 8270C-LL)	SQO Misc. Extractables (EPA 8270C-LL)	SQO Pesticides (EPA 8081)	SQO VOCs (EPA 8260)	Hg (EPA 7471A)	SQO PCBs (EPA 8082)	NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS
	A2-M-2004		10/19/04	0755	SED	X	X	X	X	X	X	X	X	X	X	3	BPA 4345-15
	B-2-M-2004		10/19/04	0725		X	X	X	X	X	X	X	X	X	X	3	BPA 16
	B2-Cc-2004	KSB	10/19/04	0900		X	X	X	X	X	X	X	X	X	X	6	DNA 17
			10/19/04														
	B-2-C-2004		10/20	0825	SED											6	18
	B-2-Ca-2004		10/20	0805	SED											6	19
	X-M-2004		10/19	0730		X	X	X	X	X	X	X	X	X	X	3	DNP 20

RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE Abby Bazin	10/20	SIGNATURE P Carey	10/20/04
PRINT NAME Abby Bazin	TIME	PRINT NAME	TIME
COMPANY Hart Crowser	1110	COMPANY Sealed coolers <4°C	14:30
RELINQUISHED BY	DATE	RECEIVED BY	DATE
SIGNATURE		SIGNATURE	
PRINT NAME	TIME	PRINT NAME	TIME
COMPANY		COMPANY	

SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:
Target Detection Levels are 1/2 SQO concentrations for applicable compounds

COOLER NO.: STORAGE LOCATION:

See Lab Work Order No. _____ for Other Contract Requirements

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT INFORMATION
CUSTODY SEALS: ☐YES ☐NO ☐N/A
GOOD CONDITION: ☐YES ☐NO
TEMPERATURE:
SHIPMENT METHOD: ☐HAND ☐COURIER ☐OVERNIGHT

TURNAROUND TIME:
☐ 24 HOURS ☐ 1 WEEK
☐ 48 HOURS ☐ STANDARD
☐ 72 HOURS OTHER

White and Yellow Copies to Lab Pink to Project Manager Lab to Return White Copy to Hart Crowser Gold to Sample Custodian

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

March 3, 2005 - Addendum

Subject: Metals Middle Waterway - 43

Project No: 186104

Officer: Russ McMillan

By: Dean Momohara

DM

Summary

The samples were analyzed and/or digested using the following methods: EPA method 245.5 (CVAA) for the digestion and analysis of mercury (Hg), EPA method 3050B and 6020 for the digestion and analysis of metals, respectively.

All analyses requested were evaluated by established regulatory quality assurance guidelines.

Due to laboratory error, samples 043511, 043515, 043516, 043517 and 043520 were initially not analyzed for silver, nickel, antimony and copper. Since the samples were disposed of, the initial extracts were reanalyzed for these analytes. Unfortunately the extracts were not spiked with silver and antimony and the laboratory control sample and matrix spikes were not analyzed. The results for these analytes were qualified as estimates.

Sample Information

Samples were received by Manchester Environmental Laboratory on 10/26/04. All coolers were received within the proper temperature range of 0°C - 6°C. The samples were received in good condition. Sixteen (16) samples were received and assigned laboratory identification numbers 434500, 434501, 434504 – 434506, 434508 – 434517 and 434520.

Holding Times

All analyses were performed within established EPA holding times.

Calibration

Instrument calibrations and calibration checks were performed in accordance with the appropriate method. All initial and continuing calibration checks were within control limits. The calibration correlation coefficients were within the acceptance range of 1.000 - 0.995. The instruments were calibrated with NIST traceable standards and verified to be in calibration with a second source NIST traceable standard. Balances are professionally calibrated yearly and calibrated in-house daily. Soil drying oven temperatures were recorded before and after each analysis batch and were within acceptable limits.

Method Blanks

No analytically significant levels of analyte were detected in the method blanks associated with these samples.

Matrix Spikes

All associated matrix spike recoveries were within the acceptance limits of 75% - 125%.

Replicates

All associated duplicate relative percent differences were within the acceptance range of 0% - 20%.

Laboratory Control Samples

All laboratory control sample recoveries were within the acceptance limits of 85% - 115% for metals and 80% - 120% for Hg.

Other Quality Assurance Measures and Issues

All internal standard recoveries were within acceptance limits.

U - The analyte was not detected at or above the reported result.

UJ - The analyte was not detected at or above the reported estimated result.

bold - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Please call Dean Momohara at (360) 871-8808 to further discuss this project.

cc: Project File

ASB
4/30/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Antimony

Project Name: Middle Waterway - 43

LIMS Project ID: 1861-04

Project Officer: Russ McMillan

Method: SW6020

Date Reported: 03/03/05

Analyte: Antimony

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434515		A-2-M-2004	Sediment/Soil	0.20	UJ	mg/Kg dw	10/19/04	02/28/05
04434516		B-2-M-2004	Sediment/Soil	0.20	UJ	mg/Kg dw	10/19/04	02/28/05
04434517		B-2-CC-2004	Sediment/Soil	0.20	UJ	mg/Kg dw	10/20/04	02/28/05
04434520		X-M-2004	Sediment/Soil	0.20	UJ	mg/Kg dw	10/19/04	02/28/05
M4308SB1		Lab BLNK	Sediment/Soil	0.20	U	mg/Kg dw		02/28/05

Authorized By: Dn

Release Date: 3/3/5

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Silver

Project Name: Middle Waterway - 43

LIMS Project ID: 1861-04

Project Officer: Russ McMillan

Date Reported: 03/03/05

Method: SW6020

Analyte: Silver

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434515		A-2-M-2004	Sediment/Soil	0.10	UJ	mg/Kg dw	10/19/04	02/28/05
04434516		B-2-M-2004	Sediment/Soil	0.10	UJ	mg/Kg dw	10/19/04	02/28/05
04434517		B-2-CC-2004	Sediment/Soil	0.10	UJ	mg/Kg dw	10/20/04	02/28/05
04434520		X-M-2004	Sediment/Soil	0.10	UJ	mg/Kg dw	10/19/04	02/28/05
M4308SB1		Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		02/28/05

Authorized By: Dn

Release Date: 3/3/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Copper

Project Name: Middle Waterway - 43 **LIMS Project ID:** 1861-04

Project Officer: Russ McMillan **Method:** SW6020

Date Reported: 03/03/05 **Analyte:** Copper

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434511		G-M-2004	Sediment/Soil	12.8		mg/Kg dw	10/15/04	02/28/05
04434511	LMX1 (matrix spike)			93.0		%	10/15/04	02/28/05
04434511	LMX2 (matrix spike)			93.1		%	10/15/04	02/28/05
04434512		EF-M-2004	Sediment/Soil	13.5		mg/Kg dw	10/15/04	11/09/04
M4308SB1		Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		11/09/04
M4308SL1		Lab LCS-	Sediment/Soil	107		%		11/09/04

Authorized By: DM Release Date: 3/3/5

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Nickel

Project Name: Middle Waterway - 43

Project Officer: Russ McMillan

LIMS Project ID: 1861-04

Date Reported: 03/03/05

Method: SW6020

Analyte: Nickel

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434516		B-2-M-2004	Sediment/Soil	30.4		mg/Kg dw	10/19/04	02/28/05
04434517		B-2-CC-2004	Sediment/Soil	25.7		mg/Kg dw	10/20/04	02/28/05
04434520		X-M-2004	Sediment/Soil	32.7		mg/Kg dw	10/19/04	02/28/05
M4308SB1		Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		02/28/05
M4308SL1		Lab LCS-	Sediment/Soil	108		%		02/28/05

Authorized By: Dn

Release Date: 3/3/05

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Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

November 15, 2004

Subject: Metals Middle Waterway - 43

Project No: 186104

Officer: Russ McMillan

By: Dean Momohara

Summary

The samples were analyzed and/or digested using the following methods: EPA method 245.5 (CVAA) for the digestion and analysis of mercury (Hg), EPA method 3050B and 6020 for the digestion and analysis of metals, respectively.

All analyses requested were evaluated by established regulatory quality assurance guidelines.

Sample Information

Samples were received by Manchester Environmental Laboratory on 10/26/04. All coolers were received within the proper temperature range of 0°C - 6°C. The samples were received in good condition. Sixteen (16) samples were received and assigned laboratory identification numbers 434500, 434501, 434504 – 434506, 434508 – 434517 and 434520.

Holding Times

All analyses were performed within established EPA holding times.

Calibration

Instrument calibrations and calibration checks were performed in accordance with the appropriate method. All initial and continuing calibration checks were within control limits.

The calibration correlation coefficients were within the acceptance range of 1.000 - 0.995. The instruments were calibrated with NIST traceable standards and verified to be in calibration with a second source NIST traceable standard. Balances are professionally calibrated yearly and calibrated in-house daily. Soil drying oven temperatures were recorded before and after each analysis batch and were within acceptable limits.

Method Blanks

No analytically significant levels of analyte were detected in the method blanks associated with these samples.

Matrix Spikes

All associated matrix spike recoveries were within the acceptance limits of 75% - 125%.

Replicates

All associated duplicate relative percent differences were within the acceptance range of 0% - 20%.

Laboratory Control Samples

All laboratory control sample recoveries were within the acceptance limits of 85% - 115% for metals and 80% - 120% for Hg.

Other Quality Assurance Measures and Issues

All internal standard recoveries were within acceptance limits.

U - The analyte was not detected at or above the reported result.

bold - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Please call Dean Momohara at (360) 871-8808 to further discuss this project.

cc: Project File

ASB
6/30/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Mercury

Project Name: Middle Waterway - 43 **LIMS Project ID:** 1861-04

Project Officer: Russ McMillan **Method:** EPA245.5

Date Reported: 11/15/04 **Analyte:** Mercury

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434500		S-M-2004	Sediment/Soil	0.029		mg/Kg dw	10/14/04	11/03/04
04434501		P-M-2004	Sediment/Soil	0.029		mg/Kg dw	10/14/04	11/03/04
04434504		R-M-2004	Sediment/Soil	0.024		mg/Kg dw	10/14/04	11/03/04
04434505		O-M-2004	Sediment/Soil	0.035		mg/Kg dw	10/14/04	11/03/04
04434506		M-M-2004	Sediment/Soil	0.027		mg/Kg dw	10/14/04	11/03/04
04434508		K-M-2004	Sediment/Soil	0.026		mg/Kg dw	10/20/04	11/03/04
04434509		Y-M-2004	Sediment/Soil	0.024		mg/Kg dw	10/15/04	11/03/04
04434510		HIJ-M-2004	Sediment/Soil	0.028		mg/Kg dw	10/15/04	11/03/04
04434511		G-M-2004	Sediment/Soil	0.023		mg/Kg dw	10/15/04	11/03/04
04434512		EF-M-2004	Sediment/Soil	0.022		mg/Kg dw	10/15/04	11/03/04
04434513		CD-M-2004	Sediment/Soil	0.028		mg/Kg dw	10/15/04	11/03/04
04434514		AB-M-2004	Sediment/Soil	0.032		mg/Kg dw	10/15/04	11/03/04
04434515		A-2-M-2004	Sediment/Soil	0.031		mg/Kg dw	10/19/04	11/03/04
04434516		B-2-M-2004	Sediment/Soil	0.023		mg/Kg dw	10/19/04	11/03/04
04434517		B-2-CC-2004	Sediment/Soil	0.021		mg/Kg dw	10/20/04	11/03/04
04434520		X-M-2004	Sediment/Soil	0.035		mg/Kg dw	10/19/04	11/03/04
04434520	LMX1	(matrix spike)		90.4		%	10/19/04	11/03/04
04434520	LMX2	(matrix spike)		94.6		%	10/19/04	11/03/04
M4306SG1		Lab LCS-	Sediment/Soil	101		%		11/03/04
M4306SH1		Lab BLNK	Sediment/Soil	0.0050	U	mg/Kg dw		11/03/04

Authorized By: Sara Sekerak Release Date: 11/15/04

Manchester Environmental Laboratory
Analysis Report for
Chromium

Project Name: **Middle Waterway - 43** **LIMS Project ID:** **1861-04**

Project Officer: Russ McMillan **Method:** SW6020
Date Reported: 11/10/04 **Analyte:** Chromium

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434511		G-M-2004	Sediment/Soil	**27.5**		mg/Kg dw	10/15/04	11/09/04
04434511	LMX1	(matrix spike)		**122**		%	10/15/04	11/09/04
04434511	LMX2	(matrix spike)		**107**		%	10/15/04	11/09/04
M4308SB1		Lab BLNK	Sediment/Soil	0.50	U	mg/Kg dw		11/09/04
M4308SL1		Lab LCS-	Sediment/Soil	**104**		%		11/09/04

Authorized By: Meredith Jones Release Date: 11/10/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Copper

Project Name: **Middle Waterway - 43** **LIMS Project ID:** **1861-04**

Project Officer: Russ McMillan **Method:** SW6020

Date Reported: 11/10/04 **Analyte:** Copper

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434512		EF-M-2004	Sediment/Soil	**13.5**		mg/Kg dw	10/15/04	11/09/04
M4308SB1		Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		11/09/04
M4308SL1		Lab LCS-	Sediment/Soil	**107**		%		11/09/04

Authorized By: Meredith Jones Release Date: 11/10/04

Manchester Environmental Laboratory
Analysis Report for
Zinc

Project Name: Middle Waterway - 43 **LIMS Project ID:** 1861-04

Project Officer: Russ McMillan **Method:** SW6020

Date Reported: 11/10/04 **Analyte:** Zinc

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434510		HIJ-M-2004	Sediment/Soil	31		mg/Kg dw	10/15/04	11/09/04
04434511		G-M-2004	Sediment/Soil	31		mg/Kg dw	10/15/04	11/09/04
04434511	LMX1 (matrix spike)			124		%	10/15/04	11/09/04
04434511	LMX2 (matrix spike)			96.5		%	10/15/04	11/09/04
04434515		A-2-M-2004	Sediment/Soil	31		mg/Kg dw	10/19/04	11/09/04
04434516		B-2-M-2004	Sediment/Soil	30		mg/Kg dw	10/19/04	11/09/04
04434517		B-2-CC-2004	Sediment/Soil	37		mg/Kg dw	10/20/04	11/09/04
04434520		X-M-2004	Sediment/Soil	32		mg/Kg dw	10/19/04	11/09/04
M4308SB1		Lab BLNK	Sediment/Soil	5.0	U	mg/Kg dw		11/09/04
M4308SL1		Lab LCS-	Sediment/Soil	113		%		11/09/04

Authorized By: Meredith Jones Release Date: 11/10/04

Manchester Environmental Laboratory
Analysis Report for
Arsenic

Project Name: **Middle Waterway - 43** **LIMS Project ID:** **1861-04**

Project Officer: Russ McMillan **Method:** SW6020

Date Reported: 11/10/04 **Analyte:** Arsenic

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434511		G-M-2004	Sediment/Soil	**2.84**		mg/Kg dw	10/15/04	11/09/04
04434511	LMX1 (matrix spike)			**99.0**		%	10/15/04	11/09/04
04434511	LMX2 (matrix spike)			**93.7**		%	10/15/04	11/09/04
04434515		A-2-M-2004	Sediment/Soil	**2.21**		mg/Kg dw	10/19/04	11/09/04
04434516		B-2-M-2004	Sediment/Soil	**2.31**		mg/Kg dw	10/19/04	11/09/04
04434517		B-2-CC-2004	Sediment/Soil	**3.26**		mg/Kg dw	10/20/04	11/09/04
04434520		X-M-2004	Sediment/Soil	**2.58**		mg/Kg dw	10/19/04	11/09/04
M4308SB1		Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		11/09/04
M4308SL1		Lab LCS-	Sediment/Soil	**111**		%		11/09/04

Authorized By: Michael Jones Release Date: 11/10/04

Manchester Environmental Laboratory
Analysis Report for
Cadmium

Project Name: Middle Waterway - 43 **LIMS Project ID:** 1861-04

Project Officer: Russ McMillan **Method:** SW6020

Date Reported: 11/10/04 **Analyte:** Cadmium

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434510		HIJ-M-2004	Sediment/Soil	0.10	U	mg/Kg dw	10/15/04	11/09/04
04434511		G-M-2004	Sediment/Soil	0.10	U	mg/Kg dw	10/15/04	11/09/04
04434511	LMX1 (matrix spike)			**107**		%	10/15/04	11/09/04
04434511	LMX2 (matrix spike)			**104**		%	10/15/04	11/09/04
04434515		A-2-M-2004	Sediment/Soil	0.10	U	mg/Kg dw	10/19/04	11/09/04
04434516		B-2-M-2004	Sediment/Soil	0.10	U	mg/Kg dw	10/19/04	11/09/04
04434517		B-2-CC-2004	Sediment/Soil	0.10	U	mg/Kg dw	10/20/04	11/09/04
04434520		X-M-2004	Sediment/Soil	0.10	U	mg/Kg dw	10/19/04	11/09/04
M4308SB1		Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		11/09/04
M4308SL1		Lab LCS-	Sediment/Soil	**106**		%		11/09/04

Authorized By: Mandalah Jones Release Date: 11/10/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Lead

Project Name: Middle Waterway - 43 **LIMS Project ID:** 1861-04

Project Officer: Russ McMillan **Method:** SW6020

Date Reported: 11/10/04 **Analyte:** Lead

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
04434511		G-M-2004	Sediment/Soil	6.74		mg/Kg dw	10/15/04	11/09/04
04434511	LMX1 (matrix spike)			107		%	10/15/04	11/09/04
04434511	LMX2 (matrix spike)			103		%	10/15/04	11/09/04
04434515		A-2-M-2004	Sediment/Soil	6.49		mg/Kg dw	10/19/04	11/09/04
04434516		B-2-M-2004	Sediment/Soil	7.18		mg/Kg dw	10/19/04	11/09/04
04434517		B-2-CC-2004	Sediment/Soil	4.22		mg/Kg dw	10/20/04	11/09/04
04434520		X-M-2004	Sediment/Soil	9.15		mg/Kg dw	10/19/04	11/09/04
M4308SB1		Lab BLNK	Sediment/Soil	0.10	U	mg/Kg dw		11/09/04
M4308SL1		Lab LCS-	Sediment/Soil	113		%		11/09/04

Authorized By: Michael Jones Release Date: 11/10/04

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

December 15, 2004

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Washington State
Department of Ecology

Subject: Middle Waterway - 43

Samples: 04434500, 04434512 – 04434517, 04434520

Officer: Russ McMillan

By: M.Mandjikov

Polychlorinated Biphenyl and DDT Analysis

Sample Analysis

Approximately 20 g of each sample was weighed into previously extracted Soxhlet extraction thimbles. The samples underwent Soxhlet extraction with acetone. Each resulting extract was solvent exchanged into hexane and eluted through a prepared macro Florisil® column with a 6% preserved diethyl ether/hexane solution. The extracts were then extracted with Tetrabutylammonium Sulfate (TBA) solution to remove the sulfur interferences, solvent exchanged into iso-octane, concentrated to 1mL and treated with concentrated sulfuric acid. At this point the extracts were still colored and required a second TBA extraction followed by an additional sulfuric acid clean up step to remove interferences prior to analysis by GC-ECD.

These methods are modifications of EPA SW- 846 methods 3540, 3620, 3360B, 3665, and 8081/8082.

Holding Times

All the samples were prepared and analyzed within the method holding times.

Calibration

All the results are reported from calibration curves, initial calibration control standards, and continuing calibration control standards that are acceptable and within the established QC limits.

Instrument degradation of DDT

All the results for all DDT degradation control samples are within the established QC limits.

Blanks

There are no target analytes detected in the blanks.

Surrogates

All the samples and QC samples were spiked with 100 ng of Tetrachloro-m-xylene (TMX) and Decachlorobiphenyl (DCB). All surrogate recoveries are within the established QC limits.

Duplicate Sample

Sample 04434512 was prepared in duplicate to evaluate the precision of the PCB analysis. Because there were no PCBs detected in either extract, no relative percent difference (RPD) is calculated.

Duplicate Matrix Spiked Samples

Sample 04434515 was prepared in triplicate. Two of the replicates were spiked with 100 ng of Chlorinated pesticides and 500 ng of PCB Aroclors 1016 and 1260 to evaluate precision, bias and accuracy of this analysis. All spike recoveries and RPDs are within the established QC limits.

Laboratory Control Samples

Analytically clean Ottawa sand was spiked identically to the matrix spikes to provide a laboratory control sample (LCS) for this extraction batch. This sample was processed and analyzed identically to the rest of the project. All LCS recoveries are within the established QC limits.

Comments

All data can be used as qualified.

ASB
6/30/05

Data Qualifier Codes

U	-	The analyte was not detected at or above the reported result.
J	-	The analyte was positively identified. The associated numerical result is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are unusable for all purposes.
NAF	-	Not analyzed for.
N	-	For organic analytes there is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
NC	-	Not Calculated
E	-	The concentration exceeds the known calibration range.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434512 | **Date Collected:** 10/15/04 | **Method:** SW8082
Field ID: EF-M-2004 | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/14/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
PCB - 1016	7.1	U
PCB - 1221	7.1	U
PCB - 1232	7.1	U
PCB - 1242	7.1	U
PCB - 1248	7.1	U
PCB - 1254	7.1	U
PCB - 1260	7.1	U
PCB - 1262	7.1	U
PCB - 1268	7.1	U

Surrogate Recoveries

Tetrachloro-m-xylene	**97**	**%**
Decachlorobiphenyl	**76**	**%**

Authorized By: [illegible] Release Date: 12/20/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434512 (duplicate - LDP1) | **Date Collected:** 10/15/04 | **Method:** SW8082
Field ID: EF-M-2004 | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/14/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
PCB - 1016	7.4	U
PCB - 1221	7.4	U
PCB - 1232	7.4	U
PCB - 1242	7.4	U
PCB - 1248	7.4	U
PCB - 1254	7.4	U
PCB - 1260	7.4	U
PCB - 1262	7.4	U
PCB - 1268	7.4	U

Surrogate Recoveries

Tetrachloro-m-xylene	**103**	**%**
Decachlorobiphenyl	**71**	**%**

Authorized By: [illegible] Release Date: 12/17/04 Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4341A1 | **Method:** SW8082

QC Type: Laboratory Method Blank | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
PCB - 1016	7.1	U
PCB - 1221	7.1	U
PCB - 1232	7.1	U
PCB - 1242	7.1	U
PCB - 1248	7.1	U
PCB - 1254	7.1	U
PCB - 1260	7.1	U
PCB - 1262	7.1	U
PCB - 1268	7.1	U

Surrogate Recoveries

Tetrachloro-m-xylene	**104**	**%**
Decachlorobiphenyl	**96**	**%**

Authorized By: [illegible] Release Date: [illegible]

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4341A2 | **Method:** SW8082

QC Type: Laboratory Method Blank | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
PCB - 1016	7.1	U
PCB - 1221	7.1	U
PCB - 1232	7.1	U
PCB - 1242	7.1	U
PCB - 1248	7.1	U
PCB - 1254	7.1	U
PCB - 1260	7.1	U
PCB - 1262	7.1	U
PCB - 1268	7.1	U

Surrogate Recoveries

Tetrachloro-m-xylene	**81**	**%**
Decachlorobiphenyl	**68**	**%**

Authorized By: [signature] Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OCS4341A1 | **Method:** SW8082

QC Type: Laboratory Control Sample | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** %

Analyte	Result	Qualifier
PCB - 1016	88	
PCB - 1260	108	

Surrogate Recoveries

Tetrachloro-m-xylene	86	%
Decachlorobiphenyl	92	%

Authorized By: [illegible] Release Date: 12/17/05 Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434500 | **Date Collected:** 10/14/04 | **Method:** SW80818082
Field ID: S-M-2004 | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/14/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
4,4'-DDE	0.59	U
4,4'-DDD	0.59	U
4,4'-DDT	0.59	U
PCB - 1016	7.3	U
PCB - 1221	7.3	U
PCB - 1232	7.3	U
PCB - 1242	7.3	U
PCB - 1248	7.3	U
PCB - 1254	7.3	U
PCB - 1260	7.3	U
PCB - 1262	7.3	U
PCB - 1268	7.3	U

Surrogate Recoveries

Tetrachloro-m-xylene	**82**	**%**
Decachlorobiphenyl	**106**	**%**

Authorized By: _____ Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434515 | **Date Collected:** 10/19/04 | **Method:** SW80818082
Field ID: A-2-M-2004 | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/14/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
4,4'-DDE	0.58	U
4,4'-DDD	0.58	U
4,4'-DDT	0.58	U
PCB - 1016	7.3	U
PCB - 1221	7.3	U
PCB - 1232	7.3	U
PCB - 1242	7.3	U
PCB - 1248	7.3	U
PCB - 1254	7.3	U
PCB - 1260	7.3	U
PCB - 1262	7.3	U
PCB - 1268	7.3	U

Surrogate Recoveries

Tetrachloro-m-xylene	**90**	**%**
Decachlorobiphenyl	**69**	**%**

Authorized By: [illegible] Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434515 (matrix spike - LMX1) | **Date Collected:** 10/19/04 | **Method:** SW80818082
Field ID: A-2-M-2004 | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/14/04 | **Units:** % Recovery

Analyte	Result	Qualifier
4,4'-DDE	88	
4,4'-DDD	75	
4,4'-DDT	72	
PCB - 1016	77	
PCB - 1260	80	

Surrogate Recoveries

Tetrachloro-m-xylene	85	%
Decachlorobiphenyl	61	%

Authorized By: M Manchester | Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434515 (matrix spike - LMX2) | **Date Collected:** 10/19/04 | **Method:** SW80818082
Field ID: A-2-M-2004 | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/14/04 | **Units:** % Recovery

Analyte	Result	Qualifier
4,4'-DDE	114	
4,4'-DDD	98	
4,4'-DDT	90	
PCB - 1016	110	
PCB - 1260	117	

Surrogate Recoveries

Tetrachloro-m-xylene	113	%
Decachlorobiphenyl	79	%

Authorized By: M Mandybur Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434516 | **Date Collected:** 10/19/04 | **Method:** SW80818082
Field ID: B-2-M-2004 | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/14/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
4,4'-DDE	0.60	U
4,4'-DDD	0.60	U
4,4'-DDT	0.60	U
PCB - 1016	7.5	U
PCB - 1221	7.5	U
PCB - 1232	7.5	U
PCB - 1242	7.5	U
PCB - 1248	7.5	U
PCB - 1254	7.5	U
PCB - 1260	7.5	U
PCB - 1262	7.5	U
PCB - 1268	7.5	U

Surrogate Recoveries

Tetrachloro-m-xylene	**103**	**%**
Decachlorobiphenyl	**72**	**%**

Authorized By: [illegible] Release Date: 12/7/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434517 | **Date Collected:** 10/20/04 | **Method:** SW80818082
Field ID: B-2-CC-2004 | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/14/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
4,4'-DDE	0.57	U
4,4'-DDD	0.57	U
4,4'-DDT	0.57	U
PCB - 1016	7.1	U
PCB - 1221	7.1	U
PCB - 1232	7.1	U
PCB - 1242	7.1	U
PCB - 1248	7.1	U
PCB - 1254	7.1	U
PCB - 1260	7.1	U
PCB - 1262	7.1	U
PCB - 1268	7.1	U

Surrogate Recoveries

Tetrachloro-m-xylene	**66**	**%**
Decachlorobiphenyl	**56**	**%**

Authorized By: [signature] Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434520 | **Date Collected:** 10/19/04 | **Method:** SW80818082
Field ID: X-M-2004 | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/14/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
4,4'-DDE	0.57	U
4,4'-DDD	0.57	U
4,4'-DDT	0.57	U
PCB - 1016	7.2	U
PCB - 1221	7.2	U
PCB - 1232	7.2	U
PCB - 1242	7.2	U
PCB - 1248	7.2	U
PCB - 1254	7.2	U
PCB - 1260	7.2	U
PCB - 1262	7.2	U
PCB - 1268	7.2	U

Surrogate Recoveries

Tetrachloro-m-xylene	**80**	**%**
Decachlorobiphenyl	**60**	**%**

Authorized By: [illegible] Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4341A1 | **Method:** SW80818082

QC Type: Laboratory Method Blank | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
4,4'-DDE	0.57	U
4,4'-DDD	0.57	U
4,4'-DDT	0.57	U
PCB - 1016	7.1	U
PCB - 1221	7.1	U
PCB - 1232	7.1	U
PCB - 1242	7.1	U
PCB - 1248	7.1	U
PCB - 1254	7.1	U
PCB - 1260	7.1	U
PCB - 1262	7.1	U
PCB - 1268	7.1	U

Surrogate Recoveries

Tetrachloro-m-xylene	**104**	**%**
Decachlorobiphenyl	**96**	**%**

Authorized By: [illegible] Release Date: 12/13/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4341A2 | **Method:** SW80818082

QC Type: Laboratory Method Blank | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
4,4'-DDE	0.57	U
4,4'-DDD	0.57	U
4,4'-DDT	0.57	U
PCB - 1016	7.1	U
PCB - 1221	7.1	U
PCB - 1232	7.1	U
PCB - 1242	7.1	U
PCB - 1248	7.1	U
PCB - 1254	7.1	U
PCB - 1260	7.1	U
PCB - 1262	7.1	U
PCB - 1268	7.1	U

Surrogate Recoveries

Tetrachloro-m-xylene	**81**	**%**
Decachlorobiphenyl	**68**	**%**

Authorized By: [illegible] Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Organochlorine Pesticides and Polychlorinated Biphenyls

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OCS4341A1 | **Method:** SW80818082

QC Type: Laboratory Control Sample | **Date Prepared:** 12/06/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/13/04 | **Units:** %

Analyte	Result	Qualifier
4,4'-DDE	101	
4,4'-DDD	86	
4,4'-DDT	84	
PCB - 1016	88	
PCB - 1260	108	

Surrogate Recoveries

Tetrachloro-m-xylene	86	%
Decachlorobiphenyl	92	%

Authorized By: [illegible] Release Date: 12/17/04

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434506 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: M-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/23/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	460	UJ
Pyridine	12	U	4-Nitrophenol	58	U
Aniline	5.8	U	Dibenzofuran	5.8	U
Phenol	5.8	U	2,4-Dinitrotoluene	5.8	U
Bis(2-Chloroethyl)Ether	5.8	U	Diethylphthalate	26	UJ
2-Chlorophenol	5.8	U	Fluorene	5.8	U
1,3-Dichlorobenzene	5.8	U	4-Chlorophenyl-Phenylether	5.8	U
1,4-Dichlorobenzene	5.8	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	5.8	U	4,6-Dinitro-2-Methylphenol	230	UJ
Benzyl Alcohol	5.8	U	N-Nitrosodiphenylamine	5.8	U
2-Methylphenol	5.8	U	1,2-Diphenylhydrazine	5.8	U
2,2'-Oxybis[1-chloropropane]	5.8	U	4-Bromophenyl-Phenylether	5.8	U
N-Nitroso-Di-N-Propylamine	5.8	U	Hexachlorobenzene	5.8	U
4-Methylphenol	**42**		Pentachlorophenol	58	U
Hexachloroethane	5.8	U	**Phenanthrene**	**12**	
Nitrobenzene	5.8	U	Anthracene	5.8	U
Isophorone	5.8	U	Caffeine	5.8	U
2-Nitrophenol	5.8	U	Carbazole	5.8	UJ
2,4-Dimethylphenol	5.8	U	Di-N-Butylphthalate	17	UJ
Bis(2-Chloroethoxy)Methane	5.8	U	**Fluoranthene**	**20**	
Benzoic Acid	460	UJ	Benzidine	5.8	UJ
2,4-Dichlorophenol	5.8	U	**Pyrene**	**28**	
1,2,4-Trichlorobenzene	5.8	U	**Retene**	**27**	
Naphthalene	5.8	U	Butylbenzylphthalate	5.8	U
4-Chloroaniline	5.8	U	**Benzo(a)anthracene**	**10**	
Hexachlorobutadiene	5.8	U	3,3'-Dichlorobenzidine	5.8	U
4-Chloro-3-Methylphenol	5.8	U	**Chrysene**	**21**	
2-Methylnaphthalene	**3.2**	**J**	Bis(2-Ethylhexyl) Phthalate	46	UJ
1-Methylnaphthalene	**1.6**	**J**	Di-N-Octyl Phthalate	5.8	U
Hexachlorocyclopentadiene	23	U	**Benzo(b)fluoranthene**	**12**	**J**
2,4,6-Trichlorophenol	5.8	U	**Benzo(k)fluoranthene**	**19**	**J**
2,4,5-Trichlorophenol	5.8	U	**Benzo(a)pyrene**	**10**	
2-Chloronaphthalene	5.8	U	3B-Coprostanol	58	UJ
2-Nitroaniline	5.8	U	**Indeno(1,2,3-cd)pyrene**	**8.8**	
Dimethylphthalate	5.8	U	Dibenzo(a,h)anthracene	5.8	U
2,6-Dinitrotoluene	5.8	U	**Benzo(ghi)perylene**	**13**	
Acenaphthylene	**3.4**	**J**			
3-Nitroaniline	5.8	U			
Acenaphthene	5.8	U			

Authorized By: _____ Release Date: 1/3/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434506 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: M-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/23/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	77	%
D5-Phenol	78	%
D4-2-Chlorophenol	78	%
1,2-Dichlorobenzene-D4	50	%
D5-Nitrobenzene	78	%
2-Fluorobiphenyl	79	%
Pyrene-D10	83	%
Terphenyl-D14	87	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434507 | **Date Collected:** 10/20/04 | **Method:** SW8270
Field ID: L-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/23/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	493	UJ
Pyridine	12	U	4-Nitrophenol	62	U
Aniline	6.2	U	Dibenzofuran	6.2	U
Phenol	6.2	U	2,4-Dinitrotoluene	6.2	U
Bis(2-Chloroethyl)Ether	6.2	U	Diethylphthalate	24	UJ
2-Chlorophenol	6.2	U	Fluorene	6.2	U
1,3-Dichlorobenzene	6.2	U	4-Chlorophenyl-Phenylether	6.2	U
1,4-Dichlorobenzene	6.2	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6.2	U	4,6-Dinitro-2-Methylphenol	247	UJ
Benzyl Alcohol	6.2	U	N-Nitrosodiphenylamine	6.2	U
2-Methylphenol	6.2	U	1,2-Diphenylhydrazine	6.2	U
2,2'-Oxybis[1-chloropropane]	6.2	U	4-Bromophenyl-Phenylether	6.2	U
N-Nitroso-Di-N-Propylamine	6.2	U	Hexachlorobenzene	6.2	U
4-Methylphenol	6.2	U	Pentachlorophenol	62	U
Hexachloroethane	6.2	U	**Phenanthrene**	**13**	
Nitrobenzene	6.2	U	**Anthracene**	**5.1**	**J**
Isophorone	6.2	U	Caffeine	6.2	U
2-Nitrophenol	6.2	U	Carbazole	6.2	UJ
2,4-Dimethylphenol	6.2	U	Di-N-Butylphthalate	27	UJ
Bis(2-Chloroethoxy)Methane	6.2	U	**Fluoranthene**	**21**	
Benzoic Acid	493	UJ	Benzidine	6.2	UJ
2,4-Dichlorophenol	6.2	U	**Pyrene**	**27**	
1,2,4-Trichlorobenzene	6.2	U	**Retene**	**30**	
Naphthalene	**6.8**		Butylbenzylphthalate	6.2	U
4-Chloroaniline	6.2	U	**Benzo(a)anthracene**	**8.9**	
Hexachlorobutadiene	6.2	U	3,3'-Dichlorobenzidine	6.2	U
4-Chloro-3-Methylphenol	6.2	U	**Chrysene**	**15**	
2-Methylnaphthalene	**4.4**	**J**	Bis(2-Ethylhexyl) Phthalate	35	UJ
1-Methylnaphthalene	**3.5**	**J**	Di-N-Octyl Phthalate	6.2	U
Hexachlorocyclopentadiene	25	U	**Benzo(b)fluoranthene**	**10**	**J**
2,4,6-Trichlorophenol	6.2	U	**Benzo(k)fluoranthene**	**12**	**J**
2,4,5-Trichlorophenol	6.2	U	**Benzo(a)pyrene**	**7.6**	
2-Chloronaphthalene	6.2	U	3B-Coprostanol	62	UJ
2-Nitroaniline	6.2	U	**Indeno(1,2,3-cd)pyrene**	**5.7**	**J**
Dimethylphthalate	6.2	U	Dibenzo(a,h)anthracene	5.7	U
2,6-Dinitrotoluene	6.2	U	**Benzo(ghi)perylene**	**8.3**	
Acenaphthylene	6.2	U			
3-Nitroaniline	6.2	U			
Acenaphthene	6.2	U			

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434507 | **Date Collected:** 10/20/04 | **Method:** SW8270
Field ID: L-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/23/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	57	%
D5-Phenol	57	%
D4-2-Chlorophenol	58	%
1,2-Dichlorobenzene-D4	26	%
D5-Nitrobenzene	59	%
2-Fluorobiphenyl	64	%
Pyrene-D10	84	%
Terphenyl-D14	87	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434508 | **Date Collected:** 10/20/04 | **Method:** SW8270
Field ID: K-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	471	UJ
Pyridine	12	U	4-Nitrophenol	59	UJ
Aniline	5.9	UJ	Dibenzofuran	5.9	U
Phenol	5.9	U	2,4-Dinitrotoluene	5.9	U
Bis(2-Chloroethyl)Ether	5.9	U	Diethylphthalate	26	UJ
2-Chlorophenol	5.9	U	Fluorene	5.9	U
1,3-Dichlorobenzene	5.9	U	4-Chlorophenyl-Phenylether	5.9	U
1,4-Dichlorobenzene	5.9	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	5.9	U	4,6-Dinitro-2-Methylphenol	235	UJ
Benzyl Alcohol	5.9	UJ	N-Nitrosodiphenylamine	5.9	U
2-Methylphenol	5.9	U	1,2-Diphenylhydrazine	5.9	U
2,2'-Oxybis[1-chloropropane]	5.9	U	4-Bromophenyl-Phenylether	5.9	U
N-Nitroso-Di-N-Propylamine	5.9	U	Hexachlorobenzene	5.9	U
4-Methylphenol	5.9	U	Pentachlorophenol	59	UJ
Hexachloroethane	5.9	U	**Phenanthrene**	**5.6**	**J**
Nitrobenzene	5.9	U	Anthracene	5.9	U
Isophorone	5.9	U	Caffeine	5.9	U
2-Nitrophenol	5.9	U	Carbazole	5.9	U
2,4-Dimethylphenol	5.9	U	Di-N-Butylphthalate	27	UJ
Bis(2-Chloroethoxy)Methane	5.9	U	**Fluoranthene**	**6.7**	
Benzoic Acid	**768**	**J**	Benzidine	5.9	UJ
2,4-Dichlorophenol	5.9	U	**Pyrene**	**9.5**	
1,2,4-Trichlorobenzene	5.9	U	**Retene**	**31**	
Naphthalene	5.9	U	Butylbenzylphthalate	5.9	U
4-Chloroaniline	5.9	UJ	Benzo(a)anthracene	5.9	U
Hexachlorobutadiene	5.9	U	3,3'-Dichlorobenzidine	5.9	UJ
4-Chloro-3-Methylphenol	5.9	U	Chrysene	5.9	U
2-Methylnaphthalene	5.9	U	Bis(2-Ethylhexyl) Phthalate	65	UJ
1-Methylnaphthalene	5.9	U	Di-N-Octyl Phthalate	5.9	U
Hexachlorocyclopentadiene	24	UJ	Benzo(b)fluoranthene	5.9	UJ
2,4,6-Trichlorophenol	5.9	UJ	Benzo(k)fluoranthene	5.9	UJ
2,4,5-Trichlorophenol	5.9	UJ	Benzo(a)pyrene	5.9	U
2-Chloronaphthalene	5.9	U	3B-Coprostanol	59	UJ
2-Nitroaniline	5.9	U	Indeno(1,2,3-cd)pyrene	59	U
Dimethylphthalate	5.9	U	Dibenzo(a,h)anthracene	5.9	U
2,6-Dinitrotoluene	5.9	U	Benzo(ghi)perylene	5.9	U
Acenaphthylene	5.9	U			
3-Nitroaniline	5.9	U			
Acenaphthene	5.9	U			

Authorized By: _____ Release Date: 1/11/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434508 | **Date Collected:** 10/20/04 | **Method:** SW8270
Field ID: K-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	75	%
D5-Phenol	43	%
D4-2-Chlorophenol	70	%
1,2-Dichlorobenzene-D4	46	%
D5-Nitrobenzene	81	%
2-Fluorobiphenyl	79	%
Pyrene-D10	90	%
Terphenyl-D14	94	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434509 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: Y-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	476	UJ
Pyridine	12	U	4-Nitrophenol	59	UJ
Aniline	5.9	UJ	Dibenzofuran	5.9	U
Phenol	5.9	U	2,4-Dinitrotoluene	5.9	U
Bis(2-Chloroethyl)Ether	5.9	U	Diethylphthalate	16	UJ
2-Chlorophenol	5.9	U	Fluorene	5.9	U
1,3-Dichlorobenzene	5.9	U	4-Chlorophenyl-Phenylether	5.9	U
1,4-Dichlorobenzene	5.9	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	5.9	U	4,6-Dinitro-2-Methylphenol	238	UJ
Benzyl Alcohol	5.9	UJ	N-Nitrosodiphenylamine	5.9	U
2-Methylphenol	5.9	U	1,2-Diphenylhydrazine	5.9	U
2,2'-Oxybis[1-chloropropane]	5.9	U	4-Bromophenyl-Phenylether	5.9	U
N-Nitroso-Di-N-Propylamine	5.9	U	Hexachlorobenzene	5.9	U
4-Methylphenol	5.9	U	**Pentachlorophenol**	**203**	**J**
Hexachloroethane	5.9	U	**Phenanthrene**	**28**	
Nitrobenzene	5.9	U	**Anthracene**	**5.7**	**J**
Isophorone	5.9	U	Caffeine	5.9	U
2-Nitrophenol	5.9	U	Carbazole	6.1	UJ
2,4-Dimethylphenol	5.9	U	Di-N-Butylphthalate	14	UJ
Bis(2-Chloroethoxy)Methane	5.9	U	**Fluoranthene**	**38**	
Benzoic Acid	**728**	**J**	Benzidine	5.9	UJ
2,4-Dichlorophenol	5.9	U	**Pyrene**	**53**	
1,2,4-Trichlorobenzene	5.9	U	**Retene**	**30**	
Naphthalene	**16**	**J**	Butylbenzylphthalate	5.9	U
4-Chloroaniline	5.9	UJ	**Benzo(a)anthracene**	**17**	
Hexachlorobutadiene	5.9	U	3,3'-Dichlorobenzidine	5.9	UJ
4-Chloro-3-Methylphenol	5.9	U	**Chrysene**	**27**	
2-Methylnaphthalene	**7.8**		Bis(2-Ethylhexyl) Phthalate	55	UJ
1-Methylnaphthalene	**4.9**	**J**	Di-N-Octyl Phthalate	5.9	U
Hexachlorocyclopentadiene	24	UJ	**Benzo(b)fluoranthene**	**22**	**J**
2,4,6-Trichlorophenol	5.9	UJ	**Benzo(k)fluoranthene**	**25**	**J**
2,4,5-Trichlorophenol	5.9	UJ	**Benzo(a)pyrene**	**20**	
2-Chloronaphthalene	5.9	U	3B-Coprostanol	59	UJ
2-Nitroaniline	5.9	U	**Indeno(1,2,3-cd)pyrene**	**9.6**	
Dimethylphthalate	5.9	U	**Dibenzo(a,h)anthracene**	**4**	**J**
2,6-Dinitrotoluene	5.9	U	**Benzo(ghi)perylene**	**12**	
Acenaphthylene	**5**	**J**			
3-Nitroaniline	5.9	U			
Acenaphthene	5.9	U			

Authorized By: _____ Release Date: 1/11/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434509 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: Y-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	82	%
D5-Phenol	93	%
D4-2-Chlorophenol	84	%
1,2-Dichlorobenzene-D4	51	%
D5-Nitrobenzene	84	%
2-Fluorobiphenyl	81	%
Pyrene-D10	94	%
Terphenyl-D14	97	%

Authorized By: DE Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434510 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: HIJ-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	11	U	2,4-Dinitrophenol	426	U
Pyridine	11	U	4-Nitrophenol	53	U
Aniline	5.3	UJ	Dibenzofuran	5.3	U
Phenol	5.3	U	2,4-Dinitrotoluene	5.3	U
Bis(2-Chloroethyl)Ether	5.3	U	Diethylphthalate	5.3	U
2-Chlorophenol	5.3	U	Fluorene	5.3	U
1,3-Dichlorobenzene	5.3	U	4-Chlorophenyl-Phenylether	5.3	U
1,4-Dichlorobenzene	5.3	U	4-Nitroaniline	11	U
1,2-Dichlorobenzene	5.3	U	4,6-Dinitro-2-Methylphenol	213	UJ
Benzyl Alcohol	5.3	UJ	N-Nitrosodiphenylamine	5.3	U
2-Methylphenol	5.3	U	1,2-Diphenylhydrazine	5.3	U
2,2'-Oxybis[1-chloropropane]	5.3	U	4-Bromophenyl-Phenylether	5.3	U
N-Nitroso-Di-N-Propylamine	5.3	U	Hexachlorobenzene	5.3	U
4-Methylphenol	5.3	U	Pentachlorophenol	53	UJ
Hexachloroethane	5.3	U	**Phenanthrene**	**9.7**	
Nitrobenzene	5.3	U	Anthracene	5.3	U
Isophorone	5.3	U	Caffeine	5.3	U
2-Nitrophenol	5.3	U	Carbazole	5.3	U
2,4-Dimethylphenol	5.3	U	Di-N-Butylphthalate	10	UJ
Bis(2-Chloroethoxy)Methane	5.3	U	**Fluoranthene**	**12**	
Benzoic Acid	**673**	**J**	Benzidine	5.3	UJ
2,4-Dichlorophenol	5.3	U	**Pyrene**	**19**	
1,2,4-Trichlorobenzene	5.3	U	**Retene**	**33**	
Naphthalene	5.3	U	Butylbenzylphthalate	5.3	U
4-Chloroaniline	5.3	U	**Benzo(a)anthracene**	**6.5**	
Hexachlorobutadiene	5.3	U	3,3'-Dichlorobenzidine	5.3	UJ
4-Chloro-3-Methylphenol	5.3	U	**Chrysene**	**14**	
2-Methylnaphthalene	5.3	U	Bis(2-Ethylhexyl) Phthalate	43	UJ
1-Methylnaphthalene	5.3	U	Di-N-Octyl Phthalate	5.3	U
Hexachlorocyclopentadiene	21	UJ	**Benzo(b)fluoranthene**	**12**	**J**
2,4,6-Trichlorophenol	5.3	UJ	**Benzo(k)fluoranthene**	**9.8**	**J**
2,4,5-Trichlorophenol	5.3	UJ	Benzo(a)pyrene	5.3	U
2-Chloronaphthalene	5.3	U	3B-Coprostanol	53	UJ
2-Nitroaniline	5.3	U	Indeno(1,2,3-cd)pyrene	5.3	U
Dimethylphthalate	5.3	U	Dibenzo(a,h)anthracene	5.3	U
2,6-Dinitrotoluene	5.3	U	Benzo(ghi)perylene	5.3	U
Acenaphthylene	5.3	U			
3-Nitroaniline	5.3	U			
Acenaphthene	5.3	U			

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434510 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: HIJ-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	80	%
D5-Phenol	87	%
D4-2-Chlorophenol	83	%
1,2-Dichlorobenzene-D4	48	%
D5-Nitrobenzene	77	%
2-Fluorobiphenyl	75	%
Pyrene-D10	93	%
Terphenyl-D14	97	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434511 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: G-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	10	U	2,4-Dinitrophenol	403	UJ
Pyridine	10	U	4-Nitrophenol	50	UJ
Aniline	5	UJ	Dibenzofuran	5	U
Phenol	5	U	2,4-Dinitrotoluene	5	U
Bis(2-Chloroethyl)Ether	5	U	Diethylphthalate	12	UJ
2-Chlorophenol	5	U	Fluorene	5	U
1,3-Dichlorobenzene	5	U	4-Chlorophenyl-Phenylether	5	U
1,4-Dichlorobenzene	5	U	4-Nitroaniline	10	U
1,2-Dichlorobenzene	5	U	4,6-Dinitro-2-Methylphenol	202	UJ
Benzyl Alcohol	5	UJ	N-Nitrosodiphenylamine	5	U
2-Methylphenol	5	U	1,2-Diphenylhydrazine	5	U
2,2'-Oxybis[1-chloropropane]	5	U	4-Bromophenyl-Phenylether	5	U
N-Nitroso-Di-N-Propylamine	5	U	Hexachlorobenzene	5	U
4-Methylphenol	5	U	Pentachlorophenol	50	UJ
Hexachloroethane	5	U	**Phenanthrene**	**8.1**	
Nitrobenzene	5	U	Anthracene	5	U
Isophorone	5	U	Caffeine	5	U
2-Nitrophenol	5	U	Carbazole	5	U
2,4-Dimethylphenol	5	U	Di-N-Butylphthalate	10	UJ
Bis(2-Chloroethoxy)Methane	5	U	**Fluoranthene**	**11**	
Benzoic Acid	**632**	**J**	Benzidine	5	UJ
2,4-Dichlorophenol	5	U	**Pyrene**	**14**	
1,2,4-Trichlorobenzene	5	U	**Retene**	**20**	
Naphthalene	**6.4**		Butylbenzylphthalate	5	U
4-Chloroaniline	5	UJ	Benzo(a)anthracene	5	U
Hexachlorobutadiene	5	U	3,3'-Dichlorobenzidine	5	UJ
4-Chloro-3-Methylphenol	5	U	**Chrysene**	**8.3**	
2-Methylnaphthalene	**6**		Bis(2-Ethylhexyl) Phthalate	38	UJ
1-Methylnaphthalene	6	U	Di-N-Octyl Phthalate	5	U
Hexachlorocyclopentadiene	20	UJ	**Benzo(b)fluoranthene**	**7.3**	**J**
2,4,6-Trichlorophenol	5	UJ	**Benzo(k)fluoranthene**	**9.5**	**J**
2,4,5-Trichlorophenol	5	UJ	Benzo(a)pyrene	5	U
2-Chloronaphthalene	5	U	3B-Coprostanol	50	UJ
2-Nitroaniline	5	U	Indeno(1,2,3-cd)pyrene	5	U
Dimethylphthalate	5	U	Dibenzo(a,h)anthracene	5	U
2,6-Dinitrotoluene	5	U	Benzo(ghi)perylene	5	U
Acenaphthylene	5	U			
3-Nitroaniline	5	U			
Acenaphthene	5	U			

Authorized By: _____ Release Date: 1/28/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434511 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: G-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	75	%
D5-Phenol	87	%
D4-2-Chlorophenol	79	%
1,2-Dichlorobenzene-D4	39	%
D5-Nitrobenzene	68	%
2-Fluorobiphenyl	75	%
Pyrene-D10	94	%
Terphenyl-D14	98	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434513 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: CD-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	468	UJ
Pyridine	12	U	4-Nitrophenol	59	UJ
Aniline	5.9	UJ	Dibenzofuran	5.9	U
Phenol	5.9	U	2,4-Dinitrotoluene	5.9	U
Bis(2-Chloroethyl)Ether	5.9	U	Diethylphthalate	9	UJ
2-Chlorophenol	5.9	U	Fluorene	5.9	U
1,3-Dichlorobenzene	5.9	U	4-Chlorophenyl-Phenylether	5.9	U
1,4-Dichlorobenzene	5.9	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	5.9	U	4,6-Dinitro-2-Methylphenol	234	UJ
Benzyl Alcohol	5.9	UJ	N-Nitrosodiphenylamine	5.9	U
2-Methylphenol	5.9	U	1,2-Diphenylhydrazine	5.9	U
2,2'-Oxybis[1-chloropropane]	5.9	U	4-Bromophenyl-Phenylether	5.9	U
N-Nitroso-Di-N-Propylamine	5.9	U	Hexachlorobenzene	5.9	U
4-Methylphenol	**13**		Pentachlorophenol	59	UJ
Hexachloroethane	5.9	U	**Phenanthrene**	**14**	
Nitrobenzene	5.9	U	Anthracene	5.9	U
Isophorone	5.9	U	Caffeine	5.9	U
2-Nitrophenol	5.9	U	Carbazole	5.9	U
2,4-Dimethylphenol	5.9	U	Di-N-Butylphthalate	7.6	UJ
Bis(2-Chloroethoxy)Methane	5.9	U	**Fluoranthene**	**18**	
Benzoic Acid	**704**	**J**	Benzidine	5.9	UJ
2,4-Dichlorophenol	5.9	U	**Pyrene**	**28**	
1,2,4-Trichlorobenzene	5.9	U	**Retene**	**17**	
Naphthalene	**6.9**		Butylbenzylphthalate	5.9	U
4-Chloroaniline	5.9	UJ	**Benzo(a)anthracene**	**7.6**	
Hexachlorobutadiene	5.9	U	3,3'-Dichlorobenzidine	5.9	UJ
4-Chloro-3-Methylphenol	5.9	U	**Chrysene**	**10**	
2-Methylnaphthalene	5.9	U	Bis(2-Ethylhexyl) Phthalate	73	UJ
1-Methylnaphthalene	5.9	U	Di-N-Octyl Phthalate	5.9	U
Hexachlorocyclopentadiene	23	UJ	**Benzo(b)fluoranthene**	**7.4**	**J**
2,4,6-Trichlorophenol	5.9	UJ	**Benzo(k)fluoranthene**	**8.3**	**J**
2,4,5-Trichlorophenol	5.9	UJ	Benzo(a)pyrene	5.9	U
2-Chloronaphthalene	5.9	U	3B-Coprostanol	59	UJ
2-Nitroaniline	5.9	U	Indeno(1,2,3-cd)pyrene	5.9	U
Dimethylphthalate	5.9	U	Dibenzo(a,h)anthracene	5.9	U
2,6-Dinitrotoluene	5.9	U	Benzo(ghi)perylene	5.9	U
Acenaphthylene	5.9	U			
3-Nitroaniline	5.9	U			
Acenaphthene	5.9	U			

Authorized By: DG Release Date: 1/3/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434513 | **Date Collected:** 10/15/04 | **Method:** SW8270
Field ID: CD-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	73	%
D5-Phenol	86	%
D4-2-Chlorophenol	76	%
1,2-Dichlorobenzene-D4	37	%
D5-Nitrobenzene	70	%
2-Fluorobiphenyl	73	%
Pyrene-D10	92	%
Terphenyl-D14	95	%

Authorized By: _____ Release Date: 1/12/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434515 | **Date Collected:** 10/19/04 | **Method:** SW8270
Field ID: A-2-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	464	UJ
Pyridine	12	U	4-Nitrophenol	58	UJ
Aniline	5.8	UJ	Dibenzofuran	5.8	U
Phenol	5.8	U	2,4-Dinitrotoluene	5.8	U
Bis(2-Chloroethyl)Ether	5.8	U	**Diethylphthalate**	**11**	
2-Chlorophenol	5.8	U	Fluorene	5.8	U
1,3-Dichlorobenzene	5.8	U	4-Chlorophenyl-Phenylether	5.8	U
1,4-Dichlorobenzene	5.8	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	5.8	U	4,6-Dinitro-2-Methylphenol	232	UJ
Benzyl Alcohol	5.8	UJ	N-Nitrosodiphenylamine	5.8	U
2-Methylphenol	5.8	U	1,2-Diphenylhydrazine	5.8	U
2,2'-Oxybis[1-chloropropane]	5.8	U	4-Bromophenyl-Phenylether	5.8	U
N-Nitroso-Di-N-Propylamine	5.8	U	Hexachlorobenzene	5.8	U
4-Methylphenol	5.8	U	Pentachlorophenol	58	UJ
Hexachloroethane	5.8	U	**Phenanthrene**	**20**	
Nitrobenzene	5.8	U	**Anthracene**	**5.1**	**J**
Isophorone	5.8	U	Caffeine	5.8	U
2-Nitrophenol	5.8	U	Carbazole	5.8	U
2,4-Dimethylphenol	5.8	U	Di-N-Butylphthalate	13	UJ
Bis(2-Chloroethoxy)Methane	5.8	U	**Fluoranthene**	**29**	
Benzoic Acid	**697**	**J**	Benzidine	5.8	UJ
2,4-Dichlorophenol	5.8	U	**Pyrene**	**40**	
1,2,4-Trichlorobenzene	5.8	U	**Retene**	**20**	
Naphthalene	5.8	U	Butylbenzylphthalate	5.8	U
4-Chloroaniline	5.8	UJ	**Benzo(a)anthracene**	**14**	
Hexachlorobutadiene	5.8	U	3,3'-Dichlorobenzidine	5.8	UJ
4-Chloro-3-Methylphenol	5.8	U	**Chrysene**	**20**	
2-Methylnaphthalene	5.8	U	Bis(2-Ethylhexyl) Phthalate	59	UJ
1-Methylnaphthalene	5.8	U	Di-N-Octyl Phthalate	5.8	U
Hexachlorocyclopentadiene	23	UJ	**Benzo(b)fluoranthene**	**19**	**J**
2,4,6-Trichlorophenol	5.8	UJ	**Benzo(k)fluoranthene**	**18**	**J**
2,4,5-Trichlorophenol	5.8	UJ	**Benzo(a)pyrene**	**19**	
2-Chloronaphthalene	5.8	U	3B-Coprostanol	58	UJ
2-Nitroaniline	5.8	U	**Indeno(1,2,3-cd)pyrene**	**6.7**	
Dimethylphthalate	5.8	U	Dibenzo(a,h)anthracene	5.8	U
2,6-Dinitrotoluene	5.8	U	**Benzo(ghi)perylene**	**7.8**	
Acenaphthylene	5.8	U			
3-Nitroaniline	5.8	U			
Acenaphthene	5.8	U			

Authorized By: _____ Release Date: 1/12/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434515 | **Date Collected:** 10/19/04 | **Method:** SW8270
Field ID: A-2-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	73	%
D5-Phenol	83	%
D4-2-Chlorophenol	79	%
1,2-Dichlorobenzene-D4	48	%
D5-Nitrobenzene	66	%
2-Fluorobiphenyl	75	%
Pyrene-D10	94	%
Terphenyl-D14	97	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434516 | **Date Collected:** 10/19/04 | **Method:** SW8270
Field ID: B-2-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	11	U	2,4-Dinitrophenol	455	UJ
Pyridine	11	U	4-Nitrophenol	57	UJ
Aniline	5.7	UJ	**Dibenzofuran**	**4.4**	**J**
Phenol	5.7	U	2,4-Dinitrotoluene	5.7	U
Bis(2-Chloroethyl)Ether	5.7	U	Diethylphthalate	10	UJ
2-Chlorophenol	5.7	U	Fluorene	5.7	U
1,3-Dichlorobenzene	5.7	U	4-Chlorophenyl-Phenylether	5.7	U
1,4-Dichlorobenzene	5.7	U	4-Nitroaniline	11	U
1,2-Dichlorobenzene	5.7	U	4,6-Dinitro-2-Methylphenol	228	UJ
Benzyl Alcohol	5.7	UJ	N-Nitrosodiphenylamine	5.7	U
2-Methylphenol	5.7	U	1,2-Diphenylhydrazine	5.7	U
2,2'-Oxybis[1-chloropropane]	5.7	U	4-Bromophenyl-Phenylether	5.7	U
N-Nitroso-Di-N-Propylamine	5.7	U	Hexachlorobenzene	5.7	U
4-Methylphenol	5.7	U	Pentachlorophenol	57	UJ
Hexachloroethane	5.7	U	**Phenanthrene**	**24**	
Nitrobenzene	5.7	U	**Anthracene**	**6.7**	
Isophorone	5.7	U	Caffeine	5.7	U
2-Nitrophenol	5.7	U	Carbazole	5.7	U
2,4-Dimethylphenol	5.7	U	Di-N-Butylphthalate	10	UJ
Bis(2-Chloroethoxy)Methane	5.7	U	**Fluoranthene**	**58**	
Benzoic Acid	**720**	**J**	Benzidine	5.7	UJ
2,4-Dichlorophenol	5.7	U	**Pyrene**	**66**	
1,2,4-Trichlorobenzene	5.7	U	**Retene**	**25**	
Naphthalene	**14**		Butylbenzylphthalate	5.7	U
4-Chloroaniline	5.7	UJ	**Benzo(a)anthracene**	**21**	
Hexachlorobutadiene	5.7	U	3,3'-Dichlorobenzidine	5.7	UJ
4-Chloro-3-Methylphenol	5.7	U	**Chrysene**	**34**	
2-Methylnaphthalene	**6.1**		Bis(2-Ethylhexyl) Phthalate	69	UJ
1-Methylnaphthalene	6.1	U	Di-N-Octyl Phthalate	5.7	U
Hexachlorocyclopentadiene	23	UJ	**Benzo(b)fluoranthene**	**32**	**J**
2,4,6-Trichlorophenol	5.7	UJ	**Benzo(k)fluoranthene**	**36**	**J**
2,4,5-Trichlorophenol	5.7	UJ	**Benzo(a)pyrene**	**21**	
2-Chloronaphthalene	5.7	U	3B-Coprostanol	57	UJ
2-Nitroaniline	5.7	U	**Indeno(1,2,3-cd)pyrene**	**9.7**	
Dimethylphthalate	5.7	U	Dibenzo(a,h)anthracene	5.7	U
2,6-Dinitrotoluene	5.7	U	**Benzo(ghi)perylene**	**10**	
Acenaphthylene	**7.9**				
3-Nitroaniline	5.7	U			
Acenaphthene	5.7	U			

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434516 | **Date Collected:** 10/19/04 | **Method:** SW8270
Field ID: B-2-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	73	%
D5-Phenol	55	%
D4-2-Chlorophenol	55	%
1,2-Dichlorobenzene-D4	47	%
D5-Nitrobenzene	83	%
2-Fluorobiphenyl	70	%
Pyrene-D10	87	%
Terphenyl-D14	94	%

Authorized By: _____ Release Date: 2/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434517 | **Date Collected:** 10/20/04 | **Method:** SW8270
Field ID: B-2-CC-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	11	U	2,4-Dinitrophenol	455	UJ
Pyridine	11	U	4-Nitrophenol	57	UJ
Aniline	5.7	UJ	Dibenzofuran	5.7	U
Phenol	5.7	U	2,4-Dinitrotoluene	5.7	U
Bis(2-Chloroethyl)Ether	5.7	U	Diethylphthalate	9.6	UJ
2-Chlorophenol	5.7	U	Fluorene	5.7	U
1,3-Dichlorobenzene	5.7	U	4-Chlorophenyl-Phenylether	5.7	U
1,4-Dichlorobenzene	5.7	U	4-Nitroaniline	11	U
1,2-Dichlorobenzene	5.7	U	4,6-Dinitro-2-Methylphenol	228	UJ
Benzyl Alcohol	5.7	UJ	N-Nitrosodiphenylamine	5.7	U
2-Methylphenol	5.7	U	1,2-Diphenylhydrazine	5.7	U
2,2'-Oxybis[1-chloropropane]	5.7	U	4-Bromophenyl-Phenylether	5.7	U
N-Nitroso-Di-N-Propylamine	5.7	U	Hexachlorobenzene	5.7	U
4-Methylphenol	5.7	U	Pentachlorophenol	57	UJ
Hexachloroethane	5.7	U	**Phenanthrene**	**11**	
Nitrobenzene	5.7	U	Anthracene	5.7	U
Isophorone	5.7	U	Caffeine	5.7	U
2-Nitrophenol	5.7	U	Carbazole	5.7	U
2,4-Dimethylphenol	5.7	U	Di-N-Butylphthalate	10	UJ
Bis(2-Chloroethoxy)Methane	5.7	U	**Fluoranthene**	**8.5**	
Benzoic Acid	455	UJ	Benzidine	5.7	UJ
2,4-Dichlorophenol	5.7	U	**Pyrene**	**9.1**	
1,2,4-Trichlorobenzene	5.7	U	**Retene**	**3.6**	**J**
Naphthalene	5.7	U	Butylbenzylphthalate	5.7	U
4-Chloroaniline	5.7	UJ	Benzo(a)anthracene	5.7	U
Hexachlorobutadiene	5.7	U	3,3'-Dichlorobenzidine	5.7	UJ
4-Chloro-3-Methylphenol	5.7	U	**Chrysene**	**6.8**	
2-Methylnaphthalene	5.7	U	**Bis(2-Ethylhexyl) Phthalate**	**64**	
1-Methylnaphthalene	5.7	U	Di-N-Octyl Phthalate	5.7	U
Hexachlorocyclopentadiene	23	UJ	Benzo(b)fluoranthene	5.7	UJ
2,4,6-Trichlorophenol	5.7	UJ	Benzo(k)fluoranthene	5.7	UJ
2,4,5-Trichlorophenol	5.7	UJ	Benzo(a)pyrene	5.7	U
2-Chloronaphthalene	5.7	U	3B-Coprostanol	57	UJ
2-Nitroaniline	5.7	U	Indeno(1,2,3-cd)pyrene	5.7	U
Dimethylphthalate	5.7	U	Dibenzo(a,h)anthracene	5.7	U
2,6-Dinitrotoluene	5.7	U	Benzo(ghi)perylene	5.7	U
Acenaphthylene	5.7	U			
3-Nitroaniline	5.7	U			
Acenaphthene	5.7	U			

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Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434517 | **Date Collected:** 10/20/04 | **Method:** SW8270
Field ID: B-2-CC-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	55	%
D5-Phenol	72	%
D4-2-Chlorophenol	61	%
1,2-Dichlorobenzene-D4	40	%
D5-Nitrobenzene	62	%
2-Fluorobiphenyl	71	%
Pyrene-D10	85	%
Terphenyl-D14	81	%

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Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434520 | **Date Collected:** 10/19/04 | **Method:** SW8270
Field ID: X-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	478	UJ
Pyridine	12	U	4-Nitrophenol	60	UJ
Aniline	6	UJ	**Dibenzofuran**	**6.9**	
Phenol	6	U	2,4-Dinitrotoluene	6	U
Bis(2-Chloroethyl)Ether	6	U	Diethylphthalate	10	UJ
2-Chlorophenol	6	U	**Fluorene**	**6.7**	
1,3-Dichlorobenzene	6	U	4-Chlorophenyl-Phenylether	6	U
1,4-Dichlorobenzene	6	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6	U	4,6-Dinitro-2-Methylphenol	239	UJ
Benzyl Alcohol	6	UJ	N-Nitrosodiphenylamine	6	U
2-Methylphenol	6	U	1,2-Diphenylhydrazine	6	U
2,2'-Oxybis[1-chloropropane]	6	U	4-Bromophenyl-Phenylether	6	U
N-Nitroso-Di-N-Propylamine	6	U	Hexachlorobenzene	6	U
4-Methylphenol	6	U	Pentachlorophenol	60	UJ
Hexachloroethane	6	U	**Phenanthrene**	**44**	
Nitrobenzene	6	U	**Anthracene**	**10**	
Isophorone	6	U	Caffeine	6	U
2-Nitrophenol	6	U	Carbazole	6	U
2,4-Dimethylphenol	6	U	Di-N-Butylphthalate	6	U
Bis(2-Chloroethoxy)Methane	6	U	**Fluoranthene**	**69**	
Benzoic Acid	**724**	**J**	Benzidine	6	UJ
2,4-Dichlorophenol	6	U	**Pyrene**	**94**	
1,2,4-Trichlorobenzene	6	U	**Retene**	**37**	
Naphthalene	**28**		Butylbenzylphthalate	6	U
4-Chloroaniline	6	UJ	**Benzo(a)anthracene**	**21**	
Hexachlorobutadiene	6	U	3,3'-Dichlorobenzidine	6	UJ
4-Chloro-3-Methylphenol	6	U	**Chrysene**	**40**	
2-Methylnaphthalene	**13**		Bis(2-Ethylhexyl) Phthalate	62	UJ
1-Methylnaphthalene	**7.8**		Di-N-Octyl Phthalate	6	U
Hexachlorocyclopentadiene	24	UJ	**Benzo(b)fluoranthene**	**43**	**J**
2,4,6-Trichlorophenol	6	UJ	**Benzo(k)fluoranthene**	**41**	**J**
2,4,5-Trichlorophenol	6	UJ	**Benzo(a)pyrene**	**21**	
2-Chloronaphthalene	6	U	3B-Coprostanol	60	UJ
2-Nitroaniline	6	U	**Indeno(1,2,3-cd)pyrene**	**7.9**	
Dimethylphthalate	6	U	Dibenzo(a,h)anthracene	6	U
2,6-Dinitrotoluene	6	U	**Benzo(ghi)perylene**	**11**	
Acenaphthylene	**7**				
3-Nitroaniline	6	U			
Acenaphthene	**7.5**				

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Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434520 | **Date Collected:** 10/19/04 | **Method:** SW8270
Field ID: X-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	79	%
D5-Phenol	84	%
D4-2-Chlorophenol	76	%
1,2-Dichlorobenzene-D4	51	%
D5-Nitrobenzene	74	%
2-Fluorobiphenyl	79	%
Pyrene-D10	97	%
Terphenyl-D14	102	%

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Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4348A1 | **Method:** SW8270

QC Type: Laboratory Method Blank | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	500	UJ
Pyridine	12	U	4-Nitrophenol	62	U
Aniline	6.2	U	Dibenzofuran	6.2	U
Phenol	**18**		2,4-Dinitrotoluene	6.2	U
Bis(2-Chloroethyl)Ether	6.2	U	**Diethylphthalate**	**16**	
2-Chlorophenol	6.2	U	Fluorene	6.2	U
1,3-Dichlorobenzene	6.2	U	4-Chlorophenyl-Phenylether	6.2	U
1,4-Dichlorobenzene	6.2	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6.2	U	4,6-Dinitro-2-Methylphenol	250	UJ
Benzyl Alcohol	12	U	N-Nitrosodiphenylamine	6.2	U
2-Methylphenol	6.2	U	1,2-Diphenylhydrazine	6.2	U
2,2'-Oxybis[1-chloropropane]	6.2	U	4-Bromophenyl-Phenylether	6.2	U
N-Nitroso-Di-N-Propylamine	6.2	U	Hexachlorobenzene	6.2	U
4-Methylphenol	6.2	U	Pentachlorophenol	62	U
Hexachloroethane	6.2	U	Phenanthrene	6.2	U
Nitrobenzene	6.2	U	Anthracene	6.2	U
Isophorone	6.2	U	Caffeine	6.2	U
2-Nitrophenol	6.2	U	Carbazole	6.2	UJ
2,4-Dimethylphenol	6.2	U	**Di-N-Butylphthalate**	**12**	
Bis(2-Chloroethoxy)Methane	6.2	U	Fluoranthene	6.2	U
Benzoic Acid	500	UJ	Benzidine	6.2	UJ
2,4-Dichlorophenol	6.2	U	Pyrene	6.2	U
1,2,4-Trichlorobenzene	6.2	U	Retene	6.2	U
Naphthalene	6.2	U	Butylbenzylphthalate	6.2	U
4-Chloroaniline	6.2	U	Benzo(a)anthracene	6.2	U
Hexachlorobutadiene	6.2	U	3,3'-Dichlorobenzidine	6.2	U
4-Chloro-3-Methylphenol	6.2	U	Chrysene	6.2	U
2-Methylnaphthalene	6.2	U	**Bis(2-Ethylhexyl) Phthalate**	**14**	
1-Methylnaphthalene	6.2	U	Di-N-Octyl Phthalate	6.2	U
Hexachlorocyclopentadiene	25	U	Benzo(b)fluoranthene	6.2	UJ
2,4,6-Trichlorophenol	6.2	U	Benzo(k)fluoranthene	6.2	UJ
2,4,5-Trichlorophenol	6.2	U	Benzo(a)pyrene	6.2	U
2-Chloronaphthalene	6.2	U	3B-Coprostanol	62	UJ
2-Nitroaniline	6.2	U	**Indeno(1,2,3-cd)pyrene**	**6.2**	**J**
Dimethylphthalate	6.2	U	Dibenzo(a,h)anthracene	6.2	U
2,6-Dinitrotoluene	6.2	U	Benzo(ghi)perylene	6.2	U
Acenaphthylene	6.2	U			
3-Nitroaniline	6.2	U			
Acenaphthene	6.2	U			

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Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4348A1 | **Method:** SW8270

QC Type: Laboratory Method Blank | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	51	%
D5-Phenol	75	%
D4-2-Chlorophenol	55	%
1,2-Dichlorobenzene-D4	71	%
D5-Nitrobenzene	78	%
2-Fluorobiphenyl	79	%
Pyrene-D10	74	%
Terphenyl-D14	80	%

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Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43
LIMS Project ID: 1861-04
Lab ID: OBS4348A2
Method: SW8270
QC Type: Laboratory Method Blank
Date Prepared: 12/13/04
Matrix: Frozen Sediment/soil
Project Officer: Russ McMillan
Date Analyzed: 12/22/04
Units: ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	500	UJ
Pyridine	12	U	4-Nitrophenol	62	U
Aniline	6.2	U	Dibenzofuran	6.2	U
Phenol	**19**		2,4-Dinitrotoluene	6.2	U
Bis(2-Chloroethyl)Ether	6.2	U	**Diethylphthalate**	**34**	
2-Chlorophenol	6.2	U	Fluorene	6.2	U
1,3-Dichlorobenzene	6.2	U	4-Chlorophenyl-Phenylether	6.2	U
1,4-Dichlorobenzene	6.2	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6.2	U	4,6-Dinitro-2-Methylphenol	250	UJ
Benzyl Alcohol	12	U	N-Nitrosodiphenylamine	6.2	U
2-Methylphenol	6.2	U	1,2-Diphenylhydrazine	6.2	U
2,2'-Oxybis[1-chloropropane]	6.2	U	4-Bromophenyl-Phenylether	6.2	U
N-Nitroso-Di-N-Propylamine	6.2	U	Hexachlorobenzene	6.2	U
4-Methylphenol	6.2	U	Pentachlorophenol	62	U
Hexachloroethane	6.2	U	Phenanthrene	6.2	U
Nitrobenzene	6.2	U	Anthracene	6.2	U
Isophorone	6.2	U	Caffeine	6.2	U
2-Nitrophenol	6.2	U	Carbazole	6.2	UJ
2,4-Dimethylphenol	6.2	U	**Di-N-Butylphthalate**	**33**	
Bis(2-Chloroethoxy)Methane	6.2	U	Fluoranthene	6.2	U
Benzoic Acid	500	UJ	Benzidine	6.2	UJ
2,4-Dichlorophenol	6.2	U	Pyrene	6.2	U
1,2,4-Trichlorobenzene	6.2	U	Retene	6.2	U
Naphthalene	6.2	U	Butylbenzylphthalate	6.2	U
4-Chloroaniline	6.2	U	Benzo(a)anthracene	6.2	U
Hexachlorobutadiene	6.2	U	3,3'-Dichlorobenzidine	6.2	U
4-Chloro-3-Methylphenol	6.2	U	Chrysene	6.2	U
2-Methylnaphthalene	6.2	U	**Bis(2-Ethylhexyl) Phthalate**	**20**	
1-Methylnaphthalene	6.2	U	Di-N-Octyl Phthalate	6.2	U
Hexachlorocyclopentadiene	25	U	Benzo(b)fluoranthene	6.2	U
2,4,6-Trichlorophenol	6.2	U	Benzo(k)fluoranthene	6.2	U
2,4,5-Trichlorophenol	6.2	U	Benzo(a)pyrene	6.2	U
2-Chloronaphthalene	6.2	U	3B-Coprostanol	62	UJ
2-Nitroaniline	6.2	U	Indeno(1,2,3-cd)pyrene	6.2	U
Dimethylphthalate	6.2	U	Dibenzo(a,h)anthracene	6.2	U
2,6-Dinitrotoluene	6.2	U	Benzo(ghi)perylene	6.2	U
Acenaphthylene	6.2	U			
3-Nitroaniline	6.2	U			
Acenaphthene	6.2	U			

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Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4348A2 | **Method:** SW8270

QC Type: Laboratory Method Blank | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	50	%
D5-Phenol	71	%
D4-2-Chlorophenol	56	%
1,2-Dichlorobenzene-D4	65	%
D5-Nitrobenzene	75	%
2-Fluorobiphenyl	77	%
Pyrene-D10	70	%
Terphenyl-D14	79	%

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Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4355A1 | **Method:** SW8270

QC Type: Laboratory Method Blank | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	500	UJ
Pyridine	12	U	4-Nitrophenol	62	U
Aniline	6.2	U	Dibenzofuran	6.2	U
Phenol	6.2	U	2,4-Dinitrotoluene	6.2	U
Bis(2-Chloroethyl)Ether	6.2	U	**Diethylphthalate**	**11**	
2-Chlorophenol	6.2	U	Fluorene	6.2	U
1,3-Dichlorobenzene	6.2	U	4-Chlorophenyl-Phenylether	6.2	U
1,4-Dichlorobenzene	6.2	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6.2	U	4,6-Dinitro-2-Methylphenol	250	UJ
Benzyl Alcohol	12	U	N-Nitrosodiphenylamine	6.2	U
2-Methylphenol	6.2	U	1,2-Diphenylhydrazine	6.2	U
2,2'-Oxybis[1-chloropropane]	6.2	U	4-Bromophenyl-Phenylether	6.2	U
N-Nitroso-Di-N-Propylamine	6.2	U	Hexachlorobenzene	6.2	U
4-Methylphenol	6.2	U	Pentachlorophenol	62	U
Hexachloroethane	6.2	U	Phenanthrene	6.2	U
Nitrobenzene	6.2	U	Anthracene	6.2	U
Isophorone	6.2	U	Caffeine	6.2	U
2-Nitrophenol	6.2	U	Carbazole	6.2	UJ
2,4-Dimethylphenol	6.2	U	**Di-N-Butylphthalate**	**12**	
Bis(2-Chloroethoxy)Methane	6.2	U	Fluoranthene	6.2	U
Benzoic Acid	500	UJ	Benzidine	6.2	UJ
2,4-Dichlorophenol	6.2	U	Pyrene	6.2	U
1,2,4-Trichlorobenzene	6.2	U	Retene	6.2	U
Naphthalene	6.2	U	Butylbenzylphthalate	6.2	U
4-Chloroaniline	6.2	U	Benzo(a)anthracene	6.2	U
Hexachlorobutadiene	6.2	U	3,3'-Dichlorobenzidine	6.2	U
4-Chloro-3-Methylphenol	6.2	U	Chrysene	6.2	U
2-Methylnaphthalene	6.2	U	**Bis(2-Ethylhexyl) Phthalate**	**17**	
1-Methylnaphthalene	6.2	U	Di-N-Octyl Phthalate	6.2	U
Hexachlorocyclopentadiene	25	U	Benzo(b)fluoranthene	6.2	UJ
2,4,6-Trichlorophenol	6.2	U	Benzo(k)fluoranthene	6.2	UJ
2,4,5-Trichlorophenol	6.2	U	Benzo(a)pyrene	6.2	U
2-Chloronaphthalene	6.2	U	3B-Coprostanol	62	UJ
2-Nitroaniline	6.2	U	Indeno(1,2,3-cd)pyrene	6.2	U
Dimethylphthalate	6.2	U	Dibenzo(a,h)anthracene	6.2	U
2,6-Dinitrotoluene	6.2	U	Benzo(ghi)perylene	6.2	U
Acenaphthylene	6.2	U			
3-Nitroaniline	6.2	U			
Acenaphthene	6.2	U			

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Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4355A1 | **Method:** SW8270

QC Type: Laboratory Method Blank | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	58	%
D5-Phenol	73	%
D4-2-Chlorophenol	61	%
1,2-Dichlorobenzene-D4	63	%
D5-Nitrobenzene	73	%
2-Fluorobiphenyl	74	%
Pyrene-D10	77	%
Terphenyl-D14	82	%

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Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OBS4355A2 | **Method:** SW8270

QC Type: Laboratory Method Blank | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	500	UJ
Pyridine	12	U	4-Nitrophenol	62	U
Aniline	6.2	U	Dibenzofuran	6.2	U
Phenol	6.2	U	2,4-Dinitrotoluene	6.2	U
Bis(2-Chloroethyl)Ether	6.2	U	**Diethylphthalate**	**11**	
2-Chlorophenol	6.2	U	Fluorene	6.2	U
1,3-Dichlorobenzene	6.2	U	4-Chlorophenyl-Phenylether	6.2	U
1,4-Dichlorobenzene	6.2	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6.2	U	4,6-Dinitro-2-Methylphenol	250	UJ
Benzyl Alcohol	6.2	U	N-Nitrosodiphenylamine	6.2	U
2-Methylphenol	6.2	U	1,2-Diphenylhydrazine	6.2	U
2,2'-Oxybis[1-chloropropane]	6.2	U	4-Bromophenyl-Phenylether	6.2	U
N-Nitroso-Di-N-Propylamine	6.2	U	Hexachlorobenzene	6.2	U
4-Methylphenol	6.2	U	Pentachlorophenol	62	U
Hexachloroethane	6.2	U	Phenanthrene	6.2	U
Nitrobenzene	6.2	U	Anthracene	6.2	U
Isophorone	6.2	U	Caffeine	6.2	U
2-Nitrophenol	6.2	U	Carbazole	6.2	UJ
2,4-Dimethylphenol	6.2	U	**Di-N-Butylphthalate**	**17**	
Bis(2-Chloroethoxy)Methane	6.2	U	Fluoranthene	6.2	U
Benzoic Acid	500	UJ	Benzidine	6.2	UJ
2,4-Dichlorophenol	6.2	U	Pyrene	6.2	U
1,2,4-Trichlorobenzene	6.2	U	Retene	6.2	U
Naphthalene	6.2	U	Butylbenzylphthalate	6.2	U
4-Chloroaniline	6.2	U	Benzo(a)anthracene	6.2	U
Hexachlorobutadiene	6.2	U	3,3'-Dichlorobenzidine	6.2	U
4-Chloro-3-Methylphenol	6.2	U	Chrysene	6.2	U
2-Methylnaphthalene	6.2	U	**Bis(2-Ethylhexyl) Phthalate**	**18**	
1-Methylnaphthalene	6.2	U	Di-N-Octyl Phthalate	6.2	U
Hexachlorocyclopentadiene	25	U	Benzo(b)fluoranthene	6.2	UJ
2,4,6-Trichlorophenol	6.2	U	Benzo(k)fluoranthene	6.2	UJ
2,4,5-Trichlorophenol	6.2	U	Benzo(a)pyrene	6.2	U
2-Chloronaphthalene	6.2	U	3B-Coprostanol	62	UJ
2-Nitroaniline	6.2	U	Indeno(1,2,3-cd)pyrene	6.2	U
Dimethylphthalate	6.2	U	Dibenzo(a,h)anthracene	6.2	U
2,6-Dinitrotoluene	6.2	U	Benzo(ghi)perylene	6.2	U
Acenaphthylene	6.2	U			
3-Nitroaniline	6.2	U			
Acenaphthene	6.2	U			

Authorized By: _____ Release Date: 1/12/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43
LIMS Project ID: 1861-04
Lab ID: OBS4355A2
Method: SW8270
QC Type: Laboratory Method Blank
Date Prepared: 12/20/04
Matrix: Frozen Sediment/soil
Project Officer: Russ McMillan
Date Analyzed: 01/06/05
Units: ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	57	%
D5-Phenol	72	%
D4-2-Chlorophenol	60	%
1,2-Dichlorobenzene-D4	70	%
D5-Nitrobenzene	77	%
2-Fluorobiphenyl	78	%
Pyrene-D10	78	%
Terphenyl-D14	82	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43
LIMS Project ID: 1861-04
Lab ID: OCS4348A1
Method: SW8270
QC Type: Laboratory Control Sample
Date Prepared: 12/13/04
Matrix: Frozen Sediment/soil
Project Officer: Russ McMillan
Date Analyzed: 12/22/04
Units: %

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	51		2,4-Dinitrophenol	142	
Pyridine		NAF	4-Nitrophenol	63	
Aniline	59		Dibenzofuran	89	
Phenol	75		2,4-Dinitrotoluene	86	
Bis(2-Chloroethyl)Ether	65		Diethylphthalate	92	
2-Chlorophenol	70		Fluorene	88	
1,3-Dichlorobenzene	59		4-Chlorophenyl-Phenylether	89	
1,4-Dichlorobenzene	58		4-Nitroaniline	41	
1,2-Dichlorobenzene	64		4,6-Dinitro-2-Methylphenol	107	
Benzyl Alcohol	75		N-Nitrosodiphenylamine	60	
2-Methylphenol	40		1,2-Diphenylhydrazine	91	
2,2'-Oxybis[1-chloropropane]	68		4-Bromophenyl-Phenylether	91	
N-Nitroso-Di-N-Propylamine	78		Hexachlorobenzene	87	
4-Methylphenol	49		Pentachlorophenol	73	
Hexachloroethane	59		Phenanthrene	91	
Nitrobenzene	77		Anthracene	45	
Isophorone	85		Caffeine		NAF
2-Nitrophenol	74		Carbazole	195	
2,4-Dimethylphenol	14		Di-N-Butylphthalate	92	
Bis(2-Chloroethoxy)Methane	85		Fluoranthene	88	
Benzoic Acid	184		Benzidine	0	
2,4-Dichlorophenol	81		Pyrene	91	
1,2,4-Trichlorobenzene	71		Retene		NAF
Naphthalene	74		Butylbenzylphthalate	102	
4-Chloroaniline	26		Benzo(a)anthracene	80	
Hexachlorobutadiene	70		3,3'-Dichlorobenzidine	3	
4-Chloro-3-Methylphenol	93		Chrysene	94	
2-Methylnaphthalene	81		Bis(2-Ethylhexyl) Phthalate	100	
1-Methylnaphthalene		NAF	Di-N-Octyl Phthalate	105	
Hexachlorocyclopentadiene	22		Benzo(b)fluoranthene	96	
2,4,6-Trichlorophenol	60		Benzo(k)fluoranthene	90	
2,4,5-Trichlorophenol	78		Benzo(a)pyrene	51	
2-Chloronaphthalene	83		3B-Coprostanol		NAF
2-Nitroaniline	73		Indeno(1,2,3-cd)pyrene	98	
Dimethylphthalate	93		Dibenzo(a,h)anthracene	102	
2,6-Dinitrotoluene	98		Benzo(ghi)perylene	96	
Acenaphthylene	49				
3-Nitroaniline	86				
Acenaphthene	82				

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OCS4348A1 | **Method:** SW8270

QC Type: Laboratory Control Sample | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** %

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	62	%
D5-Phenol	73	%
D4-2-Chlorophenol	65	%
1,2-Dichlorobenzene-D4	57	%
D5-Nitrobenzene	71	%
2-Fluorobiphenyl	79	%
Pyrene-D10	85	%
Terphenyl-D14	91	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43
LIMS Project ID: 1861-04
Lab ID: OCS4355A1
Method: SW8270
QC Type: Laboratory Control Sample
Date Prepared: 12/20/04
Matrix: Frozen Sediment/soil
Project Officer: Russ McMillan
Date Analyzed: 01/06/05
Units: %

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	97		2,4-Dinitrophenol	141	
Pyridine		NAF	4-Nitrophenol	61	
Aniline	67		Dibenzofuran	89	
Phenol	82		2,4-Dinitrotoluene	85	
Bis(2-Chloroethyl)Ether	78		Diethylphthalate	92	
2-Chlorophenol	81		Fluorene	88	
1,3-Dichlorobenzene	75		4-Chlorophenyl-Phenylether	90	
1,4-Dichlorobenzene	77		4-Nitroaniline	51	
1,2-Dichlorobenzene	81		4,6-Dinitro-2-Methylphenol	109	
Benzyl Alcohol	76		N-Nitrosodiphenylamine	109	
2-Methylphenol	68		1,2-Diphenylhydrazine	94	
2,2'-Oxybis[1-chloropropane]	80		4-Bromophenyl-Phenylether	92	
N-Nitroso-Di-N-Propylamine	87		Hexachlorobenzene	87	
4-Methylphenol	73		Pentachlorophenol	63	
Hexachloroethane	76		Phenanthrene	89	
Nitrobenzene	88		Anthracene	59	
Isophorone	90		Caffeine		NAF
2-Nitrophenol	83		Carbazole	178	
2,4-Dimethylphenol	21		Di-N-Butylphthalate	88	
Bis(2-Chloroethoxy)Methane	95		Fluoranthene	84	
Benzoic Acid	170		Benzidine	0	
2,4-Dichlorophenol	91		Pyrene	87	
1,2,4-Trichlorobenzene	84		Retene		NAF
Naphthalene	83		Butylbenzylphthalate	99	
4-Chloroaniline	8.2		Benzo(a)anthracene	81	
Hexachlorobutadiene	85		3,3'-Dichlorobenzidine	32	
4-Chloro-3-Methylphenol	101		Chrysene	90	
2-Methylnaphthalene	88		Bis(2-Ethylhexyl) Phthalate	96	
1-Methylnaphthalene		NAF	Di-N-Octyl Phthalate	101	
Hexachlorocyclopentadiene	49		Benzo(b)fluoranthene	98	
2,4,6-Trichlorophenol	78		Benzo(k)fluoranthene	83	
2,4,5-Trichlorophenol	82		Benzo(a)pyrene	71	
2-Chloronaphthalene	87		3B-Coprostanol		NAF
2-Nitroaniline	77		Indeno(1,2,3-cd)pyrene	96	
Dimethylphthalate	93		Dibenzo(a,h)anthracene	99	
2,6-Dinitrotoluene	98		Benzo(ghi)perylene	98	
Acenaphthylene	61				
3-Nitroaniline	88				
Acenaphthene	84				

Authorized By: _____ Release Date: 1/12/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Lab ID: OCS4355A1 | **Method:** SW8270

QC Type: Laboratory Control Sample | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 01/06/05 | **Units:** %

Analyte	Result	Qualifier
Surrogate Recoveries		
2-Fluorophenol	82	%
D5-Phenol	85	%
D4-2-Chlorophenol	84	%
1,2-Dichlorobenzene-D4	76	%
D5-Nitrobenzene	87	%
2-Fluorobiphenyl	89	%
Pyrene-D10	90	%
Terphenyl-D14	95	%

Authorized By: _____ Release Date: 1/7/05

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Washington State
Department of Ecology

MANCHESTER ENVIRONMENTAL LABORATORY
7411 Beach Drive E, Port Orchard Washington 98366

CASE NARRATIVE

October 22, 2004

Subject:	Middle Waterway - 43
Samples:	04-434500 to -434504, -434504 to -434511, -434513, -434515 to -434517 and -434520
Project.	1861-04
Officer:	Russ McMillan
By:	Dickey D. Huntamer Organics Analysis Unit

SEMIVOLATILE COMPOUNDS

Analytical Method(s)

The semivolatile sediment samples were prepared by Soxhlet extraction with acetone following the Manchester modification of the EPA SW 846 8270 with capillary GC/MS analysis of the sample extracts. Normal QA/QC was performed with the sample analysis.

Holding Times

All analysis-holding times were within the recommended limits.

Instrument Tuning

Calibration against DFTPP is acceptable for the initial calibration, continuing calibration and all associated sample analyses.

Calibration

The average relative response factors for target analytes were above the minimums and % Relative Standard Deviations were within the maximum of 15% for the initial calibration

except for benzoic acid, 4, 6-dinitro-2-methylphenol, 2, 4-dinitrophenol and benzidine which were low. All of these compound results were qualified as estimates, "J".

The December 22nd continuing calibration response factors for the BNA target analytes were above the minimums and % Relative Standard Deviations were within the maximum of 20%. Benzoic acid and 2, 4-dinitrophenol were low and carbazole was high. All of these compounds in samples -434500 to -434507 were qualified, "J".

The December 23rd continuing calibration for BNA's had low responses for numerous compounds due to the high hydrocarbon content of the previous samples. The system was cleaned up and the samples reanalyzed January 7th. The following compounds were low, aniline, benzyl alcohol, benzoic acid, 4-chlooraniline, hexachlorocyclopentadiene, 2, 4, 6 trichlorophenol, 2, 4, 5-thrichlorphenol, 4-nitrophenol, pentachlorophenol, benzidine, 3, 3,'-dichlorobenzidine, and coprostanol. Two compounds benzoic acid and 4, dinitrophenol were high and are 'J' qualified.

Blanks

Several target compounds were detected in the laboratory blanks. These included phenol, diethylphthalate, di-n-butylphthalate and bis-(2-ethylhexyl)phthalate. Compounds that were detected in the sample and in the blank were considered real and not the result of contamination if the levels in the sample were greater than or equal to five times the area counts of the compounds in the associated method blank.

Surrogates

The surrogate recoveries were reasonable, acceptable, and within QC limits of 25% to 121% for 2fluorophenol, 24% -113% for d5-phenol, 20% to 130% for d4-2-chlorophenol and d4-1,2-dichlorbenzene, 23%-120% for d5-nitrobenzene, 30% to 115% for 2-fluorobiphenyl, 18% to 137% for d14-terphenyl, and 50% to 150% for d10-pyrene.

Matrix Spikes

A pair of matrix spikes taken from sample 04434500 was prepared. The matrix spike samples were spiked at 16 micrograms/sample. Most target recoveries were within acceptable limits except for hexachloroethane, 4-nitrophenol which had low recovery. Four compounds 4-chloroaniline, 4-nitrophenol in one matrix spike, benzidine and 3, 3'-dichlorobenzidine were not detected in the matrix spike samples. All results for these four compounds in the source sample -434500 were rejected "REJ".

Three compounds, hexachlorocyclopentadiene and 4-chloroaniline, 4, 6-dinitro-2-methylphenol, 2, 4 dinitrophenol, benzidine and 3, 3-dichlorobenzidine were not recovered in the matrix spikes and all results for these compounds were rejected, "REJ" in the matrix spike sample, 394041.

Replicates

No duplicate sample was prepared.

Laboratory Control Samples

Laboratory fortified blank (LFB), OCS4348A1 recoveries were acceptable except for, 3, 3'dichlorobenzidine which was low and benzidine which was not detected. All results for these compounds qualified "J "as estimates. Four compounds benzoic acid, 2, 4 dinitrophenol 4, 6-dinitro-2-methylphenol and carbazole had high recoveries. Results for these compounds were qualified if detected in the samples.

The second laboratory fortified blank (LFB), OCS4355A1 recoveries were acceptable except for, 4-chloroaniline which was low and benzidine which was not detected. Four compounds benzoic acid, 2, 4 dinitrophenol 4, 6-dinitro-2-methylphenol and carbazole had high recoveries Results for these compounds were qualified if detected in the samples.

Comments

The samples were concentrated to 0.5 ml where possible to achieve sediment quality standards for reporting limits.

The data is acceptable as qualified.

ASB
Ce/30/05

DATA QUALIFIER CODES:

U -The analyte was not detected at or above the reported value.

J -The analyte was positively identified. The associated numerical value is an estimate.

UJ -The analyte was not detected at or above the reported estimated result.

REJ -The data are unusable for all purposes.

NAF -Not analyzed for.

N -For organic analytes there is evidence the analyte is present in this sample.

NJ -There is evidence that the analyte is present. The associated numerical result is an estimate.

E -This qualifier is used when the concentration of the associated value exceeds the known calibration range.

Bold -The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434500 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: S-M-2004 | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	489	UJ
Pyridine	12	U	4-Nitrophenol		REJ
Aniline	6.1	U	**Dibenzofuran**	**1.5**	**J**
Phenol	6.1	U	2,4-Dinitrotoluene	6.1	U
Bis(2-Chloroethyl)Ether	6.1	U	Diethylphthalate	9.6	UJ
2-Chlorophenol	6.1	U	Fluorene	6.1	U
1,3-Dichlorobenzene	6.1	U	4-Chlorophenyl-Phenylether	6.1	U
1,4-Dichlorobenzene	6.1	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6.1	U	4,6-Dinitro-2-Methylphenol	245	UJ
Benzyl Alcohol	6.1	U	N-Nitrosodiphenylamine	6.1	U
2-Methylphenol	6.1	U	1,2-Diphenylhydrazine	6.1	U
2,2'-Oxybis[1-chloropropane]	6.1	U	4-Bromophenyl-Phenylether	6.1	U
N-Nitroso-Di-N-Propylamine	6.1	U	Hexachlorobenzene	6.1	U
4-Methylphenol	**4.4**	**J**	Pentachlorophenol	61	U
Hexachloroethane	6.1	UJ	**Phenanthrene**	**10**	
Nitrobenzene	6.1	U	**Anthracene**	**4.9**	**J**
Isophorone	6.1	U	Caffeine	6.1	U
2-Nitrophenol	6.1	U	**Carbazole**	**3**	**J**
2,4-Dimethylphenol	6.1	U	Di-N-Butylphthalate	10	UJ
Bis(2-Chloroethoxy)Methane	6.1	U	**Fluoranthene**	**168**	**J**
Benzoic Acid	489	UJ	Benzidine		REJ
2,4-Dichlorophenol	6.1	U	**Pyrene**	**127**	
1,2,4-Trichlorobenzene	6.1	U	Retene	6.1	U
Naphthalene	**3.2**	**J**	Butylbenzylphthalate	6.1	U
4-Chloroaniline		REJ	**Benzo(a)anthracene**	**42**	
Hexachlorobutadiene	6.1	U	3,3'-Dichlorobenzidine		REJ
4-Chloro-3-Methylphenol	6.1	U	**Chrysene**	**126**	
2-Methylnaphthalene	6.1	U	Bis(2-Ethylhexyl) Phthalate	42	UJ
1-Methylnaphthalene	6.1	U	Di-N-Octyl Phthalate	6.1	U
Hexachlorocyclopentadiene	24	U	**Benzo(b)fluoranthene**	**79**	**J**
2,4,6-Trichlorophenol	6.1	U	**Benzo(k)fluoranthene**	**85**	**J**
2,4,5-Trichlorophenol	6.1	U	**Benzo(a)pyrene**	**39**	
2-Chloronaphthalene	6.1	U	3B-Coprostanol	61	UJ
2-Nitroaniline	6.1	U	**Indeno(1,2,3-cd)pyrene**	**27**	
Dimethylphthalate	6.1	U	**Dibenzo(a,h)anthracene**	**9.3**	
2,6-Dinitrotoluene	6.1	U	**Benzo(ghi)perylene**	**30**	
Acenaphthylene	**4.6**	**J**			
3-Nitroaniline	6.1	U			
Acenaphthene	6.1	U			

Authorized By: DHS Release Date: 1/11/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434500 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: S-M-2004 | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier
Surrogate Recoveries		
2-Fluorophenol	76	%
D5-Phenol	53	%
D4-2-Chlorophenol	75	%
1,2-Dichlorobenzene-D4	52	%
D5-Nitrobenzene	77	%
2-Fluorobiphenyl	77	%
Pyrene-D10	78	%
Terphenyl-D14	81	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434500 (matrix spike - LMX1) | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: S-M-2004 | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** % Recovery

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	69		2,4-Dinitrophenol	125	
Pyridine		NAF	4-Nitrophenol	47	
Aniline	64		Dibenzofuran	92	
Phenol	73		2,4-Dinitrotoluene	60	
Bis(2-Chloroethyl)Ether	77		Diethylphthalate	92	
2-Chlorophenol	75		Fluorene	90	
1,3-Dichlorobenzene	59		4-Chlorophenyl-Phenylether	88	
1,4-Dichlorobenzene	60		4-Nitroaniline	15	
1,2-Dichlorobenzene	67		4,6-Dinitro-2-Methylphenol	67	
Benzyl Alcohol	106		N-Nitrosodiphenylamine	116	
2-Methylphenol	98		1,2-Diphenylhydrazine	86	
2,2'-Oxybis[1-chloropropane]	74		4-Bromophenyl-Phenylether	102	
N-Nitroso-Di-N-Propylamine	84		Hexachlorobenzene	99	
4-Methylphenol	91		Pentachlorophenol	50	
Hexachloroethane	37		Phenanthrene	98	
Nitrobenzene	85		Anthracene	65	
Isophorone	90		Caffeine		NAF
2-Nitrophenol	55		Carbazole	186	
2,4-Dimethylphenol	61		Di-N-Butylphthalate	99	
Bis(2-Chloroethoxy)Methane	88		Fluoranthene	63	
Benzoic Acid	122		Benzidine	0	
2,4-Dichlorophenol	83		Pyrene	65	
1,2,4-Trichlorobenzene	77		Retene		NAF
Naphthalene	80		Butylbenzylphthalate	88	
4-Chloroaniline	0		Benzo(a)anthracene	77	
Hexachlorobutadiene	73		3,3'-Dichlorobenzidine	0	
4-Chloro-3-Methylphenol	94		Chrysene	67	
2-Methylnaphthalene	91		Bis(2-Ethylhexyl) Phthalate	109	
1-Methylnaphthalene		NAF	Di-N-Octyl Phthalate	107	
Hexachlorocyclopentadiene	11		Benzo(b)fluoranthene	88	
2,4,6-Trichlorophenol	65		Benzo(k)fluoranthene	72	
2,4,5-Trichlorophenol	81		Benzo(a)pyrene	67	
2-Chloronaphthalene	84		3B-Coprostanol		NAF
2-Nitroaniline	61		Indeno(1,2,3-cd)pyrene	80	
Dimethylphthalate	92		Dibenzo(a,h)anthracene	88	
2,6-Dinitrotoluene	78		Benzo(ghi)perylene	75	
Acenaphthylene	53				
3-Nitroaniline	66				
Acenaphthene	86				

Authorized By: _____ Release Date: 2/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434500 (matrix spike - LMX1) | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: S-M-2004 | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** % Recovery

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	68	%
D5-Phenol	70	%
D4-2-Chlorophenol	74	%
1,2-Dichlorobenzene-D4	58	%
D5-Nitrobenzene	80	%
2-Fluorobiphenyl	82	%
Pyrene-D10	85	%
Terphenyl-D14	87	%

Authorized By: _____ Release Date: 1/2/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434500 (matrix spike - LMX2) | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: S-M-2004 | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** % Recovery

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	60		2,4-Dinitrophenol	125	
Pyridine		NAF	4-Nitrophenol	0	
Aniline	57		Dibenzofuran	84	
Phenol	57		2,4-Dinitrotoluene	52	
Bis(2-Chloroethyl)Ether	67		Diethylphthalate	80	
2-Chlorophenol	64		Fluorene	82	
1,3-Dichlorobenzene	50		4-Chlorophenyl-Phenylether	82	
1,4-Dichlorobenzene	51		4-Nitroaniline	18	
1,2-Dichlorobenzene	58		4,6-Dinitro-2-Methylphenol	67	
Benzyl Alcohol	84		N-Nitrosodiphenylamine	97	
2-Methylphenol	80		1,2-Diphenylhydrazine	81	
2,2'-Oxybis[1-chloropropane]	65		4-Bromophenyl-Phenylether	84	
N-Nitroso-Di-N-Propylamine	73		Hexachlorobenzene	81	
4-Methylphenol	85		Pentachlorophenol	32	
Hexachloroethane	33		Phenanthrene	80	
Nitrobenzene	73		Anthracene	54	
Isophorone	80		Caffeine		NAF
2-Nitrophenol	50		Carbazole	153	
2,4-Dimethylphenol	48		Di-N-Butylphthalate	87	
Bis(2-Chloroethoxy)Methane	78		Fluoranthene	49	
Benzoic Acid	121		Benzidine	0	
2,4-Dichlorophenol	76		Pyrene	60	
1,2,4-Trichlorobenzene	68		Retene		NAF
Naphthalene	71		Butylbenzylphthalate	89	
4-Chloroaniline	0		Benzo(a)anthracene	70	
Hexachlorobutadiene	65		3,3'-Dichlorobenzidine	0	
4-Chloro-3-Methylphenol	87		Chrysene	65	
2-Methylnaphthalene	83		Bis(2-Ethylhexyl) Phthalate	104	
1-Methylnaphthalene		NAF	Di-N-Octyl Phthalate	104	
Hexachlorocyclopentadiene	14		Benzo(b)fluoranthene	75	
2,4,6-Trichlorophenol	53		Benzo(k)fluoranthene	78	
2,4,5-Trichlorophenol	81		Benzo(a)pyrene	61	
2-Chloronaphthalene	75		3B-Coprostanol		NAF
2-Nitroaniline	65		Indeno(1,2,3-cd)pyrene	74	
Dimethylphthalate	84		Dibenzo(a,h)anthracene	82	
2,6-Dinitrotoluene	71		Benzo(ghi)perylene	70	
Acenaphthylene	48				
3-Nitroaniline	63				
Acenaphthene	77				

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434500 (matrix spike - LMX2) | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: S-M-2004 | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** % Recovery

Analyte	Result	Qualifier
Surrogate Recoveries		
2-Fluorophenol	61	%
D5-Phenol	63	%
D4-2-Chlorophenol	61	%
1,2-Dichlorobenzene-D4	53	%
D5-Nitrobenzene	71	%
2-Fluorobiphenyl	75	%
Pyrene-D10	82	%
Terphenyl-D14	86	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434501 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: P-M-2004 | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	486	UJ
Pyridine	12	U	4-Nitrophenol	61	U
Aniline	6.1	U	Dibenzofuran	6.1	U
Phenol	6.1	U	2,4-Dinitrotoluene	6.1	U
Bis(2-Chloroethyl)Ether	6.1	U	Diethylphthalate	7.6	UJ
2-Chlorophenol	6.1	U	Fluorene	6.1	U
1,3-Dichlorobenzene	6.1	U	4-Chlorophenyl-Phenylether	6.1	U
1,4-Dichlorobenzene	6.1	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6.1	U	4,6-Dinitro-2-Methylphenol	243	UJ
Benzyl Alcohol	6.1	U	N-Nitrosodiphenylamine	6.1	U
2-Methylphenol	6.1	U	1,2-Diphenylhydrazine	6.1	U
2,2'-Oxybis[1-chloropropane]	6.1	U	4-Bromophenyl-Phenylether	6.1	U
N-Nitroso-Di-N-Propylamine	6.1	U	Hexachlorobenzene	6.1	U
4-Methylphenol	6.1	U	Pentachlorophenol	61	U
Hexachloroethane	6.1	U	**Phenanthrene**	**6.6**	
Nitrobenzene	6.1	U	Anthracene	6.1	U
Isophorone	6.1	U	Caffeine	6.1	U
2-Nitrophenol	6.1	U	Carbazole	6.1	UJ
2,4-Dimethylphenol	6.1	U	Di-N-Butylphthalate	16	UJ
Bis(2-Chloroethoxy)Methane	6.1	U	**Fluoranthene**	**8.6**	
Benzoic Acid	486	UJ	Benzidine	6.1	UJ
2,4-Dichlorophenol	6.1	U	**Pyrene**	**7.9**	
1,2,4-Trichlorobenzene	6.1	U	Retene	6.1	U
Naphthalene	6.1	U	Butylbenzylphthalate	6.1	U
4-Chloroaniline	6.1	U	Benzo(a)anthracene	6.1	U
Hexachlorobutadiene	6.1	U	3,3'-Dichlorobenzidine	6.1	U
4-Chloro-3-Methylphenol	6.1	U	**Chrysene**	**4.9**	**J**
2-Methylnaphthalene	6.1	U	Bis(2-Ethylhexyl) Phthalate	34	UJ
1-Methylnaphthalene	6.1	U	Di-N-Octyl Phthalate	6.1	U
Hexachlorocyclopentadiene	24	U	Benzo(b)fluoranthene	6.1	UJ
2,4,6-Trichlorophenol	6.1	U	Benzo(k)fluoranthene	6.1	UJ
2,4,5-Trichlorophenol	6.1	U	Benzo(a)pyrene	6.1	U
2-Chloronaphthalene	6.1	U	3B-Coprostanol	61	UJ
2-Nitroaniline	6.1	U	Indeno(1,2,3-cd)pyrene	6.1	U
Dimethylphthalate	6.1	U	Dibenzo(a,h)anthracene	6.1	U
2,6-Dinitrotoluene	6.1	U	Benzo(ghi)perylene	6.1	U
Acenaphthylene	6.1	U			
3-Nitroaniline	6.1	U			
Acenaphthene	6.1	U			

Authorized By: _____ Release Date: 1/11/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434501 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: P-M-2004 | **Date Prepared:** 12/20/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	74	%
D5-Phenol	70	%
D4-2-Chlorophenol	70	%
1,2-Dichlorobenzene-D4	42	%
D5-Nitrobenzene	70	%
2-Fluorobiphenyl	71	%
Pyrene-D10	73	%
Terphenyl-D14	77	%

Authorized By: _____ Release Date: 1/9/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434502 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: Q-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	480	UJ
Pyridine	12	U	4-Nitrophenol	60	U
Aniline	6	U	Dibenzofuran	6	U
Phenol	6	U	2,4-Dinitrotoluene	6	U
Bis(2-Chloroethyl)Ether	6	U	Diethylphthalate	6.9	UJ
2-Chlorophenol	6	U	Fluorene	6	U
1,3-Dichlorobenzene	6	U	4-Chlorophenyl-Phenylether	6	U
1,4-Dichlorobenzene	6	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6	U	4,6-Dinitro-2-Methylphenol	240	UJ
Benzyl Alcohol	6	U	N-Nitrosodiphenylamine	6	U
2-Methylphenol	6	U	1,2-Diphenylhydrazine	6	U
2,2'-Oxybis[1-chloropropane]	6	U	4-Bromophenyl-Phenylether	6	U
N-Nitroso-Di-N-Propylamine	6	U	Hexachlorobenzene	6	U
4-Methylphenol	6	U	Pentachlorophenol	60	U
Hexachloroethane	6	U	**Phenanthrene**	**8.2**	
Nitrobenzene	6	U	Anthracene	6	U
Isophorone	6	U	Caffeine	6	U
2-Nitrophenol	6	U	Carbazole	6	UJ
2,4-Dimethylphenol	6	U	Di-N-Butylphthalate	35	UJ
Bis(2-Chloroethoxy)Methane	6	U	**Fluoranthene**	**11**	
Benzoic Acid	480	UJ	Benzidine	6	UJ
2,4-Dichlorophenol	6	U	**Pyrene**	**11**	
1,2,4-Trichlorobenzene	6	U	**Retene**	**3.3**	**J**
Naphthalene	**3.8**	**J**	Butylbenzylphthalate	6	U
4-Chloroaniline	6	U	**Benzo(a)anthracene**	**3.5**	**J**
Hexachlorobutadiene	6	U	3,3'-Dichlorobenzidine	6	U
4-Chloro-3-Methylphenol	6	U	**Chrysene**	**6.1**	
2-Methylnaphthalene	6	U	Bis(2-Ethylhexyl) Phthalate	48	UJ
1-Methylnaphthalene	6	U	Di-N-Octyl Phthalate	6	U
Hexachlorocyclopentadiene	24	U	**Benzo(b)fluoranthene**	**4.4**	**J**
2,4,6-Trichlorophenol	6	U	**Benzo(k)fluoranthene**	**4.7**	**J**
2,4,5-Trichlorophenol	6	U	**Benzo(a)pyrene**	**3.1**	**J**
2-Chloronaphthalene	6	U	3B-Coprostanol	60	UJ
2-Nitroaniline	6	U	Indeno(1,2,3-cd)pyrene	6	U
Dimethylphthalate	6	U	Dibenzo(a,h)anthracene	6	U
2,6-Dinitrotoluene	6	U	**Benzo(ghi)perylene**	**3.3**	**J**
Acenaphthylene	6	U			
3-Nitroaniline	6	U			
Acenaphthene	6	U			

Authorized By: _____ Release Date: 1/12/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434502 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: Q-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	66	%
D5-Phenol	77	%
D4-2-Chlorophenol	68	%
1,2-Dichlorobenzene-D4	41	%
D5-Nitrobenzene	70	%
2-Fluorobiphenyl	70	%
Pyrene-D10	77	%
Terphenyl-D14	79	%

Authorized By: D.A. Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434503 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: N-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	492	UJ
Pyridine	12	U	4-Nitrophenol	62	U
Aniline	6.2	U	Dibenzofuran	6.2	U
Phenol	6.2	U	2,4-Dinitrotoluene	6.2	U
Bis(2-Chloroethyl)Ether	6.2	U	Diethylphthalate	9.9	UJ
2-Chlorophenol	6.2	U	Fluorene	6.2	U
1,3-Dichlorobenzene	6.2	U	4-Chlorophenyl-Phenylether	6.2	U
1,4-Dichlorobenzene	6.2	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	6.2	U	4,6-Dinitro-2-Methylphenol	246	UJ
Benzyl Alcohol	6.2	U	N-Nitrosodiphenylamine	6.2	U
2-Methylphenol	6.2	U	1,2-Diphenylhydrazine	6.2	U
2,2'-Oxybis[1-chloropropane]	6.2	U	4-Bromophenyl-Phenylether	6.2	U
N-Nitroso-Di-N-Propylamine	6.2	U	Hexachlorobenzene	6.2	U
4-Methylphenol	6.2	U	Pentachlorophenol	62	U
Hexachloroethane	6.2	U	**Phenanthrene**	**8**	
Nitrobenzene	6.2	U	Anthracene	6.2	U
Isophorone	6.2	U	Caffeine	6.2	U
2-Nitrophenol	6.2	U	Carbazole	6.2	UJ
2,4-Dimethylphenol	6.2	U	Di-N-Butylphthalate	22	UJ
Bis(2-Chloroethoxy)Methane	6.2	U	**Fluoranthene**	**9.9**	
Benzoic Acid	492	UJ	Benzidine	6.2	UJ
2,4-Dichlorophenol	6.2	U	**Pyrene**	**10**	
1,2,4-Trichlorobenzene	6.2	U	**Retene**	**5.3**	**J**
Naphthalene	6.2	U	Butylbenzylphthalate	6.2	U
4-Chloroaniline	6.2	U	**Benzo(a)anthracene**	**3.5**	**J**
Hexachlorobutadiene	6.2	U	3,3'-Dichlorobenzidine	6.2	U
4-Chloro-3-Methylphenol	6.2	U	**Chrysene**	**8**	
2-Methylnaphthalene	6.2	U	Bis(2-Ethylhexyl) Phthalate	49	UJ
1-Methylnaphthalene	6.2	U	Di-N-Octyl Phthalate	6.2	U
Hexachlorocyclopentadiene	25	U	Benzo(b)fluoranthene	6.2	UJ
2,4,6-Trichlorophenol	6.2	U	Benzo(k)fluoranthene	6.2	UJ
2,4,5-Trichlorophenol	6.2	U	Benzo(a)pyrene	6.2	U
2-Chloronaphthalene	6.2	U	3B-Coprostanol	62	UJ
2-Nitroaniline	6.2	U	Indeno(1,2,3-cd)pyrene	6.2	U
Dimethylphthalate	6.2	U	Dibenzo(a,h)anthracene	6.2	U
2,6-Dinitrotoluene	6.2	U	Benzo(ghi)perylene	6.2	U
Acenaphthylene	6.2	U			
3-Nitroaniline	6.2	U			
Acenaphthene	6.2	U			

Authorized By: _____ Release Date: 1/12/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434503 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: N-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/22/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	75	%
D5-Phenol	80	%
D4-2-Chlorophenol	74	%
1,2-Dichlorobenzene-D4	49	%
D5-Nitrobenzene	78	%
2-Fluorobiphenyl	78	%
Pyrene-D10	78	%
Terphenyl-D14	80	%

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434504 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: R-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/23/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	12	U	2,4-Dinitrophenol	475	UJ
Pyridine	12	U	4-Nitrophenol	59	U
Aniline	5.9	U	Dibenzofuran	5.9	U
Phenol	5.9	U	2,4-Dinitrotoluene	5.9	U
Bis(2-Chloroethyl)Ether	5.9	U	Diethylphthalate	8	UJ
2-Chlorophenol	5.9	U	Fluorene	5.9	U
1,3-Dichlorobenzene	5.9	U	4-Chlorophenyl-Phenylether	5.9	U
1,4-Dichlorobenzene	5.9	U	4-Nitroaniline	12	U
1,2-Dichlorobenzene	5.9	U	4,6-Dinitro-2-Methylphenol	237	UJ
Benzyl Alcohol	5.9	U	N-Nitrosodiphenylamine	5.9	U
2-Methylphenol	5.9	U	1,2-Diphenylhydrazine	5.9	U
2,2'-Oxybis[1-chloropropane]	5.9	U	4-Bromophenyl-Phenylether	5.9	U
N-Nitroso-Di-N-Propylamine	5.9	U	Hexachlorobenzene	5.9	U
4-Methylphenol	5.9	U	Pentachlorophenol	59	U
Hexachloroethane	5.9	U	**Phenanthrene**	**8.7**	
Nitrobenzene	5.9	U	Anthracene	5.9	U
Isophorone	5.9	U	Caffeine	5.9	U
2-Nitrophenol	5.9	U	Carbazole	5.9	UJ
2,4-Dimethylphenol	5.9	U	Di-N-Butylphthalate	15	UJ
Bis(2-Chloroethoxy)Methane	5.9	U	**Fluoranthene**	**6.1**	
Benzoic Acid	475	UJ	Benzidine	5.9	U
2,4-Dichlorophenol	5.9	U	**Pyrene**	**5.2**	**J**
1,2,4-Trichlorobenzene	5.9	U	Retene	5.9	U
Naphthalene	5.9	U	Butylbenzylphthalate	5.9	U
4-Chloroaniline	5.9	U	Benzo(a)anthracene	5.9	U
Hexachlorobutadiene	5.9	U	3,3'-Dichlorobenzidine	5.9	U
4-Chloro-3-Methylphenol	5.9	U	Chrysene	5.9	U
2-Methylnaphthalene	5.9	U	Bis(2-Ethylhexyl) Phthalate	33	UJ
1-Methylnaphthalene	5.9	U	Di-N-Octyl Phthalate	5.9	U
Hexachlorocyclopentadiene	24	U	Benzo(b)fluoranthene	5.9	UJ
2,4,6-Trichlorophenol	5.9	U	Benzo(k)fluoranthene	5.9	UJ
2,4,5-Trichlorophenol	5.9	U	Benzo(a)pyrene	5.9	U
2-Chloronaphthalene	5.9	U	3B-Coprostanol	59	UJ
2-Nitroaniline	5.9	U	Indeno(1,2,3-cd)pyrene	5.9	U
Dimethylphthalate	5.9	U	Dibenzo(a,h)anthracene	5.9	U
2,6-Dinitrotoluene	5.9	U	Benzo(ghi)perylene	5.9	U
Acenaphthylene	5.9	U			
3-Nitroaniline	5.9	U			
Acenaphthene	5.9	U			

Authorized By: _____ Release Date: 1/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434504 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: R-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/23/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	72	%
D5-Phenol	80	%
D4-2-Chlorophenol	76	%
1,2-Dichlorobenzene-D4	43	%
D5-Nitrobenzene	76	%
2-Fluorobiphenyl	75	%
Pyrene-D10	75	%
Terphenyl-D14	78	%

Authorized By: _____ Release Date: _____

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434505 | **Date Collected:** 10/14/04 | **Method:** SW8270

Field ID: O-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil

Project Officer: Russ McMillan | **Date Analyzed:** 12/23/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier	Analyte	Result	Qualifier
N-Nitrosodimethylamine	10	U	2,4-Dinitrophenol	404	UJ
Pyridine	10	U	4-Nitrophenol	50	U
Aniline	5.1	U	Dibenzofuran	5.1	U
Phenol	5.1	U	2,4-Dinitrotoluene	5.1	U
Bis(2-Chloroethyl)Ether	5.1	U	Diethylphthalate	5.1	U
2-Chlorophenol	5.1	U	Fluorene	5.1	U
1,3-Dichlorobenzene	5.1	U	4-Chlorophenyl-Phenylether	5.1	U
1,4-Dichlorobenzene	5.1	U	4-Nitroaniline	10	U
1,2-Dichlorobenzene	5.1	U	4,6-Dinitro-2-Methylphenol	202	UJ
Benzyl Alcohol	5.1	U	N-Nitrosodiphenylamine	5.1	U
2-Methylphenol	5.1	U	1,2-Diphenylhydrazine	5.1	U
2,2'-Oxybis[1-chloropropane]	5.1	U	4-Bromophenyl-Phenylether	5.1	U
N-Nitroso-Di-N-Propylamine	5.1	U	Hexachlorobenzene	5.1	U
4-Methylphenol	5.1	U	Pentachlorophenol	50	U
Hexachloroethane	5.1	U	**Phenanthrene**	**8.1**	
Nitrobenzene	5.1	U	Anthracene	5.1	U
Isophorone	5.1	U	Caffeine	5.1	U
2-Nitrophenol	5.1	U	Carbazole	5.1	UJ
2,4-Dimethylphenol	5.1	U	Di-N-Butylphthalate	10	UJ
Bis(2-Chloroethoxy)Methane	5.1	U	**Fluoranthene**	**12**	
Benzoic Acid	404	UJ	Benzidine	5.1	U
2,4-Dichlorophenol	5.1	U	**Pyrene**	**10**	
1,2,4-Trichlorobenzene	5.1	U	Retene	5.1	U
Naphthalene	5.1	U	Butylbenzylphthalate	5.1	U
4-Chloroaniline	5.1	U	Benzo(a)anthracene	5.1	U
Hexachlorobutadiene	5.1	U	3,3'-Dichlorobenzidine	5.1	U
4-Chloro-3-Methylphenol	5.1	U	**Chrysene**	**5.4**	
2-Methylnaphthalene	5.1	U	**Bis(2-Ethylhexyl) Phthalate**	**52**	
1-Methylnaphthalene	5.1	U	Di-N-Octyl Phthalate	5.1	U
Hexachlorocyclopentadiene	20	U	Benzo(b)fluoranthene	5.1	UJ
2,4,6-Trichlorophenol	5.1	U	Benzo(k)fluoranthene	5.1	UJ
2,4,5-Trichlorophenol	5.1	U	Benzo(a)pyrene	5.1	U
2-Chloronaphthalene	5.1	U	3B-Coprostanol	51	UJ
2-Nitroaniline	5.1	U	Indeno(1,2,3-cd)pyrene	5.1	U
Dimethylphthalate	5.1	U	Dibenzo(a,h)anthracene	5.1	U
2,6-Dinitrotoluene	5.1	U	Benzo(ghi)perylene	5.1	U
Acenaphthylene	5.1	U			
3-Nitroaniline	5.1	U			
Acenaphthene	5.1	U			

Authorized By: _____ Release Date: 9/7/05

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Base/Neutral/Acids

Project Name: Middle Waterway - 43 | **LIMS Project ID:** 1861-04

Sample: 04434505 | **Date Collected:** 10/14/04 | **Method:** SW8270
Field ID: O-M-2004 | **Date Prepared:** 12/13/04 | **Matrix:** Frozen Sediment/soil
Project Officer: Russ McMillan | **Date Analyzed:** 12/23/04 | **Units:** ug/Kg dw

Analyte	Result	Qualifier

Surrogate Recoveries

2-Fluorophenol	61	%
D5-Phenol	70	%
D4-2-Chlorophenol	65	%
1,2-Dichlorobenzene-D4	38	%
D5-Nitrobenzene	68	%
2-Fluorobiphenyl	71	%
Pyrene-D10	79	%
Terphenyl-D14	81	%

Authorized By: _____ Release Date: 1/7/05

Manchester Environmental Laboratory

7411 Beach Drive East, Port Orchard, Washington 98366

November 29, 2004

Subject:	**Middle Waterway - 43**
Samples:	04-434515, 434516, 434517, 434520
Project ID:	1861-04
Laboratory:	Analytical Resources, Inc.
Project Officer:	Russ McMillan
By:	Karin Feddersen KF

Volatile Organic Analysis

Summary

See the contract laboratory's case narrative for more details.

Analytical Methods

These samples were analyzed using EPA Method 8260. Routine QA/QC procedures were performed.

Calibration

Instrument calibration(s) and calibration checks were performed in accordance with the appropriate method. All initial and continuing calibration checks were within control limits with several exceptions which did not affect the results. Analytes with high recoveries indicating a possible high bias were not detected in the samples; results were therefore unaffected.

Blanks

No target compounds were detected in any of the method blanks.

Surrogates

Surrogate recoveries were within laboratory limits for all samples.

Holding Times

All samples were analyzed within the recommended holding time of 14 days from collection with the exception of sample 434515. This sample was collected on 10/15/04 rather than 10/19/04 as written on the paperwork. It was analyzed on 11/2/04, 4 days past the holding time. Since all samples were collected using the "bulk" procedure, results may be biased low.

Case Narrative

Client: WDOE
Project: Middle Waterway-43
Matrix: Sediment
ARI Job: HG99

Four sediment samples were accepted at Analytical Resources, Inc. on October 28, 2004 for analysis of Volatiles. The samples were received in good condition with no discrepancies in paperwork, at a cooler temperature of 13.0°C measured by IR thermometer, following ARI SOP.

Volatile Analysis by EPA SW8260B

The samples were analyzed November 2, 2004, within the recommended holding time of fourteen days.

Initial calibration met requirements of the method and ARI SOP.

The continuing calibration of Bromomethane and Chloroethane did not meet control limits. As there were no detectable results of these compounds at the reporting limits and responses are high, no corrective actions were taken. The continuing calibration for all other compounds met control limits.

The method blank was free of analytes of interest at the reporting limit.

An LCS/LCSD set was analyzed to provide both precision and accuracy measurements. The LCS/LCSD had recoveries and RPDs within ARI limits.

Surrogates were within ARI limits.

A matrix specific spike and spike duplicate were prepared for sample HG99A (**434515**). The MS/MSD recoveries for Vinyl Acetate and Acrolein were low, and the RPD for these compounds were outside of control limits. Because these compounds were not detectable in any of the samples at the reporting limit and the LCS/LCSD met control limits, no corrective actions were taken. All other compounds met recovery and RPD control limits.

There were no other incidents of note.

ASB
11/30/05

ANALYTICAL RESOURCES INCORPORATED

SW8260 SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Client ID	DCE	TOL	BFB	DCB	TOT OUT
MB-110204	99.4%	96.3%	89.1%	89.2%	0
LCS-110204	91.5%	102%	91.4%	88.9%	0
LCSD-110204	94.1%	99.7%	91.5%	91.4%	0
434515	104%	97.6%	88.5%	88.9%	0
434515 MS	99.2%	103%	89.7%	90.7%	0
434515 MSD	95.4%	103%	92.1%	89.9%	0
434516	102%	98.5%	87.5%	90.8%	0
434517	99.7%	98.5%	87.8%	90.4%	0
434520	101%	100%	85.7%	89.7%	0

		LCS/MB LIMITS	QC LIMITS
(DCE)	= d4-1,2-Dichloroethane	(74-128)	(71-143)
(TOL)	= d8-Toluene	(76-119)	(79-118)
(BFB)	= Bromofluorobenzene	(78-116)	(69-126)
(DCB)	= d4-1,2-Dichlorobenzene	(78-122)	(79-119)

Prep Method: SW5030
Analytical Method: SW8260B
Log Number Range: 04-18552 to 04-18555

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: MB-110204
METHOD BLANK

Lab Sample ID: MB-110204
LIMS ID: 04-18552
Matrix: Sediment
Data Release Authorized:
Reported: 11/11/04

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Date Sampled: NA
Date Received: NA

Instrument/Analyst: FINN5/JA
Date Analyzed: 11/02/04 18:40

Sample Amount: 5.00 g
Percent Moisture: NA

CAS Number	Analyte	RL	Result
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
1330-20-7	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
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

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: MB-110204
METHOD BLANK

Lab Sample ID: MB-110204
LIMS ID: 04-18552
Matrix: Sediment
Date Analyzed: 11/02/04 18:40

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

CAS Number	Analyte	RL	Result
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	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	99.4%
d8-Toluene	96.3%
Bromofluorobenzene	89.1%
d4-1,2-Dichlorobenzene	89.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: 434515
SAMPLE

Lab Sample ID: HG99A
LIMS ID: 04-18552
Matrix: Sediment
Data Release Authorized:
Reported: 11/11/04

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Date Sampled: 10/15/04
Date Received: 10/28/04

Instrument/Analyst: FINN5/JA
Date Analyzed: 11/02/04 21:58

Sample Amount: 4.27 g-dry-wt
Percent Moisture: 14.9%

CAS Number	Analyte	RL	Result
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	5.9	< 5.9 U
75-15-0	Carbon Disulfide	1.2	< 1.2 U
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	5.9	< 5.9 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	5.9	< 5.9 UJ KF
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
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	2.3	< 2.3 U
1330-20-7	**m,p-Xylene**	**1.2**	**1.2**
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
74-88-4	Methyl Iodide	1.2	< 1.2 U
74-96-4	Bromoethane	2.3	< 2.3 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

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: 434515
SAMPLE

Lab Sample ID: HG99A
LIMS ID: 04-18552
Matrix: Sediment
Date Analyzed: 11/02/04 21:58

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

CAS Number	Analyte	RL	Result
96-18-4	1,2,3-Trichloropropane	2.3	< 2.3 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 UJ KF
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 UJ KF
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	104%
d8-Toluene	97.6%
Bromofluorobenzene	88.5%
d4-1,2-Dichlorobenzene	88.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: 434516
SAMPLE

Lab Sample ID: HG99B
LIMS ID: 04-18553
Matrix: Sediment
Data Release Authorized:
Reported: 11/11/04

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Date Sampled: 10/14/04
Date Received: 10/28/04

Instrument/Analyst: FINN5/JA
Date Analyzed: 11/02/04 22:27

Sample Amount: 4.37 g-dry-wt
Percent Moisture: 12.9%

CAS Number	Analyte	RL	Result
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
75-09-2	Methylene Chloride	2.3	< 2.3 U
67-64-1	Acetone	5.7	< 5.7 U
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
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	5.7	< 5.7 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	5.7	< 5.7 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	5.7	< 5.7 U
75-25-2	Bromoform	1.1	< 1.1 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.7	< 5.7 U
591-78-6	2-Hexanone	5.7	< 5.7 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	2.3	< 2.3 U
1330-20-7	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	57	< 57 U
74-88-4	Methyl Iodide	1.1	< 1.1 U
74-96-4	Bromoethane	2.3	< 2.3 U
107-13-1	Acrylonitrile	5.7	< 5.7 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	5.7	< 5.7 U

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: 434516
SAMPLE

Lab Sample ID: HG99B
LIMS ID: 04-18553
Matrix: Sediment
Date Analyzed: 11/02/04 22:27

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

CAS Number	Analyte	RL	Result
96-18-4	1,2,3-Trichloropropane	2.3	< 2.3 U
110-57-6	trans-1,4-Dichloro-2-butene	5.7	< 5.7 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	5.7	< 5.7 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	5.7	< 5.7 U
91-20-3	Naphthalene	5.7	< 5.7 U
87-61-6	1,2,3-Trichlorobenzene	5.7	< 5.7 U

Reported in μg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	102%
d8-Toluene	98.5%
Bromofluorobenzene	87.5%
d4-1,2-Dichlorobenzene	90.8%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: 434517
SAMPLE

Lab Sample ID: HG99C
LIMS ID: 04-18554
Matrix: Sediment
Data Release Authorized:
Reported: 11/11/04

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Date Sampled: 10/19/04
Date Received: 10/28/04

Instrument/Analyst: FINN5/JA
Date Analyzed: 11/02/04 22:55

Sample Amount: 4.39 g-dry-wt
Percent Moisture: 13.6%

CAS Number	Analyte	RL	Result
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
75-09-2	Methylene Chloride	2.3	< 2.3 U
67-64-1	Acetone	5.7	< 5.7 U
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
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	5.7	< 5.7 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	5.7	< 5.7 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	5.7	< 5.7 U
75-25-2	Bromoform	1.1	< 1.1 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.7	< 5.7 U
591-78-6	2-Hexanone	5.7	< 5.7 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	2.3	< 2.3 U
1330-20-7	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	57	< 57 U
74-88-4	Methyl Iodide	1.1	< 1.1 U
74-96-4	Bromoethane	2.3	< 2.3 U
107-13-1	Acrylonitrile	5.7	< 5.7 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	5.7	< 5.7 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B **Sample ID: 434517**
 SAMPLE

Lab Sample ID: HG99C
LIMS ID: 04-18554
Matrix: Sediment
Date Analyzed: 11/02/04 22:55

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

CAS Number	Analyte	RL	Result
96-18-4	1,2,3-Trichloropropane	2.3	< 2.3 U
110-57-6	trans-1,4-Dichloro-2-butene	5.7	< 5.7 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	5.7	< 5.7 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	5.7	< 5.7 U
91-20-3	Naphthalene	5.7	< 5.7 U
87-61-6	1,2,3-Trichlorobenzene	5.7	< 5.7 U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.7%
d8-Toluene	98.5%
Bromofluorobenzene	87.8%
d4-1,2-Dichlorobenzene	90.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B **Sample ID: 434520**
 SAMPLE

Lab Sample ID: HG99D
LIMS ID: 04-18555
Matrix: Sediment
Data Release Authorized:
Reported: 11/11/04

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Date Sampled: 10/15/04
Date Received: 10/28/04

Instrument/Analyst: FINN5/JA
Date Analyzed: 11/02/04 23:24

Sample Amount: 4.28 g-dry-wt
Percent Moisture: 15.4%

CAS Number	Analyte	RL	Result
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	< 5.8 U
75-15-0	Carbon Disulfide	1.2	< 1.2 U
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
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
1330-20-7	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
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

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: 434520
SAMPLE

Lab Sample ID: HG99D
LIMS ID: 04-18555
Matrix: Sediment
Date Analyzed: 11/02/04 23:24

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

CAS Number	Analyte	RL	Result
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	101%
d8-Toluene	100%
Bromofluorobenzene	85.7%
d4-1,2-Dichlorobenzene	89.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B **Sample ID: 434515**
Page 1 of 2 **MS/MSD**

Lab Sample ID: HG99A
LIMS ID: 04-18552
Matrix: Sediment
Data Release Authorized:
Reported: 11/11/04

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Date Sampled: 10/15/04
Date Received: 10/28/04

Instrument/Analyst MS: FINN5/JA
MSD: FINN5/JA
Date Analyzed MS: 11/02/04 23:52
MSD: 11/03/04 00:20

Sample Amount MS: 4.26 g-dry-wt
MSD: 4.27 g-dry-wt
Moisture: 14.9%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Chloromethane	< 1.2	50.8	58.7	86.5%	48.1	58.5	82.2%	5.5%
Bromomethane	< 1.2	72.4	58.7	123%	69.0	58.5	118%	4.8%
Vinyl Chloride	< 1.2	72.2	58.7	123%	66.6	58.5	114%	8.1%
Chloroethane	< 1.2	79.6	58.7	136%	76.8	58.5	131%	3.6%
Methylene Chloride	< 2.3	57.6	58.7	98.1%	56.6	58.5	96.8%	1.8%
Acetone	< 5.9	332	293	113%	296	293	101%	11.5%
Carbon Disulfide	< 1.2	61.3	58.7	104%	56.0	58.5	95.7%	9.0%
1,1-Dichloroethene	< 1.2	68.9	58.7	117%	66.2	58.5	113%	4.0%
1,1-Dichloroethane	< 1.2	57.7	58.7	98.3%	57.6	58.5	98.5%	0.2%
trans-1,2-Dichloroethene	< 1.2	60.3	58.7	103%	58.2	58.5	99.5%	3.5%
cis-1,2-Dichloroethene	< 1.2	59.0	58.7	101%	56.3	58.5	96.2%	4.7%
Chloroform	< 1.2	56.8	58.7	96.8%	56.9	58.5	97.3%	0.2%
1,2-Dichloroethane	< 1.2	55.2	58.7	94.0%	56.7	58.5	96.9%	2.7%
2-Butanone	< 5.9	284	293	96.9%	273	293	93.2%	3.9%
1,1,1-Trichloroethane	< 1.2	57.9	58.7	98.6%	57.3	58.5	97.9%	1.0%
Carbon Tetrachloride	< 1.2	61.4	58.7	105%	61.2	58.5	105%	0.3%
Vinyl Acetate	< 5.9	15.3	58.7	26.1%	8.4	58.5	14.4%	58.2%
Bromodichloromethane	< 1.2	59.4	58.7	101%	58.7	58.5	100%	1.2%
1,2-Dichloropropane	< 1.2	56.6	58.7	96.4%	57.5	58.5	98.3%	1.6%
cis-1,3-Dichloropropene	< 1.2	55.9	58.7	95.2%	55.7	58.5	95.2%	0.4%
Trichloroethene	< 1.2	58.5	58.7	99.7%	57.0	58.5	97.4%	2.6%
Dibromochloromethane	< 1.2	60.8	58.7	104%	60.8	58.5	104%	0.0%
1,1,2-Trichloroethane	< 1.2	58.7	58.7	100%	57.8	58.5	98.8%	1.5%
Benzene	< 1.2	57.7	58.7	98.3%	58.0	58.5	99.1%	0.5%
trans-1,3-Dichloropropene	< 1.2	51.3	58.7	87.4%	50.4	58.5	86.2%	1.8%
2-Chloroethylvinylether	< 5.9	48.0	58.7	81.8%	46.0	58.5	78.6%	4.3%
Bromoform	< 1.2	62.0	58.7	106%	59.0	58.5	101%	5.0%
4-Methyl-2-Pentanone (MIBK)	< 5.9	308	293	105%	303	293	103%	1.6%
2-Hexanone	< 5.9	286	293	97.6%	275	293	93.9%	3.9%
Tetrachloroethene	< 1.2	57.7	58.7	98.3%	56.2	58.5	96.1%	2.6%
1,1,2,2-Tetrachloroethane	< 1.2	58.2	58.7	99.1%	57.1	58.5	97.6%	1.9%
Toluene	< 1.2	58.9	58.7	100%	59.3	58.5	101%	0.7%
Chlorobenzene	< 1.2	57.0	58.7	97.1%	56.9	58.5	97.3%	0.2%
Ethylbenzene	< 1.2	58.9	58.7	100%	59.0	58.5	101%	0.2%
Styrene	< 1.2	56.8	58.7	96.8%	54.7	58.5	93.5%	3.8%
Trichlorofluoromethane	< 1.2	69.4	58.7	118%	65.2	58.5	111%	6.2%
1,1,2-Trichloro-1,2,2-trifl	< 2.3	69.4	58.7	118%	65.5	58.5	112%	5.8%
m,p-Xylene	1.2	121	117	102%	121	117	102%	0.0%
o-Xylene	< 1.2	59.7	58.7	102%	59.3	58.5	101%	0.7%
1,2-Dichlorobenzene	< 1.2	50.7	58.7	86.4%	49.6	58.5	84.8%	2.2%
1,3-Dichlorobenzene	< 1.2	50.9	58.7	86.7%	50.2	58.5	85.8%	1.4%
1,4-Dichlorobenzene	< 1.2	49.5	58.7	84.3%	48.7	58.5	83.2%	1.6%
Acrolein	< 58.5	90.1	293	30.8%	66.2	293	22.6%	30.6%
Methyl Iodide	< 1.2	57.4	58.7	97.8%	59.6	58.5	102%	3.8%
Bromoethane	< 2.3	62.7	58.7	107%	61.4	58.5	105%	2.1%
Acrylonitrile	< 5.9	57.3	58.7	97.6%	55.3	58.5	94.5%	3.6%
1,1-Dichloropropene	< 1.2	58.0	58.7	98.8%	57.6	58.5	98.5%	0.7%
Dibromomethane	< 1.2	57.4	58.7	97.8%	57.7	58.5	98.6%	0.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B **Sample ID: 434515**
 MS/MSD

Lab Sample ID: HG99A
LIMS ID: 04-18552
Matrix: Sediment
Date Analyzed MS: 11/02/04 23:52
MSD: 11/03/04 00:20

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
1,1,1,2-Tetrachloroethane	< 1.2	61.7	58.7	105%	61.5	58.5	105%	0.3%
1,2-Dibromo-3-chloropropane	< 5.9	54.7	58.7	93.2%	51.4	58.5	87.9%	6.2%
1,2,3-Trichloropropane	< 2.3	59.3	58.7	101%	59.4	58.5	102%	0.2%
trans-1,4-Dichloro-2-butene	< 5.9	49.5	58.7	84.3%	48.7	58.5	83.2%	1.6%
1,3,5-Trimethylbenzene	< 1.2	59.5	58.7	101%	59.4	58.5	102%	0.2%
1,2,4-Trimethylbenzene	< 1.2	56.9	58.7	96.9%	56.4	58.5	96.4%	0.9%
Hexachlorobutadiene	< 5.9	41.5	58.7	70.7%	42.5	58.5	72.6%	2.4%
Ethylene Dibromide	< 1.2	58.8	58.7	100%	56.4	58.5	96.4%	4.2%
Bromochloromethane	< 1.2	59.2	58.7	101%	58.1	58.5	99.3%	1.9%
2,2-Dichloropropane	< 1.2	52.8	58.7	89.9%	53.4	58.5	91.3%	1.1%
1,3-Dichloropropane	< 1.2	54.8	58.7	93.4%	55.3	58.5	94.5%	0.9%
Isopropylbenzene	< 1.2	61.9	58.7	105%	62.3	58.5	106%	0.6%
n-Propylbenzene	< 1.2	60.2	58.7	103%	58.8	58.5	101%	2.4%
Bromobenzene	< 1.2	54.8	58.7	93.4%	53.4	58.5	91.3%	2.6%
2-Chlorotoluene	< 1.2	50.2	58.7	85.5%	52.3	58.5	89.4%	4.1%
4-Chlorotoluene	< 1.2	54.9	58.7	93.5%	51.9	58.5	88.7%	5.6%
tert-Butylbenzene	< 1.2	59.4	58.7	101%	60.2	58.5	103%	1.3%
sec-Butylbenzene	< 1.2	59.5	58.7	101%	59.1	58.5	101%	0.7%
4-Isopropyltoluene	< 1.2	57.5	58.7	98.0%	56.7	58.5	96.9%	1.4%
n-Butylbenzene	< 1.2	54.1	58.7	92.2%	53.3	58.5	91.1%	1.5%
1,2,4-Trichlorobenzene	< 5.9	36.5	58.7	62.2%	35.4	58.5	60.5%	3.1%
Naphthalene	< 5.9	37.3	58.7	63.5%	35.9	58.5	61.4%	3.8%
1,2,3-Trichlorobenzene	< 5.9	35.4	58.7	60.3%	34.1	58.5	58.3%	3.7%

Results reported in μg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: LCS-110204
LCS/LCSD

Lab Sample ID: LCS-110204
LIMS ID: 04-18552
Matrix: Sediment
Data Release Authorized:
Reported: 11/11/04

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Date Sampled: NA
Date Received: NA

Instrument/Analyst: FINN5/JA
LCSD: FINN5/JA
Date Analyzed: 11/02/04 16:40
LCSD: 11/02/04 17:43

Sample Amount: 5.00 g
LCSD: 5.00 g

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	43.7	50.0	87.4%	37.9	50.0	75.8%	14.2%
Bromomethane	57.3	50.0	115%	50.3	50.0	101%	13.0%
Vinyl Chloride	52.8	50.0	106%	45.6	50.0	91.2%	14.6%
Chloroethane	57.9	50.0	116%	49.6	50.0	99.2%	15.4%
Methylene Chloride	48.2	50.0	96.4%	45.2	50.0	90.4%	6.4%
Acetone	226	250	90.4%	260	250	104%	14.0%
Carbon Disulfide	54.3	50.0	109%	47.2	50.0	94.4%	14.0%
1,1-Dichloroethene	53.1	50.0	106%	46.5	50.0	93.0%	13.3%
1,1-Dichloroethane	48.1	50.0	96.2%	43.4	50.0	86.8%	10.3%
trans-1,2-Dichloroethene	51.1	50.0	102%	45.7	50.0	91.4%	11.2%
cis-1,2-Dichloroethene	47.4	50.0	94.8%	46.1	50.0	92.2%	2.8%
Chloroform	48.8	50.0	97.6%	45.5	50.0	91.0%	7.0%
1,2-Dichloroethane	49.9	50.0	99.8%	47.7	50.0	95.4%	4.5%
2-Butanone	242	250	96.8%	256	250	102%	5.6%
1,1,1-Trichloroethane	48.8	50.0	97.6%	43.8	50.0	87.6%	10.8%
Carbon Tetrachloride	53.3	50.0	107%	46.4	50.0	92.8%	13.8%
Vinyl Acetate	50.4	50.0	101%	51.0	50.0	102%	1.2%
Bromodichloromethane	52.9	50.0	106%	48.9	50.0	97.8%	7.9%
1,2-Dichloropropane	50.3	50.0	101%	47.0	50.0	94.0%	6.8%
cis-1,3-Dichloropropene	55.0	50.0	110%	51.1	50.0	102%	7.4%
Trichloroethene	52.8	50.0	106%	46.7	50.0	93.4%	12.3%
Dibromochloromethane	52.8	50.0	106%	52.9	50.0	106%	0.2%
1,1,2-Trichloroethane	51.9	50.0	104%	50.1	50.0	100%	3.5%
Benzene	50.6	50.0	101%	45.8	50.0	91.6%	10.0%
trans-1,3-Dichloropropene	50.6	50.0	101%	48.1	50.0	96.2%	5.1%
2-Chloroethylvinylether	49.3	50.0	98.6%	49.5	50.0	99.0%	0.4%
Bromoform	51.7	50.0	103%	55.0	50.0	110%	6.2%
4-Methyl-2-Pentanone (MIBK)	259	250	104%	277	250	111%	6.7%
2-Hexanone	243	250	97.2%	268	250	107%	9.8%
Tetrachloroethene	51.4	50.0	103%	45.7	50.0	91.4%	11.7%
1,1,2,2-Tetrachloroethane	49.4	50.0	98.8%	51.3	50.0	103%	3.8%
Toluene	52.8	50.0	106%	46.6	50.0	93.2%	12.5%
Chlorobenzene	52.6	50.0	105%	47.7	50.0	95.4%	9.8%
Ethylbenzene	52.1	50.0	104%	46.5	50.0	93.0%	11.4%
Styrene	54.4	50.0	109%	51.3	50.0	103%	5.9%
Trichlorofluoromethane	53.6	50.0	107%	44.6	50.0	89.2%	18.3%
1,1,2-Trichloro-1,2,2-trifl	53.4	50.0	107%	43.0	50.0	86.0%	21.6%
m,p-Xylene	109	100	109%	93.8	100	93.8%	15.0%
o-Xylene	52.7	50.0	105%	48.9	50.0	97.8%	7.5%
1,2-Dichlorobenzene	51.4	50.0	103%	48.5	50.0	97.0%	5.8%
1,3-Dichlorobenzene	52.2	50.0	104%	48.0	50.0	96.0%	8.4%
1,4-Dichlorobenzene	51.4	50.0	103%	47.5	50.0	95.0%	7.9%
Acrolein	241	250	96.4%	254	250	102%	5.3%
Methyl Iodide	53.1	50.0	106%	50.6	50.0	101%	4.8%
Bromoethane	50.9	50.0	102%	46.9	50.0	93.8%	8.2%
Acrylonitrile	50.9	50.0	102%	52.5	50.0	105%	3.1%
1,1-Dichloropropene	53.5	50.0	107%	44.9	50.0	89.8%	17.5%
Dibromomethane	51.5	50.0	103%	51.4	50.0	103%	0.2%

FORM III

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method 8260B

Sample ID: LCS-110204
LCS/LCSD

Lab Sample ID: LCS-110204
LIMS ID: 04-18552
Matrix: Sediment
Date Analyzed: 11/02/04 16:40
LCSD: 11/02/04 17:43

QC Report No: HG99-Washington State Dept of Ecology
Project: Middle Waterway-43

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
1,1,1,2-Tetrachloroethane	51.9	50.0	104%	50.1	50.0	100%	3.5%
1,2-Dibromo-3-chloropropane	48.6	50.0	97.2%	54.1	50.0	108%	10.7%
1,2,3-Trichloropropane	50.2	50.0	100%	54.2	50.0	108%	7.7%
trans-1,4-Dichloro-2-butene	48.4	50.0	96.8%	49.3	50.0	98.6%	1.8%
1,3,5-Trimethylbenzene	52.6	50.0	105%	48.9	50.0	97.8%	7.3%
1,2,4-Trimethylbenzene	53.3	50.0	107%	49.3	50.0	98.6%	7.8%
Hexachlorobutadiene	52.1	50.0	104%	46.7	50.0	93.4%	10.9%
Ethylene Dibromide	52.8	50.0	106%	50.7	50.0	101%	4.1%
Bromochloromethane	49.6	50.0	99.2%	48.1	50.0	96.2%	3.1%
2,2-Dichloropropane	50.0	50.0	100%	44.4	50.0	88.8%	11.9%
1,3-Dichloropropane	48.6	50.0	97.2%	49.7	50.0	99.4%	2.2%
Isopropylbenzene	54.3	50.0	109%	49.4	50.0	98.8%	9.5%
n-Propylbenzene	53.1	50.0	106%	48.9	50.0	97.8%	8.2%
Bromobenzene	50.6	50.0	101%	48.5	50.0	97.0%	4.2%
2-Chlorotoluene	48.3	50.0	96.6%	43.1	50.0	86.2%	11.4%
4-Chlorotoluene	51.0	50.0	102%	51.6	50.0	103%	1.2%
tert-Butylbenzene	52.5	50.0	105%	47.3	50.0	94.6%	10.4%
sec-Butylbenzene	54.8	50.0	110%	48.5	50.0	97.0%	12.2%
4-Isopropyltoluene	55.0	50.0	110%	49.2	50.0	98.4%	11.1%
n-Butylbenzene	55.1	50.0	110%	48.6	50.0	97.2%	12.5%
1,2,4-Trichlorobenzene	52.8	50.0	106%	48.3	50.0	96.6%	8.9%
Naphthalene	48.7	50.0	97.4%	51.1	50.0	102%	4.8%
1,2,3-Trichlorobenzene	49.5	50.0	99.0%	49.1	50.0	98.2%	0.8%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	91.5%	94.1%
d8-Toluene	102%	99.7%
Bromofluorobenzene	91.4%	91.5%
d4-1,2-Dichlorobenzene	88.9%	91.4%

FORM III

Analytical Resources, Inc.

RECOVERY REPORT

Client Name: WSDOE
Sample Matrix: SOLID
Lab Smp Id: HG99AMS
Level: LOW
Data Type: MS DATA
SpikeList File: allsoil.spk
Sublist File: voa.sub
Method File: /chem1/finn5.i/02NOV04.b/s8260b.m
Misc Info: 04-18552

Client SDG: HG99
Fraction: VOA
Client Smp ID: 434515 MS
Operator: ja
SampleType: MS
Quant Type: ISTD

SPIKE COMPOUND	CONC ADDED ug/Kg	CONC RECOVERED ug/Kg	% RECOVERED	LIMITS
1 Dichlorodifluorome	50.000	35.339	70.68	70-130
2 Chloromethane	50.000	43.275	86.55	30-139
3 Vinyl Chloride	50.000	61.542	123.09	44-149
4 Bromomethane	50.000	61.663	123.33	45-151
5 Chloroethane	50.000	67.772	135.55	60-136
6 Trichlorofluoromet	50.000	59.144	118.29	55-137
7 Acrolein	250.00	76.770	30.71	22-168
8 112Trichloro122Tri	50.000	59.130	118.26	51-146
9 Acetone	250.00	283.45	113.38	43-130
10 1,1-Dichloroethene	50.000	58.662	117.32	63-135
11 Bromoethane	50.000	53.379	106.76	56-131
12 Iodomethane	50.000	48.881	97.76	12-168
13 Methylene Chloride	50.000	49.131	98.26	25-140
14 Acrylonitrile	50.000	48.799	97.60	59-137
15 Carbon Disulfide	50.000	52.220	104.44	49-157
16 Methyl tert-Butyl	50.000	47.142	94.28	70-130
17 Trans-1,2-Dichloro	50.000	51.389	102.78	71-132
18 Vinyl Acetate	50.000	12.970	25.94*	32-115
19 1,1-Dichloroethane	50.000	49.217	98.43	75-127
20 2-Butanone	250.00	242.14	96.85	60-138
21 2,2-Dichloropropan	50.000	44.990	89.98	80-133
22 Cis-1,2-Dichloroet	50.000	50.272	100.54	80-134
24 Chloroform	50.000	48.352	96.70	74-122
26 Bromochloromethane	50.000	50.359	100.72	76-125
27 1,1,1-Trichloroeth	50.000	49.276	98.55	80-126
29 1,1-Dichloropropen	50.000	49.383	98.77	87-126
30 Carbon Tetrachlori	50.000	52.332	104.66	78-135
32 1,2-Dichloroethane	50.000	46.990	93.98	74-131
33 Benzene	50.000	49.163	98.33	81-120
35 Trichloroethene	50.000	49.847	99.69	72-126
36 1,2-Dichloropropan	50.000	48.181	96.36	83-122
37 Bromodichlorometha	50.000	50.602	101.20	82-125
39 Dibromomethane	50.000	48.932	97.86	78-122

SPIKE COMPOUND	CONC ADDED ug/Kg	CONC RECOVERED ug/Kg	% RECOVERED	LIMITS
40 2-Chloroethyl Viny	50.000	40.854	81.71	49-160
41 4-Methyl-2-Pentano	250.00	262.31	104.92	67-141
45 Trans 1,3-Dichloro	50.000	43.651	87.30	82-128
44 Toluene	50.000	50.250	100.50	78-122
42 Cis 1,3-dichloropr	50.000	47.634	95.27	73-127
46 2-Hexanone	250.00	243.50	97.40	60-145
47 1,1,2-Trichloroeth	50.000	50.041	100.08	76-125
48 1,3-Dichloropropan	50.000	46.669	93.34	80-126
49 Tetrachloroethene	50.000	49.240	98.48	84-129
50 Chlorodibromometha	50.000	51.796	103.59	77-134
51 1,2-Dibromoethane	50.000	50.054	100.11	73-126
53 Chlorobenzene	50.000	48.576	97.15	86-118
54 Ethyl Benzene	50.000	50.194	100.39	87-125
55 1,1,1,2-Tetrachlor	50.000	52.622	105.24	80-129
56 m,p-xylene	100.00	103.48	103.48	86-122
57 o-Xylene	50.000	50.875	101.75	84-119
58 Styrene	50.000	48.400	96.80	88-122
59 Isopropyl Benzene	50.000	52.728	105.46	85-132
60 Bromoform	50.000	52.773	105.55	75-134
61 1,1,2,2-Tetrachlor	50.000	49.649	99.30	73-133
63 1,2,3-Trichloropro	50.000	50.475	100.95	75-136
65 Trans-1,4-Dichloro	50.000	42.196	84.39	50-118
66 N-Propyl Benzene	50.000	51.272	102.54	87-136
67 Bromobenzene	50.000	46.666	93.33	85-126
68 1,3,5-Trimethyl Be	50.000	50.682	101.36	87-132
69 2-Chloro Toluene	50.000	42.760	85.52	81-130
70 4-Chloro Toluene	50.000	46.784	93.57	78-132
71 T-Butyl Benzene	50.000	50.557	101.11	83-128
72 1,2,4-Trimethylben	50.000	48.529	97.06	89-133
73 S-Butyl Benzene	50.000	50.702	101.40	87-134
74 4-Isopropyl Toluen	50.000	49.008	98.02	89-133
75 1,3-Dichlorobenzen	50.000	43.434	86.87	86-124
77 1,4-Dichlorobenzen	50.000	42.236	84.47	84-123
78 N-Butyl Benzene	50.000	46.089	92.18	87-135
80 1,2-Dichlorobenzen	50.000	43.192	86.38	85-120
81 1,2-Dibromo 3-Chlo	50.000	46.561	93.12	63-130
82 1,2,4-Trichloroben	50.000	31.052	62.10*	83-132
83 Hexachloro 1,3-But	50.000	35.430	70.86*	79-142
84 Naphthalene	50.000	31.814	63.63*	73-136
85 1,2,3-Trichloroben	50.000	30.166	60.33*	82-128

SURROGATE COMPOUND	CONC ADDED ug/Kg	CONC RECOVERED ug/Kg	% RECOVERED	LIMITS
$ 25 Dibromofluorometha	50.000	48.379	96.76	40-160

SURROGATE COMPOUND	CONC ADDED ug/Kg	CONC RECOVERED ug/Kg	% RECOVERED	LIMITS
$ 31 d4-1,2-Dichloroeth	50.000	49.579	99.16	71-143
$ 43 d8-Toluene	50.000	51.558	103.12	79-118
$ 62 4-Bromofluorobenze	50.000	44.868	89.74	69-126
$ 79 d4-1,2-Dichloroben	50.000	45.332	90.66	79-119

Analytical Resources, Inc.

RECOVERY REPORT

Client Name: WSDOE
Sample Matrix: SOLID
Lab Smp Id: HG99AMSD
Level: LOW
Data Type: MS DATA
SpikeList File: allsoil.spk
Sublist File: voa.sub
Method File: /chem1/finn5.i/02NOV04.b/s8260b.m
Misc Info: 04-18552

Client SDG: HG99
Fraction: VOA
Client Smp ID: 434515 MSD
Operator: ja
SampleType: MSD
Quant Type: ISTD

SPIKE COMPOUND	CONC ADDED ug/Kg	CONC RECOVERED ug/Kg	% RECOVERED	LIMITS
1 Dichlorodifluorome	50.000	32.214	64.43*	70-130
2 Chloromethane	50.000	41.111	82.22	30-139
3 Vinyl Chloride	50.000	56.870	113.74	44-149
4 Bromomethane	50.000	58.947	117.89	45-151
5 Chloroethane	50.000	65.562	131.12	60-136
6 Trichlorofluoromet	50.000	55.708	111.42	55-137
7 Acrolein	250.00	56.482	22.59	22-168
8 112Trichloro122Tri	50.000	55.858	111.72	51-146
9 Acetone	250.00	253.01	101.20	43-130
10 1,1-Dichloroethene	50.000	56.486	112.97	63-135
11 Bromoethane	50.000	52.393	104.79	56-131
12 Iodomethane	50.000	50.873	101.75	12-168
13 Methylene Chloride	50.000	48.335	96.67	25-140
14 Acrylonitrile	50.000	47.221	94.44	59-137
15 Carbon Disulfide	50.000	47.840	95.68	49-157
16 Methyl tert-Butyl	50.000	47.676	95.35	70-130
17 Trans-1,2-Dichloro	50.000	49.715	99.43	71-132
18 Vinyl Acetate	50.000	7.156	14.31*	32-115
19 1,1-Dichloroethane	50.000	49.224	98.45	75-127
20 2-Butanone	250.00	232.68	93.07	60-138
21 2,2-Dichloropropan	50.000	45.557	91.11	80-133
22 Cis-1,2-Dichloroet	50.000	48.144	96.29	80-134
24 Chloroform	50.000	48.550	97.10	74-122
26 Bromochloromethane	50.000	49.552	99.10	76-125
27 1,1,1-Trichloroeth	50.000	48.892	97.78	80-126
29 1,1-Dichloropropen	50.000	49.201	98.40	87-126
30 Carbon Tetrachlori	50.000	52.272	104.54	78-135
32 1,2-Dichloroethane	50.000	48.424	96.85	74-131
33 Benzene	50.000	49.494	98.99	81-120
35 Trichloroethene	50.000	48.745	97.49	72-126
36 1,2-Dichloropropan	50.000	49.127	98.25	83-122
37 Bromodichlorometha	50.000	50.103	100.21	82-125
39 Dibromomethane	50.000	49.266	98.53	78-122

SPIKE COMPOUND	CONC ADDED ug/Kg	CONC RECOVERED ug/Kg	% RECOVERED	LIMITS
40 2-Chloroethyl Viny	50.000	39.343	78.69	49-160
41 4-Methyl-2-Pentano	250.00	258.74	103.50	67-141
45 Trans 1,3-Dichloro	50.000	43.036	86.07	82-128
44 Toluene	50.000	50.616	101.23	78-122
42 Cis 1,3-dichloropr	50.000	47.608	95.22	73-127
46 2-Hexanone	250.00	235.34	94.14	60-145
47 1,1,2-Trichloroeth	50.000	49.372	98.75	76-125
48 1,3-Dichloropropan	50.000	47.190	94.38	80-126
49 Tetrachloroethene	50.000	47.981	95.96	84-129
50 Chlorodibromometha	50.000	51.869	103.74	77-134
51 1,2-Dibromoethane	50.000	48.177	96.35	73-126
53 Chlorobenzene	50.000	48.593	97.19	86-118
54 Ethyl Benzene	50.000	50.403	100.81	87-125
55 1,1,1,2-Tetrachlor	50.000	52.538	105.08	80-129
56 m,p-xylene	100.00	102.64	102.65	86-122
57 o-Xylene	50.000	50.553	101.11	84-119
58 Styrene	50.000	46.704	93.41	88-122
59 Isopropyl Benzene	50.000	53.243	106.49	85-132
60 Bromoform	50.000	50.435	100.87	75-134
61 1,1,2,2-Tetrachlor	50.000	48.780	97.56	73-133
63 1,2,3-Trichloropro	50.000	50.743	101.49	75-136
65 Trans-1,4-Dichloro	50.000	41.552	83.10	50-118
66 N-Propyl Benzene	50.000	50.199	100.40	87-136
67 Bromobenzene	50.000	45.576	91.15	85-126
68 1,3,5-Trimethyl Be	50.000	50.662	101.33	87-132
69 2-Chloro Toluene	50.000	44.657	89.31	81-130
70 4-Chloro Toluene	50.000	44.279	88.56	78-132
71 T-Butyl Benzene	50.000	51.392	102.79	83-128
72 1,2,4-Trimethylben	50.000	48.171	96.34	89-133
73 S-Butyl Benzene	50.000	50.490	100.98	87-134
74 4-Isopropyl Toluen	50.000	48.449	96.90	89-133
75 1,3-Dichlorobenzen	50.000	42.903	85.81*	86-124
77 1,4-Dichlorobenzen	50.000	41.626	83.25*	84-123
78 N-Butyl Benzene	50.000	45.485	90.97	87-135
80 1,2-Dichlorobenzen	50.000	42.426	84.85*	85-120
81 1,2-Dibromo 3-Chlo	50.000	43.946	87.89	63-130
82 1,2,4-Trichloroben	50.000	30.221	60.44*	83-132
83 Hexachloro 1,3-But	50.000	36.332	72.66*	79-142
84 Naphthalene	50.000	30.661	61.32*	73-136
85 1,2,3-Trichloroben	50.000	29.086	58.17*	82-128

SURROGATE COMPOUND	CONC ADDED ug/Kg	CONC RECOVERED ug/Kg	% RECOVERED	LIMITS
$ 25 Dibromofluorometha	50.000	49.957	99.91	40-160

SURROGATE COMPOUND	CONC ADDED ug/Kg	CONC RECOVERED ug/Kg	% RECOVERED	LIMITS
$ 31 d4-1,2-Dichloroeth	50.000	47.678	95.36	71-143
$ 43 d8-Toluene	50.000	51.586	103.17	79-118
$ 62 4-Bromofluorobenze	50.000	46.065	92.13	69-126
$ 79 d4-1,2-Dichloroben	50.000	44.969	89.94	79-119