



SAMPLING AND ANALYSIS RESULTS MEMORANDUM KENMORE SEDIMENT AND WATER CHARACTERIZATION

Prepared for

Washington State Department of Ecology
Dredged Material Management Program
Washington State Department of Health

On Behalf of

City of Kenmore
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Kenmore, Washington 98028

Prepared by

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March 2013

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LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
°C	degrees Celsius
µg/kg	micrograms per kilogram
ARI	Analytical Resources, Inc.
BEACH	Beach Environmental Assessment, Communication and Health
City	City of Kenmore
cm	centimeter
DGPS	differential global positioning system
dioxin/furan TEQ	total dioxin and furan toxic equivalency
DMMO	Dredged Material Management Office
DMMP	Dredged Material Management Program
DO	dissolved oxygen
DOH	Washington State Department of Health
DVR	Data Validation Report
Ecology	Washington State Department of Ecology
J	sample results qualified as “estimated”
KIP	Kenmore Industrial Park
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LDC	Laboratory Data Consultants
ML	DMMP Maximum Level
MS	matrix spike
MSD	matrix spike duplicate
MTCA	Model Toxics Control Act
ng/kg	nanograms per kilogram or parts per trillion
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCP	pentachlorophenol
PSEP	Puget Sound Estuary Program
QA	quality assurance
Results Memorandum	Sampling and Analysis Results Memorandum
SAP	<i>Sampling and Analysis Plan; Kenmore Area Sediment and Water Characterization</i>

Abbreviation	Definition
SAPA	<i>Sediment Sampling Analysis Plan Appendix</i>
SL	DMMP Screening Level
SL1	interim freshwater Screening Level 1
SL2	interim freshwater Screening Level 2
SQV	Sediment Quality Value
SVOC	Semi-volatile organic compound
TBT	tributyltin
TEQ	toxic equivalency
TOC	total organic carbon
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
WDFW	Washington Department of Fish and Wildlife

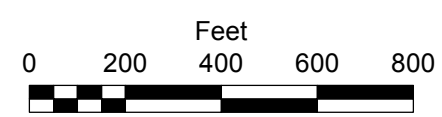
1 INTRODUCTION

This Sampling and Analysis Results Memorandum (Results Memorandum) summarizes the results of the sediment and water characterization conducted in the northeastern portion of Lake Washington in and near the City of Kenmore (City). Anchor QEA, LLC (Anchor QEA), prepared this memorandum on behalf of the City, in partnership with the Washington State Department of Ecology (Ecology), and in accordance with the procedures described in the Ecology-approved *Sampling and Analysis Plan; Kenmore Area Sediment and Water Characterization* (SAP) (Anchor QEA 2012).

The characterization effort supports a number of objectives for the City and Ecology. First, the characterization is intended to support the City's ongoing work with the U.S. Army Corps of Engineers (USACE) to support a request for funding in the USACE budget for maintenance dredging of the federal Kenmore Navigation Channel (Figure 1). Second, with financial assistance from Ecology's Clean Sites Initiative fund, the City and Ecology are conducting additional characterization activities to evaluate the potential presence of chemicals of concern along the shoreline. The characterization has been designed to support Ecology's Model Toxics Control Act (MTCA) cleanup action requirements, as well as the Health Consultations to be developed by Washington State Department of Health (DOH). Health Consultations are anticipated to be prepared by DOH for public health, safety, and environmental concerns in human-use areas along Log Boom Park, at the Washington Department of Fish and Wildlife (WDFW) public motor boat launch along the Sammamish River, and Kenmore Industrial Park (KIP; also known as Lakepointe). Additionally, at the request of the City of Lake Forest Park, two sediment samples were collected along the northwestern shoreline of Lake Washington adjacent to Lyon Creek Park.



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NOTE:
WDFW = Washington State Department of Fish and Wildlife

Figure 1
Sample Locations
Sampling and Analysis Results Memorandum
Kenmore Sediment Characterization

1.1 Kenmore Navigation Channel Screening Level Characterization

The Kenmore Navigation Channel (Figure 1) was constructed in 1981, as a USACE project authorized in Section 107 of the 1960 River and Harbors Act, to a depth of 15 feet below lake level. The Kenmore Navigation Channel is approximately 100 to 120 feet wide and 2,900 feet long, and primarily serves barge and other marine traffic for industrial and commercial uses. The Kenmore Navigation Channel was last sampled in 1996 for dredge characterization, dredged in 1997, and last surveyed in 2010, which showed areas shallower than 15 feet below lake level. The most recent maintenance dredging of the Kenmore Navigation Channel was prior to the City's 1998 incorporation. Currently, King County is the Local Sponsor Authority for the Kenmore Navigation Channel and the Sammamish River Small Boat Navigation Channel. The City, King County, and the USACE are presently exploring the possible transfer of the Local Sponsor Authority for the Kenmore Navigation Channel to the City. The USACE estimates that maintenance dredging would require removal of 31,700 cubic yards of sediment within the channel.

The Dredged Material Management Office (DMMO) at the USACE has indicated that a screening level characterization will provide information about potential options for disposal of dredged sediment. According to Dredged Material Management Program (DMMP) protocols, a full sediment characterization would provide information to determine if sediment is suitable for unconfined open-water disposal. However, these characterization results are only valid for 2 years in areas ranked "High" by DMMP, which includes the Kenmore Navigation Channel. Acquisition of funding and completion of maintenance dredging is not likely to occur within 2 years of the commencement date of this project. Given the timing of the maintenance dredging, the DMMO agreed that it made sense for the City to conduct a screening level assessment to provide information to support pursuing federal funding for maintenance dredging. The DMMO also agreed that the timing for a full DMMP characterization effort should be within 2 years of the anticipated maintenance dredging event.

The owners of the North Lake Marina are also participating parties in the sediment characterization efforts to assess the options for sediment disposal in the event that maintenance dredging is conducted within the marina. The marina owners are interested in privately funding the dredging of the marina, in conjunction with the dredging of the

Kenmore Navigation Channel, to save money and share costs (e.g., dredge equipment mobilization fees) with the USACE.

Any future proposed dredging plans for Kenmore Navigation Channel, Harbour Village Marina, or North Lake Marina will be determined by each party based on navigational needs, cost, and other considerations. A summary of previous sediment characterization and dredging is provided in the SAP (Anchor QEA 2012).

1.2 Additional Nearshore Sediment and Surface Water Characterization

The City and Ecology requested additional characterization activities to evaluate the current condition of nearshore sediment and surface water in the Kenmore area waterfront. The purpose of the additional characterization activities is to determine sediment and water quality and possible health and environmental risks. This information will provide a better understand whether potential contamination is present in sediment and surface water. The surface water and sediment results are intended to be used by Ecology for characterization activities to evaluate the presence and concentration of chemicals and possible contamination in the lake and river waterfront areas, as well as to continue the MTCA evaluation of nearshore sediments. The results will also be used to support the Health Consultations in the vicinity of Log Boom Park and adjacent to KIP that will be developed by DOH. Ecology will determine if additional testing will be required to further characterize potential sources of contamination.

1.3 Sediment Investigation Overview

This section provides a brief overview of the sediment investigation conducted in November 2012. Specific sampling and analysis protocols for the sediment sampling activities, sample location and frequency, equipment, procedures to be used during the sampling, and sample handling and analysis are described in the SAP (Anchor QEA 2012).

Sample collection and analyses were performed and prepared consistent with the multi-agency reviewed and approved SAP (Anchor QEA 2012). The SAP was developed in accordance with the 2008 DMMP User's Manual (DMMO 2009) and Ecology's *Sediment Sampling and Analysis Plan Appendix* (Ecology 2008). All sample handling and analyses

followed the most recent Puget Sound Estuary Program (PSEP) protocols for collecting and handling sediment and water samples (PSEP 1986, 1997a, 1997b, 1997c) and the 2008 DMMP User's Manual (including the 2009 update) and Clarification Papers and updates (DMMO 2009; Hoffman 1998; Kendall 2001; USACE 2010; Inouye and Fox 2011).

Between November 6 and November 8, 2012, Anchor QEA collected 30 sediment samples (including two field duplicates) from 28 locations. Ecology staff supported sample collection on November 6 and 7, 2012. Three water samples (including one duplicate) were collected at Log Boom Park, and one background water sample was collected offshore in Lake Washington on November 7, 2012. Sediment collection information and sample descriptions are provided in Table 1. Surface water collection information is provided in Table 2. Sediment and water sampling locations are shown in Figure 1.

Sediment samples for the DMMP screening level characterization were collected on November 8, 2012, and included samples SG-02 and SG-03 from North Lake Marina and SG-04 through SG-09 from the Kenmore Navigation Channel. These sediment samples were analyzed for the full DMMP analyte list (DMMO 2010, 2011) for the screening level characterization, including metals, semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), dioxins and furans, and tributyltin (TBT) in porewater, as well as total organic carbon (TOC), grain size, and moisture content. The chemistry data were compared to the DMMP interpretive criteria for marine open-water disposal (at the marine DMMP disposal sites) in Section 3.2.1 (DMMO 2010, 2011). Results are presented in Table 3.

Sediment samples HT-01 through HT-11 were collected with a hand trowel in nearshore areas at Log Boom Park, Tributary 0056, the WDFW boat launch, and Lyon Creek Park on November 7, 2012. Sediment samples SG-01, and SG-10 through SG-17 were collected using a grab sampler deployed from a sampling vessel on November 9, 2012, from the Harbour Village Marina, north and offshore of KIP, and the lower reaches of the Sammamish River. These samples were tested in accordance with the *Sediment Management Standards* (Ecology 1995) for metals, SVOCs, pesticides, PCBs, and dioxin and furans, as well as physical parameters, including TOC, grain size, and moisture content. TBT analysis was also conducted on bulk sediment at these locations. Data from these samples were compared to

the interim freshwater Sediment Quality Values (SQVs) in Section 3.22. These interim freshwater SQVs were developed by Ecology in 2003 (Ecology 2003) and adopted by the Regional Sediment Evaluation Team¹ in 2006 (USACE et al. 2006). The data and screening results are presented in Table 4.

Surface water samples, HT-01 and HT-04, and the background sample, WS-10, were collected on November 7, 2012. Water quality field parameters were measured on site (Table 2). Water samples were analyzed for total metals, dissolved metals, SVOCs, polycyclic aromatic hydrocarbons (PAHs), pentachlorophenol (PCP), total suspended solids (TSS), total dissolved solids, and hardness. The surface water results are summarized in Section 3.3. Surface water data are presented in Table 5.

¹ Consists of the USACE Northwestern Division (Portland, Seattle and Walla Walla Districts), National Marine Fisheries Service, U. S. Fish and Wildlife Service, U.S. Environmental Protection Agency Region 10, Oregon Department of Environmental Quality, Ecology, Washington Department of Natural Resources, and the Idaho Department of Environmental Quality.

2 SAMPLE COLLECTION AND HANDLING

This section provides an overview of the sample collection and handling procedures. The methods and procedures described herein were followed by Anchor QEA and their subcontractors during the November 2012 data collection activities. Detailed descriptions are found in the SAP (Anchor QEA 2012).

2.1 Sediment Collection Procedures

Sediment samples SG-02 through SG-17 were collected from the Kenmore Navigation Channel and other submerged areas (Harbour Village Marina, North Lake Marina, etc.) using a power grab sampler from a vessel equipped with differential global positioning system (DGPS) and a depth sounder. Samples from the navigation channel and in North Lake Marina were collected to the maximum penetration possible (target 25 centimeter [cm] below mudline) to better represent deeper sediment that could be removed during dredging. Samples from other submerged areas were collected from the top 10 cm to represent the biologically active zone, consistent with guidance in Ecology's *Sediment Sampling and Analysis Plan Appendix* (SAPA; Ecology 2008). Prior to deployment at each station, the power grab sampler was decontaminated, and upon retrieval, samples were evaluated for compliance with the acceptance criteria described in the SAP (Anchor QEA 2012). If an acceptable sample was collected, sediment from the appropriate interval was collected and homogenized in a stainless steel bowl prior to being placed into sample containers.

Sediment samples HT-01 through HT-11 were collected from Log Boom Park, Tributary 0056, the WDFW boat launch, and Lyon Creek Park using a hand trowel from shallow submerged sediment areas. Sediments were collected as close as possible to the target coordinates in order to collect fine-grained material (to the extent available) that represent areas where people are likely to come in contact with the sediment. Sample HT-10 at Lake Forest Park was collected from an exposed area due to the low lake level. During collection with the hand trowel, care was taken to prevent resuspension of sediment prior to and during sampling. Hand collected samples were homogenized in a stainless steel bowl prior to being placed into sample containers.

Sediment collection information recorded in the field, including water depth, recovery depth, coordinates, and sample interval, are shown in Table 1. Sediment samples were placed in a cooler with ice and delivered to ARI within 24 hours of collection. Chain-of-custody forms and daily logs are provided in Appendix A.

2.2 Surface Water Collection Procedures

Water quality parameters were measured in the field using a multi-probe water quality meter (e.g., YSI) prior to collecting a water sample. The water quality meter was lowered approximately 1 foot below the surface and was allowed to equilibrate before taking measurements of turbidity, conductivity, temperature, dissolved oxygen, and pH. Water quality field parameters, including temperature, pH, conductivity, turbidity, and dissolved oxygen (DO), that were recorded in the field are provided in Table 2. Chain-of-custody forms are provided in Appendix A.

Water samples were collected according to Ecology's Standard Operating Procedure guidance (Ecology 2006), which is consistent with the protocols of the Beach Environmental Assessment, Communication, and Health (BEACH) program (Schneider 2004). Field personnel waded into knee-deep water (approximately 2.5 feet) and collected a water sample by hand with a dipper attached to an extension rod. Samples were collected to a depth of at least 6 inches below the surface (Ecology 2006). The background location sample was collected from the boat on the same day as the shoreline water samples, using the same methods. Water samples were placed in a cooler with ice and were shipped or delivered to the laboratory within 24 hours of collection.

2.3 Deviation from the Sampling and Analysis Plan

Deviations from the SAP (Anchor QEA 2012) were limited to the movement of several target sample stations. These changes are summarized below:

- Station HT-07 was moved upstream, above the weir within tributary 0056, as directed by Maura O'Brien (Ecology).
- Station SG-01 was moved 85 feet to the northwest of the target location to locate the sample within the middle of the navigation channel.

- Station SG-04 was moved 50 feet to the northeast of the target location due to refusal encountered at the target location.
- Station SG-16 was moved 50 feet to the southwest of the target location at the request of Maura O'Brien (Ecology) to be closer to the former KIP outfall.

3 CHEMICAL TESTING RESULTS

Chemical analysis requirements for sediment and surface water samples are summarized in the Ecology-approved SAP (Anchor QEA 2012). As described in the SAP, all chemical analyses were performed by Analytical Resources, Inc. (ARI), in Tukwila, Washington. All samples were preserved in accordance with the analytical method and stored at a temperature of 4 degrees Celsius (°C).

3.1 Summary of Data Quality/Validation Results

The following section describes the assessment and validation of analytical data reported by ARI. Complete data packages are presented in Appendix B. Data validation was performed by Anchor QEA and Laboratory Data Consultants (LDC). Validation reports are presented in Appendix C.

Chemical data were validated in accordance with the analytical methods and the following U.S. Environmental Protection Agency (USEPA) guidance:

- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA 1999)
- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA 2008)

As described in the SAP, Anchor QEA performed a Stage 2A level (USEPA 2009) data quality review (equivalent to a QA1 review), in accordance with USEPA National Functional Guidelines (Anchor QEA 2012; USEPA 2004, 2008) on all data except for dioxin and furans. Dioxin and furan data were validated at a Stage 4 level (USEPA 2009) by LDC, a third party validator, using the DQOs outlined by the DMMO (2010) and the SAPA (Ecology 2008). The data were validated in accordance with the project-specific DQOs, analytical method criteria, and the laboratory's internal performance standards based on their Standard Operating Procedures.

Anchor QEA determined that accuracy was acceptable as demonstrated by the surrogate, laboratory control sample (LCS)/laboratory control sample duplicate (LCSD), and matrix spike (MS)/matrix spike duplicate (MSD) percent recovery values, with the exceptions noted in the Data Validation Report (DVR; Appendix C). Precision was also acceptable as demonstrated by the laboratory duplicates, MS/MSD, and LCS/LCSD relative percent difference values, with the exceptions noted in the DVR (Appendix C). Most data were deemed acceptable as reported; all other data are acceptable as qualified.

LDC determined that dioxin and furan analysis was conducted within all specifications of the methods, and no results were rejected. Sample results were qualified as appropriate, based on the results of the LDC validation report (Appendix C). Sample results qualified as “estimated” (J) are usable as qualified. Based on the Stage 4 data validation, results are considered valid and useable for all purposes.

3.2 Sediment Chemistry Results

The remainder of this section summarizes the results of the chemical testing of sediment samples and the comparison of the data to DMMP interpretive criteria (DMMO 2010, 2011) or the interim freshwater SQVs (Ecology 2003; USACE et al. 2006). Ecology is currently in the process of amending the freshwater SQVs. Once they are approved and published, the SQVs will be applied to these results by Ecology. Sediment data results are presented in Tables 3 and 4.

3.2.1 DMMP Screening Level Characterization

This section summarizes the comparison of chemical results from the North Lake Marina and Kenmore Navigation Channel samples with the DMMP interpretive criteria for marine open-water disposal sites (DMMO 2010, 2011). The results for the full DMMP analyte list for sediment samples from stations SG-02 to SG-09 are presented in Table 3 and are summarized below.

In North Lake Marina, four chemicals exceeded one or two DMMP screening levels. The concentrations of benzoic acid, benzyl alcohol, and total dioxin and furan toxic equivalency (dioxin/furan TEQ) exceeded the DMMP Screening Level (SL) in both samples. Benzoic acid

was also above the DMMP Maximum Level (ML) in both samples. One sample exceeded the SL for TBT. Dioxin/furan was 20.3 and 37.0 nanograms per kilogram or parts per trillion (ng/kg) toxic equivalency (TEQ) for samples SG-02 and SG-03, respectively, which is above the ML.

In Kenmore Navigation Channel three chemicals exceeded DMMP screening levels. Specifically, benzyl alcohol exceeded the SL at five of the six locations. Two of those locations exceeded the ML for benzoic acid. Dioxin/furan ranged from 1.5 to 8.4 ng/kg TEQ and was above the SL in four of the six locations.

In general, chlorinated hydrocarbons and pesticides were not detected in any of the samples, and the frequency of detection of phthalates, phenols, and PCB Aroclors was relatively low. Concentrations of PAHs and metals were below the DMMP criteria.

These preliminary screening results will inform future dredge planning. A full dredge material characterization will be required to evaluate for suitability of open-water disposal. This testing will be based on collection and testing of sediment cores and may include bioassay testing, if required.

3.2.2 Sediment Comparison to the Interim Freshwater Screening Levels

This section summarizes the results of the comparison of sediment data with the interim freshwater SQVs (Ecology 2003; USACE et al. 2006). Table 4 presents the results for shoreline sediment samples from stations HT-01 through HT-11, grab samples from stations SG-01 and SG-10 through SG-17, as well as the DMMP screening level characterization samples from stations SG-02 through SG-09, compared to the SQVs².

3.2.2.1 Shoreline Sediment Samples

Shoreline sediment samples were collected by hand trowel from 11 stations at Log Boom Park (five locations), Tributary 0056 (two locations), the WDFW boat launch (two locations), and at Lyon Creek Park (two locations). Concentrations were measured above SQVs for copper, bis(2ethylhexyl)phthalate, and dimethyl phthalate in individual samples. PAHs were detected

² SQVs are established for most parameters tested as part of this investigation, but not all.

at all of the shoreline stations, but were below the freshwater SQVs. The frequency of detection was low for chlorinated hydrocarbons, phenols, the miscellaneous extractables, and PCB Aroclors. Pesticides were not detected, where analyzed. Specific results for each location are described below.

3.2.2.1.1 Log Boom Park

In the five samples collected at Log Boom Park, concentrations exceeded the interim freshwater Screening Level 2 (SL2) for bis(2ethylhexyl)phthalate in HT-04 and for the interim freshwater Screening Level 1 (SL1) for copper in HT-05. No other concentrations exceeded SQVs in any other Log Boom Park samples. PCBs were non-detect in samples HT-01, HT-02, HG-03, and HT-05, and were below SQVs in HT-04. The dioxin/furan concentration was highest in sample HT-04, at 7.9 ng/kg TEQ, with samples HT-01, HT-02, HT-03, and HT-05 below 2.17 ng/kg TEQ.

3.2.2.1.2 Tributary 0056

Of the two samples collected at Tributary 0056, located north of Log Boom Park, no concentrations exceeded SQVs. PCBs were non-detect in each sample. The dioxin/furan concentration was less than 1.33 ng/kg TEQ in each sample.

3.2.2.1.3 WDFW Boat Launch

Of the two samples collected at the WDFW boat launch, dimethyl phthalate exceeded SQVs in both samples (above SL1 for HT-08 and SL2 for HT-09). PCBs were non-detect, and the dioxin/furan concentration was less than 1.35 ng/kg TEQ in each sample.

3.2.2.1.4 Lyon Creek Park

Of the two samples collected at Lyon Creek Park, no concentrations exceeded SQVs. PCBs were non-detect, and the dioxin/furan concentration was less than 0.52 ng/kg TEQ in each sample.

3.2.2.2 *Surface Sediment Grab Samples*

Surface sediment samples (0 to 10 cm) were collected at nine stations from the Sammamish River, Harbour Village Marina, north of KIP, and KIP shoreline. Concentrations were measured above SQVs for lead, zinc, bis(2ethylhexyl)phthalate, di-n-octyl phthalate, and benzo(b,j,k)fluoranthenes in individual samples. The frequency of detection was low for miscellaneous extractables, pesticides, and PCB Aroclors. Chlorinated hydrocarbons were not detected. Specific results for each location are described below.

3.2.2.2.1 *Sammamish River*

Three samples were collected from the lower reaches of the Sammamish River, two of which are located adjacent to KIP. No concentrations exceeded SQVs in sample locations SG-01, SG-16, and SG-17. PCBs were non-detect, and the dioxin/furan concentration ranged from 0.35 to 2.30 ng/kg TEQ.

3.2.2.2.2 *Harbour Village Marina*

Of the four samples and a duplicate sample collected at the Harbour Village Marina, five chemicals exceeded one or more screening levels: copper, zinc, two phthalates, and dioxin/furans. The SL1 was exceeded for lead and zinc in sample SG-11, and for zinc in SG-12 and SG-13. Bis(2ethylhexyl) phthalate exceeded SL2 in each sample, and di-n-octyl phthalate exceeded SL2 in SG-11 and SG-13. PCBs and pesticides were low or non-detect in each sample. The dioxin/furan concentration was lowest in sample SG-10 (6.6 ng/kg TEQ), but higher in sample SG-12 (26.6 ng/kg TEQ), SG-13 (50 ng/kg TEQ and 19 ng/kg TEQ in duplicate samples), and SG-11 (71 ng/kg TEQ).

3.2.2.2.3 *North of Kenmore Industrial Park*

One sample was collected north of KIP, beyond the end of the navigation channel. Copper, zinc, benzo(b,j,k)fluoranthenes, and bis(2ethylhexyl)phthalate exceeded the SL1 in sample SG-14. PCBs were detected slightly above the detection limit (20 micrograms per kilogram [$\mu\text{g}/\text{kg}$]). The dioxin/furan concentration was 10.1 ng/kg TEQ.

3.2.2.2.4 Kenmore Industrial Park Shoreline

Three samples were collected along KIP: one along the west shoreline and two along the south side. No concentrations exceeded SQVs in samples SG-15, SG-16, or SG-17 collected along the KIP shoreline. PCBs were non-detect, and the dioxin/furan concentration was below 2.3 ng/kg TEQ.

3.2.2.3 DMMP Screening Level Characterization Samples

Results of DMMP screening level sediment samples are presented in Section 3.2.1 and the DMMP interpretive criteria in Table 3. These results are compared to SQVs in Table 4.

Two samples were collected in North Lake Marina, and concentrations of cadmium, chromium, and zinc exceeded SL1 in both samples (SG-02 and SG-03). Concentrations exceeded SL2 for bis(2ethylhexyl)phthalate in both samples, for di-n-octyl phthalate in SG-03, and for total PCBs in SG-02. Dioxin/furan concentrations were 20.3 and 37 ng/kg TEQ.

In the Kenmore Navigation Channel, six samples were collected for DMMP characterization from 20 to 25 cm depth. Five chemicals were detected above one or more screening levels. Zinc exceeded SL1 in samples SG-05 and SG-06. Bis(2ethylhexyl)phthalate exceeded SL1 in samples SG-05, SG-08, and SG-09 and SL2 in samples SG-06 and SG-07. Di-n-octyl phthalate also exceeded SL1 in sample SG-06. Dioxin/furan concentrations ranged from 1.5 to 8.4 ng/kg TEQ. Concentrations of all other chemicals were below SQV criteria.

3.3 Surface Water Results

Chemical concentrations in surface water samples were low in the two Log Boom Park samples and in the reference sample. Results for PAHs, chlorinated hydrocarbons, phthalates, and miscellaneous extractables were all non-detect. Chemical concentrations in the Log Boom Park samples were similar to the reference sample concentrations.

4 CONCLUSIONS

The conclusions of the comparison of the sediment data to the DMMP interpretive criteria (DMMO 2010, 2011) or the interim freshwater SQVs (Ecology 2003; USACE et al. 2006) are summarized below.

4.1 DMMP Screening Level Characterization Samples

4.1.1 *Kenmore Navigation Channel*

Concentrations of benzoic acid and benzyl alcohol were above DMMP criteria for marine open water disposal. However, as allowed according to DMMP guidance, bioassay testing could be conducted on site sediment as part of a full DMMP characterization to determine if dredged sediment is suitable for open-water disposal.

The dioxin/furan TEQ exceeded the DMMP criteria in some samples. However, suitability for open-water disposal would be determined based on the volume-weighted average of dredged sediment using data collected as part of a full DMMP characterization.

A full DMMP characterization would be necessary to determine suitability for marine open-water disposal closer to when dredging would occur.

4.1.2 *North Lake Marina*

Concentrations of benzoic acid and benzyl alcohol were above DMMP criteria. However, as allowed according to DMMP guidance, bioassay testing could be conducted on site sediment as part of a full DMMP characterization to determine if dredged sediment is suitable for open-water disposal.

The dioxin/furan TEQ exceeded the ML DMMP criteria in both samples, which could influence suitability of open-water disposal, pending completion of a full DMMP characterization.

A full DMMP characterization would be necessary to determine suitability for open-water disposal closer to when dredging would occur.

4.2 Shoreline Areas

4.2.1 Log Boom Park

Sediment concentrations were below all SQVs in most samples, with bis(2ethylhexyl)phthalate above SL2 in HT-04 and copper above SL1 in HT-05. Water concentrations were similar to background concentrations. These results will be evaluated as part of future work to be conducted by DOH to develop a health consultation.

4.2.2 Kenmore Industrial Park

No concentrations exceeded SQVs along both the Lake Washington and the Sammamish River KIP shorelines. PCBs were non-detect, and the dioxin/furan concentration was below 2.3 ng/kg TEQ. These results will be evaluated as part of future work to be conducted by DOH to develop a health consultation.

4.3 Other Areas

Concentrations exceeded SQVs for total PCBs, benzo(b,j,k)fluoranthenes, bis(2ethylhexyl)phthalate, di-n-octyl phthalate, cadmium, copper, zinc, at one or more locations at Harbour Village Marina, the WDFW boat launch, and north of KIP. Dioxin/furan concentrations were higher at Harbour Village Marina and North Lake Marina than testing results from other areas, which will be evaluated by Ecology along with other results to determine next steps for further evaluation, if needed.

5 REFERENCES

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TABLES

Table 1
Sediment Grab Observation Summary

Station ID	Date Collected	Water Depth (feet)	Recovery Depth (cm)	Coordinates		Sample Interval (cm)	Sediment Observations					Grab Quality Notes, Number of Attempts
				Northing	Easting		Sediment Type	Biota	Organic Matter/Debris	Odor	Sheen	
HT-01	11/6/2012	0.5	10	279602	1288090	0-10	Gravelly SAND	Trace shells	Trace surface organic matter	None	None	Hand collected
HT-02	11/6/2012	0.8	10	279590	1288199	0-10	Fine-SAND, trace silt	Trace shells	Trace organic matter, with woody debris streaking	None	None	Hand collected
HT-03	11/6/2012	0.8	10	279505	1288473	0-10	Silty fine-SAND	None	Woody streak at 2 inches	Slight H ₂ S	None	Hand collected
HT-04	11/6/2012	0.5	10	279422	1288684	0-10	Clayey SILT	None	Substantial loose woody debris	None	None	Hand collected
HT-05	11/6/2012	1 -1.5	10	279265	1288694	0-10	Gravelly SAND	Trace clams and worms	Trace woody debris	None	None	Hand collected
HT-06	11/6/2012	0.2	10	279241	1288812	0-10	Silty fine-SAND with trace clay	None	Trace aquatic plant roots and leaves and woody debris	None	None	Hand collected
HT-07	11/6/2012	0.2	10	279734	1289089	0-10	Pebbly, medium-coarse silty SAND	None	Trace woody debris and organic matter	None	None	Hand collected near edges of stream
HT-08	11/6/2012	0.5	10	278405	1291778	0-10	Gray silty fine-SAND	Trace shells	Trace organic woody debris	None	None	Hand collected
HT-09	11/6/2012	0.5	10	278377	1291935	0-10	Fine-sandy SILT, few pebbles and trace clay	None	None	None	None	Hand collected
HT-10	11/6/2012	Dry	10	277892	1285959	0-10	Gray medium-SAND, trace fines and gravel	Trace shells	None	None	None	Hand collected
HT-11	11/6/2012	1-1.5	10	277815	1286028	0-10	Gray medium-coarse-SAND, with gravel and trace fines	Trace shells	None	None	None	Hand collected
SG-01	11/7/2012	3.0	20.5	277963	1289407	0-10	Gray fine-SAND with trace medium-sand and silt	Trace clams	None	None	None	Good grab, station moved to navigation channel
SG-02	11/8/2012	4.5	22	279179	1289549	0-22	Very soft SILT	40% plant cover	Trace organic matter	None	Trace	First grab accepted
SG-03	11/8/2012	4.6	25	279174	1289661	0-25	Soft SILT, trace fine sand at bottom 5 cm	Trace shells	Trace leaves and sticks	None	Trace	First grab accepted
SG-04	11/8/2012	20.4	20	279139	1290268	0-15	Gravelly SAND to 15 cm with large gravel below	None	Trace organic matter, sticks, roots	None	None	First grab with rocks in jaw, second grab accepted
SG-05	11/8/2012	17.4	23.5	278907	1289917	0-23	Soft SILT, trace fine sand	None	Moderate organic matter	None	None	First grab overpenetrated, second grab accepted
SG-06	11/8/2012	17.7	25	278711	1289558	0-25	Moderately stiff SILT with trace clay	Trace worms	Moderate organic matter, with 20% woody debris in bottom 3 cm	None	None	First grab insufficient recovery, second grab accepted
SG-07	11/8/2012	16.9	27	278254	1289072	0-25	Soft SILT with lenses of sand	None	15% surface wood, High pulp-like organic matter at 20 to 25 cm	None	None	First grab accepted
SG-08	11/8/2012	16.1	26	277764	1288689	0-25	Silty fine-SAND	None	Substantial organics	None	None	First grab accepted
SG-09	11/8/2012	18.4	26.5	277396	1288456	0-25	SILT and trace silty fine-sand	None	Trace organic debris	None	None	First grab accepted
SG-10	11/7/2012	4.6	26	279175	1288815	0-10	Fine sandy SILT with coarse-sand below 10 cm	None	Aquatic plants at surface, moderate organic matter with streaks of woody debris	None	None	First grab accepted
SG-11	11/7/2012	4.8	28.5	279159	1289048	0-10	Soft SILT	None	Trace macrophytes on surface, trace organic matter	None	Slight	First grab overpenetrated, second grab accepted

**Table 1
Sediment Grab Observation Summary**

Station ID	Date Collected	Water Depth (feet)	Recovery Depth (cm)	Coordinates		Sample Interval (cm)	Sediment Observations					Grab Quality Notes, Number of Attempts
				Northing	Easting		Sediment Type	Biota	Organic Matter/Debris	Odor	Sheen	
SG-12	11/7/2012	8.1	19	278974	1288780	0-10	Soft SILT	Worms	Moderate organic matter, with lens of woody material	None	None	First grab accepted
SG-13	11/7/2012	8.1	24	278858	1289306	0-10	SILT	None	Trace organics and woody debris	None	None	First grab accepted
SG-14	11/7/2012	17.2	19	279416	1290608	0-10	Slightly sandy SILT	None	Moderate organic matter	None	Slight	First grab accepted
SG-15	11/7/2012	1.9	23	278643	1290067	0-10	Slightly silty fine-SAND	Trace shells and worms	Trace woody debris	None	None	First grab accepted
SG-16	11/7/2012	10.4	21	278308	1290504	0-10	Fine-SAND	None	Trace wood fragments	None	None	First grab accepted
SG-17	11/7/2012	4.4	23.5	278642	1291535	0-10	SILT to 6 cm with soft clay below	Trace clams	Surface with abundant leaves, organic matter	None	None	First grab accepted

Notes:

Predominant sediment type displayed in ALL CAPS.

cm = centimeter

H₂S = hydrogen sulfide

ID = identification

**Table 2
Water Quality Sample Collection Summary**

Station ID	Location	Date Collected	Time	Water Depth (feet)	Coordinates		Sample Depth (feet)	Field Parameters					Comments
					Northing	Easting		Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	
HT-01	Log Boom Park Shoreline	11/7/2012	15:46	1.8	279602	1288090	1	12.5	7.69	0.148	5.78	9.06	Tannin color, moderately turbid
HT-04	Log Boom Park Shoreline	11/7/2012	16:15	2.0	279590	1288199	0.5-1	12.39	7.51	0.142	5.46	8.28	Tannin color, water sample collected from shoreward end of dock
WS-10	Reference	11/7/2012	14:50	9.6	278267	1287851	3	12.68	7.91	0.145	0.78	11.63	Moderately turbid, few floating macrophytes

Notes:

°C = degrees Celsius

DO = dissolved oxygen

ID = identification

mg/L = milligrams per liter

mS/cm = millisiemens per centimeter

NTU = Nephelometric Turbidity Unit

Table 3
Sediment Results Compared to DMMP Criteria from Kenmore Navigation Channel and North Lake Marina

	Location ID			SG-02	SG-03	SG-04	SG-05	SG-06	SG-07	SG-07	SG-08	SG-09
	Location			North Lake Marina			Kenmore Navigation Channel					
	Sample ID			SG-02-S-C-121108	SG-03-S-C-121108	SG-04-S-C-121108	SG-05-S-C-121108	SG-06-S-C-121108	SG-07-S-C-121108	SG-07-S-C-DUP-121108	SG-08-S-C-121108	SG-09-S-C-121108
	Sample Date			11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012
Sample Interval			0-22 cm	0-25 cm	0-15 cm	0-23 cm	0-25 cm	0-25 cm	0-25 cm	0-25 cm	0-25 cm	
	DMMP SL	DMMP BT	DMMP ML									
Conventional Parameters (%)												
Total organic carbon	--	--	--	7.12	6.60	2.73	5.43	4.89	4.95	7.07	3.30	5.22
Total solids	--	--	--	25.7	25.6	80.8	35.0	29.9	33.7	34.3	42.0	35.7
Total volatile solids	--	--	--	13.51	15.15	1.72	11.13	13.89	13.40	14.11	9.10	10.58
Gravel	--	--	--	0.4	11.8	71.4	3.1	0.1 U	0.5	2.6	0.3	0.1
Sand, Very Coarse	--	--	--	6.5	9.2	7.6	2.9	7.4	2.7	2.7	1.5	2.1
Sand, Coarse	--	--	--	5.5	7.2	6.9	5.3	6.6	3.1	2.8	1.5	1.7
Sand, Medium	--	--	--	5.5	7.2	7.6	11.1	6.2	6.3	6.0	3.9	6.9
Sand, Fine	--	--	--	7.2	7.8	2.9	14.3	8.6	24.4	21.9	22.2	15.9
Sand, Very Fine	--	--	--	9.1	10.1	1.0	15.2	15.9	18.9	18.6	21.2	13.4
Fines (silt + clay)	--	--	--	65.8	46.7	2.5	48.1	55.2	44.1	45.4	49.3	59.7
Silt, Coarse	--	--	--	10.0	13.1	--	7.7	8.6	11.0	13.7	13.0	19.7
Silt, Medium	--	--	--	19.3	8.4	--	16.0	15.5	12.1	11.0	13.7	12.9
Silt, Fine	--	--	--	15.2	10.9	--	9.9	12.1	7.9	7.6	8.4	10.9
Silt, Very Fine	--	--	--	11.1	7.0	--	7.1	7.8	5.9	6.1	6.3	7.6
Clay, Coarse	--	--	--	5.6	4.5	--	4.3	6.3	3.8	3.9	3.9	4.7
Clay, Medium	--	--	--	3.2	1.8	--	1.9	3.2	2.5	2.1	2.6	2.6
Clay, Fine	--	--	--	1.4	1.1	--	1.3	1.6	0.9	0.9	1.4	1.3
Metals (mg/kg)												
Antimony	150	--	200	20 U	20 U	6 U	10 U	20 U	10 U	10 U	10 U	10 U
Arsenic	57	507.1	700	20 U	20 U	6 U	10 U	20 U	10 U	10 U	10 U	10 U
Cadmium	5.1	11.3	14	1.3	1.2	0.3	0.7	0.8	0.6	0.6	0.6	0.6
Chromium	260	260	--	56	55	35	43	57	41	44	44	48
Copper	390	1027	1300	92.4	88.1	14.6	35.6	43.6	30	28.7	28	31.1
Lead	450	975	1200	62	42	5	28	31	21	21	21	24
Mercury	0.41	1.5	2.3	0.18	0.1	0.02 U	0.08	0.1	0.11	0.08	0.07	0.08
Nickel	--	--	--	48	45	30	39	46	41	42	40	43
Selenium	--	3	--	2 U	2 U	0.6 U	1 U	2 U	1 U	1 U	1 U	1 U
Silver	6.1	6.1	8.4	1 U	1 U	0.4 U	0.9 U	1 U	0.9 U	0.8 U	0.7 U	0.9 U
Zinc	410	2783	3800	231	267	49	143	164	126	123	113	130
Organometallic Compounds (µg/L)												
Tributyltin (porewater)	0.15	0.15	--	0.67	0.058	0.049	0.008	0.023	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Polycyclic Aromatic Hydrocarbons (µg/kg)												
1-Methylnaphthalene	--	--	--	21	9.8 J	20 U	13 J	20 U	20 U	19 U	9.6 J	20 U
2-Methylnaphthalene	670	--	1900	31	25	20 U	26	14 J	20 U	19 U	19 U	20 U
Acenaphthene	500	--	2000	320	33	14 J	26	17 J	20 U	19 U	19 U	20 U
Acenaphthylene	560	--	1300	22	16 J	20 U	20 U	20 U	20 U	19 U	19 U	20 U
Anthracene	960	--	13000	66	68	26	39	28	18 J	19 U	19 U	20 U
Benzo(a)anthracene	1300	--	5100	210	190	81	110	110	110	52	42	40
Benzo(a)pyrene	1600	--	3600	190	160	62	76	120	63	55	50	45
Benzo(g,h,i)perylene	670	--	3200	170	130	43	63	93	36	41	41	36
Chrysene	1400	--	21000	440	340	110	190	190	140	82	73	72
Dibenzo(a,h)anthracene	230	--	1900	67	55	15 J	21	37	17 J	12 J	11 J	13 J
Fluoranthene	1700	4600	30000	480	410	220	310	290	150	140	130	120
Fluorene	540	--	3600	98	46	14 J	37	28	12 J	9.7 J	19 U	20 U
Indeno(1,2,3-c,d)pyrene	600	--	4400	140	110	39	51	81	33	38	36	33
Naphthalene	2100	--	2400	83	58	20 U	50	38	18 J	25	14 J	24
Phenanthrene	1500	--	21000	170	190	140	180	140	72	68	64	59
Pyrene	2600	11980	16000	590	440	190	300	290	140	130	120	120
Total Benzofluoranthenes (b,j,k) (U = 0)	3200	--	9900	530	420	140	220	300	170	140	120	120
Total LPAH (DMMP) (U = 0)	5200	--	29000	760	410 J	190 J	330	250 J	120 J	103 J	78 J	83

Table 3
Sediment Results Compared to DMMP Criteria from Kenmore Navigation Channel and North Lake Marina

	Location ID			SG-02	SG-03	SG-04	SG-05	SG-06	SG-07	SG-07	SG-08	SG-09
	Location			North Lake Marina			Kenmore Navigation Channel					
	Sample ID			SG-02-S-C-121108	SG-03-S-C-121108	SG-04-S-C-121108	SG-05-S-C-121108	SG-06-S-C-121108	SG-07-S-C-121108	SG-07-S-C-DUP-121108	SG-08-S-C-121108	SG-09-S-C-121108
	Sample Date			11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012
	Sample Interval			0-22 cm	0-25 cm	0-15 cm	0-23 cm	0-25 cm	0-25 cm	0-25 cm	0-25 cm	0-25 cm
	DMMP SL	DMMP BT	DMMP ML									
Total HPAH (DMMP) (U = 0)	12000	--	69000	2820	2260	900 J	1340	1510	860 J	690 J	620 J	600 J
Chlorinated Hydrocarbons (µg/kg)												
1,2,4-Trichlorobenzene	31	--	64	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U
1,2-Dichlorobenzene	35	--	110	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U
1,3-Dichlorobenzene	--	--	--	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U
1,4-Dichlorobenzene	110	--	120	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U
Hexachlorobenzene	22	168	230	4.9 U	4.9 U	4.9 U	5.0 U	4.8 U	4.9 U	4.8 U	4.8 U	4.8 U
Hexachloroethane	--	--	--	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U
Phthalates (µg/kg)												
Bis(2-ethylhexyl)phthalate	1300	--	8300	680	510	62 U	260	540	330	300	240	240
Butylbenzyl phthalate	63	--	970	32	32	20 U	20 U	57	28	19 U	36	29
Diethyl phthalate	200	--	1200	49 U	38 J	49 U	49 U	58	49 U	48 U	48 U	49 U
Dimethyl phthalate	71	--	1400	28	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U
Di-n-butyl phthalate	1400	--	5100	19 U	9.8 J	20 U	20 U	20 U	20 U	12 J	19 U	20 U
Di-n-octyl phthalate	6200	--	6200	19 U	58 J	20 U	22 J	41 J	22 J	19 U	19 U	20 U
Phenols (µg/kg)												
2,4-Dimethylphenol	29	--	210	19 UJ	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ	19 UJ	19 UJ	20 UJ
2-Methylphenol (o-Cresol)	63	--	77	19 U	20 U	20 UJ	20 U	20 U	20 U	19 U	19 U	20 U
4-Methylphenol (p-Cresol)	670	--	3600	74	76	39 U	74	91	54	31 J	22 J	36 J
Pentachlorophenol	400	504	690	190 U	200 U	200 U	200 U	200 U	200 U	190 U	190 U	200 U
Phenol	420	--	1200	19 U	110	20 U	180	80	42	42	19	39
Miscellaneous Extractables (µg/kg)												
Benzoic acid	650	--	760	960	1300	390 U	1300	1100	430	480	300 J	510
Benzyl alcohol	57	--	870	82	130	20 U	160	190	120	100	61	110
Dibenzofuran	540	--	1700	30	35	20 U	28	20 U	20 U	19 U	19 U	20 U
N-Nitrosodiphenylamine	28	--	130	19 U	20 U	20 U	20 U	20 U	20 U	19 U	19 U	20 U
Pesticides (µg/kg)												
4,4'-DDD (p,p'-DDD)	16	--	--	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.6 U
4,4'-DDE (p,p'-DDE)	9	--	--	1.7 U	1.7 U	1.7 U	1.7 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U
4,4'-DDT (p,p'-DDT)	12	--	--	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.6 U
Aldrin	9.5	--	--	0.64 U	0.64 U	0.64 U	0.65 U	0.63 U	0.64 U	0.63 U	0.63 U	0.63 U
Chlordane, alpha- (cis-Chlordane)	--	--	--	0.83 U	0.83 U	0.83 U	0.84 U	0.82 U	0.83 U	0.81 U	0.81 U	0.81 U
Chlordane, beta- (trans-Chlordane)	--	--	--	0.78 U	0.78 U	0.77 U	0.79 U	0.77 U	0.78 U	0.76 U	0.76 U	0.76 U
Dieldrin	1.9	--	--	1.7 U	1.7 U	1.7 U	1.7 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U
Heptachlor	1.5	--	--	0.64 U	0.64 U	0.64 U	0.65 U	0.63 U	0.64 U	0.63 U	0.63 UJ	0.63 U
Hexachlorobutadiene	11	--	270	4.9 U	4.9 U	4.9 U	5.0 U	4.8 U	4.9 U	4.8 U	4.8 U	4.8 U
Nonachlor, cis-	--	--	--	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
Nonachlor, trans-	--	--	--	4.7 U	4.7 U	4.7 U	4.8 U	4.7 U	4.7 U	4.6 U	4.6 U	4.6 U
Oxychlordane	--	--	--	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U
Sum 4,4' DDT, DDE, DDD (U = 0)	--	50	69	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.6 U
Total Chlordane (U = 0)	2.8	37	--	4.7 U	4.7 U	4.7 U	4.8 U	4.7 U	4.7 U	4.6 U	4.6 U	4.6 U
PCB Aroclors (µg/kg)												
Aroclor 1016	--	--	--	19 U	19 U	20 U	19 U	19 U	19 U	19 U	18 U	20 U
Aroclor 1221	--	--	--	19 U	19 U	20 U	19 U	19 U	19 U	19 U	18 U	20 U
Aroclor 1232	--	--	--	19 U	19 U	20 U	29 U	19 U	19 U	19 U	18 U	20 U
Aroclor 1242	--	--	--	19 U	19 U	20 U	19 U	19 U	19 U	19 U	18 U	20 U
Aroclor 1248	--	--	--	58 U	38 U	20 U	19 U	19 U	19 U	19 U	18 U	20 U
Aroclor 1254	--	--	--	88	48 U	20 U	29 U	28 U	19 U	22	18 U	20 U
Aroclor 1260	--	--	--	33	22	20 U	19 U	19 U	19 U	19 U	18 U	20 U
Total PCB Aroclors (U = 0)	130	--	3100	121	22	20 U	29 U	28 U	19 U	22	18 U	20 U

Table 3
Sediment Results Compared to DMMP Criteria from Kenmore Navigation Channel and North Lake Marina

	Location ID	SG-02	SG-03	SG-04	SG-05	SG-06	SG-07	SG-07	SG-08	SG-09		
	Location	North Lake Marina			Kenmore Navigation Channel							
	Sample ID	SG-02-S-C-121108	SG-03-S-C-121108	SG-04-S-C-121108	SG-05-S-C-121108	SG-06-S-C-121108	SG-07-S-C-121108	SG-07-S-C-DUP-121108	SG-08-S-C-121108	SG-09-S-C-121108		
	Sample Date	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012		
	Sample Interval	0-22 cm	0-25 cm	0-15 cm	0-23 cm	0-25 cm	0-25 cm	0-25 cm	0-25 cm	0-25 cm		
		DMMP SL	DMMP BT	DMMP ML								
PCB Aroclors (mg/kg-OC)												
Total PCB Aroclors (U = 0)	--	38	--	1.7	0.33	0.73 U	0.53 U	0.57 U	0.38 U	0.31	0.55 U	0.38 U
Dioxin Furans (ng/kg)												
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	0.975 J	0.599 J	0.15 J	0.322 J	0.478 J	0.306 J	0.341 J	0.293 J	0.372 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	7.83	3.75	0.381 J	1.33	1.58	1.18	1.03	0.870 J	1.24
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	14.5	6.97	0.491 J	2.18	2.65	1.42 J	1.38 J	1.36 J	1.71 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	53.1	28.0	1.62 J	8.58	9.51	4.38	4.21	3.85	5.03
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	29.5	14.5	0.897 J	4.84	5.68	2.85	2.95	2.99	3.54
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	1020	610	40.5	184	237	85.5	82.7	88.5	103
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	--	7420	4760	307	1540	2520	652	613	684	798
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	--	14.9 J	9.77 J	1.13 J	4.22 J	4.89 J	4.25 J	3.82 J	3.33 J	4.12 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	--	43.9	26.5	2.51 J	9.38 J	9.24 J	8.33 J	7.29 J	6.12 J	7.92 J
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	--	334	206	16.1	60.4	70.1	31.4 J	30.2 J	27.2 J	35.0 J
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	--	2260	1620	134	473	803	167	155	160	191
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	--	3.37	2.13	0.173 J	0.841 J	0.967 J	0.643 J	0.579 J	0.553 J	0.784 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	3.04	1.71 J	0.164 J	0.684 J	0.746 J	0.442 J	0.466 J	0.409 J	0.577 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	--	3.27	1.86	0.128 J	0.785 J	0.826 J	0.452 J	0.556 J	0.540 J	0.573 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	8.04	4.83	0.289 J	1.74 J	1.90 J	1.20 J	1.05 J	1.30 J	1.43 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	8.28	4.02	0.261 J	1.45 J	1.64 J	0.989 J	0.958 J	0.964 J	1.23 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	--	3.12	1.8 J	0.185 J	0.751 J	0.846 J	0.386 J	0.411 J	0.366 J	0.497 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	--	11.7	6.21	0.361 J	2.14	2.55	1.40 J	1.34 J	1.37 J	1.74 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	--	137	84.1	4.39	25.4	31.3	14.6	14.6	18.7	17.7
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	--	7.34	4.63	0.315 J	1.63 J	1.98 J	1.06 J	1.14 J	1.83 J	1.33 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	--	366	272	10.8	71.9	108	40.9	39.5	66.0	46.6
Total Tetrachlorodibenzofuran (TCDF)	--	--	--	55.5 J	32.2 J	2.12 J	13.8 J	15.5 J	11.1 J	10.3 J	9.21 J	12.2 J
Total Pentachlorodibenzofuran (PeCDF)	--	--	--	119	59.4 J	3.51 J	22.5 J	24.5 J	14.8 J	14.2 J	12.8 J	17.1 J
Total Hexachlorodibenzofuran (HxCDF)	--	--	--	240	136 J	7.38 J	45.2	51.1 J	25.8 J	25.6	25.7 J	30.6 J
Total Heptachlorodibenzofuran (HpCDF)	--	--	--	404	273	13.1 J	79.2	104	43.8	43.3	57.2 J	52.8 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	4 - 10 ^a	--	10	37.0 J	20.3 J	1.6 J	6.8 J	8.4 J	4.2 J	4.0 J	3.9 J	4.9 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)	4 - 10 ^a	--	10	37.0 J	20.3 J	1.6 J	6.8 J	8.4 J	4.2 J	4.0 J	3.9 J	4.9 J

Notes:

a Non-dispersive Screening Levels. DMMPUs with dioxin concentrations below 10 ng/kg TEQ will be allowed for open-water disposal as long as the volume-weighted average concentration of dioxins in material from the entire dredging project does not exceed the Disposal Site Management Objective of 4 ng/kg TEQ

Detected concentration is greater than DMMP Marine SL (screening level)

Detected concentration is greater than DMMP Marine BT (bioaccumulation trigger)

Detected concentration is greater than DMMP Marine ML (maximum level)

All non-detect pesticides and dioxin/furan data were reported at the **method detection limit**; all other non-detect data were reported at the **reporting limit**. Non-detect exceedances are not highlighted.

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest reporting limit value is reported as the sum.

Totals are calculated as the sum of all detected results and 1/2 the undetected reporting limit (U=1/2). If all results are not detected, the highest reporting limit value is reported as the sum.

Total LPAH (Low PAH) are the total of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, and Anthracene. 2-Methylnaphthalene is not included in the sum of LPAHs.

Total HPAH (High PAH) are the total of Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzofluoranthenes, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene.

Sum 4,4' DDT, DDE, DDD consists of the sum of 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT.

Total Chlordane includes alpha-chlordane (cis-chlordane), beta-chlordane (trans-chlordane), cis-nonaclor, trans-nonaclor, and oxychlordane.

Total DMMP PCB Aroclors is the total of all PCB Aroclors listed in this table.

Dioxin/Furan Toxicity Equivalency (TEQ) values as of 2005, World Health Organization.

% = percent
 µg/kg = micrograms per kilogram
 µg/L = micrograms per liter
 BT = bioaccumulation trigger
 cm = centimeter
 DMMP = Dredged Material Management Program
 HPAH = high polycyclic aromatic hydrocarbons
 ID = identification
 J = estimated value
 LPAH = low polycyclic aromatic hydrocarbons
 mg/kg = milligrams per kilogram
 mg/kg-OC = milligrams per kilogram, organic carbon normalized
 ML = maximum level
 ng/kg = nanograms per kilogram
 PCB = polychlorinated biphenyl
 SL = screening level
 TEQ = toxic equivalency
 U = compound analyzed, but not detected above detection limit
 UJ = compound analyzed, but not detected above estimated detection limit
 USEPA = U.S. Environmental Protection Agency

USEPA Stage 2A validation was performed by Anchor QEA on all compounds, except dioxin/furans.
 USEPA Stage 4 validation was performed by LDC on dioxin/furans.

Bold = Detected result

-- = results not reported or not applicable
Sampling and Analysis Results Memorandum
Kenmore Sediment and Water Characterization

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID		HT-01	HT-02	HT-03	HT-04	HT-05	HT-06	HT-07	HT-08
	Location		Log Boom Park Shoreline					Tributary 0056		WDFW Boat Launch
	Sample ID		HT-01-S-C-121106	HT-02-S-C-121106	HT-03-S-C-121106	HT-04-S-C-121106	HT-05-S-C-121106	HT-06-S-E-121106	HT-07-S-E-121106	HT-08-S-C-121106
	Sample Date		11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012
	Sample Interval		0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
	Freshwater SL1	Freshwater SL2								
Conventional Parameters (%)										
Total organic carbon	--	--	0.240	0.484	0.770	6.20	0.531	1.25	1.72	3.08
Total solids	--	--	77.3	78.8	65.7	50.9	80.4	74.8	80.5	77.2
Total volatile solids	--	--	0.67	1.46	7.06	19.69	2.05	1.54	1.72	1.49
Gravel	--	--	12.1	29.8	5.6	0.4	62.9	8.3	41.1	38.0
Sand, Very Coarse	--	--	3.5	1.6	1.6	0.5	8.6	2.5	10.4	2.2
Sand, Coarse	--	--	6.3	2.4	2.0	0.8	8.1	6.9	12.7	1.8
Sand, Medium	--	--	23.8	11.3	13.0	4.3	12.7	35.8	18.4	20.5
Sand, Fine	--	--	45.2	35.2	22.6	26.2	4.8	32.2	11.1	28.5
Sand, Very Fine	--	--	6.1	17.7	48.7	54.2	0.9	8.3	3.6	5.8
Fines (silt + clay)	--	--	3.0	2.0	6.3	13.6	2.0	6.1	2.7	3.2
Silt, Coarse	--	--	3.0 U	2.0 U	6.3	13.6	2.0 U	3.7	2.7 U	3.2 U
Silt, Medium	--	--	3.0 U	2.0 U	0.1 U	0.1 U	2.0 U	0.7	2.7 U	3.2 U
Silt, Fine	--	--	3.0 U	2.0 U	0.1 U	0.1 U	2.0 U	0.6	2.7 U	3.2 U
Silt, Very Fine	--	--	3.0 U	2.0 U	0.1 U	0.1 U	2.0 U	0.4	2.7 U	3.2 U
Clay, Coarse	--	--	3.0 U	2.0 U	0.1 U	0.1 U	2.0 U	0.4	2.7 U	3.2 U
Clay, Medium	--	--	3.0 U	2.0 U	0.1 U	0.1 U	2.0 U	0.2	2.7 U	3.2 U
Clay, Fine	--	--	3.0 U	2.0 U	0.1 U	0.1 U	2.0 U	0.1	2.7 U	3.2 U
Metals (mg/kg)										
Antimony	--	--	6 UJ	6 UJ	7 UJ	10 UJ	6 UJ	7 UJ	6 UJ	6 UJ
Arsenic	20	51	6 U	6 U	7 U	10 U	6 U	7 U	6 U	6 U
Cadmium	1.1	1.5	0.2 U	0.3 U	0.3	0.5	0.4	0.3	0.3	0.3
Chromium	95	100	17.8 J	23.3 J	23.0 J	27 J	20.3 J	25.5 J	30.1 J	29.6 J
Copper	80	830	4.3	5.6	7.6	15.2	220	9.9	11.4	38.2
Lead	340	430	4	4	10	16	3	6	10	7
Mercury	0.28	0.75	0.03 U	0.02 U	0.03 U	0.23	0.02 U	0.02 U	0.03 U	0.02 U
Nickel	60	70	20	24	25	27	36	30	34	28
Selenium	--	--	0.6 U	0.6 U	0.7 U	1 U	0.6 U	0.6 U	0.6 U	0.6 U
Silver	2	2.5	0.4 U	0.4 U	0.4 U	0.6 U	0.4 U	0.4 U	0.4 U	0.4 U
Zinc	130	400	34	41	58	117	69	53	90	54
Organometallic Compounds										
Tributyltin (porewater) µg/L	--	--	--	--	--	--	--	--	--	--
Tributyltin (bulk) µg/kg	--	--	--	--	--	--	--	3.4 U	3.7 U	--
Polycyclic Aromatic Hydrocarbons (µg/kg)										
1-Methylnaphthalene	--	--	4.6 U	2.5 J	27	83	4.6 U	4.7 U	4.4 J	4.6 U
2-Methylnaphthalene	470	560	4.6 U	4.0 J	51	190	4.6 U	6.1	6.7	3.5 J
Acenaphthene	1100	1300	4.6 U	3.1 J	55	120	4.6 U	3.4 J	4.9 U	4.6 U
Acenaphthylene	470	640	4.6 U	4.9 U	3.4 J	20	4.6 U	4.7 U	4.9 U	4.6 U
Anthracene	1200	1600	4.6 U	4.6 J	54	190	3.8 J	7.8	4.9 U	4.6 U

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID		HT-01	HT-02	HT-03	HT-04	HT-05	HT-06	HT-07	HT-08
	Location		Log Boom Park Shoreline					Tributary 0056		WDFW Boat Launch
	Sample ID		HT-01-S-C-121106	HT-02-S-C-121106	HT-03-S-C-121106	HT-04-S-C-121106	HT-05-S-C-121106	HT-06-S-E-121106	HT-07-S-E-121106	HT-08-S-C-121106
	Sample Date		11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012
	Sample Interval		0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
	Freshwater SL1	Freshwater SL2								
Benzo(a)anthracene	4300	5800	4.6 U	6.0	75	330	10	38	18 J	9.6
Benzo(a)pyrene	3300	4800	4.6 U	3.3 J	57	210	5.7	42	24	10
Benzo(b,j,k)fluoranthenes	600	4000	4.6 U	9.0	120	550	16	88	50	25
Benzo(g,h,i)perylene	4000	5200	4.6 U	4.9 U	34	74	3.2 J	21	26	6.9
Chrysene	5900	6400	4.6 U	8.0	110	480	18	50	29	15
Dibenzo(a,h)anthracene	800	840	4.6 U	4.9 U	7.0	23	4.6 U	5.8	4.9 U	4.6 U
Fluoranthene	11000	15000	4.3 J	24	260	1100	22	100	50	28
Fluorene	1000	3000	4.6 U	5.8	72	230	2.4 J	6.1	4.9 U	3.2 J
Indeno(1,2,3-c,d)pyrene	4100	5300	4.6 U	4.9 U	25	69	4.6 U	19	20	5.7
Naphthalene	500	1300	4.6 U	6.8	97	380	2.6 J	5.8	2.8 J	3.3 J
Phenanthrene	6100	7600	3.1 J	20	260	860	8.0	51	20	11
Pyrene	8800	16000	3.0 J	19	170	740	18	85	39	26
Total LPAH (SEF) (U = 0)	6600	9200	3.1 J	44 J	590 J	2000	17 J	80 J	30 J	21 J
Total LPAH (SEF) (U = 1/2)	6600	9200	17 J	47 J	590 J	2000	24 J	83 J	39 J	28 J
Total HPAH (SEF) (U = 0)	31000	55000	7.3 J	69 J	860	3600	93 J	450	260 J	130
Total HPAH (SEF) (U = 1/2)	31000	55000	23 J	77 J	860	3600	98 J	450	260 J	130
Chlorinated Hydrocarbons (µg/kg)										
1,2,4-Trichlorobenzene	--	--	19 U	20 U	19 U	20 U	18 U	19 U	20 U	18 U
1,2-Dichlorobenzene	--	--	19 U	20 U	19 U	20 U	18 U	19 U	20 U	18 U
1,3-Dichlorobenzene	--	--	19 U	20 U	19 U	20 U	18 U	19 U	20 U	18 U
1,4-Dichlorobenzene	--	--	19 U	20 U	19 U	20 U	18 U	19 U	20 U	18 U
Hexachlorobenzene	--	--	19 U	20 U	19 U	23	18 U	4.9 U	4.9 U	18 U
Hexachloroethane	--	--	19 U	20 U	19 U	20 U	18 U	19 U	20 U	18 U
Phthalates (µg/kg)										
Bis(2-ethylhexyl)phthalate	220	320	16 J	18 J	66	460	23	110	79	72
Butylbenzyl phthalate	260	370	19 U	20 U	16 J	65	18 U	19 U	20 U	19
Diethyl phthalate	--	--	67	49 U	48 U	49 U	46 U	48 U	50 U	46 U
Dimethyl phthalate	46	440	19 U	20 U	19 U	20 U	18 U	19 U	20 U	97
Di-n-butyl phthalate	--	--	19 U	20 U	19 U	20 U	18 U	19 U	20 U	28
Di-n-octyl phthalate	26	45	19 U	20 U	19 U	20 U	18 U	19 U	20 U	18 U
Phenols (µg/kg)										
2,4-Dimethylphenol	--	--	19 UJ	20 UJ	19 UJ	20 UJ	18 UJ	19 UJ	20 UJ	18 UJ
2-Methylphenol (o-Cresol)	--	--	19 U	20 U	19 U	16 J	18 U	19 U	20 U	18 U
4-Methylphenol (p-Cresol)	--	--	38 U	39 U	36 J	150	24 J	38 U	40 U	37 U
Pentachlorophenol	--	--	190 U	200 U	190 U	200 U	180 U	190 U	200 U	180 U
Phenol	--	--	19 U	20 U	18 J	180	10 J	19 U	20 U	18 U
Miscellaneous Extractables (µg/kg)										
Benzoic acid	--	--	380 U	390 U	390 U	390 J	370 U	380 U	400 U	370 U
Benzyl alcohol	--	--	19 U	20 U	20	210	18 U	37	19 J	18 U
Dibenzofuran	400	440	4.6 U	5.5	78	280	4.6 U	5.6	4.9 U	4.6 U

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID	HT-01	HT-02	HT-03	HT-04	HT-05	HT-06	HT-07	HT-08	
	Location	Log Boom Park Shoreline					Tributary 0056		WDFW Boat Launch	
	Sample ID	HT-01-S-C-121106	HT-02-S-C-121106	HT-03-S-C-121106	HT-04-S-C-121106	HT-05-S-C-121106	HT-06-S-E-121106	HT-07-S-E-121106	HT-08-S-C-121106	
	Sample Date	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	
	Sample Interval	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	
	Freshwater SL1	Freshwater SL2								
Hexachlorobutadiene	--	--	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	4.9 U	4.9 U	10 UJ
N-Nitrosodiphenylamine	--	--	19 U	20 U	19 U	20 U	18 U	19 U	20 U	18 U
Pesticides (µg/kg)										
4,4'-DDD (p,p'-DDD)	--	--	--	--	--	--	--	0.66 U	0.66 U	--
4,4'-DDE (p,p'-DDE)	--	--	--	--	--	--	--	0.60 U	0.61 U	--
4,4'-DDT (p,p'-DDT)	--	--	--	--	--	--	--	0.93 U	0.94 U	--
Aldrin	--	--	--	--	--	--	--	0.27 U	0.27 U	--
Chlordane, alpha- (cis-Chlordane)	--	--	--	--	--	--	--	0.25 U	0.25 U	--
Chlordane, beta- (trans-Chlordane)	--	--	--	--	--	--	--	0.37 U	0.38 U	--
Dieldrin	--	--	--	--	--	--	--	0.49 U	0.49 U	--
Heptachlor	--	--	--	--	--	--	--	0.64 U	0.65 U	--
Nonachlor, cis-	--	--	--	--	--	--	--	2.6 U	2.6 U	--
Nonachlor, trans-	--	--	--	--	--	--	--	2.6 U	2.6 U	--
Oxychlordane	--	--	--	--	--	--	--	4.0 U	4.0 U	--
PCB Aroclors (µg/kg)										
Aroclor 1016	--	--	18 U	19 U	19 U	18 U	17 U	17 U	20 U	17 U
Aroclor 1221	--	--	18 U	19 U	19 U	18 U	17 U	17 U	20 U	17 U
Aroclor 1232	--	--	18 U	19 U	19 U	18 U	17 U	17 U	20 U	17 U
Aroclor 1242	--	--	18 U	19 U	19 U	18 U	17 U	17 U	20 U	17 U
Aroclor 1248	--	--	18 U	19 U	19 U	18 U	17 U	17 U	20 U	17 U
Aroclor 1254	--	--	18 U	19 U	19 U	28 J	17 U	17 U	20 U	17 U
Aroclor 1260	--	--	18 U	19 U	19 U	18 U	17 U	17 U	20 U	17 U
Total PCB Aroclors (U = 0)	60	120	18 U	19 U	19 U	28 J	17 U	17 U	20 U	17 U
Dioxin Furans (ng/kg)										
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	0.134 J	0.168 J	0.239 J	0.546 J	0.151 J	0.176 J	0.156 J	0.148 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	0.0671 U	0.158 J	0.640 J	2.14	0.420 J	0.274 J	0.243 J	0.144 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	0.209 U	0.137 J	0.654 J	2.18	0.340 J	0.374 J	0.347 J	0.120 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	0.193 J	0.434 J	2.25	8.69	0.884 J	1.50 J	0.911 J	0.387 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	0.103 J	0.275 J	1.29 J	4.33	0.790 J	0.785 J	0.660 J	0.289 J
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	3.79	9.30	38.7	178	18.4	25.4	17.1	8.06
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	31.4	101	272	1460	136	188	136	59.8
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	0.132 J	0.362 J	2.56 J	7.22 J	0.667 J	1.26 J	1.27 J	0.601 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	0.170 J	0.780 J	4.21 J	14.3 J	2.79 J	1.77 J	1.68 J	0.735 J
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	1.20 J	3.17 J	16.3 J	65.1 J	8.55 J	9.16 J	6.05	2.53 J
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	7.37	21.4	83.9	423	40.0	47.3	30.4	14.5
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	0.0355 U	0.135 J	0.397 J	1.41	0.0860 U	0.252 J	0.116 U	0.0818 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	0.0611 U	0.0990 U	0.303 J	0.871 J	0.115 U	0.204 J	0.142 U	0.0818 UJ
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	0.0454 J	0.0812 J	0.317 J	1.05	0.117 J	0.252 J	0.156 J	0.0758 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	0.0375 J	0.105 J	0.459 J	1.79 J	0.205 J	0.559 J	0.261 J	0.124 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	0.0493 J	0.115 J	0.518 J	1.78 J	0.219 J	0.320 J	0.221 J	0.130 J

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID		HT-01	HT-02	HT-03	HT-04	HT-05	HT-06	HT-07	HT-08
	Location		Log Boom Park Shoreline					Tributary 0056		WDFW Boat Launch
	Sample ID		HT-01-S-C-121106	HT-02-S-C-121106	HT-03-S-C-121106	HT-04-S-C-121106	HT-05-S-C-121106	HT-06-S-E-121106	HT-07-S-E-121106	HT-08-S-C-121106
	Sample Date		11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012	11/6/2012
	Sample Interval		0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
	Freshwater SL1	Freshwater SL2								
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	0.0335 J	0.145 U	0.185 J	0.618 J	0.127 J	0.180 J	0.0917 J	0.0539 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	0.0572 J	0.129 J	0.754 J	2.65	0.270 J	0.503 J	0.355 J	0.0858 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	0.643 J	1.21 J	5.68	26.8	2.44	3.93	3.43	1.59 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	0.414 U	0.0495 J	0.349 J	1.77 J	0.233 J	0.302 J	0.215 J	0.134 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	1.91 J	3.44 J	11.8	71.5	7.39	8.80	9.54	3.89 J
Total Tetrachlorodibenzofuran (TCDF)	--	--	0.444 J	1.46 J	6.63 J	25.6 J	1.25 J	4.09 J	4.03 J	1.15 J
Total Pentachlorodibenzofuran (PeCDF)	--	--	0.876 J	1.84 J	9.79 J	31.3 J	3.87 J	6.10 J	5.70 J	1.56 J
Total Hexachlorodibenzofuran (HxCDF)	--	--	1.18 J	2.42 J	13.6 J	50.5 J	4.60 J	8.75 J	6.85 J	2.41 J
Total Heptachlorodibenzofuran (HpCDF)	--	--	1.88	3.61 J	18.4 J	79.5 J	6.91 J	11.6	10.2	4.22
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)			0.25 J	0.62 J	2.2 J	7.9 J	1.1 J	1.3 J	0.98 J	0.55 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)			0.30 J	0.63 J	2.2 J	7.9 J	1.2 J	1.3 J	0.99 J	0.56 J

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID	HT-09	HT-10	HT-11	SG-01	SG-02	SG-03	SG-04	SG-05	
	Location	WDFW Boat Launch	Lyon Creek Park		Sammamish River	North Lake Marina		Kenmore Navigation Channel		
	Sample ID	HT-09-S-C-121106	HT-10-S-LFP-121106	HT-11-S-LFP-121106	SG-01-S-C-121107	SG-02-S-C-121108	SG-03-S-C-121108	SG-04-S-C-121108	SG-05-S-C-121108	
	Sample Date	11/6/2012	11/6/2012	11/6/2012	11/7/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	
	Sample Interval	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-22 cm	0-25 cm	0-15 cm	0-23 cm	
	Freshwater SL1	Freshwater SL2								
Conventional Parameters (%)										
Total organic carbon	--	--	2.13	1.91	0.456	1.33	7.12	6.60	2.73	5.43
Total solids	--	--	67.5	80.2	83.9	72.9	25.7	25.6	80.8	35.0
Total volatile solids	--	--	2.57	1.18	0.91	1.19	13.51	15.15	1.72	11.13
Gravel	--	--	19.1	33.3	51.4	0.1 U	0.4	11.8	71.4	3.1
Sand, Very Coarse	--	--	2.0	11.0	8.1	0.2	6.5	9.2	7.6	2.9
Sand, Coarse	--	--	1.9	22.2	15.6	2.1	5.5	7.2	6.9	5.3
Sand, Medium	--	--	15.2	25.8	19.3	47.4	5.5	7.2	7.6	11.1
Sand, Fine	--	--	37.3	5.9	4.7	44.2	7.2	7.8	2.9	14.3
Sand, Very Fine	--	--	13.6	1.2	0.4	4.0	9.1	10.1	1.0	15.2
Fines (silt + clay)	--	--	10.8	0.5	0.4	2.2	65.8	46.7	2.5	48.1
Silt, Coarse	--	--	6.0	0.5 U	0.4 U	--	10.0	13.1	--	7.7
Silt, Medium	--	--	1.3	0.5 U	0.4 U	--	19.3	8.4	--	16.0
Silt, Fine	--	--	1.1	0.5 U	0.4 U	--	15.2	10.9	--	9.9
Silt, Very Fine	--	--	1.1	0.5 U	0.4 U	--	11.1	7.0	--	7.1
Clay, Coarse	--	--	0.6	0.5 U	0.4 U	--	5.6	4.5	--	4.3
Clay, Medium	--	--	0.5	0.5 U	0.4 U	--	3.2	1.8	--	1.9
Clay, Fine	--	--	0.3	0.5 U	0.4 U	--	1.4	1.1	--	1.3
Metals (mg/kg)										
Antimony	--	--	7 UJ	6 UJ	6 UJ	6 UJ	20 U	20 U	6 U	10 U
Arsenic	20	51	7 U	6 U	6 U	6 UJ	20 U	20 U	6 U	10 U
Cadmium	1.1	1.5	0.4	0.3	0.3	0.2 U	1.3	1.2	0.3	0.7
Chromium	95	100	28.8 J	24.3 J	22.6 J	29.3	56	55	35.0	43
Copper	80	830	21.9	8.9	8.9	5.9 J	92.4	88.1	14.6	35.6
Lead	340	430	11	9	7	4 J	62	42	5	28
Mercury	0.28	0.75	0.03 U	0.02 U	0.02 U	0.03 U	0.18	0.1	0.02 U	0.08
Nickel	60	70	26	27	30	23	48	45	30	39
Selenium	--	--	0.7 U	0.6 U	0.6 U	0.6 U	2 U	2 U	0.6 U	1 U
Silver	2	2.5	0.4 U	0.3 U	0.4 U	0.4 U	1 U	1 U	0.4 U	0.9 U
Zinc	130	400	64	59	55	43 J	231	267	49	143
Organometallic Compounds										
Tributyltin (porewater) µg/L	--	--	--	--	--	--	0.67	0.058	0.049	0.008
Tributyltin (bulk) µg/kg	--	--	--	--	--	--	--	--	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)										
1-Methylnaphthalene	--	--	3.0 J	4.8 U	4.8 U	4.8 U	21	9.8 J	20 U	13 J
2-Methylnaphthalene	470	560	5.8	4.8 U	4.8 U	4.8 U	31	25	20 U	26
Acenaphthene	1100	1300	4.8 U	4.8 U	4.8 U	4.8 U	320	33	14 J	26
Acenaphthylene	470	640	4.8 U	4.8 U	4.8 U	4.8 U	22	16 J	20 U	20 U
Anthracene	1200	1600	3.7 J	4.8 U	4.8 U	4.8 U	66	68	26	39

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID	HT-09	HT-10	HT-11	SG-01	SG-02	SG-03	SG-04	SG-05	
	Location	WDFW Boat Launch	Lyon Creek Park		Sammamish River	North Lake Marina		Kenmore Navigation Channel		
	Sample ID	HT-09-S-C-121106	HT-10-S-LFP-121106	HT-11-S-LFP-121106	SG-01-S-C-121107	SG-02-S-C-121108	SG-03-S-C-121108	SG-04-S-C-121108	SG-05-S-C-121108	
	Sample Date	11/6/2012	11/6/2012	11/6/2012	11/7/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	
	Sample Interval	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-22 cm	0-25 cm	0-15 cm	0-23 cm	
	Freshwater SL1	Freshwater SL2								
Benzo(a)anthracene	4300	5800	24	18 J	4.8 U	15 J	210	190	81	110
Benzo(a)pyrene	3300	4800	25	21	4.8 U	15 J	190	160	62	76
Benzo(b,j,k)fluoranthenes	600	4000	64	44	2.5 J	35 J	530	420	140	220
Benzo(g,h,i)perylene	4000	5200	24	19	4.8 U	3.2 J	170	130	43	63
Chrysene	5900	6400	35	26	2.4 J	20	440	340	110	190
Dibenzo(a,h)anthracene	800	840	3.8 J	4.8 U	4.8 U	4.8 U	67	55	15 J	21
Fluoranthene	11000	15000	63	56	3.0 J	51	480	410	220	310
Fluorene	1000	3000	4.2 J	4.8 U	4.8 U	4.8 U	98	46	14 J	37
Indeno(1,2,3-c,d)pyrene	4100	5300	19	16 J	4.8 U	3.6 J	140	110	39	51
Naphthalene	500	1300	4.2 J	4.8 U	4.8 U	4.8 U	83	58	20 U	50
Phenanthrene	6100	7600	48	29	4.8 U	26	170	190	140	180
Pyrene	8800	16000	68	41	20 U	39	590	440	190	300
Total LPAH (SEF) (U = 0)	6600	9200	66 J	29	4.8 U	26	790	440 J	190 J	360
Total LPAH (SEF) (U = 1/2)	6600	9200	71 J	43	4.8 U	40	790	440 J	220 J	370
Total HPAH (SEF) (U = 0)	31000	55000	330 J	240 J	7.9 J	180 J	2800	2300	900 J	1300
Total HPAH (SEF) (U = 1/2)	31000	55000	330 J	240 J	30 J	180 J	2800	2300	900 J	1300
Chlorinated Hydrocarbons (µg/kg)										
1,2,4-Trichlorobenzene	--	--	19 U	19 U	20 U	19 U	19 U	20 U	20 U	20 U
1,2-Dichlorobenzene	--	--	19 U	19 U	20 U	19 U	19 U	20 U	20 U	20 U
1,3-Dichlorobenzene	--	--	19 U	19 U	20 U	19 U	19 U	20 U	20 U	20 U
1,4-Dichlorobenzene	--	--	19 U	19 U	20 U	19 U	19 U	20 U	20 U	20 U
Hexachlorobenzene	--	--	19 U	19 U	20 U	19 U	4.9 U	4.9 U	4.9 U	5.0 U
Hexachloroethane	--	--	19 U	19 U	20 U	19 U	19 U	20 U	20 U	20 U
Phthalates (µg/kg)										
Bis(2-ethylhexyl)phthalate	220	320	130	31	21 J	28	680	510	62 U	260
Butylbenzyl phthalate	260	370	19 U	19 U	20 U	19 U	32	32	20 U	20 U
Diethyl phthalate	--	--	48 U	48 U	49 U	48 U	49 U	38 J	49 U	49 U
Dimethyl phthalate	46	440	970	19 U	20 U	19 U	28	20 U	20 U	20 U
Di-n-butyl phthalate	--	--	17 J	19 U	20 U	19 U	19 U	9.8 J	20 U	20 U
Di-n-octyl phthalate	26	45	15 J	19 U	20 U	19 U	19 U	58 J	20 U	22 J
Phenols (µg/kg)										
2,4-Dimethylphenol	--	--	19 UJ	19 UJ	20 UJ	19 UJ	19 UJ	20 UJ	20 UJ	20 UJ
2-Methylphenol (o-Cresol)	--	--	19 U	19 U	20 U	19 UJ	19 U	20 U	20 UJ	20 U
4-Methylphenol (p-Cresol)	--	--	38 U	39 U	39 U	38 U	74	76	39 U	74
Pentachlorophenol	--	--	190 U	190 U	200 U	190 U	190 U	200 U	200 U	200 U
Phenol	--	--	11 J	19 U	20 U	19 U	19 U	110	20 U	180
Miscellaneous Extractables (µg/kg)										
Benzoic acid	--	--	140 J	390 U	390 U	380 U	960	1300	390 U	1300
Benzyl alcohol	--	--	23	19 U	20 U	19 U	82	130	20 U	160
Dibenzofuran	400	440	4.8 U	4.8 U	4.8 U	4.8 U	30	35	20 U	28

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID	HT-09	HT-10	HT-11	SG-01	SG-02	SG-03	SG-04	SG-05	
	Location	WDFW Boat Launch	Lyon Creek Park		Sammamish River	North Lake Marina		Kenmore Navigation Channel		
	Sample ID	HT-09-S-C-121106	HT-10-S-LFP-121106	HT-11-S-LFP-121106	SG-01-S-C-121107	SG-02-S-C-121108	SG-03-S-C-121108	SG-04-S-C-121108	SG-05-S-C-121108	
	Sample Date	11/6/2012	11/6/2012	11/6/2012	11/7/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	
	Sample Interval	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-22 cm	0-25 cm	0-15 cm	0-23 cm	
	Freshwater SL1	Freshwater SL2								
Hexachlorobutadiene	--	--	10 UJ	10 UJ	10 UJ	10 UJ	4.9 U	4.9 U	4.9 U	5.0 U
N-Nitrosodiphenylamine	--	--	19 U	19 U	20 U	19 U	19 U	20 U	20 U	20 U
Pesticides (µg/kg)										
4,4'-DDD (p,p'-DDD)	--	--	--	--	--	--	1.7 U	1.7 U	1.7 U	1.7 U
4,4'-DDE (p,p'-DDE)	--	--	--	--	--	--	1.7 U	1.7 U	1.7 U	1.7 U
4,4'-DDT (p,p'-DDT)	--	--	--	--	--	--	1.7 U	1.7 U	1.7 U	1.7 U
Aldrin	--	--	--	--	--	--	0.64 U	0.64 U	0.64 U	0.65 U
Chlordane, alpha- (cis-Chlordane)	--	--	--	--	--	--	0.83 U	0.83 U	0.83 U	0.84 U
Chlordane, beta- (trans-Chlordane)	--	--	--	--	--	--	0.78 U	0.78 U	0.77 U	0.79 U
Dieldrin	--	--	--	--	--	--	1.7 U	1.7 U	1.7 U	1.7 U
Heptachlor	--	--	--	--	--	--	0.64 U	0.64 U	0.64 U	0.65 U
Nonachlor, cis-	--	--	--	--	--	--	1.6 U	1.6 U	1.6 U	1.7 U
Nonachlor, trans-	--	--	--	--	--	--	4.7 U	4.7 U	4.7 U	4.8 U
Oxychlordane	--	--	--	--	--	--	2.3 U	2.3 U	2.3 U	2.3 U
PCB Aroclors (µg/kg)										
Aroclor 1016	--	--	19 U	19 U	19 U	17 U	19 U	19 U	20 U	19 U
Aroclor 1221	--	--	19 U	19 U	19 U	17 U	19 U	19 U	20 U	19 U
Aroclor 1232	--	--	19 U	19 U	19 U	17 U	19 U	19 U	20 U	29 U
Aroclor 1242	--	--	19 U	19 U	19 U	17 U	19 U	19 U	20 U	19 U
Aroclor 1248	--	--	19 U	19 U	19 U	17 U	58 U	38 U	20 U	19 U
Aroclor 1254	--	--	19 U	19 U	19 U	17 U	88	48 U	20 U	29 U
Aroclor 1260	--	--	19 U	19 U	19 U	17 U	33	22	20 U	19 U
Total PCB Aroclors (U = 0)	60	120	19 U	19 U	19 U	17 U	121	22	20 U	29 U
Dioxin Furans (ng/kg)										
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	0.183 J	0.168 J	0.153 J	0.164 J	0.975 J	0.599 J	0.150 J	0.322 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	0.305 J	0.117 J	0.0660 U	0.107 J	7.83	3.75	0.381 J	1.33
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	0.414 J	0.303 U	0.0718 J	0.0809 J	14.5	6.97	0.491 J	2.18
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	1.25 J	0.377 J	0.312 J	0.310 J	53.1	28.0	1.62 J	8.58
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	0.825 J	0.245 J	0.103 J	0.219 J	29.5	14.5	0.897 J	4.84
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	24.8	6.32	5.45	5.70	1020	610	40.5	184
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	169	40.1	44.9	40.5	7420	4760	307	1540
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	1.70 J	0.338 J	0.341 J	0.395 J	14.9 J	9.77 J	1.13 J	4.22 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	2.15 J	0.617 J	0.293 J	0.391 J	43.9	26.5	2.51 J	9.38 J
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	8.76	2.30 J	1.76 J	2.07 J	334	206	16.1	60.4
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	47.3	11.0	14.0	10.9	2260	1620	134	473
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	0.175 J	0.0751 U	0.153 U	0.0691 U	3.37	2.13	0.173 J	0.841 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	0.159 J	0.0909 U	0.0563 U	0.0770 J	3.04	1.71 J	0.164 J	0.684 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	0.165 J	0.146 J	0.0466 J	0.0592 J	3.27	1.86	0.128 J	0.785 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	0.556 J	0.136 J	0.0834 J	0.154 J	8.04	4.83	0.289 J	1.74 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	0.373 J	0.119 J	0.0660 J	0.0573 J	8.28	4.02	0.261 J	1.45 J

**Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values**

	Location ID	HT-09	HT-10	HT-11	SG-01	SG-02	SG-03	SG-04	SG-05	
	Location	WDFW Boat Launch	Lyon Creek Park		Sammamish River	North Lake Marina		Kenmore Navigation Channel		
	Sample ID	HT-09-S-C-121106	HT-10-S-LFP-121106	HT-11-S-LFP-121106	SG-01-S-C-121107	SG-02-S-C-121108	SG-03-S-C-121108	SG-04-S-C-121108	SG-05-S-C-121108	
	Sample Date	11/6/2012	11/6/2012	11/6/2012	11/7/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	
	Sample Interval	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-22 cm	0-25 cm	0-15 cm	0-23 cm	
	Freshwater SL1	Freshwater SL2								
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	0.265 J	0.140 U	0.162 U	0.0573 U	3.12	1.80 J	0.185 J	0.751 J
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	0.534 J	0.128 J	0.134 J	0.0553 J	11.7	6.21	0.361 J	2.14
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	6.28	1.05 J	0.840 J	1.19 J	137	84.1	4.39	25.4
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	0.574 J	0.0652 J	0.0272 J	0.0454 J	7.34	4.63	0.315 J	1.63 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	14.0	2.38 J	1.61 J	2.67 J	366	272	10.8	71.9
Total Tetrachlorodibenzofuran (TCDF)	--	--	2.79 J	2.82 J	0.720 J	0.679 J	55.5 J	32.2 J	2.12 J	13.8 J
Total Pentachlorodibenzofuran (PeCDF)	--	--	4.39 J	2.74 J	2.97 J	1.28 J	119	59.4 J	3.51 J	22.5 J
Total Hexachlorodibenzofuran (HxCDF)	--	--	11.2 J	2.46 J	2.49 J	2.43 J	240	136 J	7.38 J	45.2
Total Heptachlorodibenzofuran (HpCDF)	--	--	19.5	2.73 J	2.23 J	3.28 J	404	273	13.1 J	79.2
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)			1.4 J	0.52 J	0.32 J	0.46 J	37.0 J	20.3 J	1.6 J	6.8 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)			1.4 J	0.54 J	0.37 J	0.47 J	37.0 J	20.3 J	1.6 J	6.8 J

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID	SG-06	SG-07	SG-07	SG-08	SG-09	SG-10	SG-11	SG-12	
	Location	Kenmore Navigation Channel					Harbour Village Marina			
	Sample ID	SG-06-S-C-121108	SG-07-S-C-121108	SG-07-S-C-DUP-121108	SG-08-S-C-121108	SG-09-S-C-121108	SG-10-S-E-121107	SG-11-S-E-121107	SG-12-S-E-121107	
	Sample Date	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/7/2012	11/7/2012	11/7/2012	
	Sample Interval	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	
	Freshwater SL1	Freshwater SL2								
Conventional Parameters (%)										
Total organic carbon	--	--	4.89	4.95	7.07	3.30	5.22	3.14	10.8	4.65
Total solids	--	--	29.9	33.7	34.3	42.0	35.7	56.1	16.9	27.4
Total volatile solids	--	--	13.89	13.40	14.11	9.10	10.58	6.51	24.10	13.67
Gravel	--	--	0.1 U	0.5	2.6	0.3	0.1	5.3	0.1 U	0.6
Sand, Very Coarse	--	--	7.4	2.7	2.7	1.5	2.1	3.0	5.3	4.2
Sand, Coarse	--	--	6.6	3.1	2.8	1.5	1.7	3.9	4.6	3.8
Sand, Medium	--	--	6.2	6.3	6.0	3.9	6.9	13.2	4.4	3.5
Sand, Fine	--	--	8.6	24.4	21.9	22.2	15.9	26.5	5.6	5.2
Sand, Very Fine	--	--	15.9	18.9	18.6	21.2	13.4	21.9	7.4	11.6
Fines (silt + clay)	--	--	55.2	44.1	45.4	49.3	59.7	26.4	72.7	71.1
Silt, Coarse	--	--	8.6	11.0	13.7	13.0	19.7	17.2	18.6	22.9
Silt, Medium	--	--	15.5	12.1	11.0	13.7	12.9	3.9	20.2	22.9
Silt, Fine	--	--	12.1	7.9	7.6	8.4	10.9	1.9	14.3	12.5
Silt, Very Fine	--	--	7.8	5.9	6.1	6.3	7.6	1.4	10.9	6.2
Clay, Coarse	--	--	6.3	3.8	3.9	3.9	4.7	1.0	5.1	3.4
Clay, Medium	--	--	3.2	2.5	2.1	2.6	2.6	0.5	2.6	2.0
Clay, Fine	--	--	1.6	0.9	0.9	1.4	1.3	0.5	1.1	1.0
Metals (mg/kg)										
Antimony	--	--	20 U	10 U	10 U	10 U	10 U	9 UJ	30 UJ	20 UJ
Arsenic	20	51	20 U	10 U	10 U	10 U	10 U	9 UJ	30 UJ ^a	20 UJ
Cadmium	1.1	1.5	0.8	0.6	0.6	0.6	0.6	0.4	1 U	0.7 U
Chromium	95	100	57	41	44	44	48	29.8	52	44
Copper	80	830	43.6	30.0	28.7	28.0	31.1	18.8 J	97 J	47.5 J
Lead	340	430	31	21	21	21	24	19 J	50 J	27 J
Mercury	0.28	0.75	0.10	0.11	0.08	0.07	0.08	0.04	0.1	0.1
Nickel	60	70	46	41	42	40	43	33	47	41
Selenium	--	--	2 U	1 U	1 U	1 U	1 U	0.9 U	3 U	2 U
Silver	2	2.5	1 U	0.9 U	0.8 U	0.7 U	0.9 U	0.5 U	2 U	1 U
Zinc	130	400	164	126	123	113	130	97 J	377 J	185 J
Organometallic Compounds										
Tributyltin (porewater) µg/L	--	--	0.023	0.005 U	0.005 U	0.005 U	0.005 U	--	--	--
Tributyltin (bulk) µg/kg	--	--	--	--	--	--	--	3.6 U	9.8	6.8
Polycyclic Aromatic Hydrocarbons (µg/kg)										
1-Methylnaphthalene	--	--	20 U	20 U	19 U	9.6 J	20 U	5.5	13 J	5.2
2-Methylnaphthalene	470	560	14 J	20 U	19 U	19 U	20 U	12	47	13
Acenaphthene	1100	1300	17 J	20 U	19 U	19 U	20 U	14	32	18 J
Acenaphthylene	470	640	20 U	20 U	19 U	19 U	20 U	3.5 J	19 J	5.7
Anthracene	1200	1600	28	18 J	19 U	19 U	20 U	57	66	41

**Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values**

	Location ID	SG-06	SG-07	SG-07	SG-08	SG-09	SG-10	SG-11	SG-12	
	Location	Kenmore Navigation Channel					Harbour Village Marina			
	Sample ID	SG-06-S-C-121108	SG-07-S-C-121108	SG-07-S-C-DUP-121108	SG-08-S-C-121108	SG-09-S-C-121108	SG-10-S-E-121107	SG-11-S-E-121107	SG-12-S-E-121107	
	Sample Date	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/7/2012	11/7/2012	11/7/2012	
	Sample Interval	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	
	Freshwater SL1	Freshwater SL2								
Benzo(a)anthracene	4300	5800	110	110	52	42	40	200	200	120
Benzo(a)pyrene	3300	4800	120	63	55	50	45	190	210	110
Benzo(b,j,k)fluoranthenes	600	4000	300	170	140	120	120	400	570	290
Benzo(g,h,i)perylene	4000	5200	93	36	41	41	36	140	110	85
Chrysene	5900	6400	190	140	82	73	72	290	370	210
Dibenzo(a,h)anthracene	800	840	37	17 J	12 J	11 J	13 J	34	45	36
Fluoranthene	11000	15000	290	150	140	130	120	480	430	300
Fluorene	1000	3000	28	12 J	9.7 J	19 U	20 U	28	38	59
Indeno(1,2,3-c,d)pyrene	4100	5300	81	33	38	36	33	110	90	77
Naphthalene	500	1300	38	18 J	25	14 J	24	38	39	39
Phenanthrene	6100	7600	140	72	68	64	59	260	210	170
Pyrene	8800	16000	290	140	130	120	120	800	470	230
Total LPAH (SEF) (U = 0)	6600	9200	260 J	120 J	100 J	78 J	83	410 J	450 J	350 J
Total LPAH (SEF) (U = 1/2)	6600	9200	270 J	150 J	140 J	130 J	130	410 J	450 J	350 J
Total HPAH (SEF) (U = 0)	31000	55000	1500	860 J	690 J	620 J	600 J	2600	2500	1500
Total HPAH (SEF) (U = 1/2)	31000	55000	1500	860 J	690 J	620 J	600 J	2600	2500	1500
Chlorinated Hydrocarbons (µg/kg)										
1,2,4-Trichlorobenzene	--	--	20 U	20 U	19 U	19 U	20 U	20 U	20 U	20 U
1,2-Dichlorobenzene	--	--	20 U	20 U	19 U	19 U	20 U	20 U	20 U	20 U
1,3-Dichlorobenzene	--	--	20 U	20 U	19 U	19 U	20 U	20 U	20 U	20 U
1,4-Dichlorobenzene	--	--	20 U	20 U	19 U	19 U	20 U	20 U	20 U	20 U
Hexachlorobenzene	--	--	4.8 U	4.9 U	4.8 U	4.8 U	4.8 U	4.8 U	3.9 U	4.9 U
Hexachloroethane	--	--	20 U	20 U	19 U	19 U	20 U	20 U	20 U	20 U
Phthalates (µg/kg)										
Bis(2-ethylhexyl)phthalate	220	320	540	330	300	240	240	480	740	360
Butylbenzyl phthalate	260	370	57	28	19 U	36	29	20 U	24	71
Diethyl phthalate	--	--	58	49 U	48 U	48 U	49 U	50 U	44 J	100
Dimethyl phthalate	46	440	20 U	20 U	19 U	19 U	20 U	20 U	20 U	20 U
Di-n-butyl phthalate	--	--	20 U	20 U	12 J	19 U	20 U	20 U	20 U	26
Di-n-octyl phthalate	26	45	41 J	22 J	19 U	19 U	20 U	20 U	87	20 U
Phenols (µg/kg)										
2,4-Dimethylphenol	--	--	20 UJ	20 UJ	19 UJ	19 UJ	20 UJ	20 UJ	20 UJ	20 UJ
2-Methylphenol (o-Cresol)	--	--	20 U	20 U	19 U	19 U	20 U	20 U	11 J	12 J
4-Methylphenol (p-Cresol)	--	--	91	54	31 J	22 J	36 J	160	150	74
Pentachlorophenol	--	--	200 U	200 U	190 U	190 U	200 U	200 U	55 J	200 U
Phenol	--	--	80	42	42	19	39	55	140	300
Miscellaneous Extractables (µg/kg)										
Benzoic acid	--	--	1100	430	480	300 J	510	520	1400	1500
Benzyl alcohol	--	--	190	120	100	61	110	200	530	300
Dibenzofuran	400	440	20 U	20 U	19 U	19 U	20 U	19	24	13

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID	SG-06	SG-07	SG-07	SG-08	SG-09	SG-10	SG-11	SG-12	
	Location	Kenmore Navigation Channel					Harbour Village Marina			
	Sample ID	SG-06-S-C-121108	SG-07-S-C-121108	SG-07-S-C-DUP-121108	SG-08-S-C-121108	SG-09-S-C-121108	SG-10-S-E-121107	SG-11-S-E-121107	SG-12-S-E-121107	
	Sample Date	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/7/2012	11/7/2012	11/7/2012	
	Sample Interval	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	
	Freshwater SL1	Freshwater SL2								
Hexachlorobutadiene	--	--	4.8 U	4.9 U	4.8 U	4.8 U	4.8 U	4.8 U	3.9 U	10 UJ
N-Nitrosodiphenylamine	--	--	20 U	20 U	19 U	19 U	20 U	20 U	20 U	20 U
Pesticides (µg/kg)										
4,4'-DDD (p,p'-DDD)	--	--	1.7 U	1.7 U	1.7 U	1.7 U	1.6 U	1.6 U	1.3 U	1.7 U
4,4'-DDE (p,p'-DDE)	--	--	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	7.2 J	4.0 J
4,4'-DDT (p,p'-DDT)	--	--	1.7 U	1.7 U	1.7 U	1.7 U	1.6 U	1.6 U	1.3 U	1.7 U
Aldrin	--	--	0.63 U	0.64 U	0.63 U	0.63 U	0.63 U	0.62 U	0.51 U	0.64 U
Chlordane, alpha- (cis-Chlordane)	--	--	0.82 U	0.83 U	0.81 U	0.81 U	0.81 U	0.80 U	0.66 U	0.83 U
Chlordane, beta- (trans-Chlordane)	--	--	0.77 U	0.78 U	0.76 U	0.76 U	0.76 U	0.75 U	0.62 U	0.78 U
Dieldrin	--	--	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	1.3 U	1.7 U
Heptachlor	--	--	0.63 U	0.64 U	0.63 U	0.63 UJ	0.63 U	0.62 U	0.51 U	0.64 U
Nonachlor, cis-	--	--	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.3 U	1.6 U
Nonachlor, trans-	--	--	4.7 U	4.7 U	4.6 U	4.6 U	4.6 U	4.6 U	3.8 U	4.7 U
Oxychlordane	--	--	2.3 U	2.3 U	2.2 U	2.2 U	2.2 U	2.2 U	1.8 U	2.3 U
PCB Aroclors (µg/kg)										
Aroclor 1016	--	--	19 U	19 U	19 U	18 U	20 U	18 U	19 U	19 U
Aroclor 1221	--	--	19 U	19 U	19 U	18 U	20 U	18 U	19 U	19 U
Aroclor 1232	--	--	19 U	19 U	19 U	18 U	20 U	18 U	19 U	19 U
Aroclor 1242	--	--	19 U	19 U	19 U	18 U	20 U	18 U	19 U	19 U
Aroclor 1248	--	--	19 U	19 U	19 U	18 U	20 U	18 U	39 U	24 U
Aroclor 1254	--	--	28 U	19 U	22	18 U	20 U	32 U	48 U	49 U
Aroclor 1260	--	--	19 U	19 U	19 U	18 U	20 U	18 U	29 J	19 U
Total PCB Aroclors (U = 0)	60	120	28 U	19 U	22	18 U	20 U	32 U	29 J	49 U
Dioxin Furans (ng/kg)										
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	0.478 J	0.306 J	0.341 J	0.293 J	0.372 J	0.388 J	1.32	0.804 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	1.58	1.18	1.03	0.870 J	1.24	1.47	12.8	5.10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	2.65	1.42 J	1.38 J	1.36 J	1.71 J	2.26	25.8	8.29
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	9.51	4.38	4.21	3.85	5.03	8.32	119	38.8
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	5.68	2.85	2.95	2.99	3.54	4.73	52.3	18.0
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	237	85.5	82.7	88.5	103	168	2120	769
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	2520	652	613	684	798	1290	16500	6410
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	4.89 J	4.25 J	3.82 J	3.33 J	4.12 J	3.27 J	14.7 J	9.33 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	9.24 J	8.33 J	7.29 J	6.12 J	7.92 J	8.56 J	60.3	27.8
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	70.1	31.4 J	30.2 J	27.2 J	35.0 J	50.6 J	563	199
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	803	167	155	160	191	332	4150	1470
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	0.967 J	0.643 J	0.579 J	0.553 J	0.784 J	0.759 J	3.38	2.15
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	0.746 J	0.442 J	0.466 J	0.409 J	0.577 J	0.675 J	5.37 J	2.87
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	0.826 J	0.452 J	0.556 J	0.540 J	0.573 J	0.725 J	5.19	2.57 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	1.90 J	1.20 J	1.05 J	1.30 J	1.43 J	1.49 J	15.3	6.40
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	1.64 J	0.989 J	0.958 J	0.964 J	1.23 J	1.26 J	13.6	5.15

**Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values**

	Location ID	SG-06	SG-07	SG-07	SG-08	SG-09	SG-10	SG-11	SG-12	
	Location	Kenmore Navigation Channel					Harbour Village Marina			
	Sample ID	SG-06-S-C-121108	SG-07-S-C-121108	SG-07-S-C-DUP-121108	SG-08-S-C-121108	SG-09-S-C-121108	SG-10-S-E-121107	SG-11-S-E-121107	SG-12-S-E-121107	
	Sample Date	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/8/2012	11/7/2012	11/7/2012	11/7/2012	
	Sample Interval	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 25 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	
	Freshwater SL1	Freshwater SL2								
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	0.846 J	0.386 J	0.411 J	0.366 J	0.497 J	0.692 J	7.11	2.96
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	2.55	1.40 J	1.34 J	1.37 J	1.74 J	1.96	21.1	8.02
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	31.3	14.6	14.6	18.7	17.7	22.3	282	104
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	1.98 J	1.06 J	1.14 J	1.83 J	1.33 J	1.59 J	15.3	6.00
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	108	40.9	39.5	66.0	46.6	77.5	871	356
Total Tetrachlorodibenzofuran (TCDF)	--	--	15.5 J	11.1 J	10.3 J	9.21 J	12.2 J	11.3 J	51.2 J	29.7 J
Total Pentachlorodibenzofuran (PeCDF)	--	--	24.5 J	14.8 J	14.2 J	12.8 J	17.1 J	19.7 J	157 J	75.2 J
Total Hexachlorodibenzofuran (HxCDF)	--	--	51.1 J	25.8 J	25.6	25.7 J	30.6 J	39.1	472	193 J
Total Heptachlorodibenzofuran (HpCDF)	--	--	104	43.8	43.3	57.2 J	52.8 J	73.3	879	347
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)			8.4 J	4.2 J	4.0 J	3.9 J	4.9 J	6.6 J	71.0 J	26.6 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)			8.5 J	4.2 J	4.0 J	3.9 J	4.9 J	6.6 J	71.0 J	26.6 J

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID	SG-13	SG-13	SG-14	SG-15	SG-16	SG-17	
	Location	Harbour Village Marina		North of KIP	Kenmore Industrial Park Shoreline			
	Sample ID	SG-13-S-E-121107	SG-13-S-E-DUP-121107	SG-14-S-E-121107	SG-15-S-E-121107	SG-16-S-E-121107	SG-17-S-E-121107	
	Sample Date	11/7/2012	11/7/2012	11/7/2012	11/7/2012	11/7/2012	11/7/2012	
	Sample Interval	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	
	Freshwater SL1	Freshwater SL2						
Conventional Parameters (%)								
Total organic carbon	--	--	5.45	3.82	4.33	1.87	0.724	2.98
Total solids	--	--	23.2	22.7	51.0	82.4	77.7	46.9
Total volatile solids	--	--	15.02	14.56	7.61	1.24	0.98	6.70
Gravel	--	--	0.1 U	0.1 U	22.6	0.4	0.1	0.3
Sand, Very Coarse	--	--	4.3	3.4	6.0	1.5	0.4	3.3
Sand, Coarse	--	--	3.2	3.0	7.6	3.9	5.5	3.9
Sand, Medium	--	--	2.8	2.9	14.6	22.3	77.5	5.5
Sand, Fine	--	--	5.1	4.6	11.4	62.7	14.6	6.0
Sand, Very Fine	--	--	10.1	9.3	7.3	6.8	1.2	11.7
Fines (silt + clay)	--	--	74.6	76.7	30.6	2.4	0.8	69.1
Silt, Coarse	--	--	11.5	11.6	7.5	--	--	12
Silt, Medium	--	--	21.2	22.4	7.9	--	--	17.3
Silt, Fine	--	--	16.9	17.4	5.3	--	--	13.0
Silt, Very Fine	--	--	13.3	13.7	4.9	--	--	9.2
Clay, Coarse	--	--	6.4	6.1	2.0	--	--	6.1
Clay, Medium	--	--	3.3	3.0	1.2	--	--	4.3
Clay, Fine	--	--	1.9	2.5	1.7	--	--	7.2
Metals (mg/kg)								
Antimony	--	--	20 UJ	20 UJ	10 UJ	6 UJ	6 UJ	10 UJ
Arsenic	20	51	20 UJ	20 UJ	10 UJ	6 UJ	6 UJ	10 UJ
Cadmium	1.1	1.5	0.9 U	0.9 U	0.7	0.3 U	0.2 U	0.4 U
Chromium	95	100	54	55	36	20.9	29.9	54
Copper	80	830	62.1 J	62.8 J	111 J	5.5 J	5.4 J	13.5 J
Lead	340	430	32 J	32 J	26 J	7 J	4 J	7 J
Mercury	0.28	0.75	0.1	0.1	0.24	0.03 U	0.03 U	0.04
Nickel	60	70	46	45	35	20	26	34
Selenium	--	--	2 U	2 U	1 U	0.7 U	0.6 U	1 U
Silver	2	2.5	1 U	1 U	0.7 U	0.4 U	0.4 U	0.6 U
Zinc	130	400	205 J	205 J	182 J	57 J	43 J	64 J
Organometallic Compounds								
Tributyltin (porewater) µg/L	--	--	--	--	0.010	--	--	--
Tributyltin (bulk) µg/kg	--	--	12	12	--	3.6 U	--	--
Polycyclic Aromatic Hydrocarbons (µg/kg)								
1-Methylnaphthalene	--	--	18 J	7.2	34	4.7 U	4.8 U	4.9 U
2-Methylnaphthalene	470	560	24	19	59	4.7 U	4.8 U	7.4
Acenaphthene	1100	1300	17 J	16 J	130	3.8 J	4.8 U	4.9 U
Acenaphthylene	470	640	26	7.5	26	4.7 U	4.8 U	4.9 U
Anthracene	1200	1600	48	44	150	4.7 U	4.8 U	11 J

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID		SG-13	SG-13	SG-14	SG-15	SG-16	SG-17
	Location		Harbour Village Marina		North of KIP	Kenmore Industrial Park Shoreline		
	Sample ID		SG-13-S-E-121107	SG-13-S-E-DUP-121107	SG-14-S-E-121107	SG-15-S-E-121107	SG-16-S-E-121107	SG-17-S-E-121107
	Sample Date		11/7/2012	11/7/2012	11/7/2012	11/7/2012	11/7/2012	11/7/2012
	Sample Interval		0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm
	Freshwater SL1	Freshwater SL2						
Benzo(a)anthracene	4300	5800	150	160	360	4.6 J	4.8 U	42
Benzo(a)pyrene	3300	4800	140	120	250	4.1 J	2.9 J	41
Benzo(b,j,k)fluoranthenes	600	4000	380	320	720	12	8.2	91
Benzo(g,h,i)perylene	4000	5200	120	85	95	4.7 U	4.8 UJ	27
Chrysene	5900	6400	300	240	550	4.9	3.0 J	64
Dibenzo(a,h)anthracene	800	840	40	26	42	4.7 U	4.8 UJ	4.9 U
Fluoranthene	11000	15000	260	220	1200	12 J	11 J	130
Fluorene	1000	3000	46	32	150	5.5	4.8 U	2.5 J
Indeno(1,2,3-c,d)pyrene	4100	5300	100	79	97	4.7 U	4.8 UJ	24
Naphthalene	500	1300	39	40	170	4.7 U	4.8 UJ	4.0 J
Phenanthrene	6100	7600	190	160	830	16 J	2.6 J	93
Pyrene	8800	16000	290	230	920	11 J	9.7 J	120
Total LPAH (SEF) (U = 0)	6600	9200	390 J	320 J	1500	25 J	2.6 J	120 J
Total LPAH (SEF) (U = 1/2)	6600	9200	390 J	320 J	1500	35 J	17 J	120 J
Total HPAH (SEF) (U = 0)	31000	55000	1800	1500	4200	49 J	35 J	540
Total HPAH (SEF) (U = 1/2)	31000	55000	1800	1500	4200	56 J	44 J	540
Chlorinated Hydrocarbons (µg/kg)								
1,2,4-Trichlorobenzene	--	--	20 U	20 U	19 U	19 U	19 U	19 U
1,2-Dichlorobenzene	--	--	20 U	20 U	19 U	19 U	19 U	19 U
1,3-Dichlorobenzene	--	--	20 U	20 U	19 U	19 U	19 U	19 U
1,4-Dichlorobenzene	--	--	20 U	20 U	19 U	19 U	19 U	19 U
Hexachlorobenzene	--	--	4.9 U	4.9 U	4.9 U	0.97 U	19 U	19 U
Hexachloroethane	--	--	20 U	20 U	19 U	19 U	19 U	19 U
Phthalates (µg/kg)								
Bis(2-ethylhexyl)phthalate	220	320	560	430	280	21 J	19 J	150
Butylbenzyl phthalate	260	370	82	56	43	19 U	19 U	19 U
Diethyl phthalate	--	--	55	50 U	68	47 U	48 U	48 U
Dimethyl phthalate	46	440	20 U	20 U	19 U	19 U	19 U	38
Di-n-butyl phthalate	--	--	20 U	20 U	19 U	19 U	19 U	19 U
Di-n-octyl phthalate	26	45	73 J	42	24	19 U	19 U	11 J
Phenols (µg/kg)								
2,4-Dimethylphenol	--	--	20 UJ	20 UJ	19 UJ	19 UJ	19 UJ	19 UJ
2-Methylphenol (o-Cresol)	--	--	12 J	14 J	19 U	19 U	19 U	19 U
4-Methylphenol (p-Cresol)	--	--	110	110	59	10 J	39 U	270
Pentachlorophenol	--	--	52 J	200 U	190 U	190 U	190 U	190 U
Phenol	--	--	200	350	80	19 U	19 U	82
Miscellaneous Extractables (µg/kg)								
Benzoic acid	--	--	1600	1700	610	370 U	390 U	430
Benzyl alcohol	--	--	360	380	100	19 U	19 U	62
Dibenzofuran	400	440	12	17	90	4.7	4.8 U	4.9 U

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

	Location ID	SG-13	SG-13	SG-14	SG-15	SG-16	SG-17	
	Location	Harbour Village Marina		North of KIP	Kenmore Industrial Park Shoreline			
	Sample ID	SG-13-S-E-121107	SG-13-S-E-DUP-121107	SG-14-S-E-121107	SG-15-S-E-121107	SG-16-S-E-121107	SG-17-S-E-121107	
	Sample Date	11/7/2012	11/7/2012	11/7/2012	11/7/2012	11/7/2012	11/7/2012	
	Sample Interval	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	
	Freshwater SL1	Freshwater SL2						
Hexachlorobutadiene	--	--	4.9 U	4.9 U	4.9 U	0.97 U	10 UJ	10 UJ
N-Nitrosodiphenylamine	--	--	20 U	20 U	19 U	19 U	19 U	19 U
Pesticides (µg/kg)								
4,4'-DDD (p,p'-DDD)	--	--	1.7 U	1.7 U	1.7 U	0.33 U	--	--
4,4'-DDE (p,p'-DDE)	--	--	1.7 U	4.4 J	1.7 U	0.33 U	--	--
4,4'-DDT (p,p'-DDT)	--	--	1.7 U	1.7 U	1.7 U	0.33 UJ	--	--
Aldrin	--	--	0.64 U	0.64 U	0.64 U	0.13 U	--	--
Chlordane, alpha- (cis-Chlordane)	--	--	0.83 U	0.83 U	0.82 U	0.16 U	--	--
Chlordane, beta- (trans-Chlordane)	--	--	0.78 U	0.78 U	0.77 U	0.15 U	--	--
Dieldrin	--	--	1.7 U	1.7 U	1.6 U	0.33 U	--	--
Heptachlor	--	--	0.64 U	0.64 U	0.64 U	0.13 U	--	--
Nonachlor, cis-	--	--	1.6 U	1.6 U	1.6 U	0.32 U	--	--
Nonachlor, trans-	--	--	4.1 J	4.7 U	4.7 U	0.94 U	--	--
Oxychlordane	--	--	2.3 U	2.3 U	2.3 U	0.45 U	--	--
PCB Aroclors (µg/kg)								
Aroclor 1016	--	--	20 U	20 U	19 U	18 U	18 U	19 U
Aroclor 1221	--	--	20 U	20 U	19 U	18 U	18 U	19 U
Aroclor 1232	--	--	25 U	35 U	28 U	18 U	18 U	19 U
Aroclor 1242	--	--	20 U	20 U	19 U	18 U	18 U	19 U
Aroclor 1248	--	--	20 U	20 U	19 U	18 U	18 U	19 U
Aroclor 1254	--	--	50 U	25 U	20	18 U	18 U	19 U
Aroclor 1260	--	--	20 U	20 U	19 U	18 U	18 U	19 U
Total PCB Aroclors (U = 0)	60	120	50 U	35 U	20	18 U	18 U	19 U
Dioxin Furans (ng/kg)								
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	0.719 J	0.521 J	0.404 J	0.154 J	0.144 J	0.226 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	5.66	2.51	1.99	0.0891 J	0.0758 J	0.491 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	11.8	5.28	3.06	0.143 J	0.0679 J	1.03 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	97.4	32.5	12.5	0.818 J	0.202 J	2.12
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	25.6	10.8	6.86	0.350 J	0.168 J	2.33
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	1730	600	304	13.9	4.24	50.3
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	--	14400	4830	2490	105	32.0	252
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	--	10.5 J	4.89 J	5.27 J	0.446 J	0.481 J	1.11 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	--	31.5	13.1 J	13.5 J	0.632 J	0.441 J	2.03 J
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	--	353	136	102	4.11 J	1.86 J	14.9 J
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	--	3200	1120	877	27.3	8.18	82.0
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	--	2.84 J	1.22	1.09	0.103 U	0.0220 U	0.136 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	5.30 J	2.06 J	0.796 J	0.0911 J	0.0758 J	0.126 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	--	4.71	1.82	0.957 J	0.0752 J	0.0439 U	0.136 J
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	13.2	4.94	2.26	0.176 J	0.0918 J	0.625 J
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	8.24	3.39	2.08	0.103 J	0.0739 J	0.725 J

**Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values**

	Location ID	SG-13	SG-13	SG-14	SG-15	SG-16	SG-17	
	Location	Harbour Village Marina		North of KIP	Kenmore Industrial Park Shoreline			
	Sample ID	SG-13-S-E-121107	SG-13-S-E-DUP-121107	SG-14-S-E-121107	SG-15-S-E-121107	SG-16-S-E-121107	SG-17-S-E-121107	
	Sample Date	11/7/2012	11/7/2012	11/7/2012	11/7/2012	11/7/2012	11/7/2012	
	Sample Interval	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	0 - 10 cm	
	Freshwater SL1	Freshwater SL2						
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	--	7.63	2.82	0.816 J	0.0653 U	0.0259 U	0.110 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	--	15.4	5.77	2.90	0.190 J	0.0559 J	1.06 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	--	230	93.1	36.2	2.05	0.888 J	14.4
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	--	10.6	4.97	2.54 J	0.0713 J	0.0639 J	0.950 J
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	--	837	379	106	5.88	1.75 J	24.5
Total Tetrachlorodibenzofuran (TCDF)	--	--	32.4 J	15.9 J	15.4 J	1.06 J	0.681 J	2.50 J
Total Pentachlorodibenzofuran (PeCDF)	--	--	129 J	51.6 J	28.9 J	3.73 J	0.950 J	5.21 J
Total Hexachlorodibenzofuran (HxCDF)	--	--	438 J	161	64.1 J	3.85 J	1.56 J	17.8 J
Total Heptachlorodibenzofuran (HpCDF)	--	--	809	314 J	115 J	6.17 J	2.41 J	31.5
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)			50.0 J	19.0 J	10.1 J	0.64 J	0.35 J	2.3 J
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 1/2)			50.0 J	19.0 J	10.1 J	0.65 J	0.36 J	2.3 J

Table 4
Kenmore Area Sediment Results Compared to Interim Freshwater Sediment Quality Values

Notes:

 Detected concentration is greater than Freshwater SL1 screening level

 Detected concentration is greater than Freshwater SL2 screening level

a Arsenic result of 30UJ was verified to be between the MDL and the RL and below the screening level.

All non-detect pesticides and dioxin/furan data were reported at the **MDL**; all other non-detect data were reported at the **RL**.

Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest reporting limit value is reported as the sum.

Totals are calculated as the sum of all detected results and 1/2 the undetected reporting limit (U=1/2). If all results are not detected, the highest reporting limit value is reported as the sum.

Total LPAH (Low PAH) SEF is the total of 2-Methylnaphthalene, Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene and Anthracene.

Total HPAH (High PAH) SEF is the total of Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b,j,k)fluoranthenes, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, Dibenzo(a,h)anthracene and Benzo(g,h,i)perylene.

Total PCB Aroclors is the total of all PCB Aroclors listed in this table.

Dioxin/Furan TEQ values as of 2005, World Health Organization.

USEPA Stage 2A validation was performed by Anchor QEA on all compounds, except dioxin/furans.

USEPA Stage 4 validation was performed by LDC on dioxin/furans.

Bold = Detected result

-- = results not reported or not applicable

% = percent

µg/kg = micrograms per kilogram

µg/L = micrograms per liter

HPAH = high polycyclic aromatic hydrocarbons

J = estimated value

KIP = Kenmore Industrial Park

LPAH = low polycyclic aromatic hydrocarbons

MDL = method detection limit

mg/kg = milligrams per kilogram

ng/kg = nanograms per kilogram

PCB = polychlorinated biphenyl

TEQ = toxic equivalency

U = Compound analyzed, but not detected above detection limit

UJ = Compound analyzed, but not detected above estimated detection limit

USEPA = U.S. Environmental Protection Agency

WDFW = Washington State Department of Fish and Wildlife

Table 5
Surface Water Results from Log Boom Park Shoreline and Lake Washington Reference Area

Location ID	HT-01	HT-04	HT-04	WS-10
Location Description	Log Boom Park Shoreline			Reference
Sample ID	HT-01-W-C-121107	HT-04-W-C-121107	HT-04-W-C-DUP-121107	WS-10-W-C-121107
Sample Date	11/7/2012	11/7/2012	11/7/2012	11/7/2012
Sample Depth	1 ft	0.5-1 ft	0.5-1 ft	3 ft
Conventional Parameters (mg/L)				
Hardness as CaCO ₃	48	50	49	43
Total suspended solids	13.8	3.7	3.4	2.0
Total dissolved solids	76.0	78.0	74.0	59.0
Metals (µg/L)				
Antimony	1 U	1 U	0.2 U	0.2 U
Arsenic	2	2	1.2	0.9
Barium	11	9	8.7	6.2
Beryllium	0.5 U	0.5 U	0.2 U	0.2 U
Cadmium	0.5 U	0.5 U	0.1 U	0.1 U
Calcium	11100	11500	11400	10200
Chromium	2 U	2 U	0.5 U	1 U
Copper	2.8	2.6	3.2	1.6
Iron	480	330	330	160
Lead	0.5	0.5 U	0.3	0.1 U
Magnesium	4830	5060	4970	4210
Manganese	111	32	12.4	21
Mercury	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	2	1	1.2	0.7
Selenium	2 U	2 U	0.5 U	0.5 U
Silver	1 U	1 U	0.2 U	0.2 U
Thallium	1 U	1 U	0.2 U	0.2 U
Zinc	20 U	20 U	4 U	4 U
Metals, Dissolved (µg/L)				
Antimony	0.2 U	0.2 U	0.2 U	0.2 U
Arsenic	0.8	1.0	1.0	0.8
Barium	7.4	7.8	7.7	6.0
Beryllium	0.2 U	0.2 U	0.2 U	0.2 U
Cadmium	0.1 U	0.1 U	0.1 U	0.1 U
Chromium	1 U	1 U	1 U	1 U
Copper	1.9	2.1	2.0	1.2
Iron	110	150	150	90
Lead	0.1	0.1	0.1 U	0.1 U
Manganese	2.8	4.6	5.1	13.8
Mercury	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	1.1	1.1	1.0	0.8
Selenium	0.5 U	0.5 U	0.5 U	0.5 U
Silver	0.2 U	0.2 U	0.2 U	0.2 U
Thallium	0.2 U	0.2 U	0.2 U	0.2 U
Zinc	6	4 U	4 U	4 U

Table 5
Surface Water Results from Log Boom Park Shoreline and Lake Washington Reference Area

Location ID	HT-01	HT-04	HT-04	WS-10
Location Description	Log Boom Park Shoreline			Reference
Sample ID	HT-01-W-C-121107	HT-04-W-C-121107	HT-04-W-C-DUP-121107	WS-10-W-C-121107
Sample Date	11/7/2012	11/7/2012	11/7/2012	11/7/2012
Sample Depth	1 ft	0.5-1 ft	0.5-1 ft	3 ft
Polycyclic Aromatic Hydrocarbons (µg/L)				
1-Methylnaphthalene	0.10 U	0.10 U	0.10 U	0.10 U
2-Methylnaphthalene	0.10 U	0.10 U	0.10 U	0.10 U
Acenaphthene	0.10 U	0.10 U	0.10 U	0.10 U
Acenaphthylene	0.10 U	0.10 U	0.10 U	0.10 U
Anthracene	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(a)anthracene	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(a)pyrene	0.10 U	0.10 U	0.10 U	0.10 U
Benzo(b,j,k)fluoranthenes	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	0.10 U	0.10 U	0.10 U	0.10 U
Chrysene	0.10 U	0.10 U	0.10 U	0.10 U
Dibenzo(a,h)anthracene	0.10 U	0.10 U	0.10 U	0.10 U
Fluoranthene	0.10 U	0.10 U	0.10 U	0.10 U
Fluorene	0.10 U	0.10 U	0.10 U	0.10 U
Indeno(1,2,3-c,d)pyrene	0.10 U	0.10 U	0.10 U	0.10 U
Naphthalene	0.10 U	0.10 U	0.10 U	0.10 U
Phenanthrene	0.10 U	0.10 U	0.10 U	0.10 U
Pyrene	0.10 U	0.10 U	0.10 U	0.10 U
Chlorinated Hydrocarbons (µg/L)				
1,2,4-Trichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U
Hexachloroethane	2.0 U	2.0 U	2.0 U	2.0 U
Phthalates (µg/L)				
Bis(2-ethylhexyl)phthalate	3.0 U	3.0 U	3.0 U	3.0 U
Butylbenzyl phthalate	1.0 U	1.0 U	1.0 U	1.0 U
Diethyl phthalate	1.0 U	1.0 U	1.0 U	1.0 U
Dimethyl phthalate	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-butyl phthalate	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-octyl phthalate	1.0 U	1.0 U	1.0 U	1.0 U
Phenols (µg/L)				
2,4-Dimethylphenol	3.0 U	3.0 U	3.0 U	3.0 U
2-Methylphenol (o-Cresol)	1.0 U	1.0 U	1.0 U	1.0 U
4-Methylphenol (p-Cresol)	2.0 U	2.0 U	2.0 U	2.0 U
Pentachlorophenol	0.024 J	0.022 J	0.020 J	0.025 U
Phenol	1.0 U	1.0 U	1.0 U	1.0 U
Miscellaneous Extractables (µg/L)				
Benzoic acid	20 U	20 U	20 U	20 U
Benzyl alcohol	2.0 U	2.0 U	2.0 U	2.0 U
Dibenzofuran	0.10 U	0.10 U	0.10 U	0.10 U

Table 5
Surface Water Results from Log Boom Park Shoreline and Lake Washington Reference Area

Location ID	HT-01	HT-04	HT-04	WS-10
Location Description	Log Boom Park Shoreline			Reference
Sample ID	HT-01-W-C- 121107	HT-04-W-C- 121107	HT-04-W-C-DUP- 121107	WS-10-W-C- 121107
Sample Date	11/7/2012	11/7/2012	11/7/2012	11/7/2012
Sample Depth	1 ft	0.5-1 ft	0.5-1 ft	3 ft
Hexachlorobutadiene	0.050 U	0.050 U	0.050 U	0.050 U
N-Nitrosodiphenylamine	1.0 U	1.0 U	1.0 U	1.0 U

Notes:

All non-detect data were reported at the **reporting limit**.

USEPA Stage 2A validation was performed by Anchor QEA on all compounds

Bold = Detected result

-- = results not reported or not applicable

ft = feet

ID = identification

J = estimated value

mg/L = milligrams per liter

µg/L = micrograms per liter

U = Compound analyzed, but not detected above detection limit

APPENDIX A
CHAIN-OF-CUSTODY FORMS AND DAILY
LOGS (ON CD)

APPENDIX B
LAB DATA (ON CD)

APPENDIX C

DATA VALIDATION REPORT (ON CD)
