CENWS-OD-TS-DMMO

MEMORANDUM FOR: RECORD May 17, 2013

SUBJECT: SCREENING LEVEL EVALUATION OF SURFACE SEDIMENTS WITHIN THE KENMORE NAVIGATION CHANNEL AND SURROUNDING AREAS IN VICINITY IN KENMORE, WASHINGTON RELATIVE TO DREDGED MATERIAL MANAGEMENT PROGRAM (DMMP) GUIDELINES EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT FOR OPEN-WATER DISPOSAL

1. The following memorandum documents the DMMP agencies review of the screening level sediment characterization of Kenmore Navigation channel surface sediments (top 25 cm) relative to their potential suitability for open-water disposal by the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington Departments of Ecology and Natural Resources, and the Environmental Protection Agency).

Table 1. Project DMMP Tracking Details

JARPA APPLICATION NO.	N/A
SAP submitted:	October 2, 2012
SAP approved	October 9, 2012
Sampling dates: Power Grab (25 cm depth target): Kenmore Navigation Channel (6 stations) North Lake Marina (2 station) Harbor Village Marinas (4 stations) Northeast Kenmore Industrial Park (1 station) Kenmore Industrial Park Shoreline (2 stations) Sammamish River (1 station)	November 7-8, 2012 All sediment quality samples collected with Power Grab Sampler
Data characterization report submitted:	March 25, 2013
Recency Determination: High Concern (2 years)	November 2014
DAIS reference number:	KNCSC-1-A-O-333

2. Background. The testing summarized below is part of a characterization effort supported by the City of Kenmore and Ecology to assess sediment quality in the northeastern portion of Lake Washington in and near the City of Kenmore. One objective of this effort was to provide information from the existing navigation channel to support a funding request to the USACE budget for maintenance dredging of the federal Kenmore Navigation Channel (Figure 1). Another objective of the sampling was to evaluate the potential presence of contamination along the shoreline outside of the navigation channel. Data from outside the navigation channel was collected by Ecology and the City of Kenmore (funded through a grant from Ecology) 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). Sediment quality data from locations outside the Kenmore Navigation Channel are also briefly summarized in this screening level summary analysis of the Kenmore navigation channel sediment quality data. Ecology is currently preparing a report evaluating the data collected within Kenmore outside the navigation channel (https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=2134).

3. Sampling and Analysis Plan. The sampling and analysis plan (SAP) was submitted for DMMP review on October 2, 2012 and approved by the DMMP agencies with revisions on October 9, 2012.

4. Sampling. Six samples were collected within the Kenmore Navigation Channel, two samples were collected from the North Lake Marina, four samples were collected from the Harbor Village Marina, one sample was collected northeast of the Kenmore Industrial Park, two samples were collected from the shoreline adjacent to the Kenmore Industrial Park, and one sample was collected from the Sammamish River between November 7-

8, 2012, with a Power Grab sampler (Table 2). Figure 1 depicts the navigation channel and North Lake Marina stations as well as the broader set of stations collected as part of the Kenmore sediment quality evaluation. The data characterization report was submitted to the DMMP agencies for review and data quality assurance/control review on March 25, 2013. The DMMP agencies concluded, after reviewing the data validation report, that the data met QC requirements.

Table 2. Summary of Sediment Grab Collection for Kenmore Navigation Channel Stations.

Location / Grab Station ID:		Latitude (°N)	Longitude (°W)	Water depth to Mudline Elevation (feet OHW*)	Power Grab Sample collection depth from sediment surface (cm)
Kenmore Navigation Channel	SG-04	47°756370036	122°256930518	20.4	20
	SG-05	47°755716315	122°258339786	17.4	23.5
	SG-06	47°755160846	122°259784249	17.7	25
	SG-07	47°753883497	122°261725195	16.9	27
	SG-08	47°752520909	122°263244913	16.1	26
	SG-09	47°751500349	122°264164119	18.4	26.5
North Lake Marina	SG-02	47°756443177	122°259856097	4.5	22
	SG-03	47°756435163	122°259400466	4.6	25
Harbor Village Marina	SG-10	47°756394876	122°262839333	4.6	10
	SG-11	47°756362881	122°261891036	4.8	10
	SG-12	47°755842153	122°262966420	8.1	10
	SG-13	47°755825064	122°260827172	8.1	10
NE of Kenmore Ind. Park	SG-14	47°753102903	122°260341630	8.1	10
Sammamish River Navigation Channel	SG-16	47°754104225	122°255908785	10.4	10
	SG-17	47°755071890	122°251743214	4.4	10
	SG-01	47°753102903	122°260341630	3.0	10

*OHW = Ordinary High Water

Chemical Testing Summary. The Agencies' approved sampling and analysis plan was generally followed and quality assurance/quality control guidelines specified by PSEP and DMMP were generally complied with. The results of chemical analysis were compared with DMMP Marine and SMS Freshwater Guidelines (2006 Interim and 2013). A summary of chemical analysis results for all COC is provided in Table 3.

Kenmore Navigation Channel. Results for the navigation channel indicated that DMMP marine screening level (SL) guidelines were exceeded for Benzyl alcohol at five of six stations, and the maximum level (ML) was exceeded for Benzoic Acid at two of six stations. Under a full DMMP characterization, exceedances of SL or ML would require biological toxicity testing to complete the suitability determination.

North Lake Marina. Testing results from the vicinity of the North Lake Marina had one DMMP SL/BT exceedance for TBT (0.67 ppb) and two BT exceedances for dioxin/furans (20.3 and 37 pptr-TEQ). Moreover, there were two SL exceedances for Benzyl Alcohol, and two ML exceedances for Benzoic Acid.

Harbor Village Marina. Testing results from the vicinity of Harbor Village Marina outside the dredged material footprint previously characterized (http://www.nws.usace.army.mil/Portals/27/docs/civilworks/dredging/Suitability%20Determinations/2012/Harbor-Village-Marina-DY12-errata-SDM.pdf) had DMMP SL exceedances from all four sampling stations for Benzyl Alcohol, three ML exceedances for Benzoic Acid, two SL exceedances for Butylbenzylphthalate. Testing for dioxin/furans confirmed the earlier high concentrations from within the marina with three of four stations exceeding the DMMP BT (26.6 to 71 pptr-TEQ).

Kenmore Industrial Park NE Station. The Northeast station located northeast of the Kenmore navigation channel exhibited an SL exeedance for Benzyl Alcohol, and a BT exccedance for dioxin/furans (10.1 pptr-TEQ).

Sammamish River Navigation Channel. The Sammamish River stations had no DMMP guideline exceedances.

5. Freshwater SMS SL1 Guidelines. 2006 Interim Guidelines were exceeded in the Kenmore Navigation Channel for Bis(2-ethylhexyl)phthalate at 4 stations and two SL2 exceedances at two stations, whereas Zinc exceeded SL1 at two of six stations (2006 FW Guidelines). Phenol exceeded the SL1 at a single station (2013 FW Guidelines).

6. Within the Northlake marina, 2006 FW SL1 guidelines were exceeded for copper and zinc at two stations. Within Harbor Village Marina, copper SL1 guideline exceedances were noted at one of four stations, and zinc exceeded SL1 guidelines at all four stations. At Northlake marina 2006 FW SL2 guidelines were exceeded for Bis(2-ethylhexyl)phthalate whereas, the SL2 guideline was exceeded for this chemical at Harbor Village marina at all four stations sampled. Benzoic Acid SL2 exceedances (2006 FWG) were exceeded at Harbor Village marina at three of four stations. Phenol exceeded 2013 FW SL1 guidelines at one Harbor Village marina station and SL2 guidelines were exceeded at two stations. At the northeast Kenmore Industrial Park station 2006 FW SL1 guidelines for copper, zinc and for Bis(2-ethylhexyl)phthalate were exceeded. There were no guideline exceedances for FWG (2006 or 2013) at the Sammamish River stations.

7. Dioxin Testing Results Summary. Table 4 provides the full results of dioxin/furan testing for all sampling locations. Within the navigation channel total dioxin/furan concentrations in sediments ranged from 1.5 – 8.4 pptr -TEQ (U = ½ detection limit). Dioxin concentrations were elevated within the Northlake marina and within the Harbor Village marina, ranging from 20.3 – 37 pptr-TEQ within the former, and, ranging from 6.57 to 71 pptr-TEQ within the later, respectively. The single northeast Kenmore Industrial Park station exhibited a dioxin concentration of 10.1 pptr-TEQ. Dioxin concentrations at the remaining Kenmore Industrial Park stations were generally low ranging from 0.359 to 2.3 pptr-TEQ, and the Sammamish River station exhibited a dioxin concentration of 0.467 pptr-TEQ.

8. Dioxin Interim Interpretative Framework. The DMMP implemented new interim guidelines for interpreting dioxin data implemented on December 6, 2010, and are summarized below for non-dispersive disposal sites (http://www.nws.usace.army.mil/PublicMenu/documents/DMMO/New_Interim_Guidelines_for_Dioxins.pdf):

    a. Nondispersive Screening Levels. DMMUs with dioxin concentrations below 10 pptr 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 pptr TEQ.

9. Dioxin Interpretation relative to DMMP site management. As summarized in paragraph 7 above, within the Kenmore navigation channel all six stations were quantified below 10 pptr-TEQ, but only two stations were quantified below 4 pptr-TEQ. Because this was a screening level assessment of sediment quality and did not collect samples representing the full dredging prism, a volume weighted average was not calculated. These data suggest, however, that dioxin concentrations may pose an impediment to open-water disposal. The elevated dioxin results for the Northlake Marina and the Harbor Village Marina indicate these sediments are not likely to be suitable for open-water disposal. The dioxin results from the northeast Kenmore Industrial Park station are elevated and likely problematic for open-water disposal. Dioxin results for the remaining Kenmore Industrial Park shoreline stations and Sammamish River station were below DMMP new interim dioxin guidelines.

10. Antidegradation Evaluation. The Benzyl Alcohol SL and Benzoic Acid ML exceedances as well as the exceedances of the Freshwater Guidelines (especially for phenol) observed in the navigation channel samples indicate that it will be necessary to fully assess the newly-exposed sediment surface prior to dredging using z-

10. **Antidegradation Evaluation.** The Benzyl Alcohol SL and Benzoic Acid ML exceedances as well as the exceedances of the Freshwater Guidelines (especially for phenol) observed in the navigation channel samples indicate that it will be necessary to fully assess the newly-exposed sediment surface prior to dredging using z-sample analyses. A full antidegradation z-sample analysis assessment would also be required at the Northlake Marina and at the Harbor Village marina prior to any proposed dredging action.

11. The results of the screening-level evaluation of sediments from the Kenmore navigation channel and surrounding areas indicate that to determine suitability of this material for open-water disposal at the Elliott Bay disposal site, will require a full DMMP characterization including dioxin analysis, z-sample characterization and likely bioassay testing and bioaccumulation testing, where BT exceedances were observed.

Concur:

5/17/13
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Feet
0 200 400 600 800

NOTE:
WDFW = Washington State Department of Fish and Wildlife

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

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

											KENMORE NAVIGATION CHANNEL											
						Sample ID:					KNC-SG-04			KNC-SG-05			KNC-SG-06			KNC-SG-07		
						DMMU ID:					S4			S5			S6			S7		
						sample Interval					0-20 cm			0-23.5 cm			0-25 cm			0-27 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SL1	SL2	Units	SL1/SCO	SL2/CSL	DMMP	FW		DMMP	FW		DMMP	FW		DMMP	FW	
Antimony	mg/kg	150		200	mg/kg	--	--	mg/kg	--	--	6.0		U	10.0		U	20.0		U	10.0		U
Arsenic	mg/kg	57	507.1	700	mg/kg	20	51	mg/kg	14	120	6.0		U	10.0		U	20.0		U	10.0		U
Cadmium	mg/kg	5.1	11.3	14	mg/kg	1.1	1.5	mg/kg	2.1	5.4	**0.3**			**0.7**			**0.8**			**0.6**		
Chromium	mg/kg	260	260	(2)	mg/kg	95	100	mg/kg	72	88	**35.0**			**43.0**			**57.0**			**41.0**		
Copper	mg/kg	390	1,027	1,300	mg/kg	80	830	mg/kg	400	1,200	**14.6**			**35.6**			**43.6**			**30.0**		
Lead	mg/kg	450	975	1,200	mg/kg	340	430	mg/kg	360	>1300	**5.0**			**28.0**			**31.0**			**21.0**		
Mercury	mg/kg	0.41	1.5	2.3	mg/kg	0.28	0.75	mg/kg	0.66	0.80	0.02		U	**0.08**			**0.1**			**0.11**		
Nickel	mg/kg	--	--	--	mg/kg	--	--	mg/kg	--	--	**30**			**39**			**46**			**41**		
Selenium	mg/kg	(2)	**3**	(2)	mg/kg	--	--	mg/kg	11	>20	0.6		U	1		U	2		U	1		U
Silver	mg/kg	6.1	6.1	8.4	mg/kg	2.0	2.5	mg/kg	0.57	1.7	0.4		U	0.9		U	1		U	0.9		U
Zinc	mg/kg	410	2,783	3,800	mg/kg	130	400	mg/kg	3,200	>4200	**49**			**143**	**143**		**164**	**164**		**126**		
Tetrabutyltin								µg/L	97	>97	--			--			--			--		
Tributyltin (porewater)	µg/L	0.15	0.15		µg/L	--	--	µg/L	--	--	**0.049**			**0.008**			**0.023**			0.005		U
Tributyltin (bulk/sediment)	µg/kg	73.2	73.2		µg/kg	--	--	µg/kg	47	320	--			--			--			--		
Dibutyltin								µg/kg	910	130,000	--			--			--			--		
Monobutyltin								µg/kg	540	>4800	--			--			--			--		
ORGANIC CHEMICALS																						
Total LPAH	µg/kg	5,200		29,000	µg/kg	6,600	9,200	µg/kg	--	--	**194**		J	**332**			**251**		J	**120**		J
Naphthalene	µg/kg	2,100		2,400	µg/kg	500	1,300	µg/kg	--	--	20		U	**50**			**38**			**18**		J
Acenaphthylene	µg/kg	560		2,000	µg/kg	470	640	µg/kg	--	--	20		U	20		U	20		U	20		U
Acenaphthene	µg/kg	500		2,000	µg/kg	1,100	1,300	µg/kg	--	--	**14**		J	**26**			**17**		J	20		U
Fluorene	µg/kg	540		3,600	µg/kg	1,000	3,000	µg/kg	--	--	**14**		J	**37**			**28**			**12**		J
Phenanthrene	µg/kg	1,500		2,100	µg/kg	6,100	7,600	µg/kg	--	--	**140**			**180**			**140**			**72**		
Anthracene	µg/kg	560		13,000	µg/kg	1,200	1,600	µg/kg	--	--	**26**			**39**			**28**			**18**		J
2-Methylnapthalene	µg/kg	670		1,900	µg/kg	470	560	µg/kg	--	--	20		U	**26**			**14**		J	20		U
Total HPAH	µg/kg	12,000		69,000	µg/kg	31,000	55,000	µg/kg	--	--	**900**		J	**1341**			**1511**			**859**		J
Fluoranthene	µg/kg	1,700	4,600	30,000	µg/kg	11,000	15,000	µg/kg	--	--	**220**			**310**			**290**			**150**		
Pyrene	µg/kg	2,600	11,980	16,000	µg/kg	8,800	16,000	µg/kg	--	--	**190**			**300**			**290**			**140**		
Benzo(a)anthracene	µg/kg	1,300		5,100	µg/kg	4,300	5,800	µg/kg	--	--	**81**			**110**			**110**			**110**		
Chrysene	µg/kg	1,400		21,000	µg/kg	5,900	6,400	µg/kg	--	--	**110**			**190**			**190**			**140**		
Total Benzo(b+k)fluoranthenes	µg/kg	3,200		9,900	µg/kg	600	4,000	µg/kg	--	--	**140**			**220**			**300**			**140**		
Benzo(a)pyrene	µg/kg	1,600		3,600	µg/kg	3,300	4,800	µg/kg	--	--	**62**			**76**			**120**			**63**		
Indeno(1,2,3-cd)pyrene	µg/kg	600		4,400	µg/kg	4,100	5,300	µg/kg	--	--	**39**			**51**			**81**			**33**		
Dibenzo(a,h)anthracene	µg/kg	230		1,900	µg/kg	800	840	µg/kg	--	--	**220**			**21**			**37**			**17**		J
Benzo(g,h,I)perylene	µg/kg	670		3,200	µg/kg	4,000	5,200	µg/kg	--	--	**43**			**63**			**93**			**36**		
Total PAH								µg/kg	17,000	30,000	--			--			--			--		
Bulk Petroleum Hydrocarbons (TPH) Diesel								mg/kg	340	510	--			--			--			--		
Bulk Petroleum Hydrocarbons (TPH) Residual								mg/kg	3,600	4,400	--			--			--			--		
1,4-Dichlorobenzene	µg/kg	110		120	µg/kg	--	--	µg/kg	--	--	20		U	20		U	20		U	20		U
1,2-Dichlorobenzene	µg/kg	35		110	µg/kg	--	--	µg/kg	--	--	20		U	20		U	20		U	20		U
1,3-Dichlorobenzene	µg/kg	--		--	µg/kg	--	--	µg/kg	--	--	20		U	20		U	20		U	20		U
1,2,4-Trichlorobenzene	µg/kg	31		64	µg/kg	--	--	µg/kg	--	--	20		U	20		U	20		U	20		U
Hexachlorobenzne (HCB)	µg/kg	22	168	230	µg/kg	--	--	µg/kg	--	--	4.9		U	5		U	4.8		U	4.9		U
Dimethylphthalate	µg/kg	71		1,400	µg/kg	46.0	440	µg/kg	--	--	20		U	20		U	20		U	20		U
Diethylphthalate	µg/kg	200		1,200	µg/kg	--	--	µg/kg	--	--	49		U	49		U	58			49		U
Di-n-butylphthalate	µg/kg	1,400		5,100	µg/kg	--	--	µg/kg	380	1,000	20		U	20		U	20		U	20		U
Butylbenzylphthalate	µg/kg	63		970	µg/kg	260	370	µg/kg	--	--	20		U	20		U	**57**			**28**		
Bis(2-ethylhexyl)phthalate	µg/kg	1,300		8,300	µg/kg	220	320	µg/kg	--	--	62		U	**260**	**260**		**540**	**540**		**330**	**330**	
Di-n-octylphthalate	µg/kg	6,200		6,200	µg/kg	26	45	µg/kg	39	>1100	20		U	**22.0**		J	**41**	**41**	J	**22**		J
Phenol	µg/kg	420		1,200	µg/kg	--	--	µg/kg	120	210	20		U	**180**	**180**		**80**			**42**		
2-Methylphenol	µg/kg	63		77	ug/kg	--	--	ug/kg	--	--	20		U	20.0		UJ	20		UJ	20		UJ
4-Methylphenol	µg/kg	670		3,600	ug/kg	--	--	ug/kg	260	2,000	39		U	**74.0**			**91**			**54**		
2,4-Dimethylphenol	µg/kg	29		210	ug/kg	--	--	ug/kg	--	--	20		UJ	20.0		UJ	20		UJ	20		UJ
Pentachlorophenol	µg/kg	400	504	690	ug/kg	--	--	ug/kg	1,200	>1200	200		U	200		U	200		U	200		U
Benzyl alcohol	µg/kg	57		870	ug/kg	--	--	ug/kg			20.0		U	**160**			**190**			**120**		
Benzoic acid	µg/kg	650		760	µg/kg	--	--	µg/kg	2,900	3,800	390		U	**1300**			**1100**			**430**		
Dibenzofuran	µg/kg	540		1,700	µg/kg	400	440	µg/kg	--	--	20		U	**28.0**			20		U	20		U
Hexachlorobutadiene	µg/kg	29		270	µg/kg	--	--	µg/kg	--	--	4.9		U	5.0		U	4.8		U	4.9		U
N-Nitrosodiphenylamine	µg/kg	28		130	µg/kg	--	--	µg/kg	--	--	20		U	20		U	20		U	20		U

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

						Sample ID:					KNC-SG-04			KNC-SG-05			KNC-SG-06			KNC-SG-07		
						DMMU ID:					S4			S5			S6			S7		
						sample Interval					0-20 cm			0-23.5 cm			0-25 cm			0-27 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SL1	SL2	Units	SL1/SCO	SL2/CSL	DMMP	FW		DMMP	FW		DMMP	FW		DMMP	FW	
Beta-Hexachlorocyclohexane								µg/kg	7.2	1,100	--			--			--			--		
Carbazole								µg/kg	900	1,100	--			--			--			--		
p,p-DDD	µg/kg	16						µg/kg	310	860	1.7		U	1.7		U	1.7		U	1.7		U
p,p-DDE	µg/kg	9						µg/kg	21	33	1.7		U	1.7		U	1.7		U	1.7		U
p,p-DDT	µg/kg	12						µg/kg	--	--	1.7		U	1.7		U	1.7		U	1.7		U
Total DDT (sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT)	µg/kg		50	69	µg/kg	--	--	µg/kg	100	8100	1.7		U	1.7		U	1.7		U			
Endrin Ketone					µg/kg			µg/kg	8.5	>8.5												
Aldrin	µg/kg	9.5			µg/kg	--	--	µg/kg	--	--	0.64		U	0.65		U	0.63		U	0.64		U
Chlordane (sum of cis, trans, cis-nonachlor, trans-nonachlor, oxy)	µg/kg	2.8			µg/kg	--	--	µg/kg	--	--	0.83		U	0.84		U	0.82		U	0.83		U
Dieldrin	µg/kg	1.9	37		µg/kg	--	--	µg/kg	4.9	9.3	1.7		U	1.7		U	1.6		U	1.7		U
Heptachlor	µg/kg	1.5			µg/kg	--	--	µg/kg	--	--	0.64		U	0.65		U	0.63		U	0.64		U
Aroclor 1016	µg/kg										20		U	19		U	19		U	19		U
Aroclor 1221	µg/kg										20		U	19		U	19		U	19		U
Aroclor 1232	µg/kg										20		U	19		U	19		U	19		U
Aroclor 1242	µg/kg										20		U	19		U	19		U	19		U
Aroclor 1248	µg/kg										20		U	19		U	19		U	19		U
Aroclor 1254	µg/kg										20		U	29		U	28		U	19		U
Aroclor 1260	µg/kg										20		U	19		U	19		U	19		U
Total PCBs (Aroclors)	µg/kg	130		3,100	µg/kg	**60**	**120**	µg/kg	**110**	**2,500**	20		U	29		U	28		U	19		U
Total PCBs (TOC-normalized)	**µg/kg**		38***																			
Dioxin (TEQ: see Table 4 for detailed results)	**ng/kg**	4	10								**1.55**		**J**	**6.75**		J	**8.39**		**J**	**4.18**		**J**
Total Solids	%										**80.8**			**35.0**			**29.9**			**33.7**		
Total Volatile Solids	%										**1.72**			**11.13**			**13.89**			**13.4**		
Total Organic Carbon	%										**2.73**			**5.43**			**4.89**			**4.95**		
Ammonia (NH3)	mg/kg							mg/kg	230	300	**--**			**--**			**--**			**--**		
Total Sulfides	mg/kg							mg/kg	39	61	**--**			**--**			**--**			**--**		
Gravel	%										**71.4**			**3.1**			0.10		u	**0.50**		
Sand	%										**26.0**			**48.8**			**44.7**			**55.4**		
Silt	%										**2.5**			**40.7**			**44.0**			**36.9**		
Clay	%										**0.0**			**7.5**			**11.1**			**7.2**		
Fines (percent silt + clay)	%										**2.5**			**48.1**			**55.2**			**44.1**		
Bioassay Determination: **(P/F)**	%										**NA**			**NA**			**NA**			**NA**		
BTs exceeded:											**No**			**No**			**No**			**No**		
Bioaccumulation conducted:											**No**			**No**			**No**			**No**		
Bioaccumulation Determination: **(P/F)**																						
ML Rule exceeded:											**No**			**No**			**No**			**No**		
DMMP Determination:											**ND**			**ND**			**ND**			**ND**		
DMMU Volume:											**NA**			**NA**			**NA**			**NA**		
Rank (Low = L, Moderate = M, Low-Moderate =LM, High = H)											**H**			**H**			**H**			**H**		
Mean grab sampling depth (cm)	CM										**20**			**23.5**			**25**			**27**		
DMMU ID:											KNC-SG-04			KNC-SG-05			KNC-SG-06			KNC-SG-07		

*** 2006 Interim Fresh Water Guidelines**

****Newly adopted Fresh Water Guidelines through SMS Rulemaking: to be implemented in September 2013**

SL/BT = exceeds DMMP SL/BT

SL/SL1 = exceeds DMMP Screening Level or SMS FW SL1 Guidelines

ML/SL2 = exceeds DMMP Maximum Level or SMS FW SL2 Guidelines

VQ = Validation Qualifier

UCOWD = Unconfined open-water disposal

NA = Not Analyzed

ND = Not Determined

U = undetected at the reporting limit (method detection limit)

J = Estimated Concentration, at the reporting limit

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

											KENMORE NAVIGATION CHANNEL								
						Sample ID:					KNC-SG-07 (duplicate)			KNC-SG-08			KNC-SG-09		
						DMMU ID:					S7 (dup)			S8			S9		
						sample Interval					0-27 cm			0-26 cm			0-26.5 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SL1	SL2	Units	SL1/SCO	SL2/CSL	DMMP	FW		DMMP	FW		DMMP	FW	
Antimony	mg/kg	150		200	mg/kg	--	--	mg/kg	--	--	10.0		U	10.0		U	10.0		U
Arsenic	mg/kg	57	507.1	700	mg/kg	20	51	mg/kg	14	120	10.0		U	10.0		U	10.0		U
Cadmium	mg/kg	5.1	11.3	14	mg/kg	1.1	1.5	mg/kg	2.1	5.4	**0.6**			**0.6**			**0.6**		
Chromium	mg/kg	260	260	(2)	mg/kg	95	100	mg/kg	72	88	**44.0**			**44.0**			**48.0**		
Copper	mg/kg	390	1,027	1,300	mg/kg	80	830	mg/kg	400	1,200	**28.0**			**28.7**			**31.1**		
Lead	mg/kg	450	975	1,200	mg/kg	340	430	mg/kg	360	>1300	**21.0**			**21.0**			**24.0**		
Mercury	mg/kg	0.41	1.5	2.3	mg/kg	0.28	0.75	mg/kg	0.66	0.80	**0.08**			**0.07**			**0.08**		
Nickel	mg/kg	--	--	--	mg/kg	--	--	mg/kg	--	--	**42**			**40**			**43**		
Selenium	mg/kg	(2)	**3**	(2)	mg/kg	--	--	mg/kg	11	>20	1		U	1		U	1		U
Silver	mg/kg	6.1	6.1	8.4	mg/kg	2.0	2.5	mg/kg	0.57	1.7	0.8		U	0.7		U	0.9		U
Zinc	mg/kg	410	2,783	3,800	mg/kg	130	400	mg/kg	3,200	>4200	**123**			**113**			**130**	**130**	
Tetrabutyltin								µg/L	97	>97	--			--			--		
Tributyltin (porewater)	µg/L	0.15	0.15		µg/L	--	--	µg/L	--	--	0.005		U	0.005		U	0.005		U
Tributyltin (bulk/sediment)	µg/kg	73.2	73.2		µg/kg	--	--	µg/kg	47	320	--			--			--		
Dibutyltin								µg/kg	910	130,000	--			--			--		
Monobutyltin								µg/kg	540	>4800	--			--			--		
ORGANIC CHEMICALS																			
Total LPAH	µg/kg	5,200		29,000	µg/kg	6,600	9,200	µg/kg	--	--	**103**		J	**78**		J	**83**		
Naphthalene	µg/kg	2,100		2,400	µg/kg	500	1,300	µg/kg	--	--	**25**			**14**		J	**24**		
Acenaphthylene	µg/kg	560		2,000	µg/kg	470	640	µg/kg	--	--	19		U	19		U	20		U
Acenaphthene	µg/kg	500		2,000	µg/kg	1,100	1,300	µg/kg	--	--	19		U	19		U	20		U
Fluorene	µg/kg	540		3,600	µg/kg	1,000	3,000	µg/kg	--	--	**9.7**		J	19		U	20		U
Phenanthrene	µg/kg	1,500		2,100	µg/kg	6,100	7,600	µg/kg	--	--	**68**			**64**			**59**		
Anthracene	µg/kg	560		13,000	µg/kg	1,200	1,600	µg/kg	--	--	19		U	19		U	20		U
2-Methylnapthalene	µg/kg	670		1,900	µg/kg	470	560	µg/kg	--	--	19		U	19		U	20		U
Total HPAH	µg/kg	12,000		69,000	µg/kg	31,000	55,000	µg/kg	--	--	**690**		J	**623**		J	**599**		J
Fluoranthene	µg/kg	1,700	4,600	30,000	µg/kg	11,000	15,000	µg/kg	--	--	**140**			**130**			**120**		
Pyrene	µg/kg	2,600	11,980	16,000	µg/kg	8,800	16,000	µg/kg	--	--	**130**			**120**			**120**		
Benzo(a)anthracene	µg/kg	1,300		5,100	µg/kg	4,300	5,800	µg/kg	--	--	**12**		J	**11**		J	**13**		J
Chrysene	µg/kg	1,400		21,000	µg/kg	5,900	6,400	µg/kg	--	--	**82**			**73**			**72**		
Total Benzo(b+k)fluoranthenes	µg/kg	3,200		9,900	µg/kg	600	4,000	µg/kg	--	--	**140**			**120**			**120**		
Benzo(a)pyrene	µg/kg	1,600		3,600	µg/kg	3,300	4,800	µg/kg	--	--	**55**			**50**			**45**		
Indeno(1,2,3-cd)pyrene	µg/kg	600		4,400	µg/kg	4,100	5,300	µg/kg	--	--	**38**			**36**			**33**		
Dibenzo(a,h)anthracene	µg/kg	230		1,900	µg/kg	800	840	µg/kg	--	--	**12**		J	**11**		J	**13**		J
Benzo(g,h,I)perylene	µg/kg	670		3,200	µg/kg	4,000	5,200	µg/kg	--	--	**41**			**41**			**36**		
Total PAH								µg/kg	17,000	30,000	--			--			--		
Bulk Petroleum Hydrocarbons (TPH) Diesel								mg/kg	340	510	--			--			--		
Bulk Petroleum Hydrocarbons (TPH) Residual								mg/kg	3,600	4,400	--			--			--		
1,4-Dichlorobenzene	µg/kg	110		120	µg/kg	--	--	µg/kg	--	--	19		U	19		U	20		U
1,2-Dichlorobenzene	µg/kg	35		110	µg/kg	--	--	µg/kg	--	--	19		U	19		U	20		U
1,3-Dichlorobenzene	µg/kg	--		--	µg/kg	--	--	µg/kg	--	--	19		U	19		U	20		U
1,2,4-Trichlorobenzene	µg/kg	31		64	µg/kg	--	--	µg/kg	--	--	19		U	19		U	20		U
Hexachlorobenzne (HCB)	µg/kg	22	168	230	µg/kg	--	--	µg/kg	--	--	4.8		U	4.8		U			
Dimethylphthalate	µg/kg	71		1,400	µg/kg	46.0	440	µg/kg	--	--	19		U	19		U	20		U
Diethylphthalate	µg/kg	200		1,200	µg/kg	--	--	µg/kg	--	--	48		U	48		U	49		U
Di-n-butylphthalate	µg/kg	1,400		5,100	µg/kg	--	--	µg/kg	380	1,000	**12**		J	19		U	20		U
Butylbenzylphthalate	µg/kg	63		970	µg/kg	260	370	µg/kg	--	--	19		U	**36**			**29**		
Bis(2-ethylhexyl)phthalate	µg/kg	1,300		8,300	µg/kg	220	320	µg/kg	--	--	**300**	**300**		**240**	**240**		**240**	**240**	
Di-n-octylphthalate	µg/kg	6,200		6,200	µg/kg	26	45	µg/kg	39	>1100	19		U	19		U	20		U
Phenol	µg/kg	420		1,200	µg/kg	--	--	µg/kg	120	210	**42**			**19**			**39**		
2-Methylphenol	µg/kg	63		77	ug/kg	--	--	ug/kg	--	--	19		U	19		U	20		U
4-Methylphenol	µg/kg	670		3,600	ug/kg	--	--	ug/kg	260	2,000	**31**		J	**22**		J	**36**		J
2,4-Dimethylphenol	µg/kg	29		210	ug/kg	--	--	ug/kg	--	--	19		UJ	19		UJ	20		UJ
Pentachlorophenol	µg/kg	400	504	690	ug/kg	--	--	ug/kg	1,200	>1200	190		U	190		U	200		U
Benzyl alcohol	µg/kg	57		870	ug/kg	--	--	ug/kg			**100**			**61**			**110**		
Benzoic acid	µg/kg	650		760	µg/kg	--	--	µg/kg	2,900	3,800	**480**			**300**		J	**510**		
Dibenzofuran	µg/kg	540		1,700	µg/kg	400	440	µg/kg	--	--	19		U	19		U	20		U
Hexachlorobutadiene	µg/kg	29		270	µg/kg	--	--	µg/kg	--	--	4.8		U	4.8		U	4.8		U
N-Nitrosodiphenylamine	µg/kg	28		130	µg/kg	--	--	µg/kg	--	--	19		U	19		U	20		U

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

						Sample ID:					KNC-SG-07 (duplicate)			KNC-SG-08			KNC-SG-09		
						DMMU ID:					S7 (dup)			S8			S9		
						sample Interval					0-27 cm			0-26 cm			0-26.5 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SL1	SL2	Units	SL1/SCO	SL2/CSL	DMMP	FW		DMMP	FW		DMMP	FW	
Beta-Hexachlorocyclohexane								µg/kg	7.2	1,100	--			--			--		
Carbazole								µg/kg	900	1,100	--			--			--		
p,p-DDD	µg/kg	16						µg/kg	310	860	1.7		U	1.7		U	1.6		U
p,p-DDE	µg/kg	9						µg/kg	21	33	1.6		U	1.6		U	1.6		U
p,p-DDT	µg/kg	12						µg/kg	--	--	1.7		U	1.7		U	1.6		U
Total DDT (sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT)	µg/kg		50	69	µg/kg	--	--	µg/kg	100	8100				1.7		U	1.6		U
Endrin Ketone					µg/kg			µg/kg	8.5	>8.5							--		
Aldrin	µg/kg	9.5			µg/kg	--	--	µg/kg	--	--	0.63		U	0.63		U	0.63		U
Chlordane (sum of cis, trans, cis-nonachlor, trans-nonachlor, oxy)	µg/kg	2.8			µg/kg	--	--	µg/kg	--	--	0.81		U	0.81		U	0.81		U
Dieldrin	µg/kg	1.9	37		µg/kg	--	--	µg/kg	4.9	9.3	1.6		U	1.6		U	1.6		U
Heptachlor	µg/kg	1.5			µg/kg	--	--	µg/kg	--	--	0.63		U	0.63		UJ	0.63		U
Aroclor 1016	µg/kg										19		U	18		U	20		U
Aroclor 1221	µg/kg										19		U	18		U	20		U
Aroclor 1232	µg/kg										19		U	18		U	20		U
Aroclor 1242	µg/kg										19		U	18		U	20		U
Aroclor 1248	µg/kg										19		U	18		U	20		U
Aroclor 1254	µg/kg										**22**			18		U	20		U
Aroclor 1260	µg/kg										19		U	18		U	20		U
Total PCBs (Aroclors)	µg/kg	130		3,100	µg/kg	**60**	**120**	µg/kg	**110**	**2,500**	**22**			18		U	20		U
Total PCBs (TOC-normalized)	**µg/kg**		38***																
Dioxin (TEQ: see Table 4 for detailed results)	**ng/kg**	4	10								**4.02**		**J**	**3.93**		**J**	**4.87**		**J**
Total Solids	%										**34.3**			**42.0**			**35.7**		]
Total Volatile Solids	%										**14.11**			**9.1**			**10.58**		
Total Organic Carbon	%										**7.07**			**3.3**			**5.22**		
Ammonia (NH3)	mg/kg							mg/kg	230	300	**--**			**--**			**--**		
Total Sulfides	mg/kg							mg/kg	39	61	**--**			**--**			**--**		
Gravel	%										**2.60**			**0.30**			**0.10**		
Sand	%										**52.0**			**50.3**			**40.0**		
Silt	%										**38.4**			**41.4**			**51.1**		
Clay	%										**6.9**			**7.9**			**8.6**		
Fines (percent silt + clay)	%										**45.4**			**49.3**			**59.7**		
Bioassay Determination: **(P/F)**	%										**NA**			**NA**			**NA**		
BTs exceeded:											**No**			**No**			**No**		
Bioaccumulation conducted:											**No**			**No**			**No**		
Bioaccumulation Determination: **(P/F)**																			
ML Rule exceeded:											**No**			**No**			**No**		
DMMP Determination:											**ND**			**ND**			**ND**		
DMMU Volume:											**NA**			**NA**			**NA**		
Rank (Low = L, Moderate = M, Low-Moderate =LM, High = H)											**H**			**H**			**H**		
Mean grab sampling depth (cm)	CM										**27**			**26**			**26.5**		
DMMU ID:											**KNC-SG-07 (duplicate)**			**KNC-SG-08**			**KNC-SG-09**		

*** 2006 Interim Fresh Water Guidelines**

****Newly adopted Fresh Water Guidelines through SMS Rulemaking: to be implemented in September 2013**

SL/BT = exceeds DMMP SL/BT

SL/SL1 = exceeds DMMP Screening Level or SMS FW SL1 Guidelines

ML/SL2 = exceeds DMMP Maximum Level or SMS FW SL2 Guidelines

VQ = Validation Qualifier

UCOWD = Unconfined open-water disposal

NA = Not Analyzed

ND = Not Determined

U = undetected at the reporting limit (method detection limit)

J = Estimated Concentration, at the reporting limit

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

											NORTH LAKE MARINA						Harbor Village Marina					
					Sample ID:						NLM-SG-02			NLM-SG-03			HVM-SG-10			HVM-SG-11		
					DMMU ID:						S2			S3			S10			S11		
					sample Interval						0-22 cm			0-25 cm			0-26 cm			0-28.5 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	**Units**	**SL**	**BT**	**ML**	**Units**	**SL1**	**SL2**	**Units**	**SL1/SCO**	**SL2/CSL**	**DMMP**	**FW**		**DMMP**	**FW**		**DMMP**	**FW**		**DMMP**	**FW**	
Antimony	mg/kg	150		200	mg/kg	--	--	mg/kg	--	--	20		U	20		U	9		UJ	30		UJ
Arsenic	mg/kg	57	507.1	700	mg/kg	20	51	mg/kg	14	120	20		U	20		U	9		UJ	30		UJ
Cadmium	mg/kg	5.1	11.3	14	mg/kg	1.1	1.5	mg/kg	2.1	5.4	**1.3**			**1.2**			**0.4**			1		U
Chromium	mg/kg	260	260	(2)	mg/kg	95	100	mg/kg	72	88	**56**			**55**			**29.8**			**52**		
Copper	mg/kg	390	1,027	1,300	mg/kg	80	830	mg/kg	400	1,200	**92.4**	**92.4**		**88.1**	**88.1**		**18.8**		**J**	**97**	**97**	J
Lead	mg/kg	450	975	1,200	mg/kg	340	430	mg/kg	360	>1300	**62**			**42**			**19**		**J**	**50**		J
Mercury	mg/kg	0.41	1.5	2.3	mg/kg	0.28	0.75	mg/kg	0.66	0.80	**0.18**			**0.1**			**0.04**			**0.1**		
Nickel	mg/kg	--	--	--	mg/kg	--	--	mg/kg	--	--	**48**			**45**			**33**			**47**		
Selenium	mg/kg	(2)	**3**	(2)	mg/kg	--	--	mg/kg	11	>20	2		U	2		U	0.9		U	3		U
Silver	mg/kg	6.1	6.1	8.4	mg/kg	2.0	2.5	mg/kg	0.57	1.7	1		U	1		U	0.5		U	2		U
Zinc	mg/kg	410	2,783	3,800	mg/kg	130	400	mg/kg	3,200	>4200	**231**	**231**		**267**	**267**		**97**		**J**	**377**	**377**	J
Tetrabutyltin								µg/L	97	>97	--			--			--			--		
Tributyltin (porewater)	µg/L	0.15	0.15		µg/L	--	--	µg/L	--	--	**0.67**			**0.058**			--			--		
Tributyltin (bulk/sediment)	µg/kg	73.2	73.2		µg/kg	--	--	µg/kg	47	320	--			--			**3.6**		**U**	**9.8**		
Dibutyltin								µg/kg	910	130,000	--			--			--			--		
Monobutyltin								µg/kg	540	>4800	--			--			--			--		
ORGANIC CHEMICALS																						
Total LPAH	µg/kg	5,200		29,000	µg/kg	6,600	9,200	µg/kg	--	--	**760**			**410**		J	**410**		**J**	**450**		J
Naphthalene	µg/kg	2,100		2,400	µg/kg	500	1,300	µg/kg	--	--	83			58			38			39		
Acenaphthylene	µg/kg	560		2,000	µg/kg	470	640	µg/kg	--	--	22			16		J	3.5		J	19		J
Acenaphthene	µg/kg	500		2,000	µg/kg	1,100	1,300	µg/kg	--	--	**320**			**33**			**14**			**32**		
Fluorene	µg/kg	540		3,600	µg/kg	1,000	3,000	µg/kg	--	--	**98**			**46**			**28**			**38**		
Phenanthrene	µg/kg	1,500		2,100	µg/kg	6,100	7,600	µg/kg	--	--	**170**			**190**			**260**			**210**		
Anthracene	µg/kg	560		13,000	µg/kg	1,200	1,600	µg/kg	--	--	**66**			**68**			**57**			**66**		
2-Methylnapthalene	µg/kg	670		1,900	µg/kg	470	560	µg/kg	--	--	**31**			**25**			**12**			**47**		
Total HPAH	µg/kg	12,000		69,000	µg/kg	31,000	55,000	µg/kg	--	--	**2820**			**2260**			**2600**			**2500**		
Fluoranthene	µg/kg	1,700	4,600	30,000	µg/kg	11,000	15,000	µg/kg	--	--	**480**			**410**			**480**			**430**		
Pyrene	µg/kg	2,600	11,980	16,000	µg/kg	8,800	16,000	µg/kg	--	--	**590**			**440**			**800**			**470**		
Benzo(a)anthracene	µg/kg	1,300		5,100	µg/kg	4,300	5,800	µg/kg	--	--	**210**			**190**			**190**			**210**		
Chrysene	µg/kg	1,400		21,000	µg/kg	5,900	6,400	µg/kg	--	--	**440**			**410**			**290**			**370**		
Total Benzo(b+k)fluoranthenes	µg/kg	3,200		9,900	µg/kg	600	4,000	µg/kg	--	--	**530**			**420**			**400**			**570**		
Benzo(a)pyrene	µg/kg	1,600		3,600	µg/kg	3,300	4,800	µg/kg	--	--	**190**			**160**			**190**			**210**		
Indeno(1,2,3-cd)pyrene	µg/kg	600		4,400	µg/kg	4,100	5,300	µg/kg	--	--	**140**			**110**			**110**			**90**		
Dibenzo(a,h)anthracene	µg/kg	230		1,900	µg/kg	800	840	µg/kg	--	--	**67**			**55**			**34**			**45**		
Benzo(g,h,I)perylene	µg/kg	670		3,200	µg/kg	4,000	5,200	µg/kg	--	--	**170**			**130**			**140**			**110**		
Total PAH								µg/kg	17,000	30,000	**--**			**--**			**--**			**--**		
Bulk Petroleum Hydrocarbons (TPH) Diesel								mg/kg	340	510	**--**			**--**			**--**			**--**		
Bulk Petroleum Hydrocarbons (TPH) Residual								mg/kg	3,600	4,400	**--**			**--**			**--**			**--**		
1,4-Dichlorobenzene	µg/kg	110		120	µg/kg	--	--	µg/kg	--	--	19		U	20		U	20		U	20		U
1,2-Dichlorobenzene	µg/kg	35		110	µg/kg	--	--	µg/kg	--	--	19		U	20		U	20		U	20		U
1,3-Dichlorobenzene	µg/kg	--		--	µg/kg	--	--	µg/kg	--	--	19		U	20		U	20		U	20		U
1,2,4-Trichlorobenzene	µg/kg	31		64	µg/kg	--	--	µg/kg	--	--	19		U	20		U	20		U	20		U
Hexachlorobenzne (HCB)	µg/kg	22	168	230	µg/kg	--	--	µg/kg	--	--	4.9		U	4.9		U	4.8		U	3.9		U
Dimethylphthalate	µg/kg	71		1,400	µg/kg	46.0	440	µg/kg	--	--	**28**			20		U	20		U	20		U
Diethylphthalate	µg/kg	200		1,200	µg/kg	--	--	µg/kg	--	--	49		U	**38**		J	50		U	**44**		J
Di-n-butylphthalate	µg/kg	1,400		5,100	µg/kg	--	--	µg/kg	380	1,000	19		U	**9.8**		J	20		U	**20**		U
Butylbenzylphthalate	µg/kg	63		970	µg/kg	260	370	µg/kg	--	--	**32**			**32**			20		U	**24**		
Bis(2-ethylhexyl)phthalate	µg/kg	1,300		8,300	µg/kg	220	320	µg/kg	--	--	**680**	**680**		**510**	**510**		**480**	**480**		**740**	**740**	
Di-n-octylphthalate	µg/kg	6,200		6,200	µg/kg	26	45	µg/kg	39	>1100	19		U	**58**	**58**	J	20		U	**87**	**87**	
Phenol	µg/kg	420		1,200	µg/kg	--	--	µg/kg	120	210	19		U	**110**			**55**			**140**	**140**	
2-Methylphenol	µg/kg	63		77	ug/kg	--	--	ug/kg	--	--	19		U	20		U	20		U	**11**		J
4-Methylphenol	µg/kg	670		3,600	ug/kg	--	--	ug/kg	260	2,000	**74**			**76**			**160**			**150**		
2,4-Dimethylphenol	µg/kg	29		210	ug/kg	--	--	ug/kg	--	--	19		U	20		UJ	20		UJ	20		UJ
Pentachlorophenol	µg/kg	400	504	690	ug/kg	--	--	ug/kg	1,200	>1200	190		U	200		UJ	200		U	**55**		J
Benzyl alcohol	µg/kg	57		870	ug/kg	--	--	ug/kg			**82**			**130**			**200**			**530**		
Benzoic acid	µg/kg	650		760	µg/kg	--	--	µg/kg	2,900	3,800	**960**			**1300**			**520**			**1400**		
Dibenzofuran	µg/kg	540		1,700	µg/kg	400	440	µg/kg	--	--	30			35			19			24		
Hexachlorobutadiene	µg/kg	29		270	µg/kg	--	--	µg/kg	--	--	4.9		U	4.9		U	4.8		U	3.9		U
N-Nitrosodiphenylamine	µg/kg	28		130	µg/kg	--	--	µg/kg	--	--	19		U	20		U	20		U	20		U

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

						Sample ID:					NLM-SG-02			NLM-SG-03			HVM-SG-10			HVM-SG-11		
						DMMU ID:					S2			S3			S10			S11		
						sample Interval					0-22 cm			0-25 cm			0-26 cm			0-28.5 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SL1	SL2	Units	SL1/SCO	SL2/CSL	DMMP	FW		DMMP	FW		DMMP	FW		DMMP	FW	
Beta-Hexachlorocyclohexane								µg/kg	7.2	1,100	--			--			--			--		
Carbazole								µg/kg	900	1,100	--			--			--			--		
p,p-DDD	µg/kg	16						µg/kg	310	860	1.7		U	1.7		U	1.6		U	1.3		U
p,p-DDE	µg/kg	9						µg/kg	21	33	1.7		U	1.7		U	1.6		U	**7.2**		J
p,p-DDT	µg/kg	12						µg/kg	--	--	1.7		U	1.7		U	1.6		U	1.3		U
Total DDT (sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT)	µg/kg		50	69	µg/kg	--	--	µg/kg	100	8100	1.7		U	1.7		U	1.6		U	**7.2**		J
Endrin Ketone					µg/kg			µg/kg	8.5	>8.5	--			--								
Aldrin	µg/kg	9.5			µg/kg	--	--	µg/kg	--	--	0.64		U	0.64		U	0.62		U	0.51		U
Chlordane (sum of cis, trans, cis-nonachlor, trans-nonachlor, oxy)	µg/kg	2.8			µg/kg	--	--	µg/kg	--	--	4.7		U	4.7		U	0.8		U	0.66		U
Dieldrin	µg/kg	1.9	37		µg/kg	--	--	µg/kg	4.9	9.3	1.7		U	1.7		U	1.6		U	1.3		U
Heptachlor	µg/kg	1.5			µg/kg	--	--	µg/kg	--	--	0.64		U	0.64		U	0.62		U	0.51		U
Aroclor 1016	µg/kg										19		U	19		U	18		U	19		U
Aroclor 1221	µg/kg										19		U	19		U	18		U	19		U
Aroclor 1232	µg/kg										19		U	19		U	18		U	19		U
Aroclor 1242	µg/kg										19		U	19		U	18		U	19		U
Aroclor 1248	µg/kg										58		U	38		U	18		U	39		U
Aroclor 1254	µg/kg										**88**			48		U	32		U	48		U
Aroclor 1260	µg/kg										**33**			**22**			32		U	**29**		J
Total PCBs (Aroclors)	µg/kg	130		3,100	µg/kg	**60**	**120**	µg/kg	**110**	**2,500**	**121**			**22**			32		U	**29**		J
Total PCBs (TOC-normalized)	**µg/kg**		38***																			
Dioxin (TEQ: see Table 4 for detailed results)	**ng/kg**	4	10								**37**			**20.3**			**6.57**			**71**		
Total Solids	%										**25.7**			**25.6**			**56.1**			**16.9**		
Total Volatile Solids	%										**13.5**			**15.2**			**6.5**			**24.1**		
Total Organic Carbon	%										**7.1**			**6.6**			**3.1**			**10.8**		
Ammonia (NH3)	mg/kg							mg/kg	230	300	--			--			--			--		
Total Sulfides	mg/kg							mg/kg	39	61	--			--			--			--		
Gravel	%										**0.4**			**11.8**			**5.3**			**0.1**		U
Sand	%										**33.8**			**41.5**			**68.5**			**27.3**		
Silt	%										**55.6**			**39.4**			**24.4**			**64**		
Clay	%										**10.2**			**7.4**			**2**			**8.8**		
Fines (percent silt + clay)	%										**65.8**			**46.7**			**26.4**			**72.7**		
Bioassay Determination: **(P/F)**	%										**NA**			**NA**			**NA**			**NA**		
BTs exceeded:											**yes**			**yes**			**No**			**yes**		
Bioaccumulation conducted:											**No**			**No**			**No**			**No**		
Bioaccumulation Determination: **(P/F)**																						
ML Rule exceeded:											**No**			**No**			**No**			**No**		
DMMP Determination:											**ND**			**ND**			**ND**			**ND**		
DMMU Volume:											**NA**			**NA**			**NA**			**NA**		
Rank (Low = L, Moderate = M, Low-Moderate =LM, High = H)											**H**			**H**			**H**			**H**		
Mean grab sampling depth (cm)	CM										**22**			**25**			**10**			**10**		
DMMU ID:											**NLM-SG-02**			**NLM-SG-03**			**HVM-SG-10**			**HVM-SG-11**		

*** 2006 Interim Fresh Water Guidelines**

****Newly adopted Fresh Water Guidelines through SMS Rulemaking: to be implemented in September 2013**

SL/BT = exceeds DMMP SL/BT

SL/SL1 = exceeds DMMP Screening Level or SMS FW SL1 Guidelines

ML/SL2 = exceeds DMMP Maximum Level or SMS FW SL2 Guidelines

VQ = Validation Qualifier

UCOWD = Unconfined open-water disposal

NA = Not Analyzed

ND = Not Determined

U = undetected at the reporting limit (method detection limit)

J = Estimated Concentration, at the reporting limit

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

											Harbor Village Marina									NE of KIP		
						Sample ID:					HVM-SG-12			HVM-SG-13			HVM-SG-13 (DUP)			NE-KIP-SG-14		
						DMMU ID:					S12			S13			S13 (dup)			S14		
						sample Interval					0-19 cm			0-24 cm			0-24 cm			0-26 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SL1	SL2	Units	SL1/SCO	SL2/CSL	DMMP	FW		DMMP	FW		DMMP	FW		DMMP	FW	
Antimony	mg/kg	150		200	mg/kg	--	--	mg/kg	--	--	20		UJ	20		UJ	20		UJ	10		UJ
Arsenic	mg/kg	57	507.1	700	mg/kg	20	51	mg/kg	14	120	20		UJ	20		UJ	20		UJ	10		UJ
Cadmium	mg/kg	5.1	11.3	14	mg/kg	1.1	1.5	mg/kg	2.1	5.4	**0.7**		UJ	**0.9**		U	**0.9**		U	**0.7**		
Chromium	mg/kg	260	260	(2)	mg/kg	95	100	mg/kg	72	88	**44**			**54**			**55**			**36**		
Copper	mg/kg	390	1,027	1,300	mg/kg	80	830	mg/kg	400	1,200	**47.5**		**J**	**62.1**		J	**62.8**		J	**111**	**111**	**J**
Lead	mg/kg	450	975	1,200	mg/kg	340	430	mg/kg	360	>1300	**27**		**J**	**32**		J	**32**		J	**26**		**J**
Mercury	mg/kg	0.41	1.5	2.3	mg/kg	0.28	0.75	mg/kg	0.66	0.80	**0.1**			**0.1**			**0.1**			**0.24**		
Nickel	mg/kg	--	--	--	mg/kg	--	--	mg/kg	--	--	**41**			**46**			**45**			**35**		
Selenium	mg/kg	(2)	**3**	(2)	mg/kg	--	--	mg/kg	11	>20	2		U	2		U	2		U	1		UJ
Silver	mg/kg	6.1	6.1	8.4	mg/kg	2.0	2.5	mg/kg	0.57	1.7	1		U	1		U	1		U	0.7		UJ
Zinc	mg/kg	410	2,783	3,800	mg/kg	130	400	mg/kg	3,200	>4200	**185**	**185**	**J**	**205**	**205**	J	**205**	**205**	**J**	**182**	**182**	J
Tetrabutyltin								µg/L	97	>97	--			--			--			--		
Tributyltin (porewater)	µg/L	0.15	0.15		µg/L	--	--	µg/L	--	--	--			--			--			--		
Tributyltin (bulk/sediment)	µg/kg	73.2	73.2		µg/kg	--	--	µg/kg	47	320	**6.8**			12			12			--		
Dibutyltin								µg/kg	910	130,000	--			--			--			--		
Monobutyltin								µg/kg	540	>4800	--			--			--			--		
ORGANIC CHEMICALS																						
Total LPAH	µg/kg	5,200		29,000	µg/kg	6,600	9,200	µg/kg	--	--	**350**		**J**	**390**		**J**	**320**		**J**	**1500**		
Naphthalene	µg/kg	2,100		2,400	µg/kg	500	1,300	µg/kg	--	--	39			**39**			**40**			**170**		
Acenaphthylene	µg/kg	560		2,000	µg/kg	470	640	µg/kg	--	--	5.7			**26**			**7.5**			**26**		
Acenaphthene	µg/kg	500		2,000	µg/kg	1,100	1,300	µg/kg	--	--	**18**		**J**	**17**		J	**16**		**J**	**130**		
Fluorene	µg/kg	540		3,600	µg/kg	1,000	3,000	µg/kg	--	--	**59**			**46**			**32**			**150**		
Phenanthrene	µg/kg	1,500		2,100	µg/kg	6,100	7,600	µg/kg	--	--	**170**			**190**			**160**			**830**		
Anthracene	µg/kg	560		13,000	µg/kg	1,200	1,600	µg/kg	--	--	**41**			**48**			**44**			**150**		
2-Methylnapthalene	µg/kg	670		1,900	µg/kg	470	560	µg/kg	--	--	**13**			**24**			**19**			**59**		
Total HPAH	µg/kg	12,000		69,000	µg/kg	31,000	55,000	µg/kg	--	--	**1500**			**1800**			**1500**			**4200**		
Fluoranthene	µg/kg	1,700	4,600	30,000	µg/kg	11,000	15,000	µg/kg	--	--	**300**			**260**			**220**			**1200**		
Pyrene	µg/kg	2,600	11,980	16,000	µg/kg	8,800	16,000	µg/kg	--	--	**230**			**290**			**230**			**9202**		
Benzo(a)anthracene	µg/kg	1,300		5,100	µg/kg	4,300	5,800	µg/kg	--	--	**110**			**150**			**160**			**360**		
Chrysene	µg/kg	1,400		21,000	µg/kg	5,900	6,400	µg/kg	--	--	**210**			**300**			**240**			**550**		
Total Benzo(b+k)fluoranthenes	µg/kg	3,200		9,900	µg/kg	600	4,000	µg/kg	--	--	**290**			**380**			**320**			**720**		
Benzo(a)pyrene	µg/kg	1,600		3,600	µg/kg	3,300	4,800	µg/kg	--	--	**110**			**140**			**120**			**250**		
Indeno(1,2,3-cd)pyrene	µg/kg	600		4,400	µg/kg	4,100	5,300	µg/kg	--	--	**77**			**100**			**79**			**97**		
Dibenzo(a,h)anthracene	µg/kg	230		1,900	µg/kg	800	840	µg/kg	--	--	**36**			**40**			**26**			**42**		
Benzo(g,h,I)perylene	µg/kg	670		3,200	µg/kg	4,000	5,200	µg/kg	--	--	**85**			**120**			**85**			**95**		
Total PAH								µg/kg	17,000	30,000	--			--			--			--		
Bulk Petroleum Hydrocarbons (TPH) Diesel								mg/kg	340	510	--			--			--			--		
Bulk Petroleum Hydrocarbons (TPH) Residual								mg/kg	3,600	4,400	--			--			--			--		
1,4-Dichlorobenzene	µg/kg	110		120	µg/kg	--	--	µg/kg	--	--	20		U	20		U	20		U	19		U
1,2-Dichlorobenzene	µg/kg	35		110	µg/kg	--	--	µg/kg	--	--	20		U	20		U	20		U	19		U
1,3-Dichlorobenzene	µg/kg	--		--	µg/kg	--	--	µg/kg	--	--	20		U	20		U	20		U	19		U
1,2,4-Trichlorobenzene	µg/kg	31		64	µg/kg	--	--	µg/kg	--	--	20		U	20		U	20		U	19		U
Hexachlorobenzne (HCB)	µg/kg	22	168	230	µg/kg	--	--	µg/kg	--	--	4.9		U	4.9		U	4.9		U	4.9		U
Dimethylphthalate	µg/kg	71		1,400	µg/kg	46.0	440	µg/kg	--	--	20		U	20		U	20		U	19		U
Diethylphthalate	µg/kg	200		1,200	µg/kg	--	--	µg/kg	--	--	**100**			**55**			50		U	**68**		
Di-n-butylphthalate	µg/kg	1,400		5,100	µg/kg	--	--	µg/kg	380	1,000	**26**			20		U	20		U	19		U
Butylbenzylphthalate	µg/kg	63		970	µg/kg	260	370	µg/kg	--	--	**71**			**82**			**56**			**43**		
Bis(2-ethylhexyl)phthalate	µg/kg	1,300		8,300	µg/kg	220	320	µg/kg	--	--	**360**	**360**		**560**	**560**		**430**	**430**		**280**	**280**	
Di-n-octylphthalate	µg/kg	6,200		6,200	µg/kg	26	45	µg/kg	39	>1100	20		U	**73**	**73**	J	**42**	**42**		**24**		
Phenol	µg/kg	420		1,200	µg/kg	--	--	µg/kg	120	210	**300**	**300**		**200**	**200**		**350**	**350**		**80**		
2-Methylphenol	µg/kg	63		77	ug/kg	--	--	ug/kg	--	--	**12**		J	**12**		J	**14**		J	19		U
4-Methylphenol	µg/kg	670		3,600	ug/kg	--	--	ug/kg	260	2,000	**74**			**110**			**110**			**59**		
2,4-Dimethylphenol	µg/kg	29		210	ug/kg	--	--	ug/kg	--	--	20		UJ	20		UJ	20		UJ	19		UJ
Pentachlorophenol	µg/kg	400	504	690	ug/kg	--	--	ug/kg	1,200	>1200	200		U	52		J	200		U	190		U
Benzyl alcohol	µg/kg	57		870	ug/kg	--	--	ug/kg			**300**			**360**			**380**			**100**		
Benzoic acid	µg/kg	650		760	µg/kg	--	--	µg/kg	2,900	3,800	**1500**			**1600**			**1700**			**610**		
Dibenzofuran	µg/kg	540		1,700	µg/kg	400	440	µg/kg	--	--	13			**12**			**17**			**90**		
Hexachlorobutadiene	µg/kg	29		270	µg/kg	--	--	µg/kg	--	--	10		UJ	**4.9**		**U**	**4.9**		**U**	**4.9**		**U**
N-Nitrosodiphenylamine	µg/kg	28		130	µg/kg	--	--	µg/kg	--	--	20		UJ	20		U	20		U	19		U

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

						Sample ID:					HVM-SG-12			HVM-SG-13			HVM-SG-13 (DUP)			NE-KIP-SG-14		
						DMMU ID:					S12			S13			S13 (dup)			S14		
						sample Interval					0-19 cm			0-24 cm			0-24 cm			0-26 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SL1	SL2	Units	SL1/SCO	SL2/CSL	DMMP	FW		DMMP	FW		DMMP	FW		DMMP	FW	
Beta-Hexachlorocyclohexane								µg/kg	7.2	1,100	--			--			--			--		
Carbazole								µg/kg	900	1,100	--			--			--			--		
p,p-DDD	µg/kg	16						µg/kg	310	860	1.7		U	1.7		U	1.7		U	1.7		U
p,p-DDE	µg/kg	9						µg/kg	21	33	**4**		J	1.7		U	**4.4**		J	1.7		U
p,p-DDT	µg/kg	12						µg/kg	--	--	1.7		U	1.7		U	1.7		U	1.7		U
Total DDT (sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT)	µg/kg		50	69	µg/kg	--	--	µg/kg	100	8100	**4**		J	1.7		U	**4.4**		J	1.7		U
Endrin Ketone					µg/kg			µg/kg	8.5	>8.5												
Aldrin	µg/kg	9.5			µg/kg	--	--	µg/kg	--	--	0.64		U	0.64		U	0.64		U	0.64		U
Chlordane (sum of cis, trans, cis-nonachlor, trans-nonachlor, oxy)	µg/kg	2.8			µg/kg	--	--	µg/kg	--	--	0.83		U	0.83		U	0.83		U	0.82		U
Dieldrin	µg/kg	1.9	37		µg/kg	--	--	µg/kg	4.9	9.3	1.7		U	1.7		U	1.7		U	1.6		U
Heptachlor	µg/kg	1.5			µg/kg	--	--	µg/kg	--	--	0.64		U	0.64		U	0.64		U	0.64		U
Aroclor 1016	µg/kg										19		U	20		U	20		U	19		U
Aroclor 1221	µg/kg										19		U	20		U	20		U	19		U
Aroclor 1232	µg/kg										19		U	25		U	35		U	28		U
Aroclor 1242	µg/kg										19		U	20		U	20		U	19		U
Aroclor 1248	µg/kg										24		U	20		U	20		U	19		U
Aroclor 1254	µg/kg										49		U	50		U	25		U	**20**		
Aroclor 1260	µg/kg										49		U	20		U	20		U	19		U
Total PCBs (Aroclors)	µg/kg	130		3,100	µg/kg	**60**	**120**	µg/kg	**110**	**2,500**	49		U	50		U	35		U	**20**		
Total PCBs (TOC-normalized)	**µg/kg**		38***																			
Dioxin (TEQ: see Table 4 for detailed results)	**ng/kg**	4	10								**26.6**			**50.4**			**18.9**			**10.1**		
Total Solids	%										**27.4**			**23.2**			**22.7**			**51**		
Total Volatile Solids	%										**13.7**			**15.0**			**14.6**			**7.6**		
Total Organic Carbon	%										**4.7**			**5.45**			**3.8**			**4.33**		
Ammonia (NH3)	mg/kg							mg/kg	230	300	--			--			--			--		
Total Sulfides	mg/kg							mg/kg	39	61	--			--			--			--		
Gravel	%										**0.6**			**0.1**		U	**0.1**		**U**	**22.6**		
Sand	%										**64.5**			**25.5**			**23.2**			**46.9**		
Silt	%										**64.5**			**62.9**			**65.1**			**25.6**		
Clay	%										**6.4**			**11.6**			**11.6**			**4.9**		
Fines (percent silt + clay)	%										**71.1**			**74.6**			**76.7**			**30.6**		
Bioassay Determination: **(P/F)**	%										**NA**			**NA**			**NA**			**NA**		
BTs exceeded:											**yes**			**yes**			**yes**			**yes**		
Bioaccumulation conducted:											**No**			**No**			**No**			**No**		
Bioaccumulation Determination: **(P/F)**																						
ML Rule exceeded:											**No**			**No**			**No**			**No**		
DMMP Determination:											**ND**			**ND**			**ND**			**ND**		
DMMU Volume:											**NA**			**NA**			**NA**			**NA**		
Rank (Low = L, Moderate = M, Low-Moderate =LM, High = H)											**H**			**H**			**H**			**H**		
Mean grab sampling depth (cm)	CM										**10**			**10**			**10**			**10**		
DMMU ID:											**HVM-SG-12**			**HNM-SG-13**			**HNM-SG-13 (DUP)**			**NE-KIP-SG-14**		

*** 2006 Interim Fresh Water Guidelines**

****Newly adopted Fresh Water Guidelines through SMS Rulemaking: to be implemented in September 2013**

SL/BT = exceeds DMMP SL/BT

SL/SL1 = exceeds DMMP Screening Level or SMS FW SL1 Guidelines

ML/SL2 = exceeds DMMP Maximum Level or SMS FW SL2 Guidelines

VQ = Validation Qualifier

UCOWD = Unconfined open-water disposal

NA = Not Analyzed

ND = Not Determined

U = undetected at the reporting limit (method detection limit)

J = Estimated Concentration, at the reporting limit

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

											Sammamish River Navigation Channel								
						Sample ID:					KIP-SG-16			KIP-SG-17			SAM-SG-01		
						DMMU ID:					S16			S17			S01		
						sample Interval					0-21			0-23.5 cm			0-10 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SL1	SL2	Units	SL1/SCO	SL2/CSL	DMMP	FW		DMMP	FW		DMMP	FW	
Antimony	mg/kg	150		200	mg/kg	--	--	mg/kg	--	--	6		UJ	10		UJ	6		UJ
Arsenic	mg/kg	57	507.1	700	mg/kg	20	51	mg/kg	14	120	6		UJ	10		UJ	6		UJ
Cadmium	mg/kg	5.1	11.3	14	mg/kg	1.1	1.5	mg/kg	2.1	5.4	**0.2**		U	**0.4**		U	0.2		UJ
Chromium	mg/kg	260	260	(2)	mg/kg	95	100	mg/kg	72	88	**29.9**			**54**			**29.3**		
Copper	mg/kg	390	1,027	1,300	mg/kg	80	830	mg/kg	400	1,200	**5.4**		**J**	**13.5**		J	**5.9**		**J**
Lead	mg/kg	450	975	1,200	mg/kg	340	430	mg/kg	360	>1300	**4**		**J**	**7**		J	**4**		**J**
Mercury	mg/kg	0.41	1.5	2.3	mg/kg	0.28	0.75	mg/kg	0.66	0.80	0.03		U	**0.04**			0.03		U
Nickel	mg/kg	--	--	--	mg/kg	--	--	mg/kg	--	--	**26**			**34**			**23**		
Selenium	mg/kg	(2)	**3**	(2)	mg/kg	--	--	mg/kg	11	>20	0.6		U	1		U	0.6		U
Silver	mg/kg	6.1	6.1	8.4	mg/kg	2.0	2.5	mg/kg	0.57	1.7	0.4		U	0.6		U	0.4		U
Zinc	mg/kg	410	2,783	3,800	mg/kg	130	400	mg/kg	3,200	>4200	**43**		J	**64**		**J**	**43**		**J**
Tetrabutyltin								µg/L	97	>97	--			--			--		
Tributyltin (porewater)	µg/L	0.15	0.15		µg/L	--	--	µg/L	--	--	--			--			--		
Tributyltin (bulk/sediment)	µg/kg	73.2	73.2		µg/kg	--	--	µg/kg	47	320	--			--			--		
Dibutyltin								µg/kg	910	130,000	--			--			--		
Monobutyltin								µg/kg	540	>4800	--			--			--		
ORGANIC CHEMICALS																			
Total LPAH	µg/kg	5,200		29,000	µg/kg	6,600	9,200	µg/kg	--	--	**2.6**		**J**	**120**		**J**	**26**		
Naphthalene	µg/kg	2,100		2,400	µg/kg	500	1,300	µg/kg	--	--	4.8		UJ	**4**		J	4.8		U
Acenaphthylene	µg/kg	560		2,000	µg/kg	470	640	µg/kg	--	--	4.8		UJ		4.9		4.8		U
Acenaphthene	µg/kg	500		2,000	µg/kg	1,100	1,300	µg/kg	--	--	**4.8**		UJ	**4.9**		**U**	4.8		U
Fluorene	µg/kg	540		3,600	µg/kg	1,000	3,000	µg/kg	--	--	**4.8**		U	**2.5**		**J**	4.8		U
Phenanthrene	µg/kg	1,500		2,100	µg/kg	6,100	7,600	µg/kg	--	--	**2.6**		J	**93**			**26**		
Anthracene	µg/kg	560		13,000	µg/kg	1,200	1,600	µg/kg	--	--	**4.8**		U	**11**		**J**	4.8		U
2-Methylnapthalene	µg/kg	670		1,900	µg/kg	470	560	µg/kg	--	--	**4.8**		U	**7.4**			4.8		U
Total HPAH	µg/kg	12,000		69,000	µg/kg	31,000	55,000	µg/kg	--	--	**35**		J	**540**					
Fluoranthene	µg/kg	1,700	4,600	30,000	µg/kg	11,000	15,000	µg/kg	--	--	**11**		J	**130**			4.8		U
Pyrene	µg/kg	2,600	11,980	16,000	µg/kg	8,800	16,000	µg/kg	--	--	**9.7**		J	**120**			**39**		
Benzo(a)anthracene	µg/kg	1,300		5,100	µg/kg	4,300	5,800	µg/kg	--	--	**4.8**		U	**42**			**15**		**J**
Chrysene	µg/kg	1,400		21,000	µg/kg	5,900	6,400	µg/kg	--	--	**3**		J	**64**			**20**		
Total Benzo(b+k)fluoranthenes	µg/kg	3,200		9,900	µg/kg	600	4,000	µg/kg	--	--	**8.2**			**91**			**35**		**J**
Benzo(a)pyrene	µg/kg	1,600		3,600	µg/kg	3,300	4,800	µg/kg	--	--	**2.9**		J	**41**			**15**		**J**
Indeno(1,2,3-cd)pyrene	µg/kg	600		4,400	µg/kg	4,100	5,300	µg/kg	--	--	**4.8**		UJ	**24**			**3.6**		**J**
Dibenzo(a,h)anthracene	µg/kg	230		1,900	µg/kg	800	840	µg/kg	--	--	**4.8**		UJ	**4.9**		**U**	4.8		U
Benzo(g,h,I)perylene	µg/kg	670		3,200	µg/kg	4,000	5,200	µg/kg	--	--	**4.8**		UJ	**27**			**3.2**		**J**
Total PAH								µg/kg	17,000	30,000	**--**			**--**			**39.0**		
Bulk Petroleum Hydrocarbons (TPH) Diesel								mg/kg	340	510	**--**			**--**					
Bulk Petroleum Hydrocarbons (TPH) Residual								mg/kg	3,600	4,400	**--**			**--**					
1,4-Dichlorobenzene	µg/kg	110		120	µg/kg	--	--	µg/kg	--	--	19		U	19		U	19		U
1,2-Dichlorobenzene	µg/kg	35		110	µg/kg	--	--	µg/kg	--	--	19		U	19		U	19		U
1,3-Dichlorobenzene	µg/kg	--		--	µg/kg	--	--	µg/kg	--	--	19		U	19		U	19		U
1,2,4-Trichlorobenzene	µg/kg	31		64	µg/kg	--	--	µg/kg	--	--	19		U	19		U	19		U
Hexachlorobenzne (HCB)	µg/kg	22	168	230	µg/kg	--	--	µg/kg	--	--	19		U	19		U	19		U
Dimethylphthalate	µg/kg	71		1,400	µg/kg	46.0	440	µg/kg	--	--	19		U	**38**			19		U
Diethylphthalate	µg/kg	200		1,200	µg/kg	--	--	µg/kg	--	--	48		U	48		U	48		U
Di-n-butylphthalate	µg/kg	1,400		5,100	µg/kg	--	--	µg/kg	380	1,000	19		U	19		U	19		U
Butylbenzylphthalate	µg/kg	63		970	µg/kg	260	370	µg/kg	--	--	19		U	19		U	19		U
Bis(2-ethylhexyl)phthalate	µg/kg	1,300		8,300	µg/kg	220	320	µg/kg	--	--	19		J	**150**			**28**		
Di-n-octylphthalate	µg/kg	6,200		6,200	µg/kg	26	45	µg/kg	39	>1100	19		U	**11**		J	19		U
Phenol	µg/kg	420		1,200	µg/kg	--	--	µg/kg	120	210	19		U	**82**			19		UJ
2-Methylphenol	µg/kg	63		77	ug/kg	--	--	ug/kg	--	--	19		U	19		U	19		UJ
4-Methylphenol	µg/kg	670		3,600	ug/kg	--	--	ug/kg	260	2,000	39		U	**270**			38		U
2,4-Dimethylphenol	µg/kg	29		210	ug/kg	--	--	ug/kg	--	--	19		UJ	19		UJ	19		UJ
Pentachlorophenol	µg/kg	400	504	690	ug/kg	--	--	ug/kg	1,200	>1200	190		U	190		UJ	190		U
Benzyl alcohol	µg/kg	57		870	ug/kg	--	--	ug/kg			19		U	**62**			19		U
Benzoic acid	µg/kg	650		760	µg/kg	--	--	µg/kg	2,900	3,800	390		U	**430**			380		U
Dibenzofuran	µg/kg	540		1,700	µg/kg	400	440	µg/kg	--	--	4.8		U	4.9		U	4.8		U
Hexachlorobutadiene	µg/kg	29		270	µg/kg	--	--	µg/kg	--	--	10		UJ	10		UJ	10		UJ
N-Nitrosodiphenylamine	µg/kg	28		130	µg/kg	--	--	µg/kg	--	--	19		U	19		U	19		U

Table 3. Kenmore Navigation Channel Screening Level Evaluation Summary Relative to DMMP Guidelines

						Sample ID:					KIP-SG-16			KIP-SG-17			SAM-SG-01		
						DMMU ID:					S16			S17			S01		
						sample Interval					0-21			0-23.5 cm			0-10 cm		
		DMMP (Marine-DW)			SMS (freshwater-DW-2006)*			SMS (freshwater-DW-2013)**			mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ	mg/kg-DW	mg/kg-DW	VQ
CHEMICAL NAME	Units	SL	BT	ML	Units	SL1	SL2	Units	SL1/SCO	SL2/CSL	DMMP	FW		DMMP	FW		DMMP	FW	
Beta-Hexachlorocyclohexane								µg/kg	7.2	1,100	--			--			--		
Carbazole								µg/kg	900	1,100	--			--			--		
p,p-DDD	µg/kg	16						µg/kg	310	860	--			--			--		
p,p-DDE	µg/kg	9						µg/kg	21	33									
p,p-DDT	µg/kg	12						µg/kg	--	--	--			--			--		
Total DDT (sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT)	µg/kg		50	69	µg/kg	--	--	µg/kg	100	8100									
Endrin Ketone					µg/kg			µg/kg	8.5	>8.5									
Aldrin	µg/kg	9.5			µg/kg	--	--	µg/kg	--	--	--			--			--		
Chlordane (sum of cis, trans, cis-nonachlor, trans-nonachlor, oxy)	µg/kg	2.8			µg/kg	--	--	µg/kg	--	--	--			--			--		
Dieldrin	µg/kg	1.9	37		µg/kg	--	--	µg/kg	4.9	9.3	--			--			--		
Heptachlor	µg/kg	1.5			µg/kg	--	--	µg/kg	--	--	--			--			--		
Aroclor 1016	µg/kg										18		U	19		U	17		U
Aroclor 1221	µg/kg										18		U	19		U	17		U
Aroclor 1232	µg/kg										18		U	18		U	17		U
Aroclor 1242	µg/kg										18		U	19		U	17		U
Aroclor 1248	µg/kg										18		U	19		U	17		U
Aroclor 1254	µg/kg										18		U	19		U	17		U
Aroclor 1260	µg/kg										18		U	19		U	17		U
Total PCBs (Aroclors)	µg/kg	130		3,100	µg/kg	**60**	**120**	µg/kg	**110**	**2,500**	18		U	19		U	17		U
Total PCBs (TOC-normalized)	**µg/kg**		38***																
Dioxin (TEQ: see Table 4 for detailed results)	**ng/kg**	4	10								**0.359**			**2.3**			**0.467**		
Total Solids	%										**77.7**			**46.9**			**72.9**		
Total Volatile Solids	%										**1.0**			**6.7**			**1.2**		
Total Organic Carbon	%										**0.724**			**3.0**			**1.3**		
Ammonia (NH3)	mg/kg							mg/kg	230	300	--			--			--		
Total Sulfides	mg/kg							mg/kg	39	61	--			--			--		
Gravel	%										**0.1**			**0.3**			0.1		U
Sand	%										**99.2**			**30.4**			**93.9**		
Silt	%													**51.5**			--		
Clay	%													**17.6**			--		
Fines (percent silt + clay)	%										**0.8**			**69.1**			**2.2**		
Bioassay Determination: **(P/F)**	%										**NA**			**NA**			**NA**		
BTs exceeded:											**No**			**No**			**No**		
Bioaccumulation conducted:											**No**			**No**			**No**		
Bioaccumulation Determination: **(P/F)**																			
ML Rule exceeded:											**No**			**No**			**No**		
DMMP Determination:											**ND**			**ND**			**ND**		
DMMU Volume:											**NA**			**NA**			**NA**		
Rank (Low = L, Moderate = M, Low-Moderate =LM, High = H)											**H**			**H**			**H**		
Mean grab sampling depth (cm)	CM										**10**			**10**			**10**		
DMMU ID:											**KIP-SG-16**			**KIP-SG-17**			**SAM-SG-01**		

*** 2006 Interim Fresh Water Guidelines**

****Newly adopted Fresh Water Guidelines through SMS Rulemaking: to be implemented in September 2013**

SL/BT = exceeds DMMP SL/BT

SL/SL1 = exceeds DMMP Screening Level or SMS FW SL1 Guidelines

ML/SL2 = exceeds DMMP Maximum Level or SMS FW SL2 Guidelines

VQ = Validation Qualifier

UCOWD = Unconfined open-water disposal

NA = Not Analyzed

ND = Not Determined

U = undetected at the reporting limit (method detection limit)

J = Estimated Concentration, at the reporting limit

Table 4. Dioxin/furan Testing Summary for Kenmore Navigation Channel Screening Level Assessment.

		Kenmore Navigation Channel (KNC)														
	WHO (05)	KNC-SG-04			KNC-SG-05			KNC-SG-06			KNC-SG-07			KNC-SG-07 (dup)		
Analyte	**TEF**	**ng/kg-dw**	**LQ**	**TEQ**	**ng/kg-dw**	**LQ**	**TEQ**	**ng/kg-dw**	**LQ**	**TEQ**	**ng/kg-dw**	**LQ**	**TEQ**	**ng/kg-dw**	**LQ**	**TEQ**
2,3,7,8-TCDD	1	0.15	J	0.15	0.322	J	0.322	0.478	J	0.478	0.306	J	0.306	0.341	J	0.341
1,2,3,7,8-PeCDD	1	0.381	J	0.381	1.33		1.33	1.58		1.58	1.18		1.18	1.03		1.03
1,2,3,4,7,8-HxCDD	0.1	0.491	J	0.0491	2.18		0.218	2.65		0.265	1.42	J	0.142	1.38	J	0.138
1,2,3,6,7,8-HxCDD	0.1	1.62	J	0.162	8.58		0.858	9.51		0.951	4.38		0.438	4.21		0.421
1,2,3,7,8,9-HxCDD	0.1	0.897	J	0.0897	4.84		0.484	5.68		0.568	2.85		0.285	2.95		0.295
1,2,3,4,6,7,8-HpCDD	0.01	40.5		0.405	184		1.84	237		2.37	85.5		0.855	82.7		0.827
OCDD	0.0003	307		0.0921	1540		0.462	2520		0.756	652		0.1956	613		0.1839
2,3,7,8-TCDF	0.1	0.173	J	0.0173	0.841	J	0.0841	0.967	J	0.0967	0.643	J	0.0643	0.579	J	0.0579
1,2,3,7,8-PeCDF	0.03	0.164	J	0.00492	0.684	J	0.02052	0.746	J	0.02238	0.442	J	0.01326	0.466	J	0.01398
2,3,4,7,8-PeCDF	0.3	0.128	J	0.0384	0.785	J	0.2355	0.826	J	0.2478	0.452	J	0.1356	0.556	J	0.1668
1,2,3,4,7,8-HxCDF	0.1	0.289	J	0.0289	1.74	J	0.174	1.9	J	0.19	1.2	J	0.12	1.05	J	0.105
1,2,3,6,7,8-HxCDF	0.1	0.261	J	0.0261	1.45	J	0.145	1.64	J	0.164	0.989	J	0.0989	0.958	J	0.0958
2,3,4,6,7,8-HxCDF	0.1	0.185	J	0.0185	0.751	J	0.0751	0.846	J	0.0846	0.386	J	0.0386	0.411	J	0.0411
1,2,3,7,8,9-HxCDF	0.1	0.361	J	0.0361	2.14		0.214	2.55		0.255	1.4	J	0.14	1.34	J	0.134
1,2,3,4,6,7,8-HpCDF	0.01	4.39		0.0439	25.4		0.254	31.3		0.313	14.6		0.146	14.6		0.146
1,2,3,4,7,8,9-HpCDF	0.01	0.315	J	0.00315	1.63	J	0.0163	1.98	J	0.0198	1.06	J	0.0106	1.14	J	0.0114
OCDF	0.0003	10.8		0.00324	71.9		0.02157	108		0.0324	40.9		0.01227	39.5		0.01185
Total TEQ (u = 1/2):				1.55			6.75			8.39			4.18			4.02
Total TEQ (u=0):				1.55			6.75			8.39			4.18			4.02
TOC (%)				2.7			5.4			4.9			5.0			7.1

Legend:
KNC = Kenmore Navigation Channel
NLM = North Lake Marina
HVM = Harbor Village Marina
KIP = Kenmore Industrial Park
J = Estimated concentration, reported at reporting limit
U = Anayte not detected at or above the reported concentation

Table 4. Dioxin/furan Testing Summary for Kenmore Navigation Channel Screening Level Assessment.

		Kenmore Navigation Channel						North Lake Marina					
	WHO (05)	KNC-SG-08			KNC-SG-09			NLM-SG-02			NLM-SG-03		
Analyte	TEF	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ
2,3,7,8-TCDD	1	0.293	J	0.293	0.372	J	0.372	0.975		0.975	0.599	J	0.599
1,2,3,7,8-PeCDD	1	0.87	J	0.87	1.24		1.24	7.83		7.83	3.75		3.75
1,2,3,4,7,8-HxCDD	0.1	1.36	J	0.136	1.71	J	0.171	14.5		1.45	6.97		0.697
1,2,3,6,7,8-HxCDD	0.1	3.85		0.385	5.03		0.503	53.1		5.31	28		2.8
1,2,3,7,8,9-HxCDD	0.1	2.99		0.299	3.54		0.354	29.5		2.95	14.5		1.45
1,2,3,4,6,7,8-HpCDD	0.01	88.5		0.885	103		1.03	1020		10.2	610		6.1
OCDD	0.0003	684		0.2052	798		0.2394	7420		2.226	4760		1.428
2,3,7,8-TCDF	0.1	0.553	J	0.0553	0.784	J	0.0784	3.37		0.337	2.13		0.213
1,2,3,7,8-PeCDF	0.03	0.409	J	0.01227	0.577	J	0.01731	3.04		0.0912	1.71	J	0.0513
2,3,4,7,8-PeCDF	0.3	0.54	J	0.162	0.573	J	0.1719	3.27		0.981	1.86		0.558
1,2,3,4,7,8-HxCDF	0.1	1.3	J	0.13	1.43	J	0.143	8.04		0.804	4.83		0.483
1,2,3,6,7,8-HxCDF	0.1	0.964	J	0.0964	1.23	J	0.123	8.28		0.828	4.02		0.402
2,3,4,6,7,8-HxCDF	0.1	0.366	J	0.0366	0.497	J	0.0497	3.12		0.312	1.8	J	0.18
1,2,3,7,8,9-HxCDF	0.1	1.37	J	0.137	1.74	J	0.174	11.7		1.17	6.21		0.621
1,2,3,4,6,7,8-HpCDF	0.01	18.7		0.187	17.7		0.177	137		1.37	84.1		0.841
1,2,3,4,7,8,9-HpCDF	0.01	1.83	J	0.0183	1.33	J	0.0133	7.34		0.0734	4.63		0.0463
OCDF	0.0003	66		0.0198	46.6		0.01398	366		0.1098	272		0.0816
Total TEQ (u = 1/2):				3.93			4.87			37.0			20.3
Total TEQ (u=0):				3.93			4.87			37.0			20.3
TOC (%)				3.3			5.2			7.1			6.6

Table 4. Dioxin/furan Testing Summary for Kenmore Navigation Channel Screening Level Assessment.

		Harbor Village Marina														
	WHO (05)	HVM-SG-10			HVM-SG-11			HVM-SG-12			HVM-SG-13			HVM-SG-13 (dup)		
Analyte	TEF	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ
2,3,7,8-TCDD	1	0.388		0.388	1.32	J	1.32	0.804	J	0.804	0.719	J	0.719	0.521	J	0.521
1,2,3,7,8-PeCDD	1	1.47		1.47	12.8		12.8	5.1		5.1	5.66		5.66	2.51		2.51
1,2,3,4,7,8-HxCDD	0.1	2.26		0.226	25.8		2.58	8.29		0.829	11.8		1.18	5.28		0.528
1,2,3,6,7,8-HxCDD	0.1	8.32		0.832	119		11.9	38.8		3.88	97.4		9.74	32.5		3.25
1,2,3,7,8,9-HxCDD	0.1	4.73		0.473	52.3		5.23	18		1.8	25.6		2.56	10.8		1.08
1,2,3,4,6,7,8-HpCDD	0.01	168		1.68	2120		21.2	769		7.69	1730		17.3	600		6
OCDD	0.0003	1290		0.387	16500		4.95	6410		1.923	14400		4.32	4830		1.449
2,3,7,8-TCDF	0.1	0.759	J	0.0759	3.38		0.338	2.15		0.215	2.84	J	0.284	1.22		0.122
1,2,3,7,8-PeCDF	0.03	0.675	J	0.02025	5.37	J	0.1611	2.87		0.0861	5.3	J	0.159	2.06	J	0.0618
2,3,4,7,8-PeCDF	0.3	0.725	J	0.2175	5.19		1.557	2.57	J	0.771	4.71		1.413	1.82		0.546
1,2,3,4,7,8-HxCDF	0.1	1.49	J	0.149	15.3		1.53	6.4		0.64	13.2		1.32	4.94		0.494
1,2,3,6,7,8-HxCDF	0.1	1.26	J	0.126	13.6		1.36	5.15		0.515	8.24		0.824	3.39		0.339
2,3,4,6,7,8-HxCDF	0.1	0.692	J	0.0692	7.11		0.711	2.96		0.296	7.63		0.763	2.82		0.282
1,2,3,7,8,9-HxCDF	0.1	1.96		0.196	21.1		2.11	8.02		0.802	15.4		1.54	5.77		0.577
1,2,3,4,6,7,8-HpCDF	0.01	22.3		0.223	282		2.82	104		1.04	230		2.3	93.1		0.931
1,2,3,4,7,8,9-HpCDF	0.01	1.59	J	0.0159	15.3		0.153	6		0.06	10.6		0.106	4.97		0.0497
OCDF	0.0003	77.5		0.02325	871		0.2613	356		0.1068	837		0.2511	379		0.1137
Total TEQ (u = 1/2):				6.57			71.0			26.6			50.4			18.9
Total TEQ (u=0):				6.57			71.0			26.6			50.4			18.9
TOC (%)				3.1			10.8			4.7			5.5			3.8

Table 4. Dioxin/furan Testing Summary for Kenmore Navigation Channel Screening Level Assessment.

		NE of KIP			Sammamish River Navigation Channel								
	WHO (05)	NE-KIP-SG-14			KIP-SG-16			KIP-SG-17			SAM-SG-01		
Analyte	TEF	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ	ng/kg-dw	LQ	TEQ
2,3,7,8-TCDD	1	0.404	J	0.404	0.144	J	0.144	0.226	J	0.226	0.164	J	0.164
1,2,3,7,8-PeCDD	1	1.99		1.99	0.0758	J	0.0758	0.491	J	0.491	0.107	J	0.107
1,2,3,4,7,8-HxCDD	0.1	3.06		0.306	0.0679	J	0.00679	1.03	J	0.103	0.0809	J	0.00809
1,2,3,6,7,8-HxCDD	0.1	12.5		1.25	0.202	J	0.0202	2.12		0.212	0.31	J	0.031
1,2,3,7,8,9-HxCDD	0.1	6.86		0.686	0.168	J	0.0168	2.33		0.233	0.219	J	0.0219
1,2,3,4,6,7,8-HpCDD	0.01	304		3.04	4.24		0.0424	50.3		0.503	5.7		0.057
OCDD	0.0003	2490		0.747	32		0.0096	252		0.0756	40.5		0.01215
2,3,7,8-TCDF	0.1	1.09		0.109	0.022	U	0.0011	0.136	U	0.0068	0.0691	U	0.003455
1,2,3,7,8-PeCDF	0.03	0.796	J	0.02388	0.0758	J	0.002274	0.126	J	0.00378	0.077	J	0.00231
2,3,4,7,8-PeCDF	0.3	0.957	J	0.2871	0.0439	U	0.006585	0.136	J	0.0408	0.0592	J	0.01776
1,2,3,4,7,8-HxCDF	0.1	2.26		0.226	0.0918	J	0.00918	0.625	J	0.0625	0.154	J	0.0154
1,2,3,6,7,8-HxCDF	0.1	2.08		0.208	0.0739	J	0.00739	0.725	J	0.0725	0.0573	J	0.00573
2,3,4,6,7,8-HxCDF	0.1	0.816	J	0.0816	0.0259	U	0.001295	0.11	U	0.0055	0.0573	U	0.002865
1,2,3,7,8,9-HxCDF	0.1	2.9		0.29	0.0559	J	0.00559	1.06	J	0.106	0.0553	J	0.00553
1,2,3,4,6,7,8-HpCDF	0.01	36.2		0.362	0.888	J	0.00888	14.4		0.144	1.19	J	0.0119
1,2,3,4,7,8,9-HpCDF	0.01	2.54	J	0.0254	0.0639	J	0.000639	0.95	J	0.0095	0.0454	J	0.000454
OCDF	0.0003	106		0.0318	1.75	J	0.000525	24.5		0.00735	2.67	J	0.000801
Total TEQ (u = 1/2):				10.1			0.359			2.30			0.467
Total TEQ (u=0):				10.1			0.359			2.30			0.461
TOC (%)				4.3			0.7			3.0			1.3

Table 4. Dioxin/furan Testing Summary for Kenmore Navigation Channel Screening Level Assessment.

		SRM Performance					
	WHO (05)	Puget Sound SRM-111412			SRM Acceptance Limits		
Analyte	**TEF**	**ng/kg-dw**	**LQ**	**TEQ**	ng/kg-dw (AVG)	**TEQ**	In/Out (Low/High)
2,3,7,8-TCDD	1	**1.08**		**1.08000**	**1.05**	**1.05**	In (.525/1.57)
1,2,3,7,8-PeCDD	1	**1.22**		**1.22000**	**1.08**	**1.08**	In (.542/1.63)
1,2,3,4,7,8-HxCDD	0.1	**1.53**	J	**0.15300**	**1.59**	**0.159**	In (0.797/2.39)
1,2,3,6,7,8-HxCDD	0.1	**4.15**		**0.41500**	**3.88**	**0.388**	In (1.94/5.82)
1,2,3,7,8,9-HxCDD	0.1	**2.96**		**0.29600**	**3.04**	**0.304**	In (1.52/4.55)
1,2,3,4,6,7,8-HpCDD	0.01	**106**		**1.06000**	**90.6**	**0.906**	In (45.3/136)
OCDD	0.0003	**892**		**0.26760**	**811**	**0.2433**	In (406/1217)
2,3,7,8-TCDF	0.1	**0.918**	J	**0.09180**	**1.11**	**0.111**	In (0.557/1.67)
1,2,3,7,8-PeCDF	0.03	1.05	JEMPC	0.01575	**1.23**	**0.0369**	In (0.613/1.84)
2,3,4,7,8-PeCDF	0.3	**0.898**	J	**0.26940**	**1.07**	**0.321**	In (0.533/1.60)
1,2,3,4,7,8-HxCDF	0.1	**3.27**		**0.32700**	**3.02**	**0.302**	In (1.51/4.53)
1,2,3,6,7,8-HxCDF	0.1	**1.12**	J	**0.11200**	**1.09**	**0.109**	In (.545/1.64)
2,3,4,6,7,8-HxCDF	0.1	**2.12**	J	**0.21200**	**1.83**	**0.183**	In (.917/2.75)
1,2,3,7,8,9-HxCDF	0.1	**0.667**	J	**0.06670**	**0.511**	**0.0511**	In (.255/0.77)
1,2,3,4,6,7,8-HpCDF	0.01	**20**		**0.20000**	**18.7**	**0.187**	In (9.36/28.1)
1,2,3,4,7,8,9-HpCDF	0.01	**1.87**	J	**0.01870**	**1.63**	**0.0163**	In (.815/2.44)
OCDF	0.0003	**58.3**		**0.01749**	**58.4**	**0.01752**	In (29.2/87.6)
Total TEQ (u = 1/2):				**5.822**		**5.465**	
Total TEQ (u=0):				**5.789**		**5.465**	
TOC (%)							

Legend:
JEMPC = Estimated maximum potential concentration (treated as undetected)
All Congerers in reported acceptance ranges