

SUBJECT: DETERMINATION ON THE SUITABILITY OF PROPOSED MAINTENANCE DREDGED MATERIAL FROM PORT OF TACOMA WASHINGTON UNITED TERMINAL PROJECT HIGH SPOT MAINTENANCE DREDGING, (NWS-2008- 01128-WRD) IN COMMENCEMENT BAY, WASHINGTON EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT FOR OPEN-WATER DISPOSAL AT A DMMP NON- DISPERSIVE OPEN-WATER DISPOSAL SITE.

1. The following summary reflects the consensus determination of 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) on the suitability of an estimated 5,600 cy of maintenance dredging material from the wharf high spot area within the Port of Tacoma Washington United Terminal Project, for open-water unconfined disposal at the Commencement Bay non-dispersive open-water disposal site in Tacoma, Washington. This portion of the project is part of a larger characterization of an estimated 234,000 cy (see Table 2)

Table 1. Project Details

SAP received	May 30, 2008
SAP approved	June 25, 2008
Sampling dates (High Spot Area only) (vibracorer)	July 29, 2008
Final data report for High Spot Subarea submitted	September 29, 2008
Recency Determination: Low-Moderate Concern (6 years)	July 2014
DAIS reference number	WUTHS--1-A-F-259

Table 2. Washington United Terminal Project dredging characterization SAP Breakdown.

Dredging Subarea	DMMU ID (characterized depth)	Core Station ID (WUT)	Volume (cy)
Wharf High Spot area	WUT-5 (-44.6 – 54 ft MLLW)	05-01, 05-02	5,600 (this SDM)
Wharf subarea	WUT-4 (-47.5 – 54 ft MLLW)	04-01, 04-02, 04-03, 04-04	28,400
Cutback area	WUT-01 (+20 - +16 ft MLLW)	BH1, BH2, BH3	12,300
	WUT-02 (+16 - +8 ft MLLW)	BH1, BH2, BH3	24,700
	WUT-03 (+8 – 0 ft MLLW)	BH1, BH2, BH3	24,700
			61,700 (characterized footprint) 138,300 (uncharacterized / native material)
Total Project :	5 DMMUs	9 Core Stations	95,700 cy (characterized Volume) 234,000 cy (Total Project Volume)

2. **Background.** As noted in Table 2 above, the results described in this suitability determination are restricted to the “high spot” area. This area is highlighted by the Port of Tacoma for dredging as soon as possible, because it poses a risk of grounding for ships during very low tide conditions. The DMMP agencies will review the sediment quality data for the remaining areas in the Wharf subarea and Cutback area, outside the Wharf “high spot” area in a separate suitability determination due to the urgency of the “high spot” area for early dredging.
3. **SAP review and Sampling.** The draft SAP was submitted to DMMP agencies for review on May 30,2008 and approved on June 25, 2008. The sampling was initiated and completed on July 29, 2008, and vibracorer

samples were collected at two stations within the “high spot” Dredged Material Management Unit-5 (DMMU-5)(see **Figure 1**: Vicinity Map; **Figure 2**: Proposed dredging and cutback areas; **Figure 3**: Actual & Proposed Sampling Locations for High Spot Dredging subarea). The testing also included evaluation of dioxins/furans, as well as the PSDDA/DMMP Chemical of Concern list. . The approved sampling and analysis plan was generally followed. The sampling and analysis characterization report was submitted to the DMMP agencies for review on September 29, 2008, and the DMMP agencies concluded that the quality assurance/quality control guidelines specified by the DMMP were generally complied with, and these data were deemed suitable for decision-making using best-professional-judgment.

4. **Chemical Analysis and Comparison with DMMP Marine Guidelines.** The Agencies’ approved sampling and analysis plan was followed and quality assurance/quality control guidelines specified by PSEP and DMMP were generally complied with. A summary of chemical analysis results for all COC except dioxins/furans is provided in **Table 2**, and demonstrates that for the single DMMU analyzed, there were no detected or undetected chemicals exceeding either **DMMP-Marine** or **SMS-Marine** guidelines. **Table 3** provides the results of dioxin/furan testing results for the High Spot DMMU, and demonstrate relatively low dioxin/furan concentrations in the lower ranges of those observed during previous testing, with a total PCDD/F TEQ concentration of **0.633 ppbtr** (U = ½) and **0.296** (U = 0). Based on these chemical testing results, no toxicity testing is required. Furthermore, based on these testing results, there is no reason-to-believe that would trigger the requirement to resample and analyze the exposed surface after maintenance dredging of the high spot area has been completed.
5. **Suitability for Unconfined-Open Water Disposal.** Therefore, based on these testing results, all 5,600 cubic yards of maintenance dredged material is suitable for unconfined-open-water disposal at the Commencement Bay disposal site based on best-professional-judgment.
6. This memorandum affirms the suitability of the sediment proposed for dredging at the Port of Tacoma Washington United Terminal “High Spot” Wharf dredging Project maintenance dredging area for unconfined-open-water disposal at an appropriate DMMP non-dispersive disposal site in Commencement Bay. However, this suitability determination does not constitute final agency approval of the project. A dredging plan for this project must be completed as part of the final project approval process. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under Section 404(b)(1) of the Clean Water Act.

SUBJECT: DETERMINATION ON THE SUITABILITY OF PROPOSED MAINTENANCE DREDGED MATERIAL FROM PORT OF TACOMA WASHINGTON UNITED TERMINAL PROJECT HIGH SPOT MAINTENANCE DREDGING, (NWS-2008-01128-WRD) IN COMMENCEMENT BAY, WASHINGTON EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT FOR OPEN-WATER DISPOSAL AT A DMMP NON- DISPERSIVE OPEN-WATER DISPOSAL SITE.

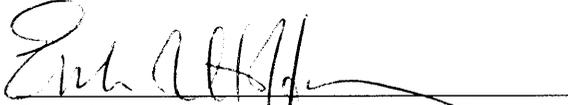
Concur:

Oct 9, 2008
Date



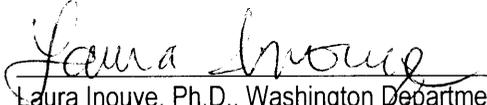
David R. Kendall, Ph.D., Seattle District Corps of Engineers

Oct 9, 2008
Date



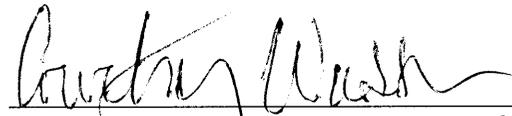
Erika Hoffman, Environmental Protection Agency

Oct 9, 2008
Date



Laura Inouye, Ph.D., Washington Department of Ecology

9 Oct 08
Date



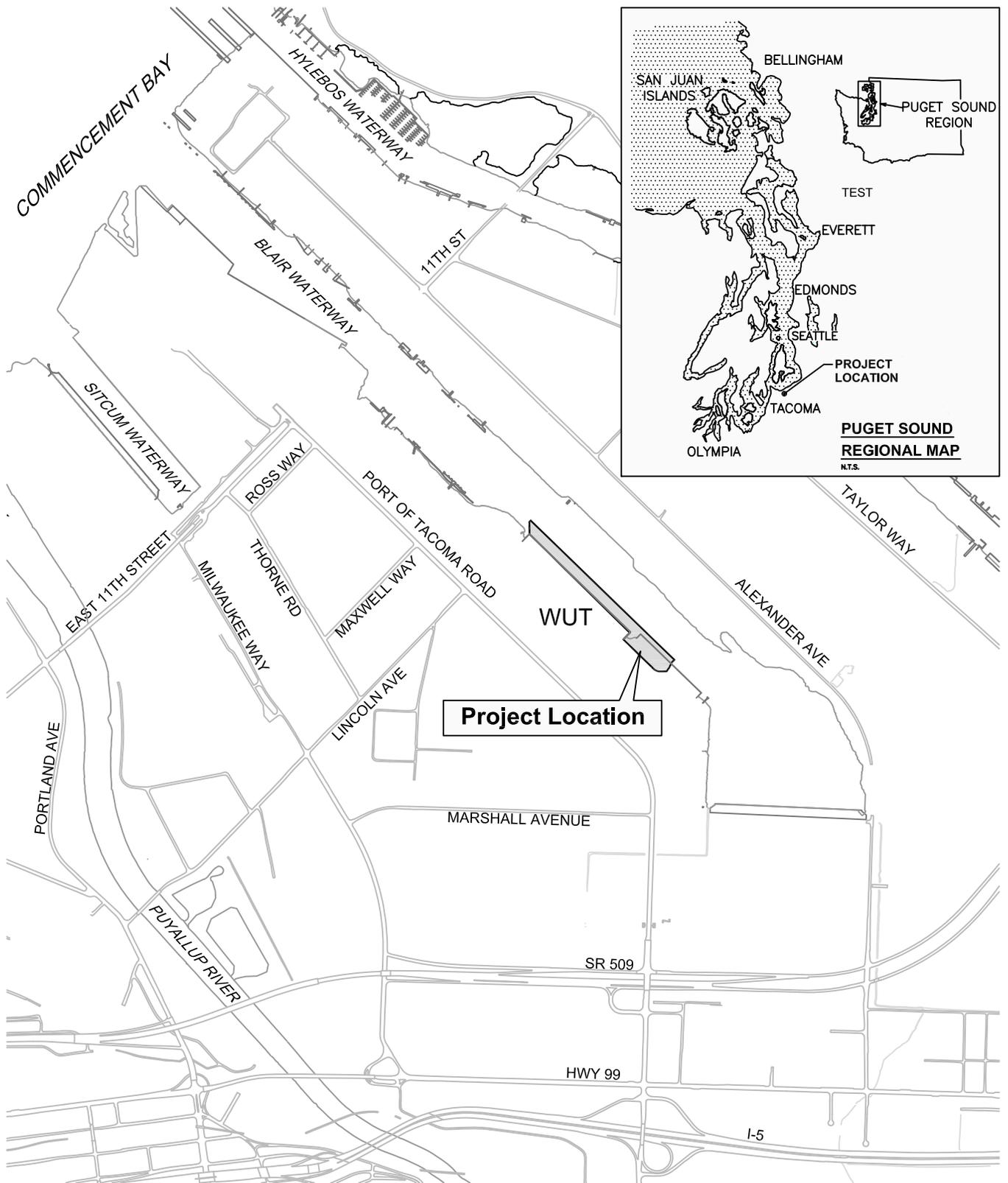
Courtney Wasson, Washington Department of Natural Resources

Copied furnished:

Olivia Romano, Corps Regulatory Project Manager
Robert Brenner, Port of Tacoma
Erika Hoffman, EPA
Laura Inouye, Ph.D. Department of Ecology
Helen Pressley, Department of Ecology
Courtney Wasson, DNR
DMMO file

This Page Intentionally Blank

May 29, 2008 8:23am cdauidson K:\Jobs\060092-Port of Tacoma\0600920106009201042.dwg FIG 1



Source: Prepared from drawing provided by the Port of Tacoma.
Horizontal Datum: Washington State Plane South, NAD83.
Vertical Datum: Mean Lower Low Water (MLLW).

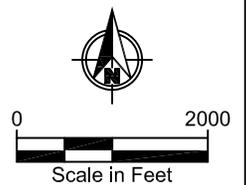
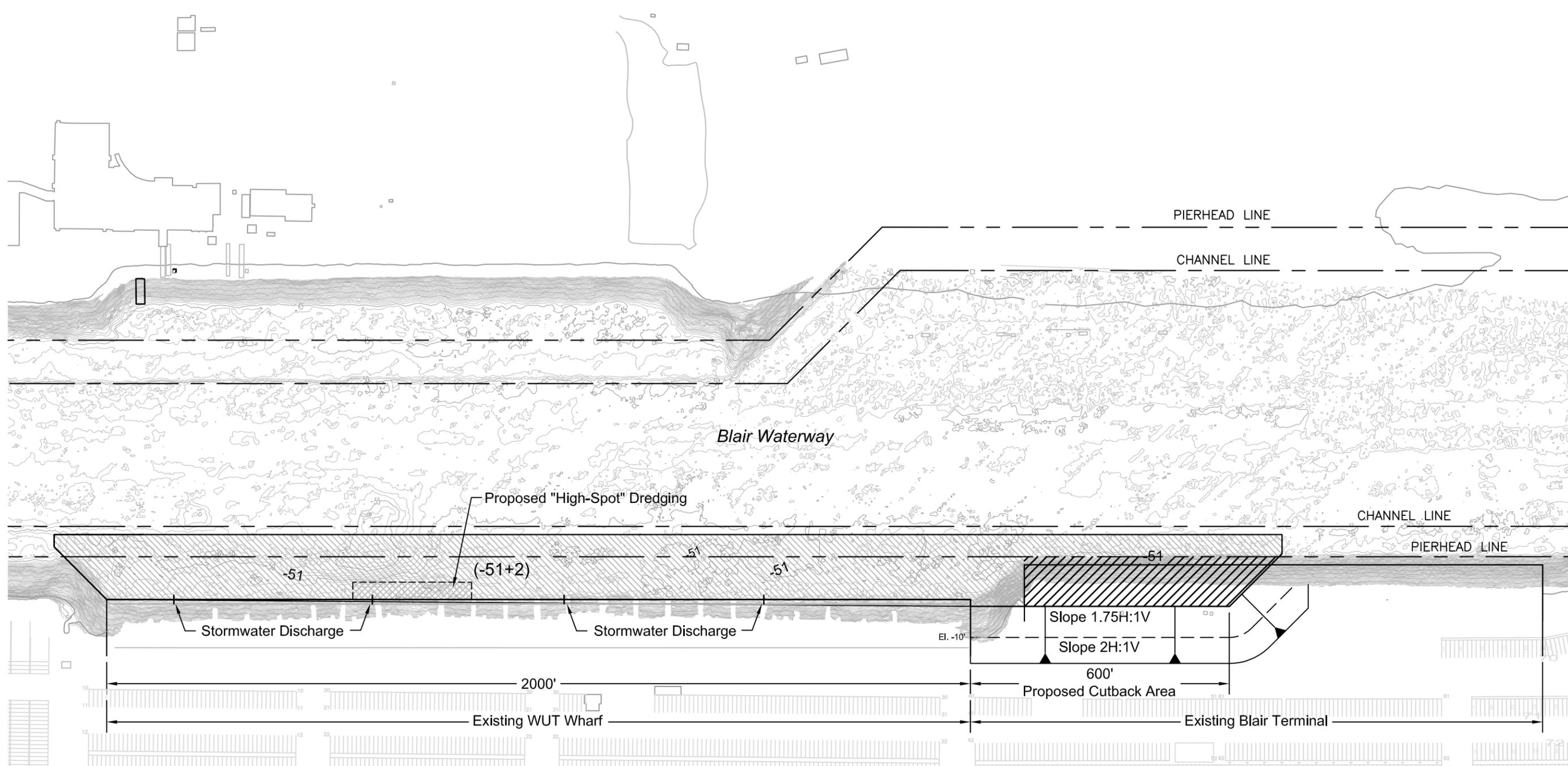


Figure 1
Vicinity Map
Blair Waterway

May 29, 2008 8:32am cdavidson K:\Jobs\060092-Port of Tacoma\060092\1060092\1035.dwg FIG 2



Source: Drawing prepared from survey provided by CRA dated 12/19/2007.
 Horizontal Datum: Washington State Plane South, NAD83.
 Vertical Datum: Mean Lower Low Water (MLLW).

- (-51+2) Design Depth Elevation and Allowable Overdepth in Feet
- Proposed Maintenance Dredging (Approximate)
- Proposed "High-Spot" Dredging (Approximate)
- Proposed Cut-Back Area (Approximate)

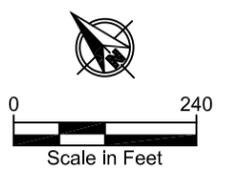
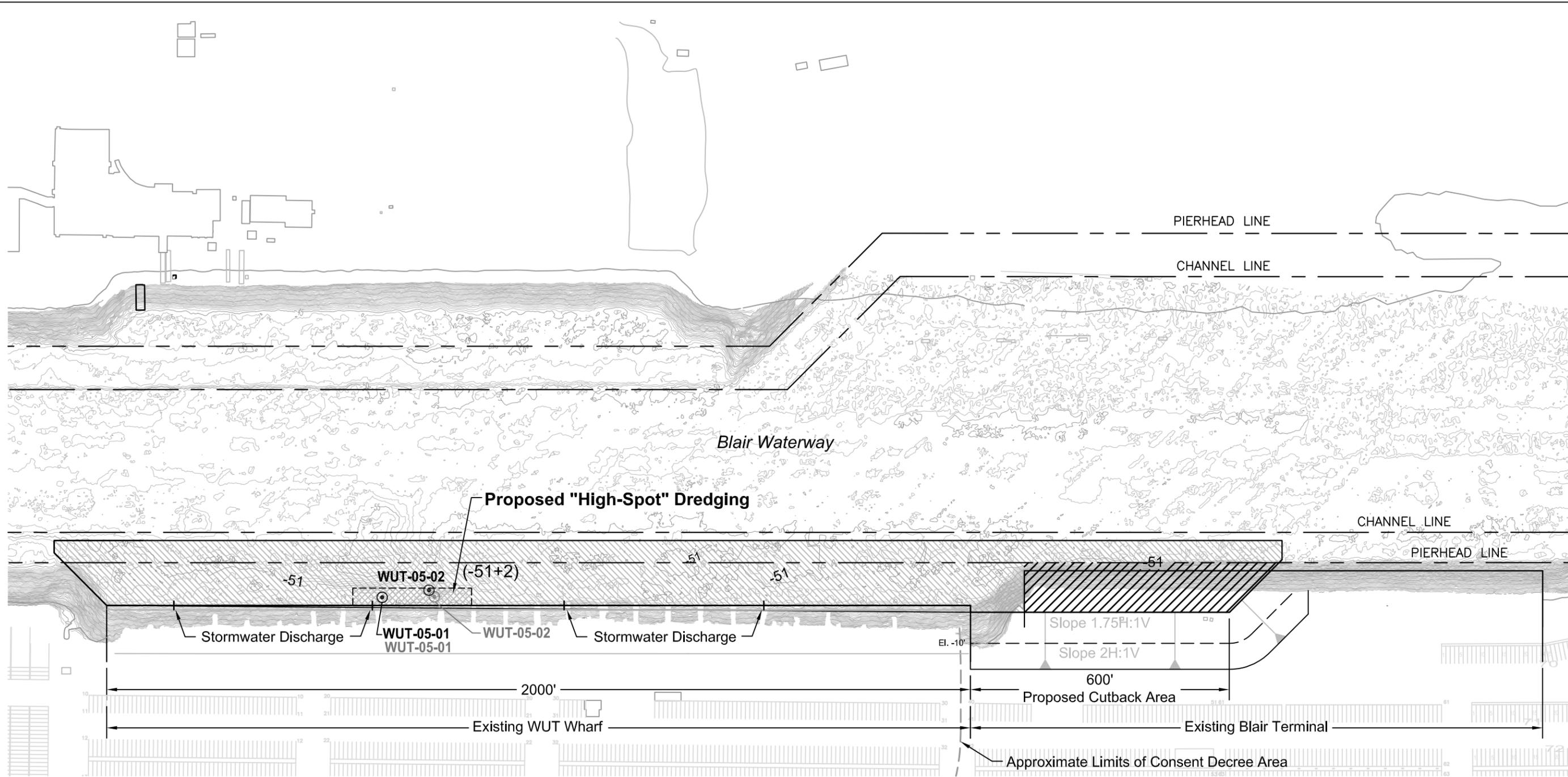
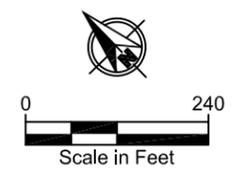


Figure 2
 Plan View of Proposed Dredging and Cutback Areas
 Blair Waterway

Sep 17, 2008 1:48pm cdavidson K:\Jobs\060092-Port of Tacoma\060092\01063.dwg FIG 3



- Legend**
- (-51+2) Design Depth Elevation and Allowable Overdepth in Feet
 - Proposed Maintenance Dredging (Approximate)
 - Proposed "High-Spot" Dredging (Approximate)
 - Proposed Cut-Back Area (Approximate)
 - WUT-05-01 Proposed Sample Location and Designation
 - WUT-05-01 Actual Sample Location and Designation



Source: Drawing prepared from survey provided by CRA dated 12/19/2007.
 Horizontal Datum: Washington State Plane South, NAD83.
 Vertical Datum: Mean Lower Low Water (MLLW).

Figure 3
Actual and Proposed Sampling Locations for High Spot Dredging Blair Waterway

Table 3
Summary of Sediment Chemical Results Compared to DMMP Evaluation Criteria and Sediment Management Standards

Sample Sample Date Depth	Dredged Material Management Program Criteria			WUT-05-CS 7/30/08 Composite
	Screening Level	Bioaccumulation Trigger	Maximum Level	
Conventionals (mg/kg)				
Sulfide	--	--	--	9.7J
Conventionals (mg-N/kg)				
Ammonia	--	--	--	1.01J
Conventionals (pct)				
Total organic carbon	--	--	--	0.571
Total Solids	--	--	--	87.1
Total solids (preserved)	--	--	--	80.1
Total volatile solids	--	--	--	1.86
Grain Size (pct)				
Gravel	--	--	--	3.6
Sand	--	--	--	89.2
Silt	--	--	--	4.9
Clay	--	--	--	2.4
Fines (Silt + Clay)	--	--	--	7.3
Metals (mg/kg)				
Antimony	150	--	200	6UJ
Arsenic	57	507.1	700	6U
Cadmium	5.1	11.3	14	0.2U
Chromium	--	267	--	12.6
Copper	390	1027	1300	12.4
Lead	450	975	1200	2U
Mercury	0.41	1.5	2.3	0.05U
Nickel	140	370	370	9
Selenium	--	3	--	0.2U
Silver	6.1	6.1	8.4	0.3U
Zinc	410	2783	3800	22
Organometallic Compounds				
Tributyltin ion in porewater ⁽¹⁾ (µg/L)	0.15	0.15	--	--
Tributyltin ion in sediment (µg TBT/kg)	73	--	--	3.7U
Dibutyltin ion in sediment (µg TBT/kg)	--	--	--	5.5U
Butyltin ion in sediment (µg TBT/kg)	--	--	--	3.9U
LPAHs (µg/kg)				
Total LPAH ⁽²⁾	5200	--	29000	20U
Naphthalene	2100	--	2400	20UJ
Acenaphthylene	560	--	1300	20U
Acenaphthene	500	--	2000	20U
Fluorene	540	--	3600	20U
Phenanthrene	1500	--	21000	20U
Anthracene	960	--	13000	20U
2-Methylnaphthalene	670	--	1900	20U
HPAHs (µg/kg)				
Total HPAH	12000	--	69000	20U
Fluoranthene	1700	4600	30000	20U
Pyrene	2600	11980	16000	20U
Benzo(a)anthracene	1300	--	5100	20U
Chrysene	1400	--	21000	20U
Total Benzofluoranthenes (b, j, k) ⁽³⁾	3200	--	9900	20U
Benzo(a)pyrene	1600	--	3600	20U
Indeno(1,2,3-cd)pyrene	600	--	4400	20U
Dibenzo(a,h)anthracene	230	--	1900	20U
Benzo(g,h,i)perylene	670	--	3200	20U
Chlorinated Hydrocarbons (µg/kg)				
1,3-Dichlorobenzene	170	--	--	1.1U
1,4-Dichlorobenzene	110	--	120	1.1U
1,2-Dichlorobenzene	35	--	110	1.1U
1,2,4-Trichlorobenzene	31	--	64	5.6U
Hexachlorobenzene	22	168	230	20U
Phthalates (µg/kg)				
Dimethylphthalate	71	--	1400	20U
Diethylphthalate	200	--	1200	20U
Di-n-butylphthalate	1400	--	5100	20U
Butylbenzylphthalate	63	--	970	20U
Bis(2-Ethylhexyl)phthalate	1300	--	8300	20UJ
Di-n-octylphthalate	6200	--	6200	20UJ
Phenols (µg/kg)				
Phenol	420	--	1200	22
2-Methylphenol	63	--	77	20U
4-Methylphenol	670	--	3600	20U
2,4-Dimethylphenol	29	--	210	20UJ
Pentachlorophenol	400	504	690	99U
Miscellaneous Extractables (µg/kg)				
Benzyl alcohol	57	--	870	20U
Benzoic acid	650	--	760	200U
Dibenzofuran	540	--	1700	20U
Hexachloroethane	1400	--	14000	20UJ
Hexachlorobutadiene	29	--	270	20UJ
n-Nitroso-di-phenylamine	28	--	130	20UJ

**Table 3
Summary of Sediment Chemical Results Compared to DMMP Evaluation Criteria and Sediment Management Standards**

Sample Sample Date Depth	Dredged Material Management Program Criteria			WUT-05-CS 7/30/08 Composite
	Screening Level	Bioaccumulation Trigger	Maximum Level	
Volatile Organics (µg/kg)				
Trichloroethene	160	--	1600	1.1U
Tetrachloroethene	57	--	210	1.1U
Ethylbenzene	10	--	50	1.1U
m,p-Xylene	--	--	--	1.1U
o-Xylene	--	--	--	1.1U
Total Xylene ⁽⁴⁾	40	--	160	1.1U
Pesticides (µg/kg)				
Total DDT ⁽⁵⁾	6.9	50	69	2.0U
4,4'-DDD	--	--	--	2.0U
4,4'-DDE	--	--	--	2.0U
4,4'-DDT	--	--	--	2.0UJ
Aldrin	10	--	--	0.98U
Total Chlordane ⁽⁶⁾	10	37		2.0U
alpha-Chlordane (cis-Chlordane)	--	--	--	0.98U
gamma-Chlordane (trans, beta-Chlordane)	--	--	--	0.98U
cis-Nonachlor	--	--	--	2.0U
Oxychlordane	--	--	--	2.0U
trans-Nonachlor	--	--	--	2.0U
Dieldrin	10	--	--	2.0U
Heptachlor	10	--	--	0.98U
gamma-BHC (Lindane)	10	--	--	0.98U
PCBs (mg/kg OC)				
Total PCB	--	38	--	2U
PCBs (µg/kg)				
Total PCB	130	--	3100	10U
Aroclor 1016	--	--	--	10U
Aroclor 1221	--	--	--	10U
Aroclor 1232	--	--	--	10U
Aroclor 1242	--	--	--	10U
Aroclor 1248	--	--	--	10U
Aroclor 1254	--	--	--	10U
Aroclor 1260	--	--	--	10U
Aroclor 1262	--	--	--	10U
Aroclor 1268	--	--	--	10U



Notes:

Bold = Detected result

J = Estimated value

U = Compound analyzed, but not detected above detection limit

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

⁽¹⁾ Insufficient porewater was available in the sample to test for tributyltin; therefore, tributyltin was analyzed in bulk sediment.

⁽²⁾ 2-Methylnaphthalene is not included in the sum of LPAHs

⁽³⁾ Benzo(j)fluoranthene is included in the total of benzo(b&k)fluoranthenes

⁽⁴⁾ Total xylene is the sum of o-, m-, p- isomers

⁽⁵⁾ Total DDT consists of the sum of 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT

⁽⁶⁾ Total Chlordane includes alpha-chlordane (cis-chlordane), beta-chlordane (trans-chlordane, gamma-chlordane), cis-nonaclor, trans-nonaclor and oxychlordane.

Data measured in dry weight basis

-- = results not reported or not applicable

Totals are calculated as the sum of all detected results. If all are undetected results, the highest reporting limit value is reported as the sum.

Table 4. Port of Tacoma - Washington United Terminal Project dioxin/furan testing summary

Analyte	WHO (05)	WUT-95-CS		
	TEF	C1		
		ng/kg-dw	LQ	TEQ
2,3,7,8-TCDD	1	0.181	u	0.0905
1,2,3,7,8-PeCDD	1	0.27	u	0.135
1,2,3,4,7,8-HxCDD	0.1	0.232	u	0.0116
1,2,3,6,7,8-HxCDD	0.1	0.501	u	0.02505
1,2,3,7,8,9-HxCDD	0.1	0.255		0.0255
1,2,3,4,6,7,8-HpCDD	0.01	11.4		0.114
OCDD	0.0003	124		0.0372
2,3,4,7,8-PeCDF	0.3	0.244	u	0.0366
2,3,7,8-TCDF	0.1	0.177		0.0177
1,2,3,4,7,8-HxCDF	0.1	0.742		0.0742
1,2,3,6,7,8-HxCDF	0.1	0.244	u	0.0122
2,3,4,6,7,8-HxCDF	0.1	0.244	u	0.0122
1,2,3,7,8,9-HxCDF	0.1	0.244	u	0.0122
1,2,3,7,8-PeCDF	0.03	0.251		0.00753
1,2,3,4,6,7,8-HpCDF	0.01	1.85		0.0185
1,2,3,4,7,8,9-HpCDF	0.01	0.158	u	0.00079
OCDF	0.0003	6.08		0.001824
Total TEQ: (u = 1/2)				0.633
Total TEQ: (U = 0)				0.296
Total TOC, %:				0.571