

SUBJECT: DETERMINATION ON THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM THE PIERCE COUNTY TERMINAL (PCT) CUTBACK **ADDENDUM** IN THE BLAIR WATERWAY, COMMENCEMENT BAY, TACOMA, WASHINGTON, (PERMIT #2000-2-00765) EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT FOR OPEN-WATER DISPOSAL AT THE COMMENCEMENT BAY OPEN WATER SITE OR AT AN APPROVED BENEFICIAL USE SITE.

1. **Introduction.** This document reflects the suitability of additional material (over the 2.1 million cy originally characterized; see original SDM dated July 12, 2001). It 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 **additional 205,060 cubic yards (cy)** of dredged material from the Port of Tacoma's Pierce County Terminal Expansion Site, in the Blair Waterway in Tacoma, Washington. Disposal of suitable material is planned for the Commencement Bay non-dispersive DMMP disposal site, potentially in combination with approved upland sites, approved in-water contained sites, and/or approved beneficial use sites. Project depth of -51 ft. MLLW would be provided along with one foot of allowable overdepth (to -52 ft. MLLW) in the project area.

This determination of suitability for open-water disposal is based on the acceptability of the sampling conducted by Port of Tacoma contractors and subcontractors in February 2003 (Table 1). All relevant test data from this sampling event is contained in a report submitted by GeoEngineers dated 7 April 2003. These data were considered sufficient and acceptable for decision-making by the Agencies based on best professional judgment.

Table 1. Regulatory Tracking Dates

SAP received	February 17, 2003
SAP approved	February 18, 2003
Sampling dates	February 19, 2003
Data report submitted	April 9, 2003
Recency Determination: Low/Moderate Concern (5-7 years)	February 2008-2010
DAIS Tracking number	PCTEX-1-A-F-185

Table 2. Project Synopsis

Time of proposed dredging	1 July – 14 March of 2003-2004
Proposed disposal sites	Commencement Bay open water non-dispersive site; and or at permitted beneficial use site(s); and/or at approved upland locations
Sediment ranking	Low (surface fill material); Moderate (upper native material)
Project last dredged	new work

2. **Background.** During preparation for year two of the PCT dredging under this permit, it was discovered that design adjustments and additional cutback dredging would be necessary to accomplish the original goal of the project. This SDM addendum reflects characterization of the additional material identified for dredging during this design update process.
3. **Comparisons with Original Characterization.** The original PCT characterization highlighted several new issues for the DMMP agencies, and lessons learned from that project were brought forward to be dealt with proactively on this additional characterization. Some of the decisions and lessons learned included:
 - The surface portion of the dredge prism, consisting of material dredged from construction of the Blair Waterway in previous decades and used as fill on surrounding tide flats, is distinct in the sediment profiles. Data from the initial characterization showed that this portion of the dredge prism was of low concern for contamination, and the present testing showed similar data.
 - The upper 6-8 feet of native sediment layer—former tide flat area—showed the highest amount of contamination in the initial characterization. That layer was targeted in this characterization with a moderate ranking for composite analysis as well as with archiving of smaller subunits. Contamination was found in the same strata in this characterization and archived subunits were subsequently analyzed.
 - Only PCBs and pesticides were found at levels exceeding DMMP and SMS screening levels in the initial characterization. Main contaminants in this characterization proved to be PAHs and DDT with PCBs not found at levels of concern.
4. **Sampling.** Sampling took place on February 19, 2003. Two borings (noted as S-16 and S-17) were made by hollow stem auger in the proposed dredge area. Samples from all borings taken in a given DMMU (C10 or C11) were composited for analysis. DMMU C10 consists of the layer of fill material deposited onto native tide flats from previous Blair dredging. DMMU C11 consists of the top 6 ft. of the native material. Discreet samples were taken from every two feet within each boring and archived, pending results of the composite analyses.
5. **Composite Chemical Analysis.** The Agencies' approved sampling and analysis plan was followed, and quality assurance/quality control guidelines specified by PSEP and the DMMP program were generally complied with. Chemical analyses were performed by Columbia Analytical Services of Kelso, Washington. Conventional results are presented in Table 3. Chemical analysis results (Table 4) demonstrated that the "fill" (DMMU C10) was predominately free of chemicals of concern, with very few detections of any COCs. However, the DMMU representing the top 6 ft. "native" layer (C11) showed high levels of many HPAHs that exceeded screening levels, as did total HPAHs. One HPAH (fluoranthene) also exceeded the BT. Other detections of COCs in C11 were all below SLs. Based on these results, all archived subsamples in DMMU C11, and in the two-foot layer directly below C11, were analyzed for DMMP COCs.
6. **Subunit Chemical Analysis.** Analysis proceeded on all DMMP COCs except metals and volatiles for subunits S-16A, S-16B, S-16C, S-16D, S-17A, S-17B, S-17C and S-17D. Again, CAS performed the analyses and the Agencies' approved sampling and analysis plan was followed, and quality assurance/quality control guidelines specified by PSEP and the DMMP program were generally complied with. Total HPAHs exceeded the SL in subunits S-16B, S-16C and S-17B, as did most of the individual HPAHs (Table 4). Detected levels of fluoranthene exceeded the BT in all these subunits, and levels of pyrene were detected at the ML in S-16C. Total DDT was also detected above the SL in S-16B and above the BT in S-16C and S-17C. Contaminated subunits all correspond to between 2

and 6 ft below the native surface; no COCs exceeded SLs in any subunits in the top two feet of native material or below 6 feet into the native layer.

- Further Testing.** The Port of Tacoma chose not to continue with toxicity or bioassay testing in any subunits for which chemicals exceeded regulatory screening and/or bioaccumulation levels. Without this further testing, these subunits are considered unsuitable for open water disposal.

Table 3. Sediment conventional results of the PCT addendum characterization.

		<i>Surface fill composite</i>	<i>Upper Native composite</i>	<i>Core 16 subunits</i>				<i>Core 17 Subunits</i>			
PARAMETER		C-10	C-11	S-16A	S-16B	S-16C	S-16D	S-17A	S-17B	S-17C	S-17D
Volume (cubic yards)		9,800	14,700	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450
Grain Size	% Gravel	25.7	2.2	-	-	-	-	-	-	-	-
	% Sand	64.0	22.0	-	-	-	-	-	-	-	-
	% Silt	8.6	57.9	-	-	-	-	-	-	-	-
	% Clay	2.8	13.6	-	-	-	-	-	-	-	-
	% Fines (clay+silt)	11.4	71.5	-	-	-	-	-	-	-	-
Total Organic Carbon, %		0.21	1.26	1.05	3.05	3.58	0.38	1.16	0.39	3.04	0.92
Total Sulfides, mg/kg		0.7	1.9	-	-	-	-	-	-	-	-
Total Ammonia, mg/kg		1.5	43	-	-	-	-	-	-	-	-

- DMMU Borders and Buffers.** Based on chemical results, subunits considered unsuitable for open water disposal are S-16B, S-16C, S-17B and S-17C. As in the original SDM, an additional one foot of vertical buffer overlying and underlying unsuitable material must be removed and disposed with the unsuitable material.
- Comparison to SMS Guidelines.** All results of the chemical analyses were organic carbon normalized, if necessary, and compared to Washington State Sediment Management Standards. This analysis showed that all project sediment suitable for open water disposal under DMMP criteria is also below SMS criteria for all contaminants. Thus, sediment suitable for open water disposal is also suitable for beneficial uses.
- Suitability.** This memo documents the suitability of proposed dredged sediments for the Pierce County Terminal additional cutback in the Blair Waterway for open water disposal. The data gathered were deemed sufficient and acceptable for regulatory decision-making under the DMMP program. Based on the results of the previously described testing, the DMMP agencies concluded that **190,360 cubic yards are suitable** for open water disposal. Suitable areas include DMMU C10 (fill material) and all native material below the testing prism. Portions of subunits S-16A, S-16D, S-17A and S-17D that are not included in the one-foot buffer adjacent to unsuitable material are also suitable for open water disposal. Open water disposal may be at the Commencement Bay non-dispersive site or at an approved beneficial use site.

A total of **14,700 cubic yards are not suitable** for open water disposal and must be disposed at an approved upland or confined site. Not suitable units are subunits S-16B, S-16C, S-17B and S-17C, along with associated buffer areas as described in paragraph 8.

A Dredging and Disposal plan for this project must be completed as part of the final project approval process. For this project, the contract plans and specifications will need to provide strict surveying control and documentation procedures to limit the potential for unsuitable material to be inadvertently disposed in open water. The project Dredging and Disposal Plan shall describe these procedures in detail, and all procedures will be subject to review and approval by the DMMO prior to commencement of dredging. The Dredging and Disposal plan shall be provided to all DMMP agency representatives at least two weeks prior to the pre-dredge meeting.

The Port must verify that all approved control procedures are used during dredging operations. The Port shall provide documentation that all unsuitable material was effectively segregated from suitable material and disposed at appropriate locations. Disposal locations for unsuitable material shall also be documented, along with the volume of material disposed at each location.

This suitability determination does not constitute final agency approval of the project. A final decision on project approval 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.

11. References.

GeoEngineers 2003. Dredge material characterization, 145-foot Dredging Cutback Modification to the Pierce County Terminal Expansion Project (Corps Permit 2000-2-00765) Tacoma, Washington. Report to the Port of Tacoma, April 7, 2003.

Table 4. Results of Chemical Analysis for PCT addendum.

Chemical Parameter	DMMP PROGRAM			COMPOSITES		SUBUNITS							
	SL (1998)	BT (1998)	ML (1998)	C10	C11	S-16A	S-16B	S-16C	S-16D	S-17A	S-17B	S-17C	S-17D
Metals: mg/kg dry weight													
Antimony	150	150	200	0.07	0.581								
Arsenic	57	507.1	700	2.16	8.64	-	-	-	-	-	-	-	-
Cadmium	5.1	--	14	0.041	0.08	-	-	-	-	-	-	-	-
Chromium	--	--	--	14.6	21	-	-	-	-	-	-	-	-
Copper	390	--	1,300	13.8	27.9	-	-	-	-	-	-	-	-
Lead	450	--	1,200	2.54	13	-	-	-	-	-	-	-	-
Mercury	0.41	1.5	2.3	0.02	0.06	-	-	-	-	-	-	-	-
Nickel	140	370	370	17.7	16	-	-	-	-	-	-	-	-
Silver	6.1	6.1	8.4	0.07	0.263	-	-	-	-	-	-	-	-
Zinc	410	--	3,800	21.3	33.9	-	-	-	-	-	-	-	-
Nonionizable Organic Compounds: ug/kg dry weight													
Aromatic Hydrocarbons													
Total LPAH	5,200	--	29,000	11.6	452	27.2	1,215	717	5.5	32	810	6.9	10.6
Naphthalene	2,100	--	2,400	3 J	29	3.5	98	57	<1.9	3.6	<1.8	<1.9	2
Acenaphthylene	560	--	1,300	<1.7	11	<1.9	<1.9	<1.9	<2.0	<2.0	<1.9	<2.0	<1.9
Acenaphthene	500	--	2,000	<1.2	13	<1.4	39	<1.4	<1.4	<1.4	33	<1.4	<1.4
Fluorene	540	--	3,600	<2.0	19	2.7	78	<2.4	<2.4	2.5	57	<2.4	<2.4
Phenanthrene	1,500	--	21,000	8.6 J	190	18	440	290	5.5	23	290	6.9	8.6
Anthracene	960	--	13,000	<1.7	190	3	560	370	<2.0	2.9	430	<2.0	<1.9
2-Methylnaphthalene *	670	--	1,900	4.2 J	19	8.6	45	<1.7	4.3	8.1	<1.7	2.8	4.4
Total HPAH	12,000	--	69,000	48.8	23,680	55.2	33,070	48,070	6	155	41,010	85	27
Fluoranthene	1,700	4,600	30,000	9.2 J	4,900	13	7,500	11,000	<3.1	36	9,000	20	6.8
Pyrene	2,600	--	16,000	12	5,400	13	8,400	16,000	2.6	38	11,000	15	6.6
Benz[a]anthracene	1,300	--	5,100	3.8 J	1,300	6.9	2,000	2,200	<2.0	11	2,800	5.9	3.4
Chrysene	1,400	--	21,000	9 J	5,500	10	7,200	9,100	3.1	30	10,000	24	7
Total benzofluoranthenes	3,200	--	9,900	5.4	3,700	8.5	4,400	5,800	ND	21.6	5,000	14.7	3.5
Benzo[a]pyrene	1,600	3,600	3,600	2.6 J	1,000	3.8	1,300	1,600	<2.3	7.1	1,200	2.3	<2.2
Indeno[1,2,3-c,d]pyrene	600	--	4,400	3 J	680	<2.5	940	1,000	<2.7	4.9	800	<2.7	<2.6
Dibenzo[a,h]anthracene	230	--	1,900	<2.6 U	230	<2.9	230	270	<3.1	<3.1	210	<3.1	<3.0
Benzo[g,h,i]perylene	670	--	3,200	3.8 J	970	<3.1	1,100	1,100	<3.2	5.9	1,000	3.5	<3.2
Chlorinated Benzenes ug/kg dry weight													
1,2-Dichlorobenzene	35	37	110	<1.5	<1.9	<1.7	<1.8	<1.8	<1.9	<1.8	<1.8	<1.9	<1.8
1,3-Dichlorobenzene	170	1,241	--	<1.9	<2.3	<2.1	<2.2	<2.2	<2.3	<2.3	<2.2	<2.3	<2.2
1,4-Dichlorobenzene	110	120	120	<2.2	<2.7	<2.5	<2.6	<2.6	<2.7	<2.7	<2.6	<2.7	<2.6
1,2,4-Trichlorobenzene	31	--	64	<1.8	3.7 J	<2.0	<2.1	<2.1	<2.1	<2.1	<2.1	<2.2	<2.1
Hexachlorobenzene	22	168	230	<2.5	<3.0	<2.8	<2.9	<2.9	<3.0	<3.0	<2.9	<3.0	<2.9
Phthalate Esters ug/kg dry weight													
Dimethyl phthalate	1,400	1,400	--	<2.1	<2.6	<2.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.6	<2.5
Diethyl phthalate	1,200	--	--	<4.1	<4.9	<4.6	<4.8	<4.8	<4.9	<4.9	<4.8	<5.0	<4.8
Di-n-butyl phthalate	5,100	10,220	--	3.5 J	<3.7	<3.4	<3.6	<3.6	<3.7	<3.6	<3.6	<3.7	<3.6
Butyl benzyl phthalate	970	--	--	11	<2.1	<2.0	<2.1	<2.1	<2.1	<2.1	<2.1	<2.2	<2.1

Chemical Parameter	DMMP PROGRAM			COMPOSITES		SUBUNITS							
	SL (1998)	BT (1998)	ML (1998)	C10	C11	S-16A	S-16B	S-16C	S-16D	S-17A	S-17B	S-17C	S-17D
Bis[2-ethylhexyl]phthalate	8,300	13,870	--	38 J	53 J	12	<2.4	<2.4	9.2	9.4	<2.4	4.3	3.6
Di-n-octyl phthalate	6,200	--	--	<1.4	<1.7	<1.6	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7
Miscellaneous ug/kg dry weight													
Dibenzofuran	540	--	1,700	1.5 J	18	3.7	71	<1.8	<1.9	<1.8	<1.8	<1.9	<1.8
Hexachlorobutadiene	29	212	270	<1.7	3.0 J	<1.9	<1.9	<1.9	<2.0	<2.0	<1.9	<2.0	<1.9
Hexachloroethane	1,400	10,200	14,000	<2.6	<3.1	<2.9	<3.0	<3.0	<3.1	<3.1	<3.0	<3.1	<3.0
N-nitrosodiphenylamine	28	130	130	<2.6	<3.1	<2.9	<3.0	<3.0	<3.1	<3.1	<3.0	<3.1	<3.0
Pesticides/PCBs ug/kg dry weight													
p,p'-DDE	--	--	--	<0.16	<0.70	0.26 J	8.1 D	<8.6	<0.44	0.34 JP	<0.14	<7.1	<0.14
p,p'-DDD	--	--	--	0.23 JP	1.4	0.24 J	4.2 JD	15 D	<0.47	0.23 J	0.19 J	16 D	<0.50
p,p'-DDT	--	--	--	<0.20	2.5	<0.23	13 D	44 D	<0.41	<0.24	<3.1	38 D	<1.2
Total DDT	6.9	50.0	69.0	0.23	3.9	0.5	25.3	59.0	ND	0.57	0.19	54.5	ND
Aldrin	10	37	--	<0.58	<0.70	<0.12	<1.5	<1.6	<0.20	<0.13	<0.13	<7.4	<0.13
alpha-Chlordane	10	37	--	<0.33	2.2 P	<0.38	13D	<26.8	<0.39	<0.94	<1.66	30 D	<0.39
Dieldrin	10	37	--	<0.13	0.26 J	<0.15	<1.9	<8.6	<0.16	<0.16	<0.16	3.6 JD	<0.15
Heptachlor	10	37	--	<0.19	<0.23	<0.21	<2.7	<2.8	<0.23	<0.23	<0.23	<2.3	<0.22
gamma-BHC (Lindane)	10	37	--	<0.20	<0.91	<0.66	<8.3	<17	<0.24	<0.81	<0.25	<9.5	<0.24
PCBs													
PCBs (dry wgt - ug/kg)	130	--	3,100	ND	ND	ND	ND	ND	--	ND	8.2	ND	--
PCBs (TOC norm.- mg/kg)	--	38	--	ND	ND	ND	ND	ND	--	ND	2.1	ND	--
Volatile Organic Compounds: ug/kg dry weight													
Trichloroethene	160	1,168	1,600	<0.33	<0.39	-	-	-	-	-	-	-	-
Tetrachloroethene	57	102	210	<0.36	<0.44	-	-	-	-	-	-	-	-
Ethylbenzene	10	27	50	<0.66	<0.80	-	-	-	-	-	-	-	-
Total Xylene	40	--	160	<2.60	<3.07	-	-	-	-	-	-	-	-
Ionizable Organic Compounds: ug/kg dry weight													
Phenol	420	876	1,200	2.7 J	<2.7	<2.6	<2.6	<2.6	<2.7	4.1	<2.6	<2.7	<2.6
2-Methylphenol	63	--	77	<4.0	<4.8	<4.5	<4.7	<4.7	<4.8	<4.7	<4.7	<4.8	<4.7
4-Methylphenol	670	--	3,600	<3.4	<4.1	<3.8	<4.0	<4.0	<4.1	<4.1	<4.0	<4.1	<4.0
2,4-Dimethylphenol	29	--	210	<6.4	<7.7	<7.2	<7.5	<7.5	<7.7	<7.6	<7.5	<7.8	<7.5
Pentachlorophenol	400	504	690	<9.9	<12	<12	<12	<12	<12	<12	<12	<12	<12
Benzyl alcohol	57	--	870	<4.3	<5.2	<4.9	<5.1	<5.1	<5.2	14	<5.1	6.5	<5.1
Benzoic acid	650	--	760	<120	<140	<130	<140	<140	<140	<140	<140	<140	<140

Notes:

* 2-Methylnaphthalene not summed with other LPAH's (not an SMS COC)

ND = Not detected.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

D = Laboratory data qualifier indicating that the sample was diluted for the analysis.

P = The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP pesticides)/

< = Chemical not detected above reported level.

-- = Not available or not applicable.

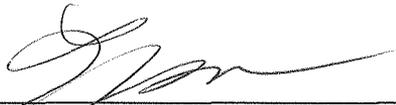
pink shading indicates DMMP SL exceedance

red shading indicates DMMP BT exceedance

yellow shading w/ bold outline indicates DMMP ML exceedance

Concur:

6/18/03
Date



Lauran Cole Warner, Seattle District Corps of Engineers

17 June 2003
Date



Justine Barton, Environmental Protection Agency

6/18/03
Date



Tom Gries, Washington Department of Ecology

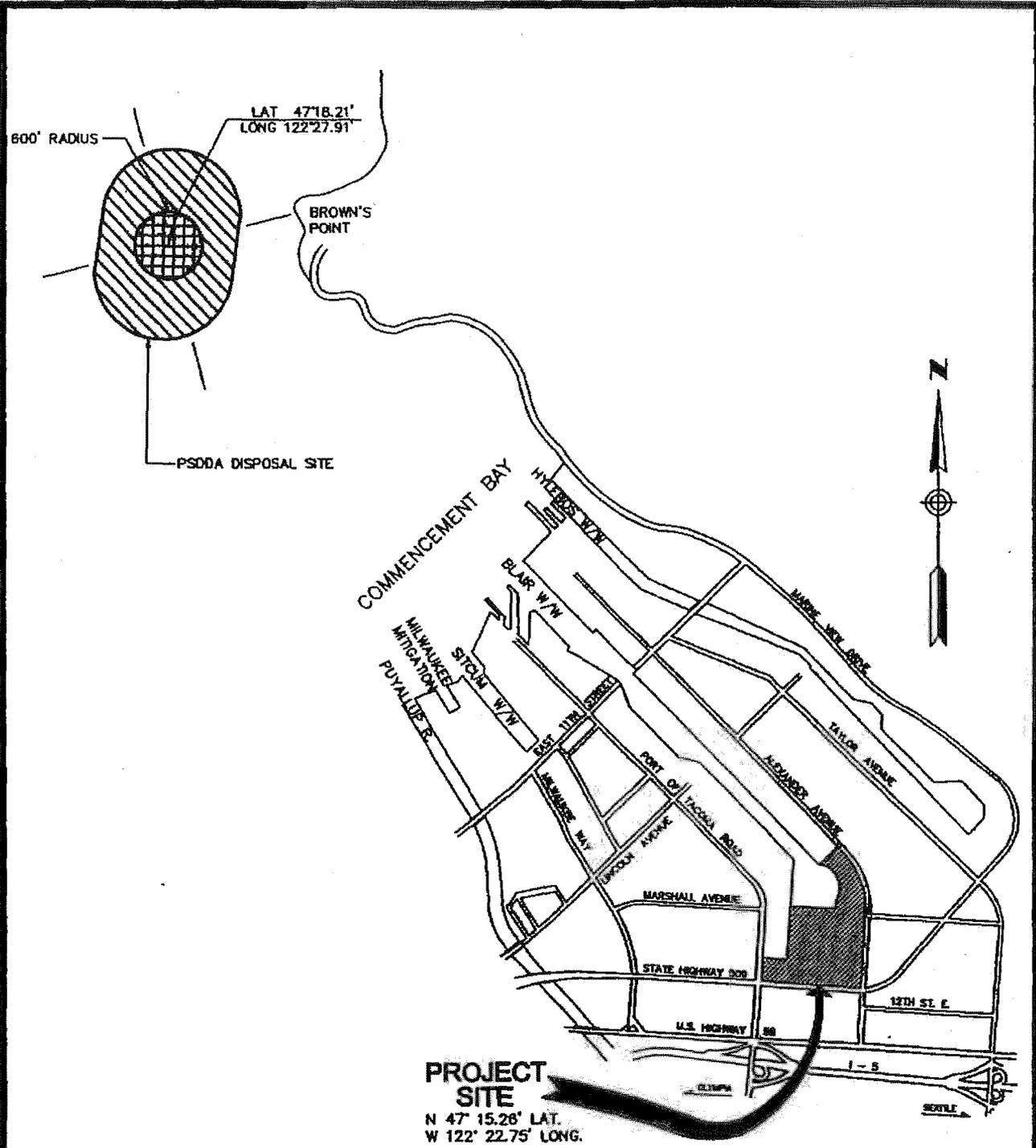
6/18/2003
Date



Peter Leon, Washington Department of Natural Resources

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Bill Sullivan, Puyallup Tribe
DMMO file



VICINITY MAP
N.T.S.

045405400-031800

0454054E.DWG

SLE.DGE



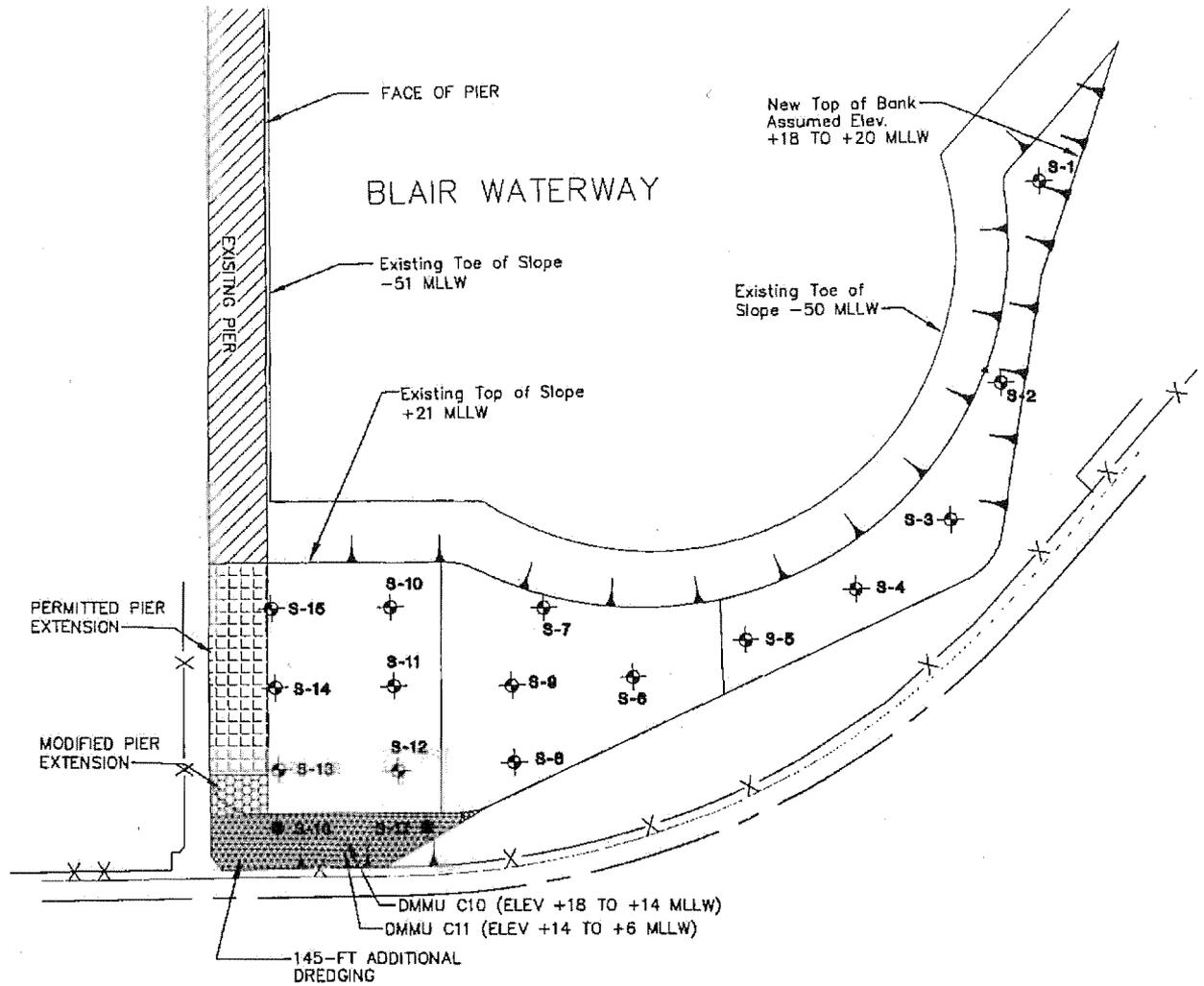
VICINITY MAP

FIGURE 1

045405405:02/17/03

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SLF:SOY

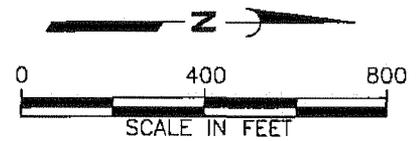


EXPLANATION:

S-1 PREVIOUS SAP BORING NUMBER AND APPROXIMATE LOCATION

DREDGED MATERIAL MANAGEMENT UNIT (DMMU) BOUNDARY

S-16 SAPA THREE BORING NUMBER AND APPROXIMATE LOCATION



NOTE:

The locations of all features shown are approximate.

Reference: Base drawing by Berger/Abam Engineers, Inc., dated November 5, 1999.



SAPA THREE SAMPLE LOCATIONS

FIGURE 2