CENWS-OD-TS-NR

MEMORANDUM FOR: RECORD October 8, 2015

SUBJECT: DETERMINATION REGARDING THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM TIDEWATER COVE MARINA FOR OPEN-WATER FLOWLANE DISPOSAL IN THE COLUMBIA RIVER.

1. Introduction. This memorandum 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) regarding the suitability of 15,539 cubic yards (cy) of dredged material from the Tidewater Cove Marina in Vancouver, Washington for open-water disposal. Proposed disposal is in the flowlane area of the Columbia River between river miles (RM) 108 and 109.

2. Background. Tidewater Cove Marina is located on the Washington side of the Columbia River between river mile 109 and 110. Tidewater Marina is proposing dredging for an entrance channel and moorage basin to support continued boater access to their slips (Figure 1). As of June 2015, the marina was under construction and was partially occupied.

   Proposed dredging will remove up to approximately 5 feet of sediment and would achieve a target depth of -12 feet based on the Columbia River Datum (CRD) in the entrance channel and -10 feet CRD in the boat basin (Figure 1). With a one foot overdredge allowance, the maximum depth allowed is -13 feet CRD in the entrance channel (4,543 CY) and -11 feet CRD in the boat basin (10,996 CY). Dredging will occur using a clamshell dredge and the material will be transported to the disposal area by bottom-dump barge. The disposal site recommended by the USACE Portland District is shown in Figure 2 and is located just upstream of RM108.

   Initially, the dredging proponent hoped to dispose of the dredged material as upland fill at Ross Island, an island in the Columbia River managed by the Oregon Department of Environmental Quality (ODEQ). The sediment characterization was therefore designed to fulfill the Ross Island chemical screening list and the Sampling Plan was not provided for review to the DMMP agencies. However, the analytes included all freshwater chemicals of concern required in the 2013 DMMP User Manual[1]. However, sediment conventionals such as grain size and total organic carbon were not analyzed based on communication with ODEQ that indicated that these parameters were not necessary for Ross Island fill characterization.

   When the proponent decided to explore other disposal options, the DMMP agencies were contacted to determine if the existing chemical data would be sufficient to make a suitability determination for flowlane disposal within the Columbia River.

   There is no record of dredging activities occurring on-site previously. No known previous chemical or

[1] The 2014 DMMP user manual was released in December 2014. Sampling at Tidewater Cove occurred in October 2014; thus this project's data were compared to the DMMP 2013 User Manual, which incorporated the interim 2006 freshwater screening levels (from the 2006 Sediment Evaluation Framework).

biological sediment sampling has been conducted within the boundaries of the project site.

3. Project Summary. Table 1 includes project summary and tracking information.

Table 1. Project Summary

Project ranking	Moderate
Proposed dredging volume (including one foot overdredge)	15,539 cubic yards
Proposed dredging depth (including one foot overdredge)	Entrance channel: -13 ft below the CRD Boat Basin: -11 ft below the CRD
SAP received	Never received.
SAP approved	SAP was neither reviewed nor approved by the DMMP agencies
Sampling date	October 14, 2014
Sediment data characterization report received	June 23, 2015
DMMO tracking number	TIDEC-1-A-F-369
EIM study ID	TIDEC16
USACE Permit Application Number	pending
Recency Determination (moderate rank = 5 years)	September 2019

4. Project Ranking and Sampling Requirements. From a DMMP perspective, the Tidewater Cove entrance channel and moorage areas would be ranked "moderate" based on guidance from the DMMP User Manual (DMMP, 2014), the lack of previous sediment characterization, and known historical uses of the project site including an abandoned ship and several old dock structures that were previously removed.

For a moderate-ranked project with heterogeneous sediment, the number of samples and analyses are calculated using the following guidelines (DMMP, 2014):

- Maximum volume of sediment represented by each field sample = 4,000 cubic yards
- Maximum volume of sediment represented by each analysis in the upper 4-feet of the dredging prism (surface sediment) = 16,000 cubic yards
- Maximum volume of sediment represented by each analysis in the subsurface portion of the dredging prism = 24,000 cubic yards

The total project volume is 15,539 cubic yards and includes up to one foot of overdredge allowance. For a DMMP characterization, the project would be assigned one surface dredged material management unit (DMMU1) of 15,539 cy, including both the entrance channel (4,543 CY) and the boat basin (10,996 CY). The DMMU would have been characterized by one composite sample of 4 to 5 core samples.

The actual characterization per Ross Island requirements consisted of five samples taken from five locations within the DMMU, with each sample analyzed separately. Figure 3 shows the sample locations. The sampling frequency more than meets DMMP requirements. Some sediment that would

be considered part of the z-layer (e.g. between -11 to -13 ft CRD in the boat basin) was included in the samples.

5. Sampling. Sampling took place October 14, 2014 at five locations shown in Figure 3. Sample material was collected using either steel sediment sampling tube manually advanced to refusal or via petite Ponar grab sampler. Table 2 presents the sample locations, sampling methodology, and sample collection details. Refusal was met at 3-3.5 ft below mudline in the boat basin portion of the DMMU and at less than 1 ft below mudline in the entrance channel portion despite several attempts. Consequently, sediment was retrieved in the entrance channel portion (locations TWC-01 and TWC-02) using the petite Ponar grab sampler.

   Two of the three cores in the boat basin portion of the DMMU (TWC-03 and -05) fully penetrated the dredge prism and extended partway into the z-layer. Material representing the z-layer was composited with the overlying material in the dredge prism to form a composite. The composite samples from each location were analyzed discretely; sample compositing between sampling locations did not occur.

   The lengths of the core sections included in the sediment core depth composites were not corrected for recovery. Because sampling refusal was encountered, the DMMP agencies accepted the uncorrected core lengths as being representative of the DMMU.

   Separate two-foot z-samples were neither planned nor collected. This deviation from normal DMMP sampling requirements was deemed inconsequential due to the following:
   - Boat Basin. Portions of the z-layer material were included in the sample cores collected from the boat basin. Sample data is reviewed in Section 6.
   - Entrance channel. Samples from the entrance channel only represented the dredge prism material. However, the entrance channel samples did not contain chemicals at levels of concern (Section 6). Thus z-sample analyses would not be triggered on the basis of the overlying dredged material.

6. Sediment Conventional, Grain Size and Chemical Analysis. Sediment conventional analyses and grain size measurements were not required by ODEQ for the initial proposed upland disposal and thus were not performed. A description of the sediment at each sampling station can be found in Table 2.

   Because biological testing was not determined necessary, the DMMP agencies have decided that the omission of ammonia and total sulfides analyses is not sufficient to withhold a suitability determination.

   The remaining missing required conventionals (total solids, total volatile solids, total organic carbon, and grain-size) are critical to understanding the physical properties (and in the case of TOC, chemical properties) of dredged material. Lacking evidence of chemical contamination (see below), the DMMP agencies are allowing this omission on a best-professional judgment (BPJ) basis.

   The chemical analysis results compared to DMMP freshwater guidelines are found in Table 3. No chemicals were detected in exceedance of the DMMP screening level 1 (SL1) guidelines. Two chemicals (dimethyl phthalate and di-n-octyl phthalate) had non-detects that exceeded the screening level in 3 of 5 samples. All non-detect exceedances occurred in the boat basin portion of the DMMU.

With the adoption of Ecology's SMS freshwater standards in the 2014 DMMP User Manual, dimethyl phthalate no longer has a freshwater SL1; therefore, the non-detect exceedances of the 2006 freshwater interim screening level is not considered a concern.

Di-n-octyl phthalate was reported as a non-detect at concentrations of 65.8, 52.1, and 131 ug/kg dry wt at stations TWC-03, TWC-04, and TWC-05, respectively, all of which exceed the 2006 interim freshwater screening level of 26. In the 2014 DMMP User Manual, the SL1 for di-n-octyl phthalate was revised upwards to 39 ug/kg, but still remains below the non-detect concentrations. The consultant reported that the reporting limits for di-n-octyl phthalate were elevated due to dilutions required to detect PAHs. Given that all six phthalates were non-detect except for one estimated detection below the SL1 for bis(2-ethylhexyl)phthalate (100 J ug/kg in sample TWC-04) and the known historical use of the site, the DMMP agencies concur that the presence of di-n-octyl phthalate above the SL1 is highly unlikely.

PCBs were either not detected or were detected at concentrations an order of magnitude below the screening level at all locations. The sample at TWC-04 was re-extracted and re-analyzed after initial analysis produced a result that was two orders of magnitude higher than the laboratory duplicate result of 18.6 ug/kg. The result for the re-extracted sample (10.6 ug/kg) was more consistent with the laboratory duplicate and is considered valid for use in this suitability determination.

Metals, PAHs, chlorinated hydrocarbons, phenols, pesticides, organotins, and the miscellaneous extractables were either not detected or were detected at concentrations well below the SL1 at all sampling locations.

Dioxin/furans were not measured. Given the location and known historical uses of the site, the DMMP agencies concur that dioxin/furan analysis is not necessary for this project.

7. Biological Testing. Dioxin/furan concentrations were not measured. DMMU 1 did not have any SL1 exceedances. Bioaccumulation triggers (BTs) have not been set for freshwater sediments. Therefore, bioassays and bioaccumulation testing were not required.

8. Sediment Exposed by Dredging. Sediment exposed by dredging must either meet the State of Washington Sediment Quality Standards (SQS) (Ecology, 2013) or the State's antidegradation standard (DMMP, 2008). In the case of Tidewater Cove, z-samples were not collected separately. However, with the exception of the three non-detect exceedances for di-n-octyl phthalate noted above, there were no chemical concentrations above the SL1. Based on the tiered testing approach, analysis of z-samples is not required for this DMMU. Therefore, this project is in compliance with the State of Washington anti-degradation standard.

9. Suitability Determination. The chemical data provide no substantial evidence that contamination is present in the sediment material. Although di-n-octyl phthalate was non-detect in three of five samples at a concentration in excess of the freshwater SL1, no other phthalates were detected at a concentration above their respective SL1. Dimethyl phthalate had a non-detect exceedance of the 2006 freshwater interim SL, however this chemical is no longer included in Ecology's SMS freshwater standards and no longer has an SL1 value in the 2014 User Manual.

In summary, based on the results of the previously described testing, the DMMP agencies concluded that the 15,539 cubic yards of dredged material in DMMU 1 are suitable for open-water disposal.

A pre-dredge meeting with DNR, Ecology, EPA and the Corps of Engineers is required at least 7 days prior to dredging. A dredging and disposal quality control plan must be developed and submitted to the Regulatory Branch of the Seattle District Corps of Engineers at least 7 days prior to the pre-dredge meeting. Dredging, positioning, and disposal will all need to be addressed with enough detail to provide assurance to the agencies that the dredge plan will be properly implemented.

A Portland District Corps of Engineers agreement must be acquired for open-water disposal. Disposal at the selected flowlane site must be in accordance with Portland District procedures.

This suitability determination does ***not*** constitute final agency approval of the project. During the public comment period that follows a public notice, the resource agencies will provide input on the overall project. 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.

10. References.

DMMP, 2008. *Quality of Post-Dredge Sediment Surfaces (Updated).* A Clarification Paper Prepared by David Fox (USACE), Erika Hoffman (EPA) and Tom Gries (Ecology) for the Dredged Material Management Program, June 2008.

DMMP, 2014. *Dredged Material Evaluation and Disposal Procedures (User Manual)*. Prepared by the Seattle District Dredged Material Management Office for the Dredged Material Management Program, December 2014.

DMMP, 2013. *Dredged Material Evaluation and Disposal Procedures (User Manual)*. Prepared by the Seattle District Dredged Material Management Office for the Dredged Material Management Program, July 2013.

Ecology, 2013. *Sediment Management Standards – Chapter 173-204 WAC*. Washington State Department of Ecology, February 2013.

Maul Foster Alongi, 2014. *Tidewater Cove Sediment Characterization Results.* Prepared by Maul Foster Alongi for Tidwater Cove Marina, Portland, OR. November, 2014.

Maul Foster Alongi, 2015. *Biological Assessment Addendum.* Prepared by Maul Foster Alongi for Tidwater Cove Marina, Portland, OR. July 9, 2015.

11. Agency Signatures.

signed copy on file in DMMO - Seattle District office

Concur:

_____ _____
Date Heather Fourie – U.S. Army Corps of Engineers, Seattle District

_____ _____
Date Justine Barton - Environmental Protection Agency

_____ _____
Date Laura Inouye, Ph.D. - Washington Department of Ecology

_____ _____
Date Celia Barton - Washington Department of Natural Resources

Copies furnished:

DMMP signatories
Steven Manlow – USACE, Seattle District Regulatory
Phil Wiescher – Maul Foster Alongi
Bill Moses – Project Manager for Tidewater Cove Marina
Jon Gornick - USACE, Portland District Waterways Maintenance Section

Table 2. Sample locations, depths, and sample description

Sample	X Coordinate	Y Coordinate	Dredge depth (including OD) (ft CRD)	Mudline elevation (ft CRD)	sample core length (ft)	sample depth (ft CRD)	Sample bottom elevation (ft CRD)	z layer top elev (ft CRD)	z layer bottom elevation (ft CRD)	z layer bottom elev (ft. below mudline)	Collection Method	Sediment Description
TWC -01	1099196.621	108493.167	mudline to -13	-12	1	-12 to -13	-13	-13	-15	3	Grab depth composite	Silty sand (SM); tan to gray; loose; wet; trace organic debris; 2-mm-wide ribbons of sheen.
TWC -02	1099254.667	108602.876	mudline to -13	-7.3	1	-7.3 to -8.3	-8.3	-13	-15	7.7	Grab depth composite	Silty sand (SM); gray; loose; wet; trace organic debris; glass shards; trace sheen.
TWC -03	1099540.485	108909.230	mudline to -11	-8.25	3.5	-8.25 to -11.75	-11.75	-11	-13	4.75	Sediment core depth composite	Silty sand (SM); gray; loose; wet; trace organic debris; biological structures (bivalve shells) present; trace sheen.
TWC -04	1099615.128	108922.831	mudline to -11	-7.55	3	-7.55 to -10.55	-10.55	-11	-13	5.45	Sediment core depth composite	Silty sand (SM); grey; loose; wet; trace organic debris; biological structures (bivalve shells) present.
TWC -05	1099710.226	108942.914	mudline to -11	-8.8	3.5	-8.8 to -12.3	-12.3	-11	-13	4.2	Sediment core depth composite	Silty sand (SM); gray; loose; wet; <5% gravel present; trace organic debris; biological structures (bivalve shells) present; trace sheen.

Notes: Washington State Plane South coordinates are shown.

Table 3. Chemical analysis results for Tidewater Cover Marina

Tidewater Cove DY16	2013 DMMP	Sample Results									
Chemical	SL1[a]	TWC-01		TWC-02		TWC-03		TWC-04[b]		TWC-05	
Conventionals											
Total Solids (%)	--	78.1		82		69.1		66.1		64.9	
Metals (mg/kg dry wt)											
Antimony	--	0.245	U	0.244	U	0.3	J	0.321	J	0.81	J
Arsenic	20	1.26		1.73		3.44		4.04		4.05	
Cadmium	1.1	0.245	U	0.244	U	0.866		0.87		0.875	
Chromium	95	4.25		6.63		13.5		14.7		16.6	
Copper	80	5.09		6.74		18.1		20.4		21.4	
Lead	340	2.41		4.2		11.9		13.1		30.9	
Mercury	0.28	0.01	U	0.012		0.088		0.12		0.07	
Nickel	60	5.72		8.71		13		16.2		14.7	
Silver	2	0.245	U	0.244	U	0.246	U	0.247	U	0.247	U
Zinc	130	25.6		42.6		112		115		120	
PCBs (ug/kg dry wt)											
Aroclor 1016	--	1.77	U	3.48	U	1.81	U	1.84	U	1.85	U
Aroclor 1221	--	1.77	U	3.48	U	1.81	U	1.84	U	1.85	U
Aroclor 1232	--	1.77	U	3.48	U	1.81	U	1.84	U	1.85	U
Aroclor 1242	--	1.77	U	3.48	U	1.81	U	4.63	J	1.85	U
Aroclor 1248	--	1.77	U	1.74	U	1.81	U	1.84	U	1.85	U
Aroclor 1254	--	1.77	U	1.74	U	6.93	J	10.6	J	4.91	J
Aroclor 1260	--	1.77	U	1.74	U	3.62	J	3.37	J	5.48	J
Total PCBs	60	1.77	U	3.48	U	10.6	J	18.6	J	10.4	J
SVOCs (ug/kg dry wt)											
1,2,4-Trichlorobenzene	--	3.17	U	3.24	U	16.5	U	13.1	U	32.7	U
1,2-Dichlorobenzene	--	3.17	U	3.24	U	16.5	U	13.1	U	32.7	U
1,4-Dichlorobenzene	--	3.17	U	3.24	U	16.5	U	13.1	U	32.7	U
2,4-Dimethylphenol	--	6.36	U	6.5	U	33	U	26.1	U	65.6	U
2-Methylnaphthalene	470	2.54	U	2.6	U	63.4		69.4		27.9	J
2-Methylphenol	--	3.17	U	3.24	U	16.5	U	13.1	U	32.7	U
3- & 4-Methylphenol	--	3.17	U	3.24	U	73.4		40.4	J	32.7	U
Acenaphthene	1100	1.27	U	1.3	U	18.7		15.6		13.1	U
Acenaphthylene	470	1.27	U	1.3	U	9.19	J	8.13	J	13.1	U
Anthracene	1200	1.27	U	1.3	U	32.1		32.2		20	J
Benzo(a)anthracene	4300	1.27	U	2.5	J	26.4		55.5		35.5	
Benzo(a)pyrene	3300	1.91	U	4.11		28.4		57.1	J	52.6	
Benzo(b)fluoranthene	600	1.91	U	4.08		31.2		65.2		58.6	
Benzo(ghi)perylene	4000	1.27	U	2.14	J	15.1		36.4		32.8	
Benzo(k)fluoranthene	600	1.91	U	2.51	J	15.1	J	24.4		27	J
Benzoic acid	--	159	U	163	U	826	U	654	U	1640	U
Benzyl alcohol	--	6.36	U	6.5	U	33	U	26.1	U	65.6	U
Bis(2-ethylhexyl)phthalate	220	19.1	U	19.5	U	98.9	U	110	J	197	U
Butylbenzylphthalate	260	12.7	U	13	U	65.8	U	52.1	U	131	U
Chrysene	5900	1.27	U	2.32	J	41.2		77	J	57.2	
Dibenzo(a,h)anthracene	800	1.27	U	1.3	U	6.58	U	8.07	J	13.1	U
Dibenzofuran	400	1.27	U	1.3	U	14.1		14.8		13.1	U
Diethyl phthalate	--	12.7	U	13	U	65.8	U	52.1	U	131	U
Dimethyl phthalate	46	12.7	U	13	U	65.8	U	52.1	U	131	U
Di-n-butyl phthalate	--	12.7	U	13	U	65.8	U	52.1	U	131	U
Di-n-octyl phthalate	26	12.7	U	13	U	65.8	U	52.1	U	131	U
Fluoranthene	11000	1.27	U	3.25		80.6		127		98.3	
Fluorene	1000	1.27	U	1.3	U	23.8		24.9		18.9	J
Hexachlorobenzene	--	1.27	U	1.3	U	6.58	U	5.21	U	13.1	U
Hexachlorobutadiene	--	3.17	U	3.24	U	16.5	U	13.1	U	32.7	U
Hexachloroethane	--	3.17	U	3.24	U	16.5	U	13.1	U	32.7	U
Indeno(1,2,3-cd)pyrene	4100	1.27	U	2.21	J	12.8	J	30.1		30.2	
Naphthalene	500	2.54	U	2.6	U	72.7		70.8		39.5	J
N-Nitrosodiphenylamine	--	3.17	U	3.24	U	16.5	U	26.1	U	32.7	U
Pentachlorophenol	--	25.4	U	26	U	132	U	105	U	262	U
Phenanthrene	6100	1.27	U	2.19	J	105		134		78.3	
Phenol	--	2.54	U	2.6	U	13.2	U	10.5	U	26.2	U
Pyrene	8800	1.27	U	2.82		76.2		143		107	

Tidewater Cove DY16	2013 DMMP	Sample Results									
Chemical	SL1[a]	TWC-01		TWC-02		TWC-03		TWC-04[b]		TWC-05	
LPAHs (U=1/2)	6600	2.54	U	6.09	J	261	J	286	J	170	J
HPAHs (U=1/2)	31000	1.91	U	26.6	J	330	J	624	J	506	J
Total PAHs (U=1/2)	--	2.54	U	34.0	J	655	J	979	J	703	J
TPH (mg/kg dry wt)											
Gasoline	--	3.33	U	2.97	U	4.19	U	3.83	U	4.32	U
Diesel	--	7.41	U	7.17	U	24	J	28.6	J	27.4	J
Lube Oil	--	14.8	U	14.3	U	41.4	J	52.3	J	54.9	J
Total TPH—Diesel	--	14.8	U	14.3	U	65.4	J	80.9	J	82.3	J
Organochlorine Pesticides (ug/kg dry wt)											
2,4'-DDD (Mitotane)	--	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
2,4'-DDE (o',p'-DDE)	--	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
2,4'-DDT	--	0.682	U	0.67	U	1.37	U	0.672	U	0.696	U
4,4'-DDD	16	0.682	U	0.67	U	1.37	U	0.672	U	1.39	U
4,4'-DDE	9	0.682	U	0.67	U	1.51	U	1.34	U	1.39	U
4,4'-DDT	12	0.682	UJ	0.67	UJ	0.685	UJ	1.34	U	0.696	UJ
Aldrin	9.5	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
alpha-Chlordane (cis)	2.8	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
cis-Nonachlor	2.8	0.682	U	0.67	U	1.37	U	0.672	U	0.696	U
Dieldrin	1.9	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
gamma-Chlordane (trans)	2.8	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
Heptachlor	1.5	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
Hexachlorobenzene	--	1.7	U	1.67	U	1.71	U	1.68	U	1.74	U
Hexachlorobutadiene	--	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
Lindane	--	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
Oxychlordane	2.8	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
trans-Nonachlor	2.8	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
Total Chlordane	--	0.682	U	0.67	U	0.685	U	0.672	U	0.696	U
Organotins (ug/kg dry wt)											
n-Butyltin	--	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Di-n-butyltin	--	3.1	U	3.1	U	3.1	U	3.5	J	3.2	U
Tri-n-butyltin	75	1.3	U	1.3	U	1.3	U	4.1		1.3	U

NOTES:

-- = not available.

Values shaded in yellow indicate an undetected value that is higher than the regulatory value.

Values shaded in blue have detected/undetected values that met regulatory guidelines on re-analysis

DMMP = Dredged Material Management Program.

DMMU = dredged material management unit.

ft bml = feet below mudline.

HPAH = high-molecular-weight polycyclic aromatic hydrocarbon; sum of benzofluoranthenes, fluoranthene, pyrene, benz(a)anthracene, chrysene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene.

J = Result is estimated.

LPAH = low-molecular-weight polycyclic aromatic hydrocarbon; sum of naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.

mg/kg = milligrams per kilogram.

PAH = polycyclic aromatic hydrocarbon.

PCB = polychlorinated biphenyl.

SEF = sediment evaluation framework.

SL = screening level.

SVOC = semivolatile organic compound.

TPH = total petroleum hydrocarbons.

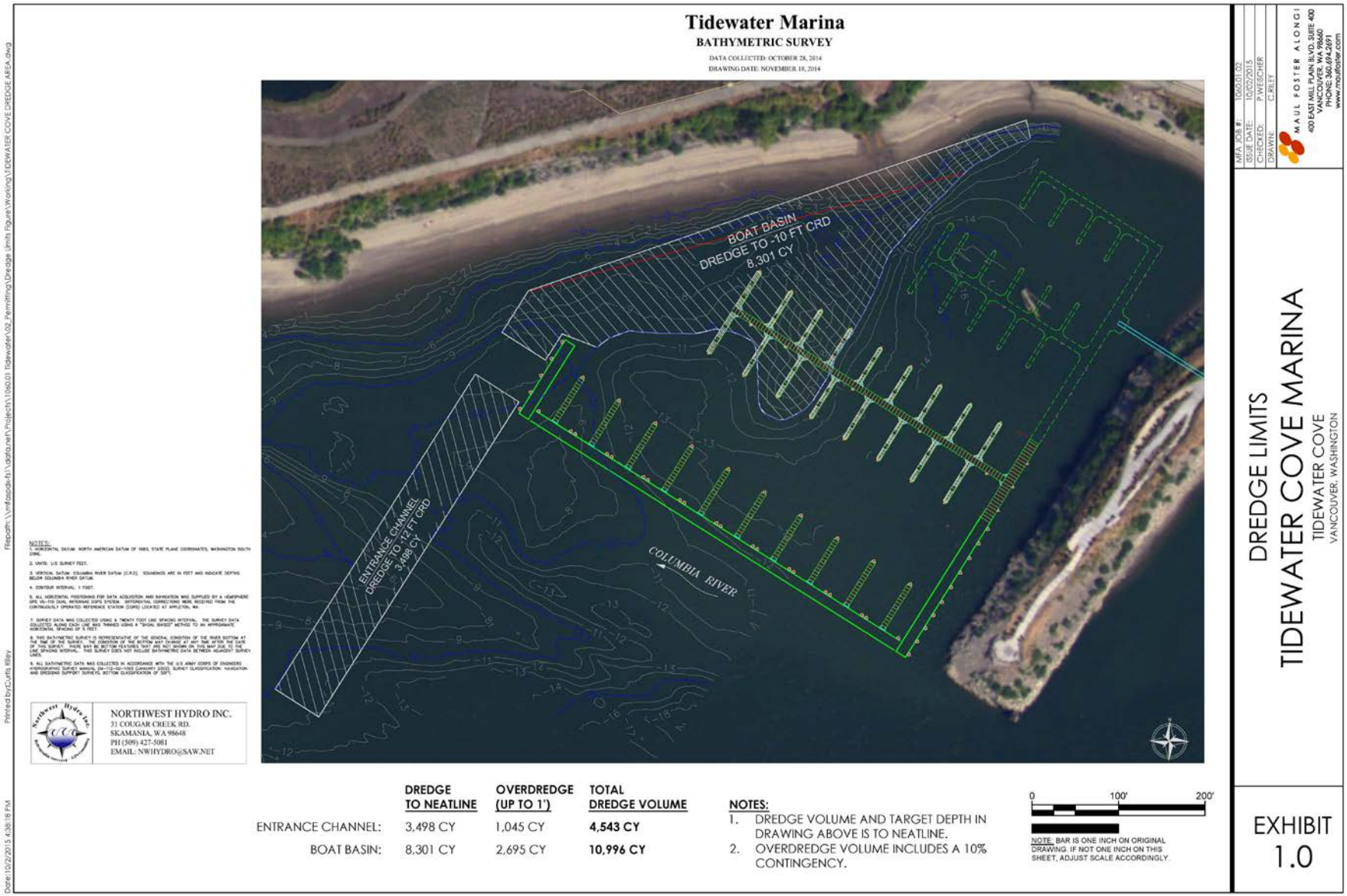
U = Result is non-detect.

ug/kg = micrograms per kilogram.

[a]Values correspond with 2006 SEF Interim Freshwater SLs.

[b]TWC-04 reextraction sample results are shown for PCBs.

Figure 1. Bathymetric Survey and Dredge Quantities



	DREDGE TO NEATLINE	OVERDREDGE (UP TO 1')	TOTAL DREDGE VOLUME
ENTRANCE CHANNEL:	3,498 CY	1,045 CY	**4,543 CY**
BOAT BASIN:	8,301 CY	2,695 CY	**10,996 CY**

NOTES:
1. DREDGE VOLUME AND TARGET DEPTH IN DRAWING ABOVE IS TO NEATLINE.
2. OVERDREDGE VOLUME INCLUDES A 10% CONTINGENCY.

0 100' 200'

NOTE: BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALE ACCORDINGLY.

Figure 2. Disposal Site Location

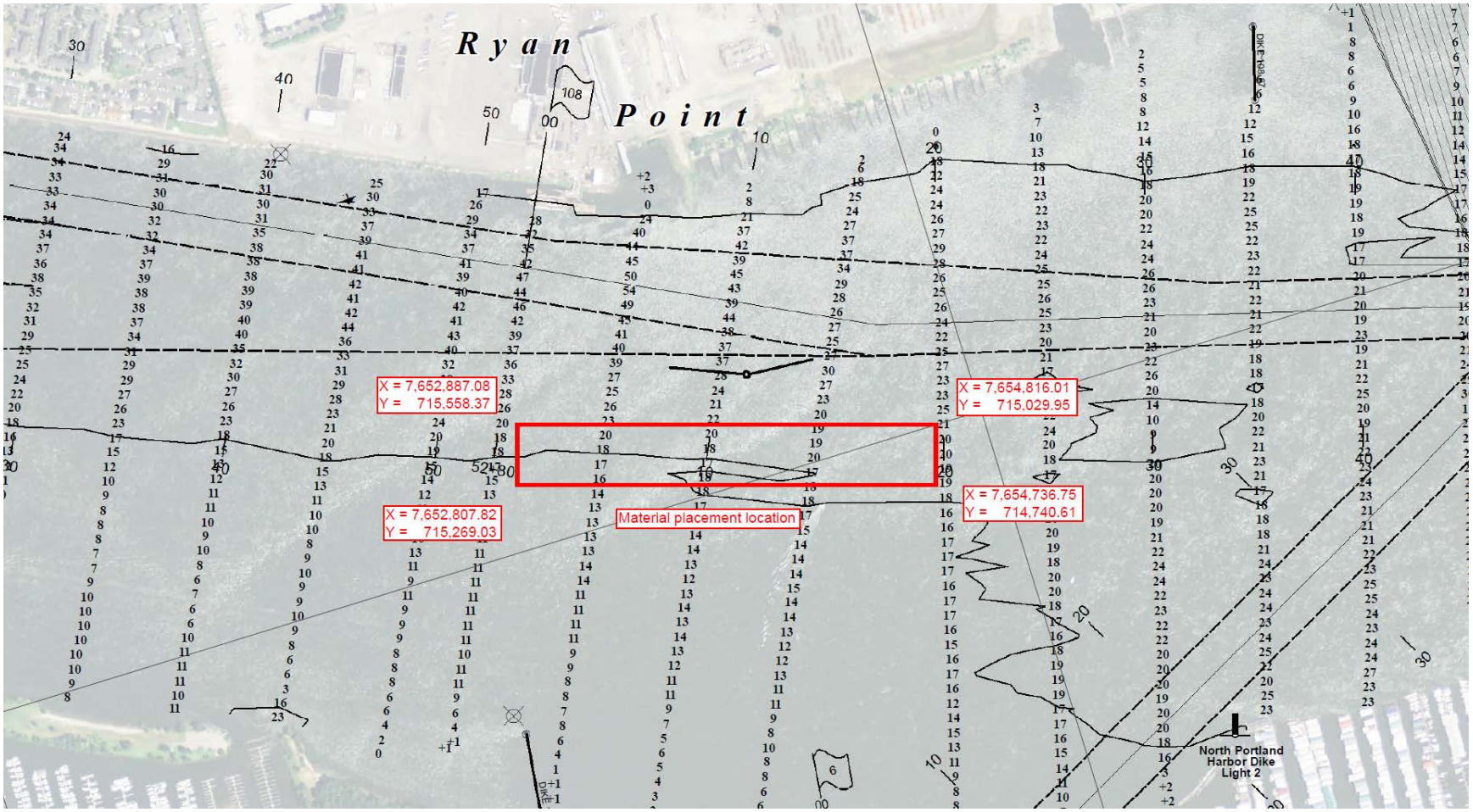


Figure 3. Sample Locations