CENWS-OD-TS-NR

MEMORANDUM FOR: RECORD January 7, 2016

SUBJECT: DETERMINATION REGARDING THE SUITABILITY OF PROPOSED DREDGED MATERIAL FROM EMERALD KALAMA CHEMICAL 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 1,600 cubic yards (cy) of dredged material adjacent to the Emerald Kalama Chemical (EKC) property in Kalama, Washington for open-water disposal. Proposed disposal is in the flowlane area of the Columbia River between river miles (RM) 73.0 and 73.2, as shown on Figure 1.

2. Background. The EKC property is located on the Washington side of the Columbia River between RM 74 and 75. EKC is proposing maintenance dredging at EKC's dock facility near Kalama, Washington to accommodate ships with deeper drafts. The dock is located on the Columbia River at approximately RM 75. The EKC facility is used to produce various chemical products. Raw materials are imported and offloaded at the dock; the chemical products are shipped to customers by rail or trucks. No products are exported through the dock.

   Maintenance dredging has never been performed at the dock since it was constructed in the early 1960s. In 2014, the DMMP approved the disposal of approximately 100 cy of dredged material from an area in and around an outfall located downstream of the dock (DMMP, 2014).

   The proposed dredging depth will remove up to 1,600 cy of sediment adjacent to the dock (DMMU1). The proposed dredging depth is -43 feet CRD with 2 feet of allowable overdredge to 45 feet CRD. Dredging will be performed using a clamshell dredge and the material will be transported to the disposal area by bottom-dump barge.

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

Table 1. Project Summary

Project ranking	Moderate
Characterized dredging volume	1,600 CY
Proposed dredging depth	-43 ft CRD (-45 ft with 2-ft overdredge)
1st draft SAP received	February 27, 2015
DMMP comments on 1st draft	March 24, 2015
2nd draft SAP received	May 19, 2015
DMMP comments on 2nd draft	June 8, 2015
3rd draft SAP received	June 19, 2015
DMMP comments on 3rd draft	June 29, 2015

4th draft SAP received	July 2, 2015
DMMP comments on 4th draft	July 2, 2015
5th draft SAP received	July 6, 2015
DMMP comments on 5th draft	July 16, 2015
Final SAP received	July 21, 2015
SAP approved	July 21,2015
Sampling date	August 8, 2015
Draft Sediment Characterization Report (SCR) received	November 5, 2015
DMMP comments on 1st draft SCR	November 24, 2015
2nd Draft SCR received	December 9, 2015
DMMP comments on 2nd draft SCR	December 14, 2015
3rd Draft SCR received	December 17, 2015
SCR Approved	January 7, 2016
DMMO tracking number	EKCHM-1-A-F-373
EIM study ID	EKCHM15
Recency Determination (moderate rank = 5 years)	August 2020

4. Project Ranking and Sampling Requirements. Sediments adjacent to the dock at the EKC property in Kalama are currently ranked "moderate" (DMMP, 2014). For a moderate-ranked project with homogeneous 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 cy
    - Maximum volume of sediment represented by each sample = 20,000 cy

    Two cores were collected from DMMU1; thus, the sampling frequency meets the DMMP requirements.

5. Sampling. Sampling took place August 8, 2015 using a vibracore at locations EKC1-CS and EKC3-CS shown in Figure 2. Prior to the fieldwork it was anticipated that mainstem river currents and layered sand and gravel substrate might make typical vibracore sampling challenging. This proved to be the case, and resulted in poor core penetration and low core recoveries (Table 2). Sampling was attempted at two additional locations (EKC2-CS and EKC4-CS) shown on Figure 2, but no material could be collected from those locations. Although poor, the sample recoveries are considered acceptable given that the approved Sampling and Analysis Plan was followed, the potential conditions anticipated, and changes coordinated. All recovered sample material was composited for the single DMMU sample. For future reference, the sediment characterization report states that the nature of the material (layered sand and gravel) was the cause of sampling problems rather than river currents. The report suggests that future sampling in this area should consider using the MudMole (a diver-supported, linear-impact hammer sampler), or sonic or traditional drilling to obtain full depth cores.

    Z-samples. A Z-sample was not collected from DMMU1 due to poor sample recovery.

6. Sediment Conventional, Grain Size and Chemical Analysis.

Samples were analyzed by ALS Environmental in Kelso, Washington. All chemical and sediment conventional analytical results were subjected to the equivalent of EPA Stage 2B (EPA 2009) validation; only minor quality control issues were reported. All data are considered sufficient and acceptable for regulatory decision-making, as qualified, under the DMMP program.

Sediment conventional results (Table 3) show that the proposed dredged material is predominantly sand (87%) and gravel (11%). Chemical analysis results are also compared to DMMP freshwater guidelines in Table 3. No chemicals were detected in exceedance of the DMMP screening level 1 (SL1) guidelines. Metals, PAHS, chlorinated hydrocarbons, phenols, pesticides, PCBs, and the miscellaneous extractables were either not detected or were detected at concentrations well below the SL1 in the composite sample for DMMU1.

Organometallics. Bulk organotin analysis was not required for this project.

Dioxins/furans. Dioxins/furans analysis was not required for this project.

7. Biological Testing. There were no SL1 exceedances for the standard COCs. 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). There were no chemical concentrations above the SL1 in the dredge prism sample, and no reason to think that exposed deeper sediments could cause degradation relative to the current surface. 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.

In summary, based on the results of the previously described testing, the DMMP agencies concluded that the 1,600 cubic yards of dredged material in DMMU 1 are suitable for open-water flowlane 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, 2014. *DMMP Tier 1 Evaluation of Emerald Kalama Chemical, LLC – Water Intake and Outfall Line Maintenance, Columbia River, with Upland Disposal*. October 6, 2014.

Ecological Land Services, Inc., 2015. *Sediment Sampling and Analysis Plan for Maintenance Dredging in the Columbia River at Emerald Kalama Chemical, LLC, Kalama, Washington*. Revised July 20, 2015.

Ecological Land Services, Inc., 2015. Sediment Characterization Report for Maintenance Dredging in the Columbia River at Emerald Kalama Chemical, LLC, Kalama, Washington. December 17, 2015.

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

EPA, 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use.*

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
Danette Guy – USACE, Seattle District Regulatory
Lynn Simpson – Ecological Land Services
Chris Wrobel – Emerald Kalama Chemical

Table 2. Sample locations, depths, and sample description

DMMU	Station Designation	Latitude	Longitude	Collection Date	Mudline Elevation (ft CRD)	Core Penetration (ft)	Core Recovered (ft)	% Core Recovery	DMMU Volume (cy)	Proposed Dredge Depth, including 2 ft overdepth (ft CRD)
1	EKC1-CS	46.02146	122.8613	8/8/2015	-38.8	6.8	1.0	15	1,600	-45
	EKC2-CS	46.02125	122.861	8/8/2015	-37.3	0	0.0	0		
	EKC3-CS	46.02095	122.86063	8/8/2015	-38.1	9	2.0	22		
	EKC4-CS	46.02075	122.86031	8/8/2015	-37.8	5.5	0.0	0		

Notes: Coordinates are in NAD83.

Table 3. Comparison of results to DMMP freshwater guidelines

Parameter	Units	Freshwater Guidelines		DMMU-1	
		SL1	SL2		
Conventionals					
Gravel (> 2,000 µm)	%			11.27	
Sand (62.5 to 2,000 µm)	%			87.21	
Silt (3.9 to 62.5 µm)	%			2.79	
Clay (0 to 3.9 µm)	%			0.71	
Total Volatile Solids	%	--	--	2.97	J
Total Sulfide	mg/kg	--	--	2.91	
Total Solids*	%	--	--	77.4	
Ammonia Nitrogen	mg/kg	--	--	2.22	
Total Organic Carbon	%	--	--	0.149	
Metals					
Antimony	mg/kg	--	--	0.053	J
Arsenic	mg/kg	14	120	1.56	
Cadmium	mg/kg	2.1	5.4	0.056	
Chromium	mg/kg	72	88	7.00	
Copper	mg/kg	400	1200	12.00	
Lead	mg/kg	360	> 1,300	1.48	
Mercury	mg/kg	0.66	0.8	0.004	J
Nickel	mg/kg	38	110	8.01	
Selenium	mg/kg	11	> 20	0.09	J
Silver	mg/kg	0.57	1.7	0.016	J
Zinc	mg/kg	3200	< 4,200	26.9	
PAHs					
Naphthalene	ug/kg	---	---	6.5	U
Acenaphthylene	ug/kg	---	---	2.7	J
Acenaphthene	ug/kg	---	---	6.5	U
Fluorene	ug/kg	---	---	4.4	J
Phenanthrene	ug/kg	---	---	25	
Anthracene	ug/kg	---	---	7	
2-Methylnaphthalene	ug/kg	---	---	6.5	U
Total LPAHs	ug/kg	---	---	39.1	J
Fluoranthene	ug/kg	---	---	23	
Pyrene	ug/kg	---	---	19	
Benzo(a)anthracene	ug/kg	---	---	8.7	
Chrysene	ug/kg	---	---	8.7	
Benzo(b,j,k)fluoranthene	ug/kg	---	---	7.8	
Benzo(a)pyrene	ug/kg	---	---	6.6	J+
Indeno(1,2,3-cd)pyrene	ug/kg	---	---	3.7	J+
Dibenzo(a,h)anthracene	ug/kg	---	---	6.5	U
Benzo(g,h,i)perylene	ug/kg	---	---	6.5	U
Total HPAHs	ug/kg	---	---	77.5	J
Total PAHs[2]	ug/kg	17000	30000	116.6	J
Chlorinated Hydrocarbons					

Parameter	Units	Freshwater Guidelines		DMMU-1	
		SL1	SL2		
1,4-Dichlorobenzene	ug/kg	---	---	6.5	U
1,2-Dichlorobenzene	ug/kg	---	---	6.5	U
1,2,4-Trichlorobenzene	ug/kg	---	---	6.5	U
Hexachlorobenzene	ug/kg	---	---	6.5	U
Beta-Hexachlorocyclohexane	ug/kg	7.2	11	3.2	U
Phthalates					
Dimethyl Phthalate	ug/kg	---	---	6.5	U
Diethyl Phthalate	ug/kg	---	---	6.5	U
Di-n-Butyl Phthalate	ug/kg	380	1000	13	U
Butyl Benzyl Phthalate	ug/kg	---	---	6.5	U
Bis(2-Ethylhexyl)Phthalate	ug/kg	500	22000	65	U
Di-n-Octyl Phthalate	ug/kg	39	> 1,100	6.5	U
Phenols					
Phenol	ug/kg	120	210	20	U
2-Methylphenol	ug/kg	---	---	7.5	U
3- and 4-Methylphenol[1]	ug/kg	260	2000	7.5	U
2,4-Dimethylphenol	ug/kg	--	--	33	U
Pentachlorophenol	ug/kg	1200	> 1,200	65	U
Miscellaneous Extractables					
Benzyl Alcohol	ug/kg	---	---	13	U
Benzoic Acid	ug/kg	2900	3800	400	U
Dibenzofuran	ug/kg	200	680	6.5	U
Hexachlorobutadiene	ug/kg	---	---	6.5	U
N-Nitrosodiphenylamine	ug/kg	---	---	6.5	U
Carbazole	ug/kg	900	1100	3.8	J
Pesticides					
4,4'-DDD	ug/kg	--	--	3.2	U
4,4'-DDE	ug/kg	--	--	3.2	U
4,4'-DDT	ug/kg	--	--	3.2	U
sum of 4,4'-(DDD,DDE,DDT)	ug/kg	--	--	3.2	U
2,4'-DDD	ug/kg	--	--	3.2	U
2,4'-DDE	ug/kg	--	--	3.2	U
2,4'-DDT	ug/kg	--	--	3.2	U
2,4'-DDD and 4,4' DDD	ug/kg	310	860	3.2	U
2,4'-DDE and 4,4' DDE	ug/kg	21	33	3.2	U
2,4'-DDT and 4,4' DDT	ug/kg	100	8,100	3.2	U
Aldrin	ug/kg	--	--	3.2	U
Dieldrin	ug/kg	4.9	9.3	3.2	U
Heptachlor	ug/kg	--	--	3.2	U
Endrin Ketone	ug/kg	8.5	> 8.5	3.2	U
Total Chlordane	ug/kg	--	--	3.2	U
cis-Chlordane	ug/kg	--	--	3.2	U
cis-Nonachlor	ug/kg	--	--	3.2	U
Oxychlordane	ug/kg	--	--	3.2	U
trans-Chlordane	ug/kg	--	--	3.2	U
trans-Nonachlor	ug/kg	--	--	3.2	U

Parameter	Units	Freshwater Guidelines		DMMU-1	
		SL1	SL2		
PCBs (Aroclors)					
Aroclor 1016	ug/kg	--	--	0.064	U
Aroclor 1221	ug/kg	--	--	0.13	U
Aroclor 1232	ug/kg	--	--	0.064	U
Aroclor 1242	ug/kg	--	--	0.064	U
Aroclor 1248	ug/kg	--	--	0.064	U
Aroclor 1254	ug/kg	--	--	0.064	U
Aroclor 1260	ug/kg	--	--	0.064	U
Total PCBs (Aroclors)	ug/kg	110	2,500	0.13	U
Bulk Petroleum Hydrocarbons					
Diesel Range Organics	mg/kg	340	510	16	J
Residual Range Organics	mg/kg	3600	4400	21	J

Notes

* = Not converted to dry weight basis
1 - Screening levels are for 4-methylphenol
2 - Total PAHs for freshwater projects include the sum of all PAHs listed, plus 1-methylnaphthalene
J = estimated concentration
U = undetected
SL = screening level
Bold = Detected value
Shaded cell exceeds one or more criteria.

Figure 1. Site Location Map

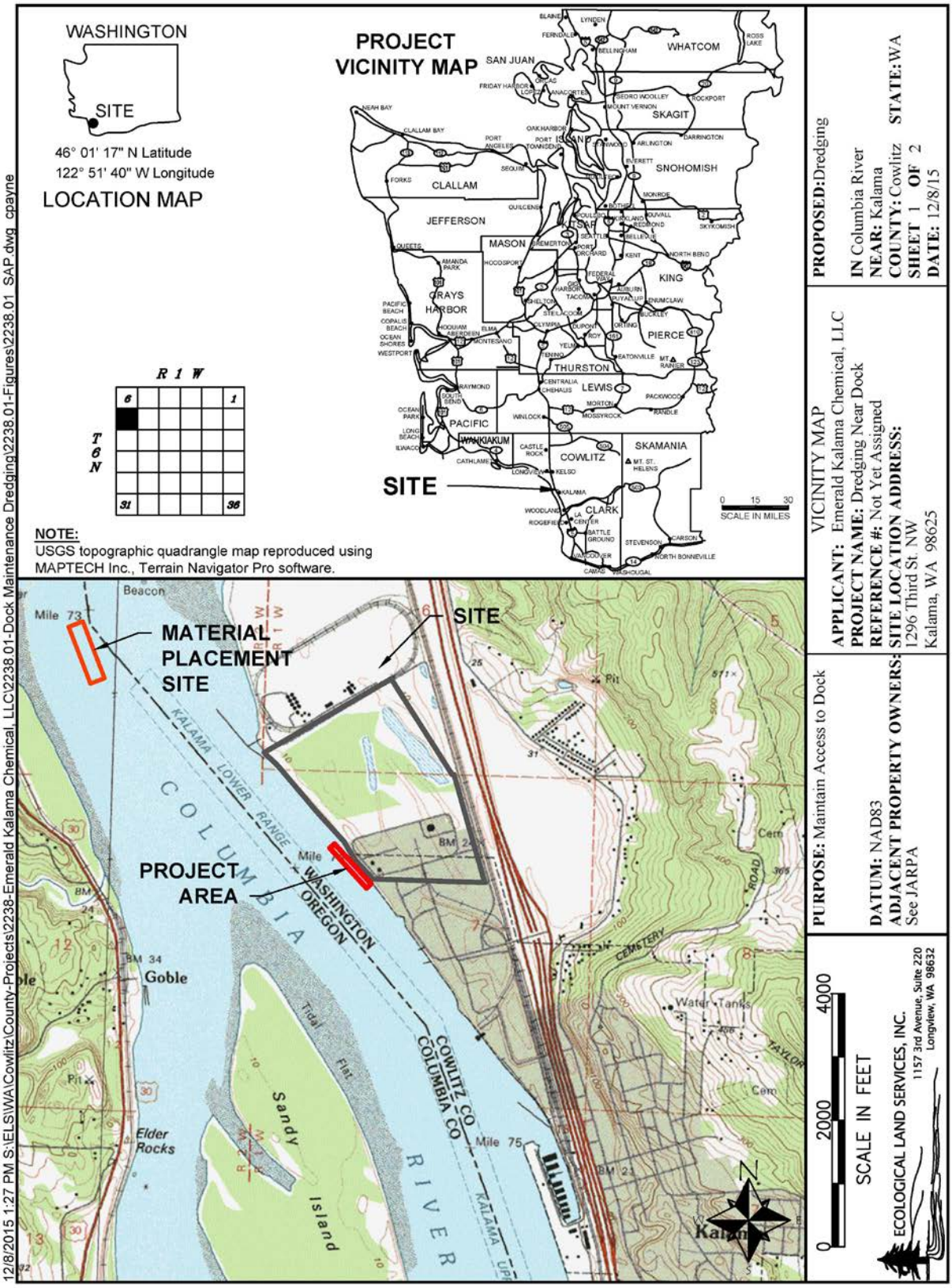

Figure 2. Sampling Locations