CHINOOK CHANNEL

Project Description

The Chinook project in Baker Bay is located near river mile (RM) 5.0 of the Columbia River. The authorized channel is 150 wide and 10 feet deep to a turning basin at Chinook The turning basin is 590 feet long, 500 feet wide, 10 feet deep and is maintained by locals (fig. 1).

Sediment

Sediments have been classified as silty sand to sandy silt in specific locations in the channel.

Sediment Evaluations

1980 July and August, the report titled "Analysis of Elutriates, Native Water, and Bottom Material in Selected Rivers and Estuaries in Western Oregon and Washington" was conducted by the USGS and USACE. The purpose of this report was to provide reconnaissance to determine short-term water quality conditions associated with dredging operations in river and estuaries.

Three sediment samples were retrieved from shoals along the length of the channel. Sediments were analyzed for grain size and contaminates. The material progressed from silty sand to sandy silt from the beginning of the channel to the boat basin. Metals, pesticides, and PCB's were below established guidelines. Elutriate tests reveled concentrations of ammonia, cadmium, and manganese which exceeded guidelines. It was predicted that these would not cause adverse impacts.

1986 December, sediments were analyzed for grain size and contaminates. The analysis of the sediments reveled the same patterns as in the 1980 testing. Elurtiate testing for cadmium and manganese were below concern levels.

1987 July, sediments were analyzed for grain size and contaminates. The analysis of the sediments reveled the same patterns as in the 1980 testing. Elutriate testing for cadmium and manganese were below the concern levels.

1992 March, three samples were taken from silty shoals close to the mooring basin jetty using a modified Gray O'Hara box corer. Physical and chemical analysis was conducted. The channel material consisted of sandy silt with concentrations of heavy metals below the established concern levels. Organic contaminates were below concern levesl. One pesticide, one phenol and, two PAH's were detected. But no unacceptable adverse environmental impacts were expected. The material to be dredged was determined to be suitable for unconfined in-water or upland disposal.

1997 June, Six sediment samples taken from shoals in the channel were analyzed for both chemical and physical properties. Physical analysis indicated the material is primarily silty sand progressing to silt as the sampling approaches the marina. Chemical analysis include metals, polynuclear aromatic hydrocarbons (PAHs), total organic carbon (TOC), acid volatile sulfide (AVS), pesticides/polychlorobiphenyls (PCBs). All chemical and physical analysis for this material indicate that the material is suitable for either unconfined in-water or upland disposal with no adverse environmental impact expected.

2004 June, A total of six (6) box-core surface grab sediment samples were collected along the length of the Chinook Entrance Channel June 29, 2004. All samples were submitted for physical analyses including total volatile solids and 2 samples were analyzed for metals (9 inorganic), total organic carbon, pesticides and polychlorinated biphenyls, phenols, phthalates, miscellaneous extractables, polynuclear aromatic hydrocarbon and both porewater and total sediment organotin. Two (2) samples were

classified as “fat clay", and 4 samples as “poorly graded sand.” Mean grain size for all the samples was 0.13mm (range 0.0082mm to 0.2076mm), with 0.0% gravel, 65.2% sand (range 1.0% to 97.6%), and 34.8% fines (range 2.4% to 99.0%). Volatile solids for all samples ranged from 0.4% to 11.2% with a mean value of 3.7%. The material represented by this sampling event has been determined suitable for unconfined in-water placement, with no anticipated adverse environmental impact.

2006 June, A total of four (4) ponar surface grab sediment samples were collected along the length of the Chinook Entrance Channel June 28, 2006. All samples were submitted for physical analyses (including total volatile solids), metals (9 inorganic), total organic carbon, pesticides, polychlorinated biphenyls, phenols, phthalates, miscellaneous extractables, and polynuclear aromatic hydrocarbon..

Four (4) samples were submitted for physical analyses. Two (2) samples had > 90% sand, one (1) had 67.4% sand, and one had 7.8% sand. Median grain-size ranged from 0.217 mm to 0.008 mm. Volatile solids ranged from 1.04% to 10.8%.

The chemical data collected indicates low levels of metals present. DDT was detected in three samples and Aldrin in one. PCB detection/reporting levels were low, with non-detect (ND) results reported. Phenol and total phthalates were detected in all samples but at low levels. In three samples 4-Methylphenal were ND below 4.6 ppb however at station 0628-BBSS-P-04 it was detected at 2,300 ppb which exceed the DMEF screening level of 670 ppb. No LPAHs and HPAHs were detected in sample 062806-BBCC-P-01 while various LPAHs and HPAHs were detected in the other three samples.

Material from the Chinook Channel have not historically had a problem with the presence of significant levels of chemical of concern. In the present study except for the 4-Methlphenal at station 0628-BBSS-P-04 all chemicals of concern were below their respective DMEF screening levels (SL) and the material is considered suitable for unconfined in-water disposal. Additional testing of the fine grained material above RM 1.5 represented by station 0628-BBSS-P-04 would require additional testing before a suitability determination could be rendered.

2008 October, Six (6) gravity core samples were collected from Chinook Channel with penetration from 6.1’ to 8.5’. The dredging prism in the study area varies from 2’ to 5’. All sediment was fine-grained silt and clay with sand. Each of the 6 cores collected were retained as discrete samples, which were then divided to represent the dredging prism and the new surface material (NSM). All 12 sub-samples were then submitted for all standard SEF chemical parameters. Only the samples inside the breakwater were submitted for organotin (TBT) analyses. Only the dredge prism samples (6) were submitted for physical analyses.

The 3 additional core samples collected to provide the weight of evidence that 4-metholphenol was not present in the proposed dredge sediments were divided into 6 analyses representing the dredge prism and the newly exposed surface after dredging.

Analyses indicated 4-methol phenol was non-detect, with detection levels well below the SEF screening.

Some method detection limits (MDLs) for some of the semi-volatile compounds (a few phenols, phthalates and miscellaneous extractables) were greater than their respective SEF screening levels. A weight of evidence approach can, also, be applied to evaluate these higher than desired detection limits. The 2006 data did not detect any of these compounds, with sufficiently low MDLs to evaluate all compounds and is similar in grain-size to the 2008 material tested. In addition, none of these compounds have been detected in any of the historical data from Chinook or any other fine-grained side channels in the Columbia River system, including those in close proximity or up-stream: Ilwaco, Astoria turning basin or boat basins, Skipanon Channel or boat basin, Tongue Point, Old Mouth of Cowlitz or Westport Slough. There is no known source or history of these compounds being present in the lower Columbia River including the Willamette River Federal Channel. The portion of the channel sampled in 2008 was last dredged sometime prior to the 2004 sampling event. The 2004, 2006, and 2008 Chinook data represents material beyond channel mile 1+24 that is undisturbed by any dredging during that time frame.

As a result of the weight of evidence provided above, the Chinook Channel (outer and inner portions as described) sediments are considered acceptable for open in-water placement without further characterization. The characterized sediment of Chinook Channel meets the SEF guidance of low-ranked material and has subsequent suitability determination duration of 7-years (2015).