

Beneficial Use of Solid Waste Determination Evaluation Form



State of Oregon
Department of
Environmental
Quality

Applicant: Port of Portland

BUD#: 20110803

Solid Waste: dredged sediment

Summary of Proposed Beneficial Use:

The Port of Portland proposes to use approximately 20,000 to 40,000 cubic yards of sediments that the Port will dredge from the Columbia River at Terminal #6, Berths 601, 603, 604, 605 and 607, as fill material for future marine commercial and industrial development at the established West Hayden Island Placement site.

Reviewer: Tim Spencer

Date: September 30,
2011

Tier: One Two Three

Beneficial Use of Solid Waste

Beneficial use of solid waste is a sustainability practice that may involve using an industrial waste in a manufacturing process to make another product or using a waste as a substitute for construction materials.

The environmental benefits of substituting industrial waste materials for virgin materials includes conserving energy, reducing the need to extract natural resources and reducing demand for disposal facilities.

Oregon Administrative Rules (OAR) 340-093-0260 - 0290 establish standing beneficial uses and a process for DEQ review of case-specific beneficial use proposals. Under these rules, DEQ may issue a beneficial use determination as an alternative to a disposal permit for proposals that meet the rule criteria. Once a beneficial use determination is issued, DEQ no longer regulates the waste as a solid waste as long as the waste is used in accordance with the approved beneficial use determination.

Beneficial Use Determination Evaluation Summary

Yes, the Beneficial Use of this solid waste meets all the case-specific performance criteria listed below and is approved.

No, the Beneficial Use of this solid waste does not meet all the case-specific performance criteria listed below and is not approved.

Notes: The Port of Portland submitted information necessary for DEQ to make a determination,

Case-Specific Beneficial Use Performance Criteria:

DEQ may approve an application for a case-specific beneficial use of solid waste only if all the following performance criteria are addressed: 1) Characterization of the Solid Waste; 2) Productive Beneficial Use

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of the Solid Waste; and, 3) The affect of the Proposed Beneficial Use on Public Health, Safety, Welfare and/or the Environment.

1) Characterization of the Solid Waste

Did the applicant characterize the solid waste and proposed beneficial use sufficiently to demonstrate compliance with the rules for case-specific beneficial use determinations (OAR 340-093-0280) by submitting required information for the appropriate tier? (See tier sections below for detailed characterization information.)

Yes No

Notes: The Port of Portland provided the necessary description of the material and how it is proposed to be used.

Was the following information submitted for DEQ review and how adequate was it?

Tier 1 Applicable Not applicable

- Did the applicant provide an adequate description of the material proposed for beneficial use, the manner of generation and the estimated quantity to be used beneficially each year?
 Yes No

Notes: The material is fine to medium -grained sediment (mix of silt and fine to medium grained sand) from T-6 (Terminal 6 berths 601,603, 604, 605,and 607) in the Columbia River. The sediments will be generated by maintenance dredging and the quantity will be approximately 20,000 to 40,000 cubic yards. Dredging will occur in accordance with existing U.S. Army Corps of Engineers permit Nos. NWP-2006-635 and NWP-2008-28

- Did the applicant provide an adequate description of the proposed beneficial use and justify how the proposed use is beneficial?
 Yes No

Notes: The Port of Portland proposes to use the sediments as fill material to increase site grade prior to future development at West Hayden Island (see section 2 notes below).

- Did the applicant provide a sufficient comparison of the chemical and physical characteristics of the material proposed for beneficial use with the material it will replace?
 Yes No

Notes: Dredge sediments have similar characteristics to soil fill. In DEQ's experience, dredged sediments are commonly used as fill material.

- Did the applicant successfully demonstrate compliance of the proposed beneficial use with the performance criteria in OAR 340-093-0280 based on knowledge of the process that generated the material, properties of the finished product, or testing?
 Yes No

Notes: See notes 2) and 3) below.

- If required, did the applicant provide any other DEQ required information to evaluate the proposal?
 Yes No

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Notes: In addition to the original application, the applicant provided the original report on sediment quality, updated land use information from the city of Portland verifying that the LUCS issued for Post Office Bar sediment was still valid for sediment placement at West Hayden Island, and information about outreach efforts that the Port has taken..

Tier 2 Applicable Not applicable

- Did the applicant submit all the information required for a Tier 1 application?
 Yes No

Notes: See notes for Tier 1.

- Did the applicant submit adequate sampling and analysis to make a determination of suitability for beneficial use? (Note: The analysis must provide chemical, physical, and biological characterization of the material proposed for beneficial use and identify potential contaminants in the material or the end product, as applicable.)

Yes No

Notes: The Regional Sediment Evaluation Team's Project Review Group (PRG) has classified the dredge prism sediments from Berths, 601, 603, 604, and 605, and 607 as suitable for unconfined in-water placement. However, sediment quality data collected from Berth 607 detected tributyltin (TBT) levels that exceeded the screening level values for aquatic receptors. The Portland District Project Review Group (PRG) determined that this material was unsuitable for unconfined inwater disposal without additional biological testing. Accordingly, the Port ran 28-day bioassays on sensitive species. Bioassays passed the sediment evaluation framework (SEF) success criteria and the review group (PRG) determined the dredge material suitable for unconfined aquatic placement. DEQ's review of the upland disposal scenario at West Hyden Island indicates that , the tributyltin levels detected in one sediment sample (berth 607) do not represent a significant risk to terrestrial ecological receptors for the following reasons: 1) Tributyltin has very low solubility and strong affinity for absorption onto soil particles. Consequently, it has low mobility in soil and in groundwater; 2) Terrestrial species have a higher tolerance to its effects; 3) Berth 607 sediment will be mixed with sediment from other T-6 berths resulting in greatly reduced concentrations of tributyltin within the sediment fill.

- When applicable, did the applicant provide a risk screening comparing the concentration of hazardous substances in the material to existing DEQ approved, risk-based screening level values, and demonstrate compliance with acceptable risk levels?

Yes No

Notes: The Port of Portland provided a comparison of chemicals detected to screening levels (Table 1 of the application) for upland ecological and human receptors. The applicant's screening against DEQ risk screening levels identified three compounds of potential concern that exceeded DEQ Level II ecological screening levels (SLVs) (mercury, zinc, and dibenzofuran). Accordingly, the applicant performed a detailed risk analysis of these three compounds (Table 2 of the application) considering the ingestion pathway for non-threatened and endangered terrestrial species and threatened and endangered birds (bald eagles). This analysis identified zinc as the only contaminant of potential concern to T&E birds but ultimately concluded that the weighted average zinc levels essentially are equivalent to background concentrations in the Portland area. DEQ's evaluation concurs with the Port's conclusions and finds that the T-6 dredge sediments

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pose no more ecological risk than the previously approved Post Office Bar dredged sediment. Mercury exceeded SLV for T&E in one sample, but only by .01 ppm. Average concentrations for mercury in T-6 sediment are well below conservative screening values. Similarly, average dibenzofuran levels were well below SLVs. Zinc at 98 ppm (average value) exceeded the screening value of 86 ppm, based on a default background concentration. The concentration of zinc detected, however, is within the expected range of naturally occurring background concentrations in Oregon soil and DEQ has revised (draft) the background level for zinc to 95ppm.

- When applicable, did the applicant supply the location or type of land use where the material will be applied, consistent with the risk scenarios used to evaluate risk?
 Yes No

Notes: The Port of Portland is the site owner. The current zoning is Multiple Use Forest 19 Acre Minimum (MUF 19) with a Significant Environmental Concern overlay. The City of Portland has confirmed through Land Use Compatibility Statements, the most recent signed September 22, 2010, that the placement of dredged sediments is currently allowed on West Hayden Island (a pre-existing nonconforming use allowed outright). The City of Portland provided follow-up information via email on September 29, 2011 confirming that the 2010 LUCs was still valid for placement of dredged sediments on West Hayden Island.

The primary human health risk scenario used was occupational. This scenario is protective for commercial/industrial, recreational and other uses. Only residential use of the property would not be acceptable. Ecological risk was evaluated for threatened and endangered species, such as the bald eagle.

- When applicable, did the applicant supply contact information of property owner(s) if this is a site-specific land application proposal, including name, address, phone number, e-mail, site address and site coordinates (latitude and longitude)? Yes No

Notes: The Port of Portland is the applicant and property owner. Approximate site coordinates are in the application.

- Did the applicant supply an adequate description of how the material will be managed to minimize potential adverse impacts to public health, safety, welfare, or the environment?

Yes No

Notes: The West Hayden Island Placement Facility is an existing dredge material facility. The Port of Portland prepared the facility by constructing a berm around the entire 102-acre site. The lowest elevation of the berm is more than 5 feet higher than the 100-year flood plain. The T-6 dredge material would be placed within a cell at the back of the site, furthest from the shoreline of the Columbia River. Return water is held in settling ponds and no surface water would be released back into the river. Contaminant concentrations in the sediments do not pose an unacceptable risk to people and wildlife.

Tier 3 Applicable Not applicable

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- Did the applicant submit all the information required for a Tier 1 & Tier 2 application?
 Yes No
- Did the applicant provide an adequate discussion of the justification for the proposal?
 Yes No
- Is there an estimated length of time that would be required to complete the project, if it is a demonstration?
 Yes No
- If it is a demonstration project, are their methods proposed to ensure safe and proper management of the material?
 Yes No

2) Productive Beneficial Use of the Solid Waste

Has the applicant demonstrated that the proposed beneficial use is a productive use of the material by providing information substantiating the criteria listed below?

Yes No

Notes: See notes below.

- Did the applicant successfully identify or demonstrate a reasonably likely proposed beneficial use for the material that is not speculative?
 Yes No

This criterion consists of three parts.

1. Identified Use:

Has the applicant clearly stated what the waste is going to be used for, that the waste is compatible with that use and the proposed quantity is necessary?

Yes No

2. Reasonably Likely Use:

Has the applicant identified, with supporting documentation, the timeframe within which this use is likely to occur (e.g., zoning info, master plan for development, letters from local jurisdictions, etc)?

Yes No

3. Not Speculative:

For Land application - has this material been used at other sites for the same purpose, is the material feasible for use at this site for this purpose, or has the applicant identified a known potential for this use at this site?

Yes No N/A

For uses other than land application - has the material been used in a product before, is the material feasible for use in a product, or has the applicant identified a known potential for use in this product?

Yes No N/A

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Notes: The Port of Portland has identified the intended use as fill material at West Hayden Island. The Port requires a large volume of material (well over 40,000 cubic yards) for development.

While the City of Portland has not made a final decision, it has started a planning process on how West Hayden Island will be developed. In 2004 Metro identified West Hayden Island as a "Regionally Significant Industrial Area." In 2010 Metro completed a draft Urban Growth Report that assumes approximately 380 acres on West Hayden Island is available for large lot future industrial development. Metro further determined that West Hayden Island contained both high development value and high riparian value. In July 2010 the Portland City Council adopted Resolution No. 36805 that directs the Bureau of Planning and Sustainability to develop a legislative proposal for annexation of West Hayden Island and to identify no more than 300 acres for future marine terminal development. The City of Portland has begun a process to develop a legislative proposal and expects a council decision on the proposal in the Spring 2012. If approved, the Port of Portland would then take further steps towards development with an expectation that the complete planning and initial development process will take a minimum of five to ten years.

The value of sediments as fill material is not speculative. Sediments are commonly used for fill material. In making a determination that the proposed use is beneficial, DEQ relied on the history of dredged sediment placement at the site, the fact that current land use allows sediment placement, that use of dredged sediments as fill material is a common practice, that the Port of Portland requires fill material to develop the property for future marine commercial or industrial use, that the sediment contaminant concentrations are below screening levels for current uses by people and wildlife, and that the City is engaged in a planning process to evaluate area uses that include marine development.

- Is the use a valuable part of a manufacturing process, an effective substitute for a valuable raw material or commercial product, or otherwise authorized by the Department and does not constitute disposal? Yes No

Notes: Sediments are an effective substitute for soil fill material. The Port of Portland has identified a need for fill material at the West Hayden Island location. Placement at this location for this purpose would not constitute disposal under the beneficial use rules.

Current land use would allow the placement of dredged sediments at this location as a disposal activity (approved under a DEQ Solid Waste permit). This would be the alternative to meeting the requirements of a beneficial use determination.

- Is the use in accordance with applicable engineering standards, commercial standards, and agricultural or horticultural practices? Yes No

Notes: Sediments are an effective substitute for fill. Structural, landscaping, and hardscape materials will likely be required on top of the fill to prepare the finished surface as part of development.

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3) Effect of Proposed Beneficial Use on Public Health, Safety, Welfare and/or the Environment

Has the applicant demonstrated the proposed beneficial use will **not** create an adverse impact to public health, safety, welfare, or the environment, by providing information substantiating compliance with the criteria listed in the bullet list below?

Yes No

Notes: See notes below.

- Has the applicant demonstrated that the material is not a hazardous waste under ORS 466.00?
 Yes No

Notes: Contaminant concentrations in the sediment are well below hazardous waste criteria.

- Has the applicant demonstrated that until the time this material is used according to a beneficial use determination, the material will be managed, including any storage, transportation, or processing, to prevent releases to the environment or nuisance conditions?
 Yes No

Notes: The material is required to be managed to prevent adverse impact as part of the dredging 401 Water Quality Certification.

The Port of Portland prepared the West Hayden Island Placement Facility by constructing a berm around the entire 102-acre site. The lowest elevation of the berm is more than 5 feet higher than the 100-year flood plain. The T-6 dredge material would be placed within a cell at the back of the site, furthest from the shoreline of the Columbia River. In addition, DEQ evaluated the likelihood that flooding could result in environmental contamination. Assuming a conservative scenario that all the T-6 sediments are released back into the Columbia River from a flood event, about 125 million cubic feet of water will pass by the island within an hour, and 3 billion (125,000,000 x 24 = 3,000,000,000) cubic feet within a day. Because the dredged material is fine to medium grained, it will be dispersed widely during such an event and be so diluted that any identified contaminants would be further below levels of concern for any aquatic life or people.

The U.S. Army Corps of Engineers evaluated the potential for contaminants from dredged material placed at West Hayden Island to migrate to groundwater and hence to the Columbia River or other water bodies and found it to be negligible. In addition, a DEQ hydrogeologist conducted an analysis for the Post Office Bar Sediment project and concluded that seepage to the Columbia River or wetlands via groundwater will have virtually no impact from chemicals in the sediment placement areas. The pertinent findings include:

- The dredged sediments consist of silt and fine to medium sand.
- The material underlying the disposal cell is sand, but also contains significant quantities of silts.
- It is more likely that silty material will absorb zinc, mercury and dibenzofuran rather than these chemicals migrating to groundwater or the Columbia River.
- Using conservative estimates and calculations, DEQ estimates that the time needed for groundwater to flow from the placement cell to the Columbia River is greater than two years, during which time silty material will absorb any potential contaminants that move along the groundwater flow path.
- Even if chemicals such as zinc enter groundwater the flow of groundwater will be very slow, no more than 0.03 cubic feet per second.

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- Using the lowest flow in the Columbia River on record (63,600 cubic feet per second on 9/9/2001) at a nearby gauging station, the dilution ratio of Columbia River water to discharging groundwater is over 2 million to 1.
- Rainfall appears to form the wetlands rather than groundwater discharge because geotechnical and monitoring wells indicate the depth to groundwater is about 10 to 15 feet below ground surface. This means that any chemicals in the groundwater will not reach the nearby wetlands.

Contaminant levels in the T-6 sediments are very low to begin with and do not pose a significant risk to groundwater quality

- Has the applicant demonstrated that hazardous substances in the material, if any, meet one of the criteria in the bulleted list below? Yes No
 - Hazardous substances do not significantly exceed the concentration in a comparable raw material or commercial product;
 - Hazardous substances do not exceed naturally occurring background concentrations; or
 - Hazardous substances will not exceed acceptable risk levels, including persistence and potential bioaccumulation, when the material is managed according to a beneficial use determination.

Notes: DEQ's evaluation concludes that sediment contaminant concentrations do not pose an unacceptable risk to human or ecological receptors. A 98 ppm weighted average concentration of zinc is not significantly different than DEQ's current default background concentration of 86 ppm zinc or DEQ's (draft) revised background concentration for Zinc of 95 ppm.

- Has the applicant demonstrated that the proposed beneficial use will not result in the increase of a hazardous substance in a sensitive environment, such as a park, wildlife refuge or wetland? Yes No

Notes: The T-6 sediments are currently in a sensitive environment, the Columbia River. West Hayden Island has not been sampled to determine existing concentrations of hazardous substances, but low concentrations are often detected in soil and sediment in the Portland/Metro area and are considered to be urban anthropogenic baseline or background. The concentrations of hazardous substances in the T-6 material is similar to concentrations detected in other dredge sediment placements at West Hayden Island (e.g., Post Office Bar). Additionally, the concentrations of hazardous substances in the T-6 sediments are at a low level and will not adversely impact people or the environment at West Hayden Island.

- Has the applicant demonstrated that the proposed beneficial use will not create objectionable odors, dust, unsightliness, fire, or other nuisance conditions? Yes No

Notes: Dredged sediments will be pumped as a slurry from a barge into a bermed cell. The Port of Portland manages the West Hayden Island Placement Facility to address potential nuisance conditions.

- Has the applicant indicated that the proposed beneficial use will comply with any other applicable federal, state, and local regulations? Yes No

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Notes: The dredging project will be managed by the U.S. Army Corps of Engineers and DEQ has issued a 401 Water Quality Certification. The City of Portland has confirmed through Land Use Compatibility Statements and an updated interpretation and confirmation that the placement of dredged sediments is currently allowed on West Hayden Island.

4) Public Involvement Evaluation (Note: this is not a Beneficial Use evaluation criterion)
Determine a public involvement recommendation using the current **Guidance to DEQ Solid Waste Program Staff and Managers on Public Notice & Participation.**

- Is public notice and participation being recommended for this application?
 Yes No

Notes: DEQ will provide a public notice and open the beneficial use determination for public comment and meet with the local community.