Confined Disposal Facilities: Portland Harbor Draft Feasibility Study
By Environmental Stewardship Concepts, LLC
For the Willamette Riverkeeper and the Portland Harbor CAG
July 27, 2012

Introduction

A confined disposal facility (CDF) is a disposal area for contaminated dredged material and is a remediation option being proposed in the Feasibility Study. CDFs are engineered disposal areas used to retain moderately contaminated sediment dredged from rivers, lakes and coastal waters. The effectiveness of a CDF depends on its design, construction, operation and management *(Palermo and Averett 2000).* CDFs may be used to contain volatile and semivolatile organic compounds. The size and design of CDFs can be tailored to accommodate the project constraints and sediment contamination levels. They may be simple structures with passive weir systems, i.e. barriers that stretch across the width of the river; or complete structures with leachate collection systems, liners, and other engineering controls to mitigate contaminants from migrating off-site. The most basic designs must incorporate a large enclosed area for material disposal and adjoining areas for retention and decantation of turbid water and clay or bentonite liners *(Palermo and Averett 2000).* However, even with the liners in place, some leaching of contaminants is possible. Localized aesthetic impacts such as noise and odor are also common with the utilization of a CDF.

CDFs require active monitoring of groundwater, surface water, air emissions, soils and leachate because CDFs can be active for twenty or more years after installation. Continuous monitoring is required to ensure that there are no seepages of contaminants entering the groundwater through the bottom of the CDF, or effluent waters discharging into adjacent harbor, lake or stream systems *(Palermo and Averett 2000)*. As the ponded water inside the CDF begins to rise, lateral leakages must be restricted to allow for proper release to the proper pathways *(US EPA 2003)*. Confined disposal facilities require reliable maintenance, can be costly, and have been associated with diminishing capacities *(US EPA 2003).*

These facilities are able to retain a high percentage of the contaminants they receive and can produce effluents that consistently meet state water quality requirements when managed optimally. CDF operators can use computer models to track and calculate the long-term release of contaminants in order to meet regulations and make changes to better the control of contaminated matter *(US EPA 2003).* In lakes and river systems outside CDFs, biological communities may not be exposed to the high levels of contamination as a result of the confinement and removal of the contaminated sediments by these systems *(US EPA 2003).* However, the living organisms that inhabit

or frequent the large area occupied by CDFs may uptake increased levels of contaminants concentrated there. The accumulation of contaminants in the tissues of organisms inhabiting the environment around the CDF is possible, which can lead to bioaccumulation of the contaminants up the food chain *(US EPA 2003).*

The design of the CDF and its dike structures must take into account factors such as currents, storm surges and earthquakes. Without a complete engineering analysis, the structural aspects of any CDF will fail. In Trenton New Jersey, a dike within the disposal facility failed, causing a discharge of sediments dredged from the Delaware River into area wetlands in August of 2009. Engineering considerations must include the r) stability since seismic activity has been known to damage the structure of a CDF and disrupt their activities. This requires installation of structures that allow for limited deformation in the event of an earthquake *(The Port of Los Angeles, April 2009).* In the event of a catastrophic earthquake, contaminated sediments can be released, contaminating the surrounding areas. The release of contaminated matter would expose previously uncontaminated areas, adversely affecting fish, wildlife and human health. A CDF project should include a contingency plan for timely inspections after any such earthquake or seismic event.

Concerns surrounding the installation of a CDF are many: migration of contaminants into ground water due to surface runoff and leaching below the CDF; ability to withstand earthquakes; bioaccumulation effects on local wildlife and human health; and proper monitoring for the life of the CDF. Given the physical parameters defining the successful implementation of a CDF are substantial, complete engineering plans for a CDF, taking into account their disadvantages, is required. These CDF plans must include public input throughout their design and construction.

Draft Feasibility Study Main Text

Comments:

In discussing the selection of upland disposal options, **Section 7.4** states that))) water CDFs/CAD was generally minimized, such that if a larger CDF/CAD could handle the capacity of multiple smaller ones, then the) qr t R qor)) Sediments throughout the harbor contain different predominant contaminants. For the purpose of ex situ treatment options relative to the chemicals dredged, multiple, smaller CDFs could be beneficial. Please describe how the generalization of the treatment of specific sediment contaminants will be avoided under this method.

Appendix Ja

Description of Disposal Options

Details about disposal options are described in this appendix. Information from this appendix supports **Section 6.2.9** in the main text of the FS draft.

Comments:

Section 1.2 states that in-water CADs are not specifically evaluated in the FS but may be used in the remedial design. If this is a potentially viable technology and if it may be included in the remedial design, it needs to be evaluated in the FS.

Sections 1.2.1 and **1.2.2** l))) qor) -Site; therefore,))))) qs qzo)) P) '))) permit exemption.

Section 1.3.1 l) o)))) w) z) qor) D)) Section 2.2.5), the concept for the Swan Island Lagoon CDF is subject to P) w))) l))))))) changes? Will there be opportunities for public input?

Appendix Jb

Evaluation of Potential Water Quality Impacts from In-Water Disposal Alternatives

This appendix evaluates potential water quality impacts associated with the construction and long-term use of in-water disposal technologies. Models, parameters, and hypothetical characteristics of the Terminal 4 and Swan Island Lagoon CDFs are discussed. The appendix states that modeling results suggest that CDF construction and long-term use will be protective of human health and the environment.

Comments:

Section 1.0))) o) qr t)))))) simpl) l)))))))) section. Will the Arkema CDF undergo a comparable analysis, as it is included as a potential disposal option in the FS?

Section 1.0) l))))) escribed here) could be modified or refined in remedial design if these disposal options are)))) P)))))) to comment on these modifications and/or refinements?

Section 2.2 states that, during berm construction, water quality monitoring)) P))))) -term))) effectiveness; language should be changed to ensure that water quality monitoring will be conducted during berm construction.

Section 2.2 states that imported materials being placed during the berm)))) Are there specific standards for the imported material? This information is critical to a meaningful water quality impact assessment.

Section 2.2.1.1) l) w)) qr t))))))
the ability to meet acute water quality criteria at the end of the pipe should be
P)))))))))))
measures to ensure meeting water quality standards.

Section 2.2.1.1) l) w) s' o)))))))
the end of the pipe after the above evaluations, then a mixing zone analysis would need to show that acute water quality criteria would be met within a mixing
P)))) l) l))))))
water quality criteria are not met within a mixing zone.

Section 3.1) l))))))))
appropriate requirements (ARARs) related to surface water will be established by the EPA for the Portland Harbor Superfund Site in the Record of Decision (ROD), and the determination of how water quality standards and associated performance standards are applied to a Portland Harbor CDF facility will be
))) P)))))))) t m)
opportunity for public input during this process?

Section 3.1))) qr t)))))
considered during)) P))))))
during the process of creating different standards than those used in the FS?

Section 3.5 states that MODFLOW-2000 was used for groundwater modeling. There is a more recent, 2005, version of) P)))))
current version used?

Appendix Jc

Seismic Assessment of CDF Designs

This appendix evaluated the Swan Island Lagoon CDF option in its long-term effectiveness, considering potential seismic occurrences. A prior, more in-depth analysis was conducted on the Terminal 4 CDF, so some information was extrapolated from the Terminal 4 analysis. Additionally, information from monitoring well logs and regional geologic data were reviewed to assess the similarity between the two proposed CDFs. The appendix concluded that the Swan Island Lagoon CDF should satisfy the seismic-related CDF performance standard.

Comments:

Section 3.0 states that detailed analyses of certain seismic hazards, such as
l)) l)) l)))))
the remedial design phase. Given the uncertainty and concern over the CDF and seismic activity, the CDF design should be established and all parameters fully analyzed during the FS process. The CDF engineering should be as fully developed as possible before being chosen as a remedial technology.

References

Morace, J.L. 2012, Reconnaissance of contaminants in selected wastewater-treatment-plant effluent and stormwater runoff entering the Columbia River, Columbia River Basin, Washington and Oregon, 2008 10: U.S. Geological Survey Scientific Investigations Report 2012 5068, 68 p.

Palermo, M. R., and Averett, D. E. (2000). q))) D qr t E) h) o)))) *DOER Technical Notes Collection* (ERDCTN-DOER-C18), U.S. Army Engineer Research and Development Center, Vicksburg, MS. *www.wes.army.mil/el/dots/doer*

US Army Corps of Engineers. April 2009. Port of Los Angeles Channel Deepening Project: Volume I Final Supplemental Environmental Impact Statement/ Supplemental Environmental Impact Report. Attachment D: Briefing Paper Berths 243-245.

US EPA. 2003. u) z) q) r) t P) r))) o) US Army Corps of Engineers. Report April, 2003.