Sedimentation Comments on the Portland Harbor Draft Feasibility Study
By Environmental Stewardship Concepts, LLC
For the Willamette Riverkeeper and the Portland Harbor CAG
July 27, 2012

Introduction

Sedimentation rates are measured for a river bed to determine the average additional sediment laid down over time. It is usually calculated in centimeters per year (cm/yr) and may be a negative value for those areas of the river that experience activities that cause erosion (near-shore areas, boat-scour events, debris movement, high current, navigation channel erosion, etc.). A cross sectional analysis of the river bed at a particular river mile will indicate the sedimentation rate from a shore to shore perspective (perpendicular to the river flow), while a lateral analysis will look at the same area (eastern shore, navigation channel, or western shore) for a stretch of river that is parallel to the river flow.

The sedimentation rate analysis by the Lower Willamette Group (LWG) has determined that, overall, the river is depositional. However, there is a great deal of variation in deposition across the riverbed laterally and longitudinally, which makes calculation of an average sedimentation rate an unrealistic representation of the river. High streamflow is also a barrier to predictable and dependable sedimentation rates in a river. The Willamette River consistently has human activities, navigational dredging, high streamflow events, and tides that disrupt the amount of sediment laid down over time, as well as the likelihood of the sediment staying in place. Predictably high
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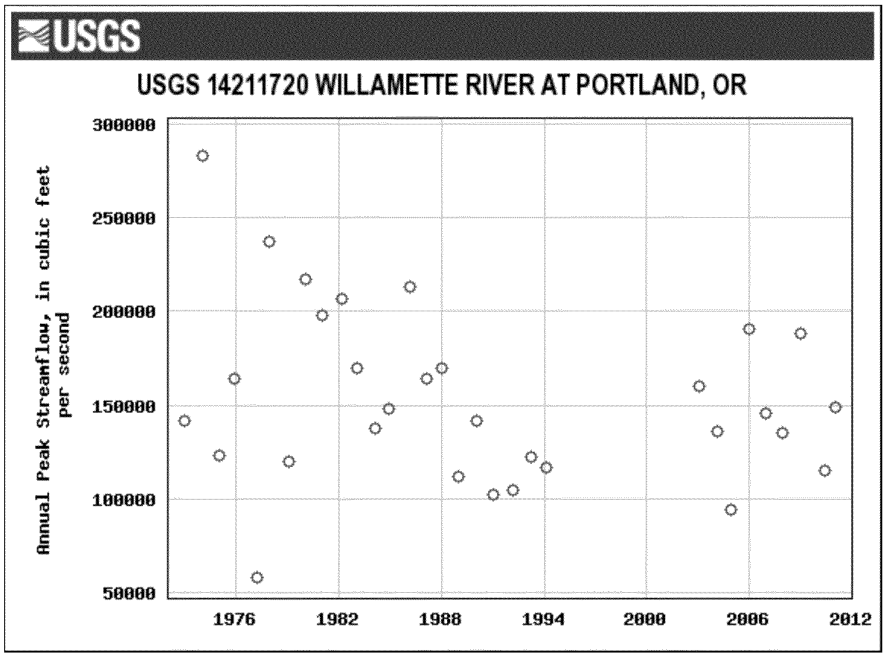
with the characteristics of the Willamette River. An average sedimentation rate of 2.6 cm/yr was calculated in this report from only six years of data (May 2003 to January 2009), and excluded data from January 2002 to May 2003 which had an average sedimentation rate of 0 cm/yr. Whatever the calculated sedimentation rate, however, the rate will not be true for every part of the river, and for those segments of the river where it is true, it ma))))))))) D

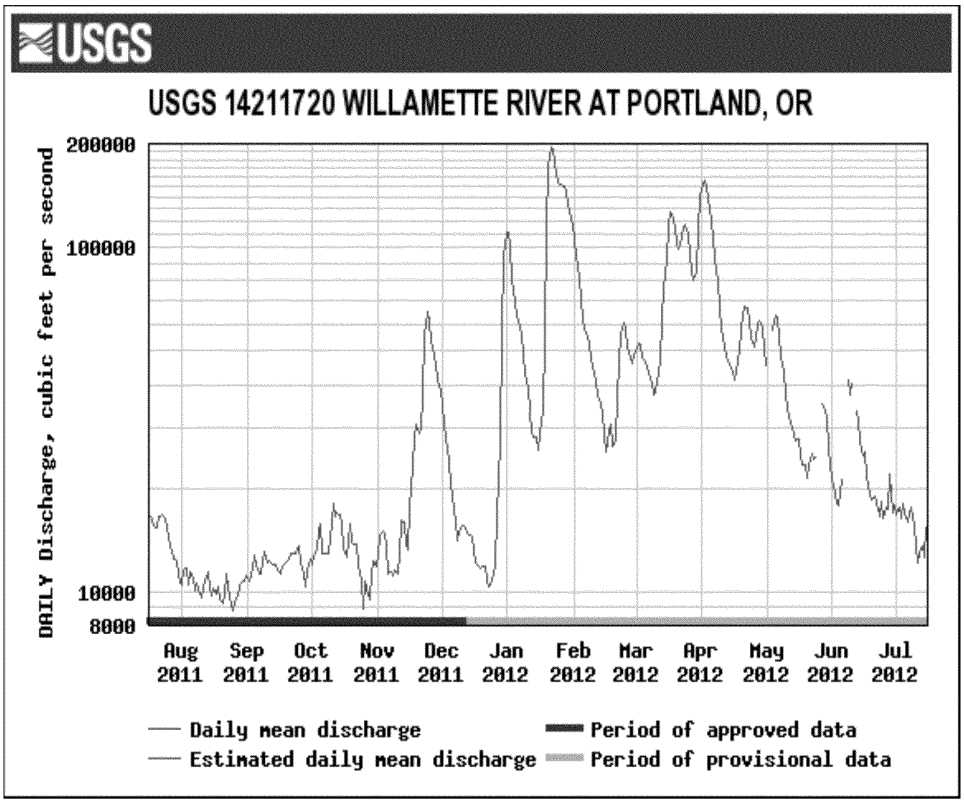
Figure 1 shows the highest streamflow recorded for each year, from 1972 to 2011, at Portland Harbor. Figure 2 shows the daily discharge, or streamflow, for one continuous year at Portland Harbor (July 2011-July 2012). These figures demonstrate the high flow capabilities of the river at Portland Harbor. As streamflow increases, the less likely the sediment will be able to drop out of the current and settle along the riverbed.

Figure 1. Annual Peak Streamflow



http://nwis.waterdata.usgs.gov/or/nwis/peak/?site_no=14211720

Figure 2. Daily Discharge July 2011 to July 2012



http://waterdata.usgs.gov/or/nwis/dv?cb_00060=on&format=gif_default&begin_date=2011-07-17&end_date=2012-07-15&site_no=14211720&referred_module=sw

Portland Harbor Draft Feasibility Study
Comments Related to Sedimentation

General Comments

The Portland Harbor has been drastically modified to accommodate a navigation channel, which constitutes 60% of the riverbed. It is noted in the Feasibility Study that 90% of the river in Portland is depositional. That the Harbor is a stopping point for much of the Willamette River sediment is questionable based on the size, substantial flows and extreme tides in the area. Care should be taken in the remediation effort to determine impacts downstream as well.
MNR still shows little evidence for sustained protection of a river system with high flow events and tides. Its use as a remediation method disregards the immediate need for treatment and permanent removal of contaminated sediment and instead relies on the unpredictable and variable burial of sediments over decades. The health and protection of humans and wildlife should not be left up
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Specific Comments

2.2.1 Sediment

y)))))) y but biased toward areas of known or suspected contamination based on existing information with additional
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Comment 1: How far up and downstream? What was the reasoning for the distance sampled up or downriver? Was there seasonal sampling completed up and downstream of the Harbor?

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Comment 2: Were sediment toxicity tests also run on sediments up and downstream of the site as well?

z))) 6 t t 8-) area weighted average concentration (SWAC) for vgf))

Comment 3: What are natural neighbors? How is a SWAC calculated? These need to be defined on first reference, or in the introductory material. The only place SWAC is defined is in the Executive Summary, which should be a summary of information that can be found in the body of the FS.

z) y "eg))) E) zi w))) y) e)) G D G H Q) D) localized areas with highly elevated concentrations, surface sediment total dioxin/furan

TEQ concentrations in the Study Area are similar to those in the upstream and
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Comment 4: The SWAC is not a good indicator for the PCB/TEQ hotspots that need remediation. The hotspots and their locations should be described here.

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Comment 5: If surface sediments are higher than elsewhere, than not all the sources are historical, and simple burial will not achieve cleanup objectives.

3.2.1 RAO Considerations

Because of these upstream loads, Portland Harbor sediment remedies by themselves will not result in the achievement of surface water concentrations at the Site below these potential surface water ARARs. Other contaminant reduction efforts conducted under other regulations and programs within the Willamette River watershed would be necessary to achieve these)) D

Comment 6: Could a determination about the sediment remedies be made based on the source control plans already in place?

4.2 RAL Development Methods

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contaminant and there is some uncertainty with the evaluations (see Section 4.5), the
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Comment 7: Remediation of the site and the human and ecological health of the Harbor)))))))))))
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across the site and their being uncertainty about the evaluation of natural recovery.

4.3.1 Total PCB RALS

y B))) - and) 30-year curves, the calibrated QEAFATE contaminant fate model (Appendix Ha) was used and assumes that all active remediation is completed at time zero, without significant natural recovery to the system during the active remediation period. This is a simplifying and conservative assumption used for RAL development purposes only; detailed modeling and evaluations of alternatives in Section 8 include assessment of Site recovery processes both during and after construction.

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there is not any significant natural recovery during active remediation? There will most likely be more disturbance to the system, rather than less, that will prevent

any natural recovery from taking place during active remediation. The benefit of active remediation has to do with its permanent removal of contaminated sediments from the environment.

e B)))) B)))))) events that)) temporarily reveal recently buried, somewhat higher levels of contaminants at or near the 10- or 30-year points in time. As discussed more in Appendix Ha, these situations generally appear to be temporary and focused around specific erosional e D

Comment 9: In an active Harbor that experiences tides and contains a large amount of manmade debris, erosional events are the norm and should be modeled as such.

4.4 Summary of Selected RALS for the Draft FS

For some of the lower RALs provided by EPA, EPA generally appeared to judge these xer)))) xl)) vxl)))))) 6 i ve) I G H H

Comment 10: The use of lower RALs to achieve a specific RG makes sense. Why wait over a decade, and rely on the unpredictable process of natural recovery, to achieve an RG when the active remediation process can achieve it more immediately?

5.6.1 Erosion Due to River Currents

z))) B) -year flow event creates some short-term perturbations in the Site surface sediment concentrations, these changes are relatively D

Comment 11: Is the 100-year flow event the same as a 100-year flood event? Description of similar elements between the modeling and the real flood event would be helpful to the public.

6.2.2.1.1 Empirical Lines of Evidence

e)))) nyz)) 6) y) I D J D N)) -beam) r 8 B) bathymetric survey data (and specifically the data on sedimentation rates within the Site collected from May 2003 to January 2009) were used to calibrate the long-term sediment) D

g) H I S) "))) - May 2003 used to calibrate the long-term sediment transport model. Table 6.2-2 shows that for this period, the calculated average net sedimentation rate was 0, much lower than the other two averages calculated: 2.1 and 3.5 (May-03 to Mar-04 and Mar-04 to Jan-09, respectively). To exclude this data leaves out a major data set that could have decreased the overall sedimentation rate.

t) ation rates are generally higher towards the upstream end of the Site (i.e., upstream of RM 7) and downstream of RM 3, while the middle portion of the Site generally experiences somewhat lower net sedimentation (particularly between RMs 5 and 7, where there are several zones of no discernible change in bed elevation shown on Figure 6.2-H 8 D

Comment 13: Some of the most contaminated sediment occurs between RMs 5 and 7, which has a low net sedimentation rate. This should indicate that sediment removal is an integral part of remediation of this area.

Table 6.2-2 Site-wide Net Sedimentation Rates Estimated from Multi-beam Bathymetric Survey Data

Comment 14: The average net sedimentation rate should have been done across consistent time periods. What is the reason for averaging across 16 months, 10 months, and then 58 months?