2013 Source Control Conference

Navigating the Complexities of Overlapping Authorities: Portland Harbor Case Study

Stormwater Source Control at a Superfund Site

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Portland Harbor Superfund Site
Portland, Oregon

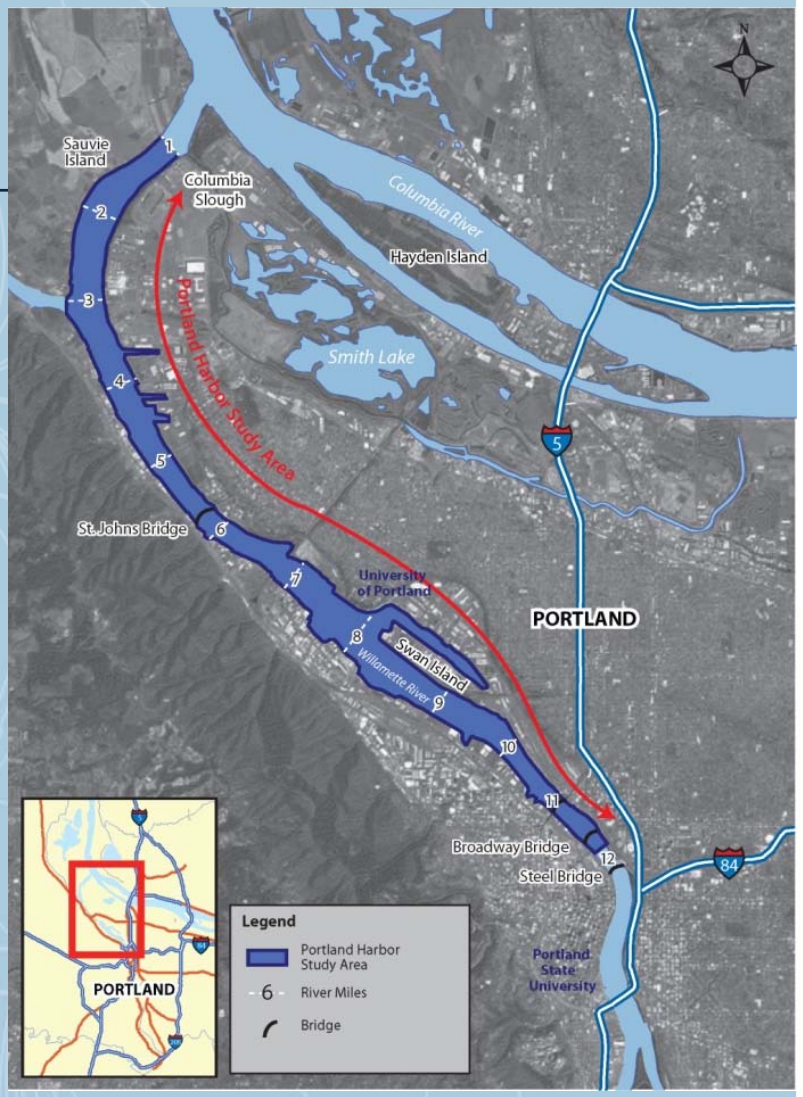
- Listed on NPL in 2000; Draft Remedial Investigation (RI) and Draft Feasibility Study (FS) undergoing EPA review; Record of Decision expected 2014-15
- 11-mile stretch of Willamette River
- Largely in zoned industrial sanctuary

PORTLAND HARBOR SUPERFUND SITE STORMWATER REGULATION

- **Industries in Harbor subject to three regulatory authorities for stormwater:**
  - EPA
  - Oregon Department of Environmental Quality (ODEQ)
  - City of Portland

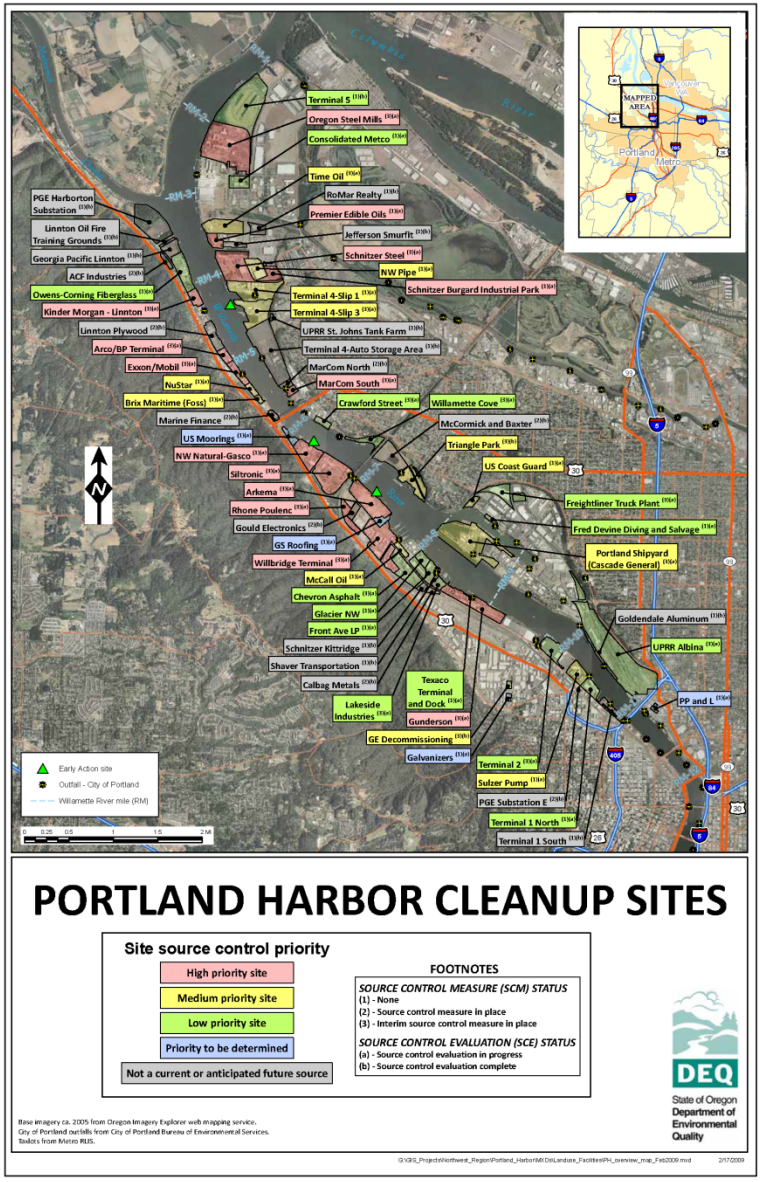
EPA PERSPECTIVE:

- Authority under CERCLA
- 11-mile stretch of Willamette River
  - Including bed and banks
  - Including upland properties if necessary for implementation of the remedy
- Memorandum of Understanding (MOU) with ODEQ gives ODEQ primary responsibility for source control of adjacent upland properties, subject to EPA review



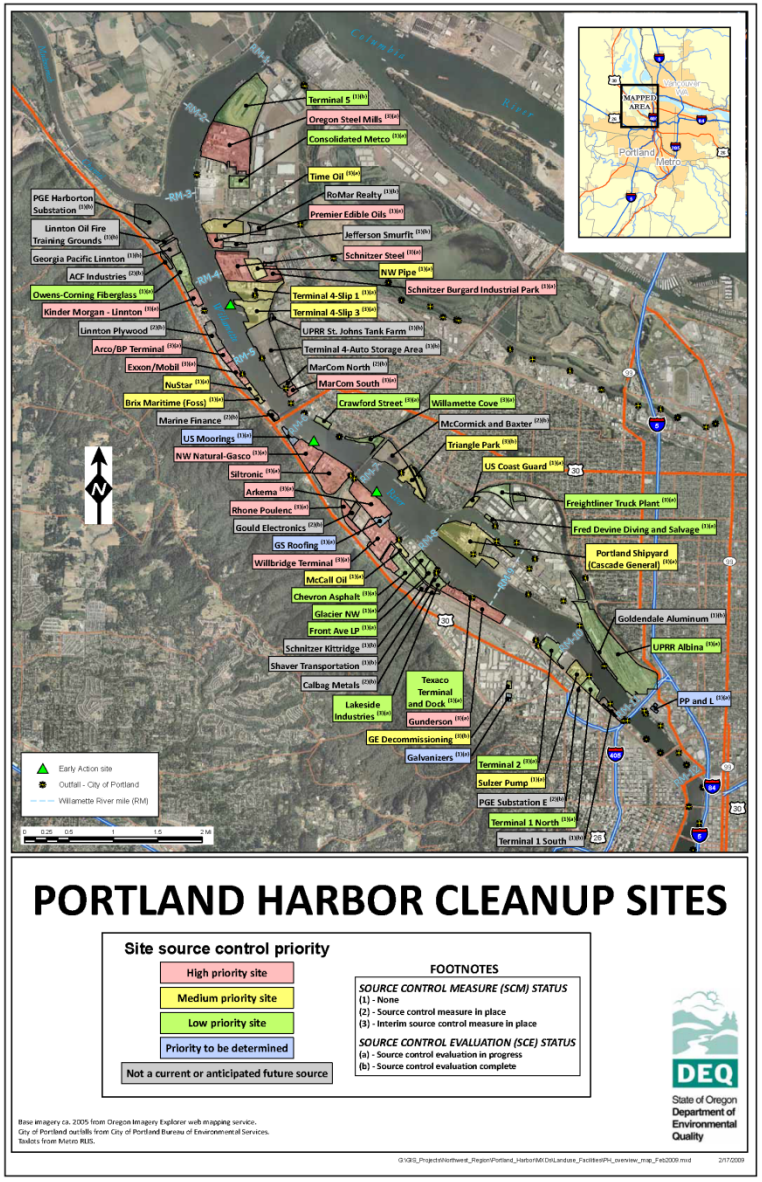
ODEQ PERSPECTIVE:

- **ODEQ Cleanup Section:**
  - Focus on upland properties, riparian and stormwater sources
  - Primary authority under CERCLA and Oregon Cleanup Law, ORS 465.200 *et seq.*
  - MOU with EPA requires ODEQ to control upland sources
    - To prevent recontamination of sediment
    - To control in-river risk to human health and ecological receptors



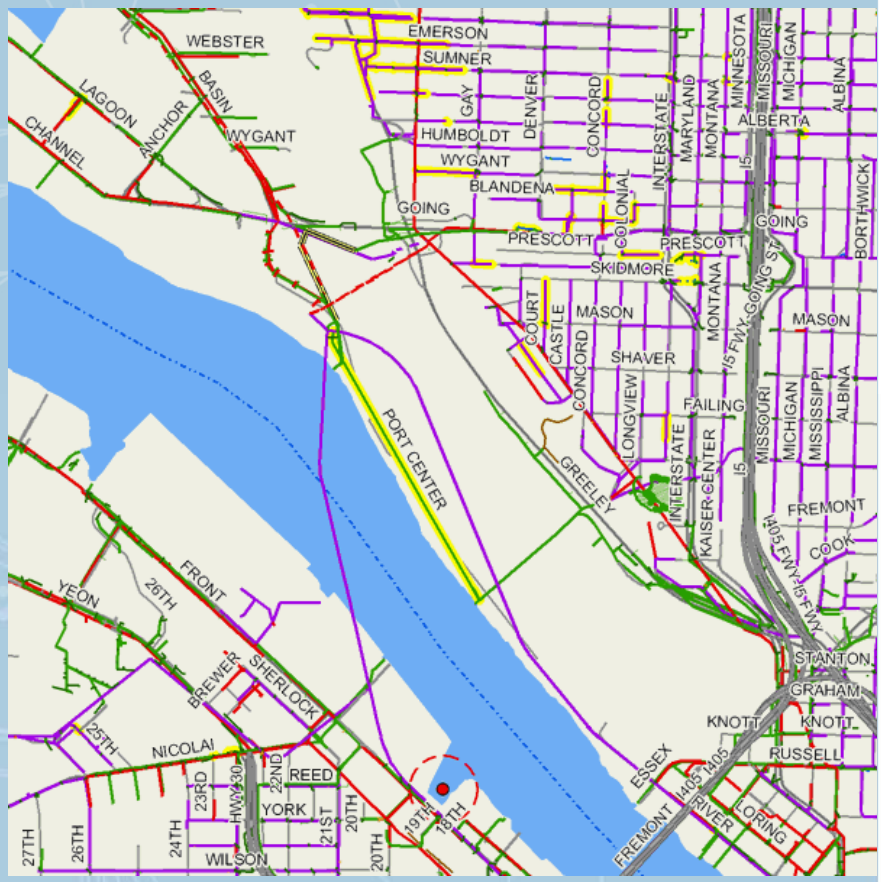
ODEQ PERSPECTIVE: (cont.)

- **ODEQ Water Quality Section:**
  - ODEQ also has delegated Clean Water Act (CWA) authority
    - NPDES permits:
      - Industrial
      - POTW
      - MS-4
    - NPDES General Stormwater 1200-Z permit
    - NPDES Individual Stormwater permits
    - TMDLs



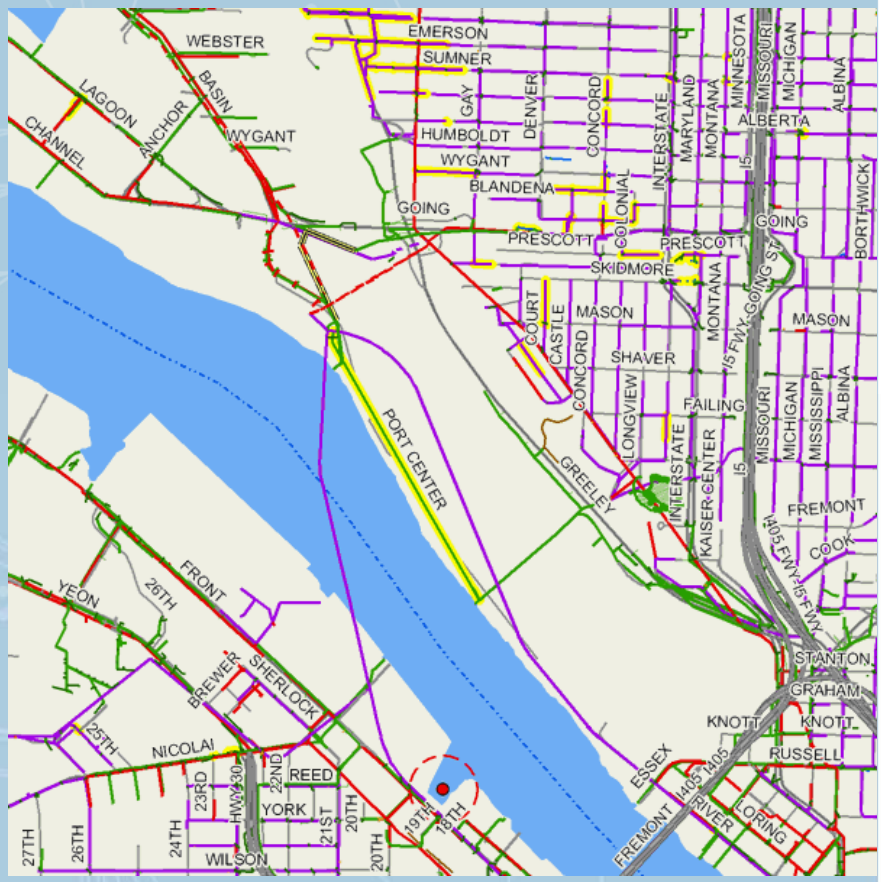
CITY OF PORTLAND PERSPECTIVE:

- **IGA for City Outfalls:**
  - 2003 Intergovernmental Agreement with ODEQ to identify and control contaminant sources from City stormwater conveyance systems discharging into the Portland Harbor Study Area



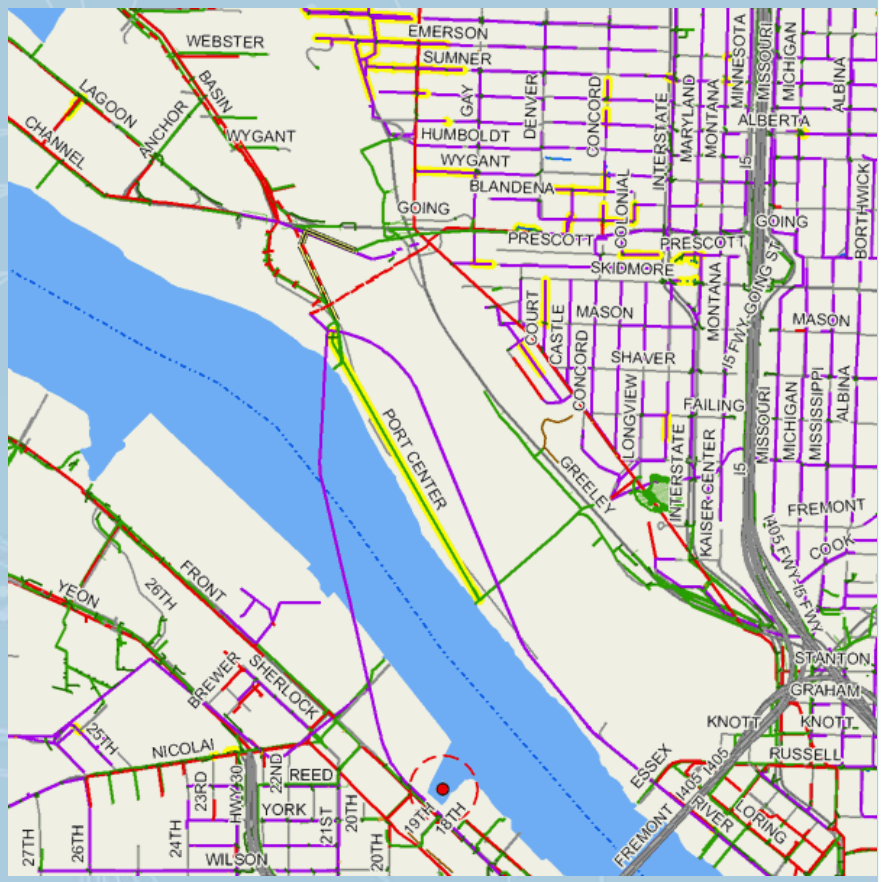
CITY OF PORTLAND PERSPECTIVE:
(cont.)

- **Stormwater Permit Authority:**
  - City of Portland acts as Local Agent for implementation of NPDES General Industrial Stormwater Permit 1200Z within City boundaries



CITY OF PORTLAND PERSPECTIVE:
(cont.)

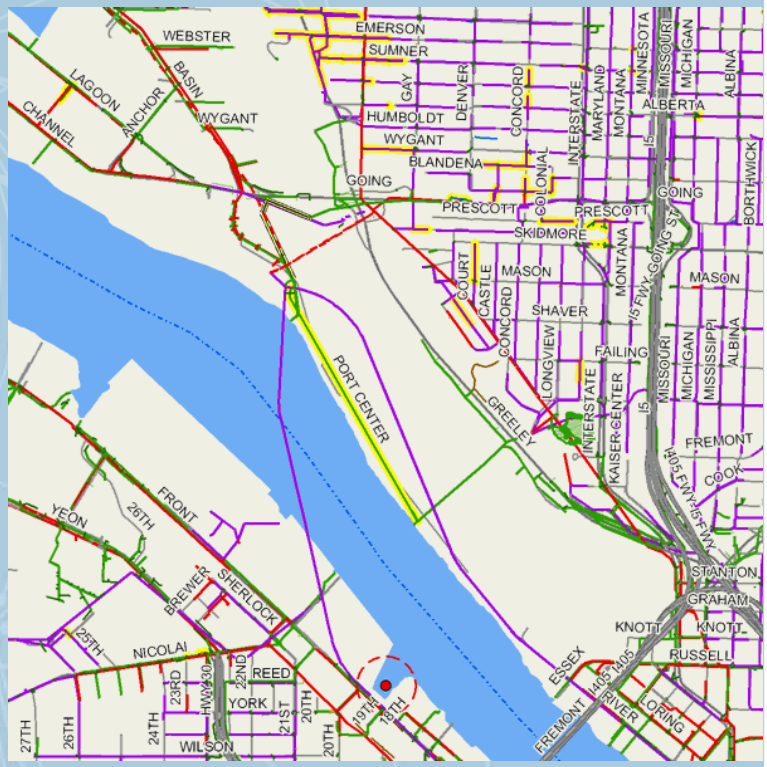
- **City Code Authority:**
  - City regulates all discharges into its Storm Sewer system under City Code Chapter 17.39



CITY OF PORTLAND PERSPECTIVE:
(cont.)

City MS-4 stormwater Permit and sanitary sewer permits:

- City subject to MS-4 NPDES permit for municipal stormwater discharges
- City subject to NPDES permit for POTW, which includes combined sewer overflows (CSOs) and emergency sanitary sewage overflows (SSOs) caused by blockages, failures at pump stations, etc.



OVERALL TOOLS TO CONTROL CONTAMINANTS IN STORMWATER

- Best Management Practices (BMPs)
- Stormwater Pollution Control Plans (SWPCPs)
- Monitoring
- Corrective Actions
  - BMPs
  - Treatment
  - Stormwater redirection (infiltration)
  - Process Changes
  - Source remediation/removal

Think of as serially escalating . . .

LOWEST LEVEL: CITY CODE COMPLIANCE

- If not required to have 1200-Z Stormwater permit, but discharge to City storm sewer, then City can use City Code 17.39 to require:
  - BMPs and SWPCP
  - Accidental Spill Prevention Plan
  - Monitoring data to characterize types and loads of pollutants

SECOND LEVEL: NPDES PERMIT REQUIRED

- Could be WWTP, MS-4 NPDES Permit or individual permits
- This discussion focuses on 1200Z Industrial General Stormwater permit
  - Listed SIC Codes, or as otherwise required by DEQ
  - BMPs and SWPCP
  - Quarterly Monitoring
  - Benchmarks based on meeting water quality standards for receiving water body
    - Statewide benchmarks
    - Sector specific benchmarks
    - Impairment parameters for 303(d) listed receiving waters
  - Required Tier I and Tier II Corrective Actions for exceeding benchmarks

SECOND LEVEL: NPDES 1200-Z PERMIT REQUIRED (cont.)

- Regulatory concentration goals clear and fixed (statewide and sector-specific benchmarks and impairment reference concentrations)
- **Consequences clear:**
  - Tier I corrective actions required (SWPCP review and possibly additional BMPs) if exceeded in any one sampling event
  - Tier II correction actions (treatment) required if geometric mean of quarterly samples in second year of permit do not meet benchmark; implementation required by year 4 of permit
    - Control measures required to meet technology based effluent limits: "to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice."

THIRD LEVEL: SOURCE CONTROL UNDER CERCLA OR OREGON CLEANUP RULES

- **First, legal limitations (WE'LL GET BACK TO THESE...):**
  - CERCLA 107(j) ("federal permit shield"):

    "Recovery by any person (including the United States or any State or Indian tribe) for response costs or damages *resulting from a federally permitted release* shall be pursuant to existing law in lieu of this section."
  - CERCLA 101(10):

    "The term 'federally permitted release' means (A) discharges in compliance with a [NPDES permit], [or] (B) discharges resulting from circumstances identified and reviewed and made part of the public record with respect to a [NPDES permit] and subject to a condition of such permit, [or] (C) continuous or anticipated intermittent discharges from a point source, identified in a [NPDES permit] or permit application, which are caused by events occurring within the scope of relevant operating or treatment systems . . ."

THIRD LEVEL: SOURCE CONTROL UNDER CERCLA OR OREGON CLEANUP RULES (cont.)

- **Legal limitations:** (cont.)
  - Oregon Cleanup Law ("Oregon permit shield"):
    - **OAR 340-122-030 (2)**

"Conditional Exemption of Permitted Releases. These rules do not apply to permitted or authorized releases of hazardous substances, unless the Director determines that application of these rules might be necessary in order to protect public health, safety or welfare, or the environment. These rules may be applied to the deposition, accumulation, or migration resulting from otherwise permitted or authorized releases."

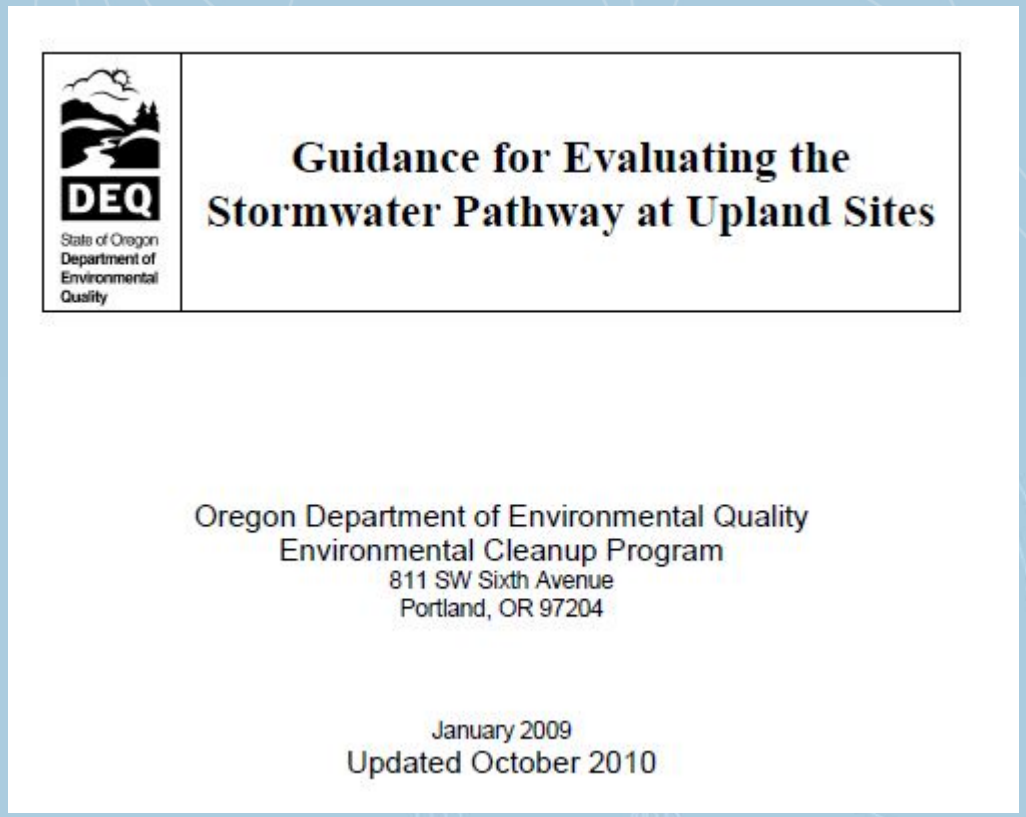
THIRD LEVEL: SOURCE CONTROL UNDER CERCLA OR OREGON CLEANUP RULES (cont.)

- Implemented under Voluntary Cleanup Agreement with or Order from DEQ Cleanup Section
- Requires risk assessment, source control evaluation and implementation of source control
- Guidance:
  - *EPA/ODEQ Portland Harbor Joint Source Control Strategy ("JSCS"), 12/05*
  - *ODEQ Guidance for Evaluating the Stormwater Pathway at Upland Sites, updated 10/10*

EPA/ODEQ JSCS 12/05

- *EPA/ DEQ PORTLAND HARBOR JOINT SOURCE CONTROL STRATEGY* -- FINAL, DECEMBER 2005
  - Upland Site Characterization
    - Identify complete migration pathways
    - Identify site COIs
    - Collect appropriate samples and screen against against JSCS Table 3-1 Screening Level Values and apply weight of evidence approach to identify pathway specific COPCs
    - For stormwater and storm line solids, compare to DEQ "Tool for Evaluating Stormwater Data, Appendix E to *Guidance for Evaluating the Stormwater Pathway at Upland Sites,* as updated October 2010
  - Perform Source Control Evaluation
  - If necessary, implement Source Control Measures

ODEQ Guidance for Evaluating the Stormwater Pathway



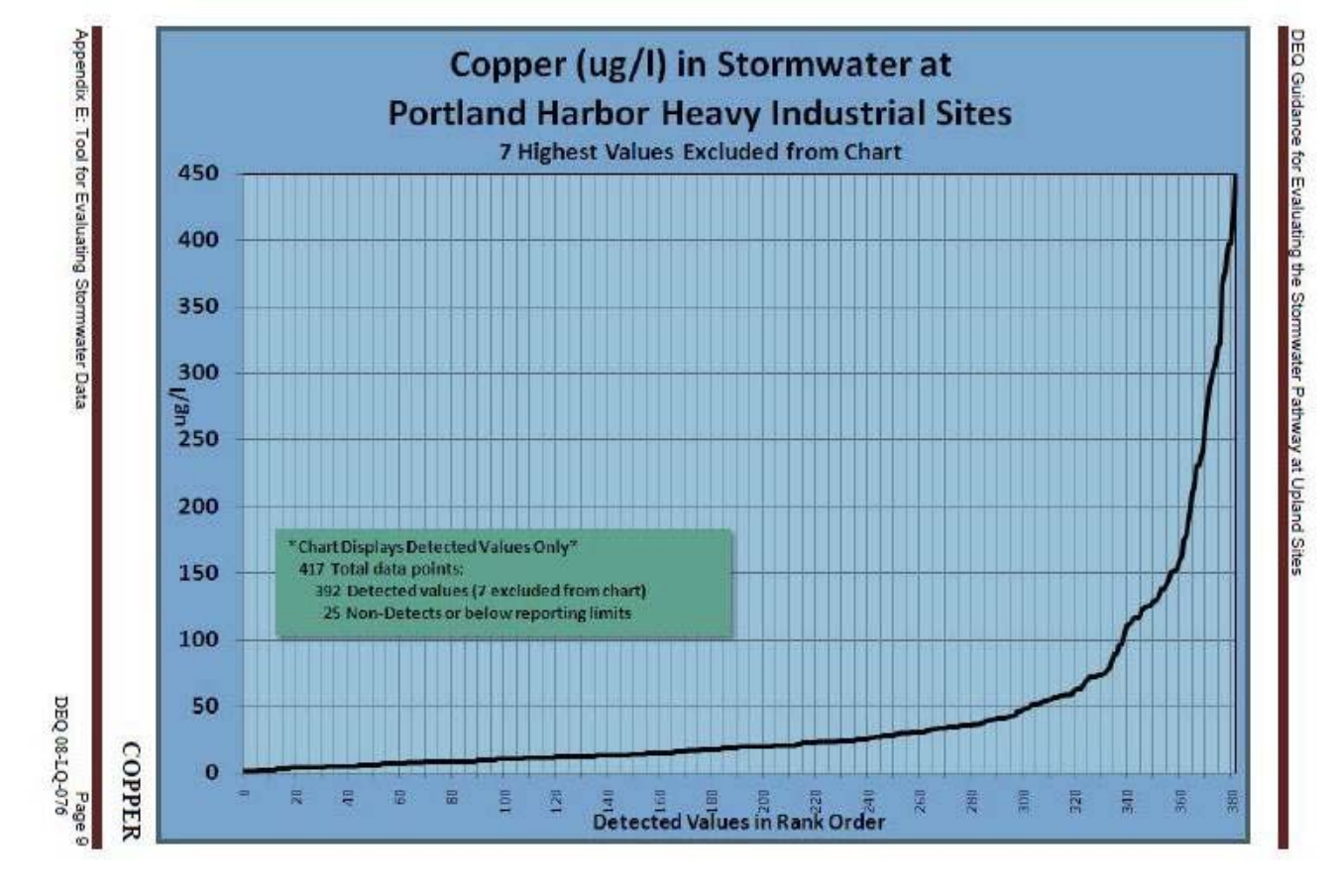
DEQ
State of Oregon Department of Environmental Quality

Guidance for Evaluating the Stormwater Pathway at Upland Sites

Oregon Department of Environmental Quality
Environmental Cleanup Program
811 SW Sixth Avenue
Portland, OR 97204

January 2009
Updated October 2010

App. E: "Knee of the Curve" Data analysis



THIRD LEVEL: SOURCE CONTROL UNDER CERCLA OR OREGON CLEANUP RULES (cont.)

- **Using this guidance, consequences much less clear than under 1200Z permit**
  - JSCS starts with Screening Level Values (SLVs), which are not administratively promulgated standards
  - Can use "knee of the curve" tool
  - Coupled with other "Lines of Evidence"
    - Which can include loading models, with assumptions that can be debated all ways to Sunday
- **However, these are the tools we have to try to make good decisions**

Comparison: 1200Z to JSCS SCE

	1200-Z NPDES	Portland Harbor Cleanup Source Control
Legal basis	Promulgated Administrative Rule	--General cleanup rules --Agency Guidance on application to stormwater
Who has to comply?	SIC Code or otherwise required	Only if under VCA or Order from DEQ Cleanup section
Overall Goal	Meet WQSs in receiving body based on model	Risk-based: meet WQSs and be protective and prevent recontamination of sediment.

Comparison: 1200Z to JSCS SCE

	1200-Z NPDES	Portland Harbor Cleanup Source Control
Specific Goals	Benchmarks (guideline concentrations, not effluent limitations)	Presumption that meet JSCS SLVs at end of pipe.
How applied	Single exceedance > review of SWPCP and BMPs Exceedance by GeoMean in Permit Yr 2 >Tier II treatment requirements, to be implemented by Permit Yr 4	Unclear. City of Portland Outfall report (2010) focused its analysis on geometric means. Oversight of industrial sites seems focused on individual exceedances.

ODEQ NPDES 1200Z Evaluation Report: "The geometric mean tends to dampen the effect of very high or low values and is an appropriate measure of stormwater discharges given their highly variable nature."

Parameter Specific Comparison: Lead

	CWA Program: 1200-Z NPDES	**Cleanup Program: Portland Harbor JSCS**
Pb	40 ug/l (total) benchmark	0.54 ug/l (dissolved) SLV 5-15 ug/l (total) "flat portion" of stormwater comparison curve in App. E to *Guidance for Evaluating the Stormwater Pathway*

Lead at 1200Z Permit Level

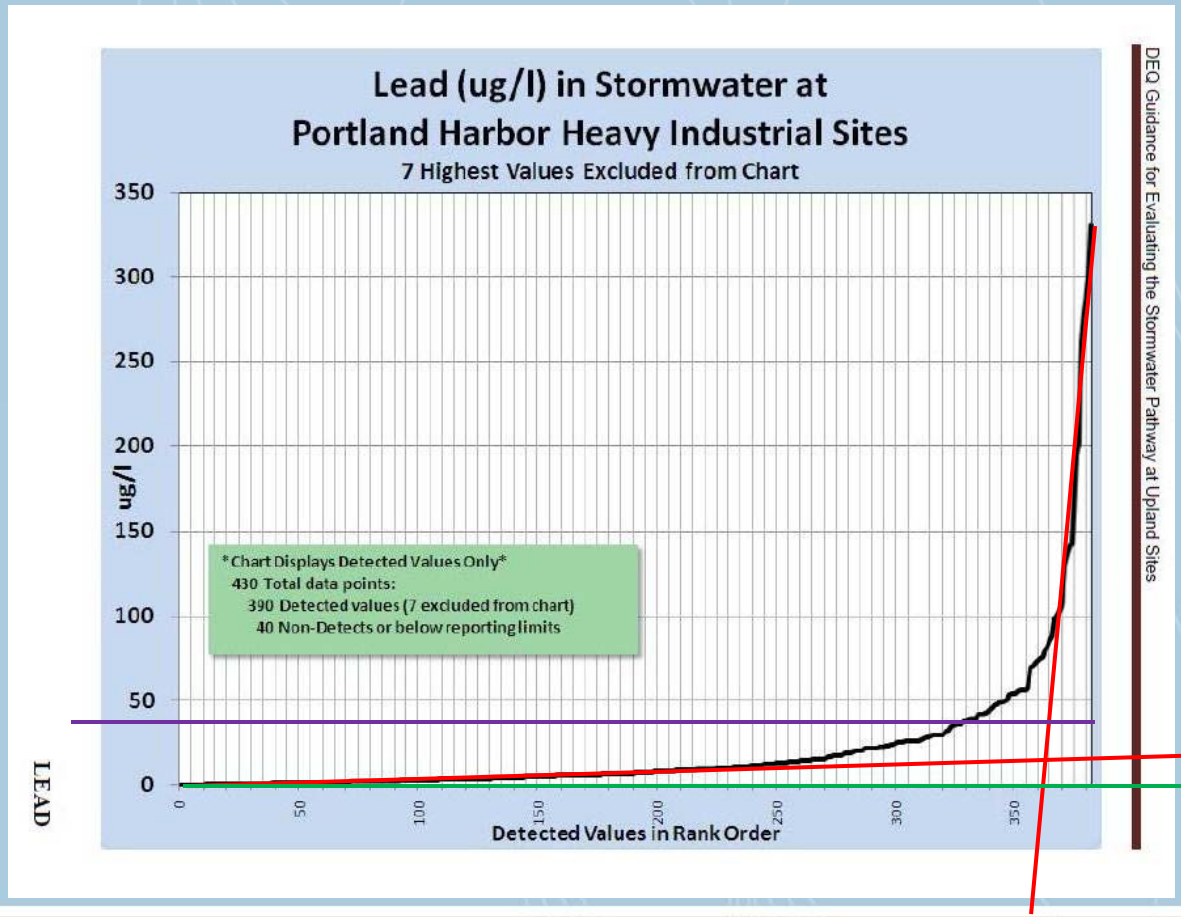
- **Goal: Protecting in-stream beneficial uses, focused on water column exposure pathways.**
  - Benchmark of 40 ug/l is risk based
  - based on model to predict end-of-pipe concentration that has only 10% probability of exceeding in-stream water quality criteria

Lead at JSCS SCE level

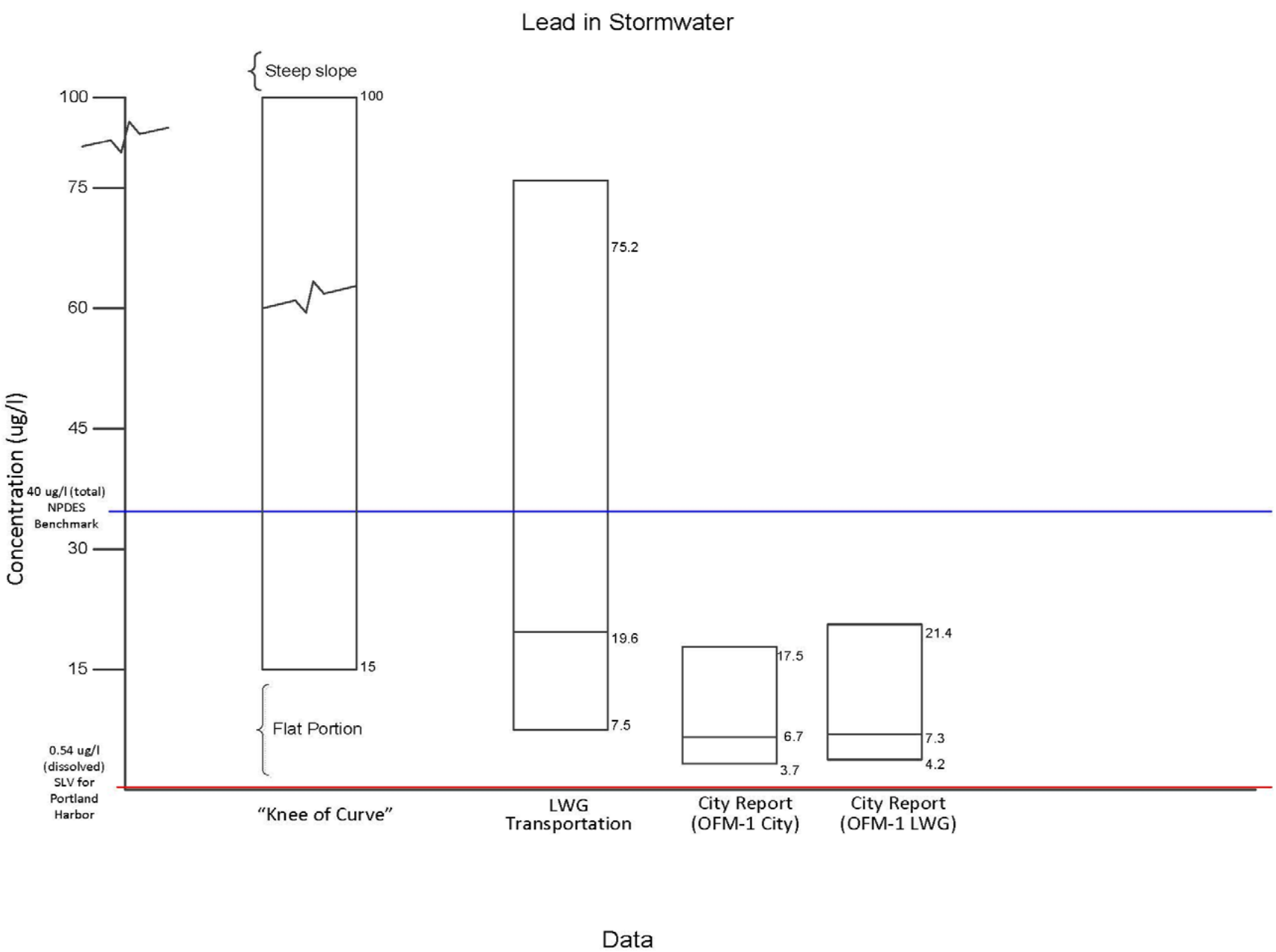
- How ODEQ/EPA currently approaching:
  - Goal is to meet the JSCS SLV of 0.54 ug/l (10x lower than 1200Z permit level)
  - However, if
    - have implemented all practical BMPs **AND**
    - have achieved "flat portion" of App. E curves **AND**
    - loading study shows no likely adverse impact on sediment,
  - then no further treatment required at this time **but** adaptive management required and additional treatment may be required in future.

Lead—Portland Harbor "Knee of Curve"

1200Z benchmark 40 ug/l



JSCS SLV 0.54 ug/l


Lead in Stormwater
Steep slope
100
75
60
45
40 ug/l (total) NPDES Benchmark
30
15
0.54 ug/l (dissolved) SLV for Portland Harbor
Concentration (ug/l)
100
15
Flat Portion
75.2
19.6
7.5
17.5
6.7
3.7
21.4
7.3
4.2
"Knee of Curve"
LWG Transportation
City Report (OFM-1 City)
City Report (OFM-1 LWG)
Data

Lead conclusions

- Legal:
  - EPA has no CERCLA authority to require further source control of discharge absent violation of permit since lead covered by conditions of permit
  - ODEQ has authority under exception to Oregon permit shield ONLY IF (1) ODEQ Director determines necessary to protect environment OR (2) applied to the deposition or accumulation of lead.
    - Hard to argue 0.54 ug/l SLV "necessary" to protect water column because 1200Z permit, which has been through rulemaking process, determined that 40 ug/l is protective.
    - Could require more than meeting 40 ug/l benchmark if necessary to prevent deposition that is causing environmental harm

Lead conclusions

- Practical:
  - With respect to protection to water column, 1200Z and Cleanup Program should require same concentration at end of pipe, both in terms of numeric benchmark/SLV and how applied (e.g. to geometric mean)
  - However, IF lead accumulation in sediments is determined through Portland Harbor RI/FS to be posing unacceptable risk AND loading study suggests a particular stormwater outfall could be materially contributing to that risk, then further controls could be required by ODEQ
    - Doesn't seem likely. Lead considered by EPA to be contaminant of secondary ecological significance in Portland Harbor. Does not biomagnify.
  - MS-4 and SSO discharges (which include transportation corridors) also need to meet 1200Z benchmark and/or lower concentration determined to be necessary to prevent unacceptable risk from deposition .

Parameter Specific Comparison: Copper

	CWA Program: 1200-Z NPDES	**Cleanup Program: Portland Harbor JSCS**
Cu	20 ug/l (total) benchmark—technology based	2.7 ug/l (dissolved) SLV 5-20 ug/l "flat portion" of stormwater comparison curve in App. E to *Guidance for Evaluating the Stormwater Pathway*

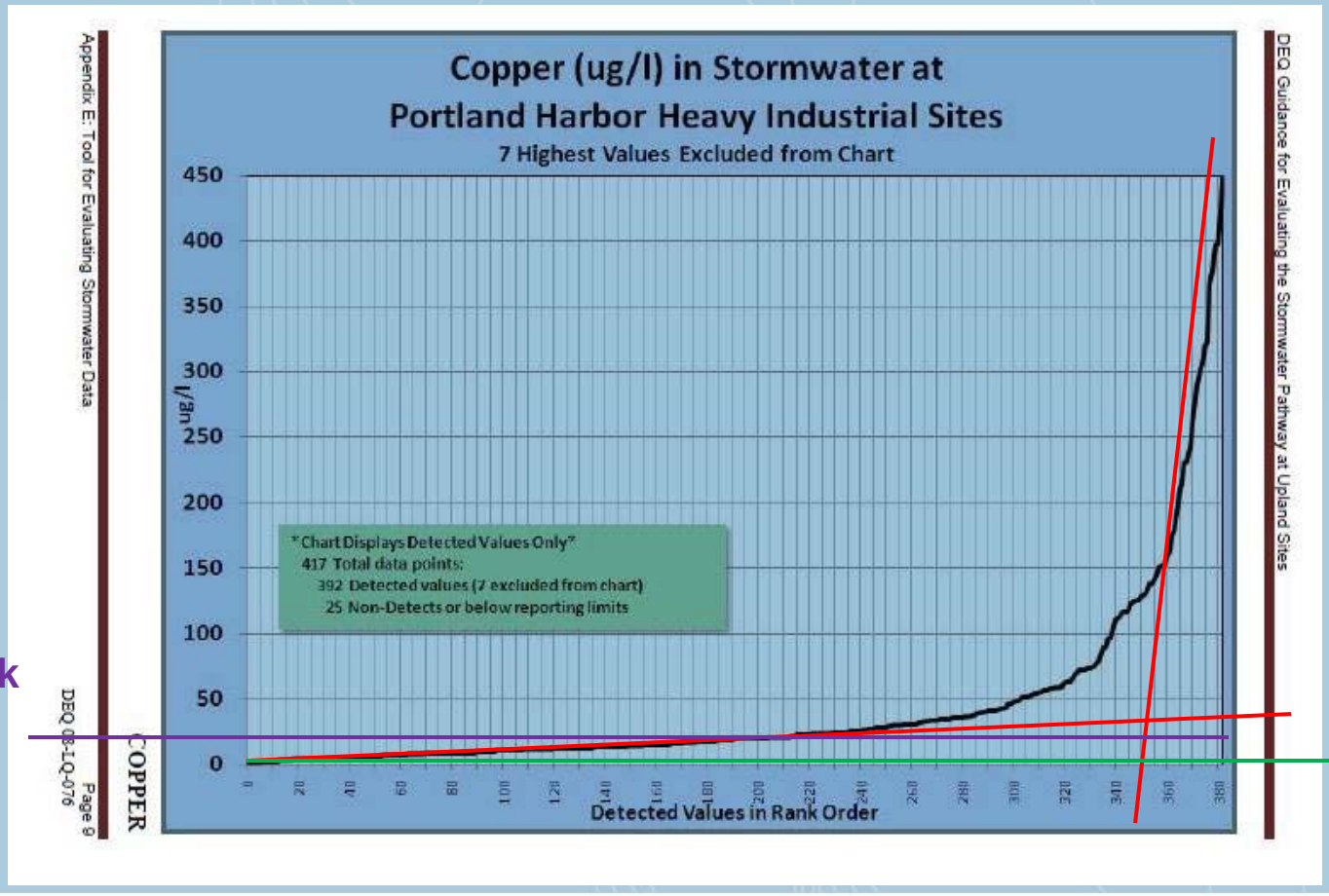
Copper at 1200Z Permit Level

- **Goal: Protecting in-stream beneficial uses, focused on water column exposure pathways.**
- Questions regarding appropriate benchmark:
  - Benchmark of 20 ug/l is technology based
  - Would have adopted 6 ug/l to achieve goal of <10% probability of exceeding WQS but for the lack of affordable and feasible treatment technologies
  - Currently questions whether appropriate to take into account chelation potential in receiving water in adjusting benchmark
  - Benchmark will be reconsidered in next permit modification (2017)

Copper at JSCS SCE level

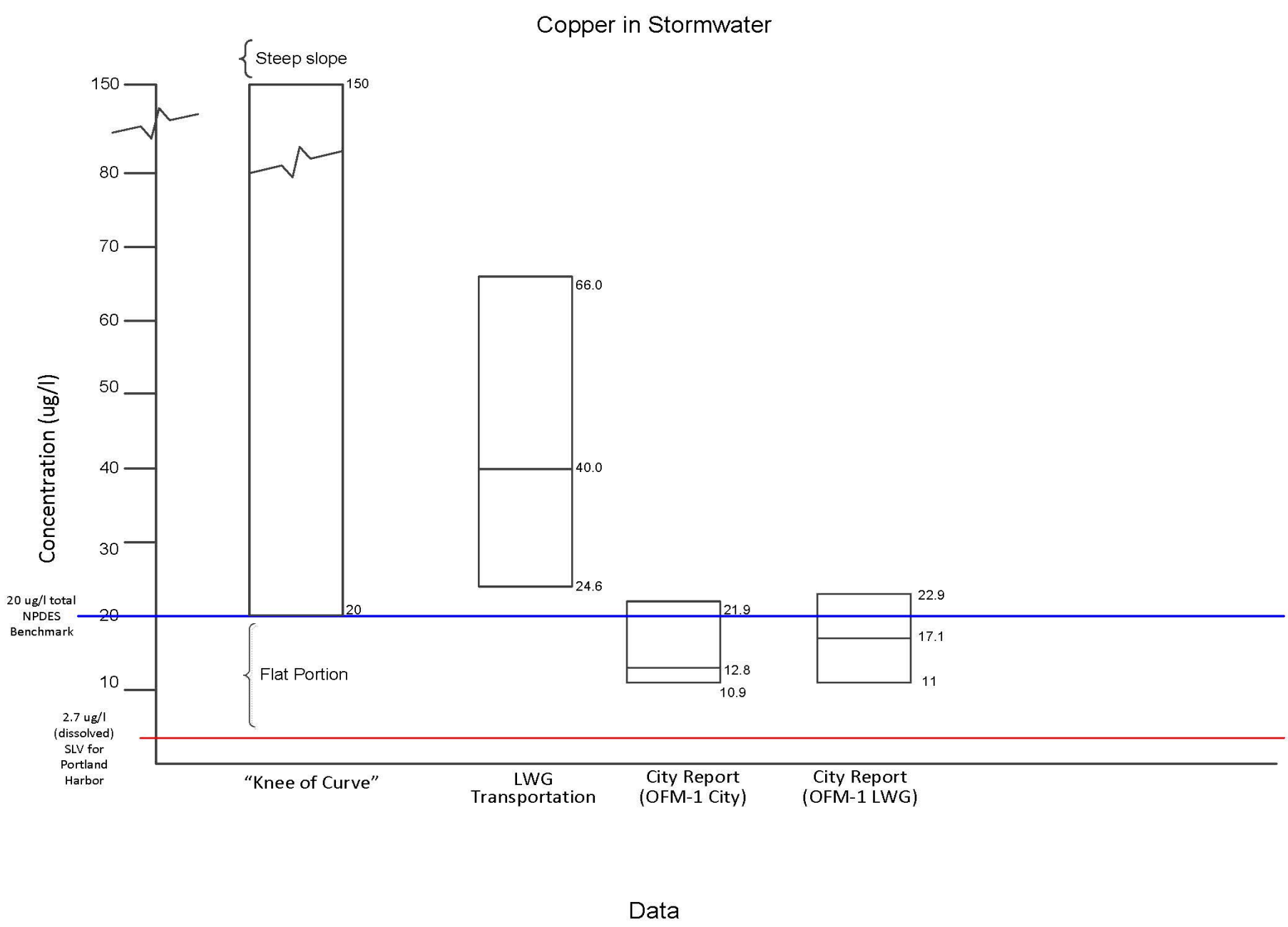
- How ODEQ/EPA currently approaching:
  - Goal is to meet the JSCS SLV of 2.7 ug/l (10x below NPDES benchmark)
  - However, if
    - have implemented all practical BMPs **AND**
    - have achieved "flat portion" of App. E curves **AND**
    - loading study shows no likely adverse impact on sediment,
  - then no further treatment required at this time **but** adaptive management required and additional treatment may be required in future.

Copper—Portland Harbor "Knee of Curve"



1200Z benchmark 20 ug/l

JSCS SLV: 2.7 ug/l


Copper in Stormwater
Steep slope
150
80
70
60
50
40
30
20
10
150
20
66.0
40.0
24.6
21.9
12.8
10.9
22.9
17.1
11
Concentration (ug/l)
20 ug/l total NPDES Benchmark
Flat Portion
2.7 ug/l (dissolved) SLV for Portland Harbor
"Knee of Curve"
LWG Transportation
City Report (OFM-1 City)
City Report (OFM-1 LWG)
Data

Copper conclusions

- Legal:
  - EPA—same as lead: EPA has no CERCLA authority absent violation of permit
  - ODEQ has authority under exception to Oregon permit shield ONLY IF (1) ODEQ Director determines necessary to protect environment OR (2) applied to the deposition or accumulation of lead.
    - Maybe consider that 1200Z benchmark (20 ug/l) is technology based, rather than risk based. Permit risk-based criteria would have been 6 ug/l, compared to 2.7 ug/l JSCS SLV.
    - But hard for Director to determine it is "necessary" for a discharger under the Cleanup program to meet more stringent criteria when it is not "necessary" for a neighboring property discharging under the 1200Z NPDES permit to do so
    - Could require more than meeting 20 ug/l benchmark if necessary to prevent deposition that is causing environmental harm, but copper not generally deposition problem due to solubility

Copper conclusions

- Practical:
  - As with lead, 1200Z and Cleanup Program should require same concentration at end of pipe (numeric and method, e.g. geometric mean)
  - However, IF copper accumulation in sediments is determined through Portland Harbor RI/FS to be posing unacceptable risk AND loading study suggests a particular stormwater outfall could be materially contributing to that risk, then further controls could be required by ODEQ
    - Doesn't seem likely. Copper considered by EPA to be contaminant of secondary ecological significance in Portland Harbor Highly soluble and does not biomagnify.
  - Many dischargers in Pdx Harbor exceed 20 ug/l and there are no known feasible treatment technolgies, so even meeting 20 ug/l will take time
  - MS-4 and SSO discharges (which include transportation corridors) need to meet 1200Z benchmark and/or lower concentration determined to be necessary to prevent unacceptable risk from deposition

Parameter Specific Comparison: PCBs

	CWA Program: 1200-Z NPDES	Cleanup Program: Portland Harbor JSCS
Total PCBs	2 ug/l impairment reference concentration for discharges into 303(d) listed water bodies (such as Portland Harbor)	0.000064 ug/l SLV Approx. 0- 0.1 ug/l "flat portion" of stormwater comparison curve in App. E to *Guidance for Evaluating the Stormwater Pathway*

PCBs at 1200Z Permit Level

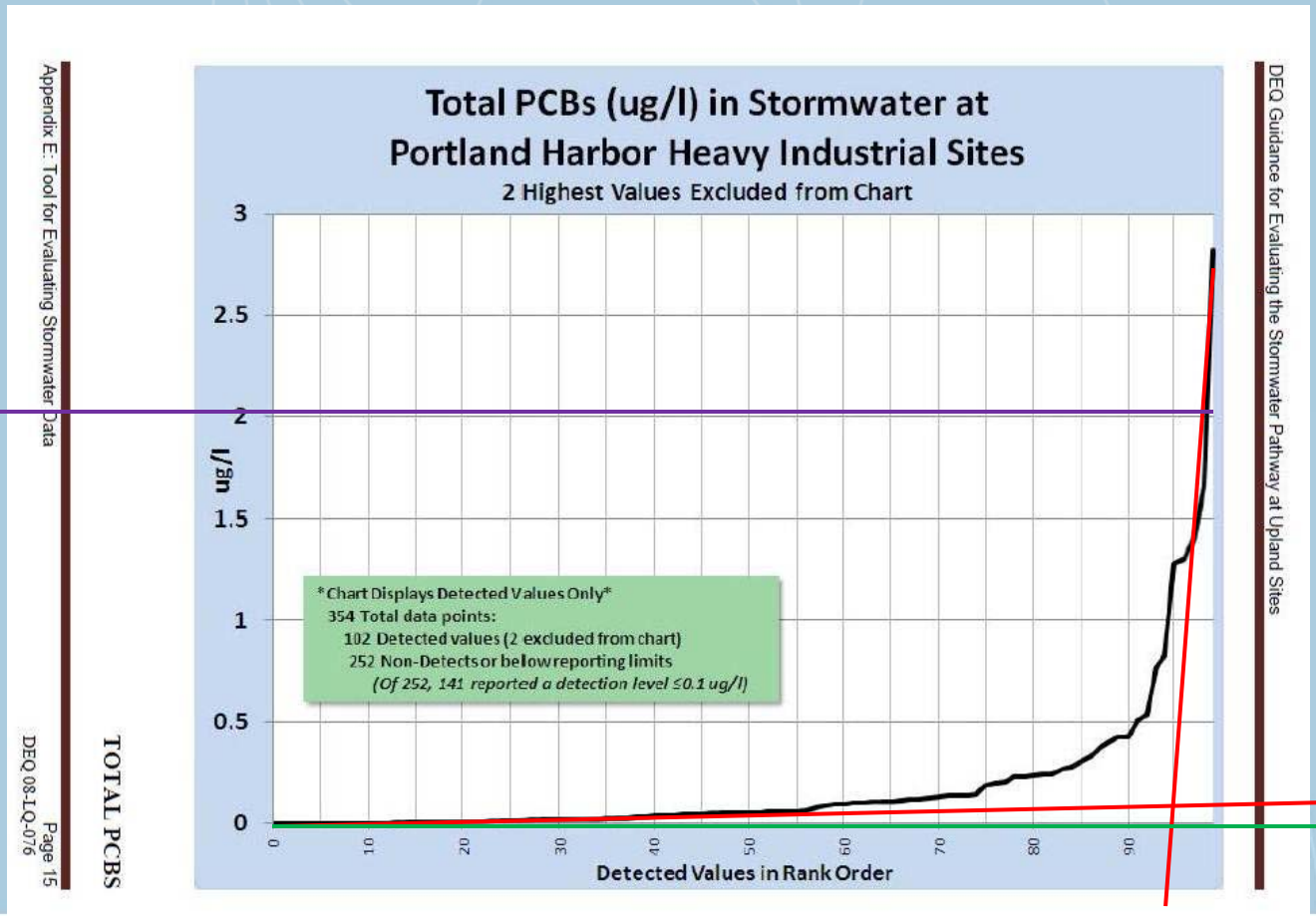
- **Goal: Protecting in-stream beneficial uses, focused on water column exposure pathways.**
- Only addressed as reference concentration for 303(d) impaired receiving water bodies (such as Portland Harbor)
  - Reference Concentration is 2 ug/l

PCBs at JSCS SCE level

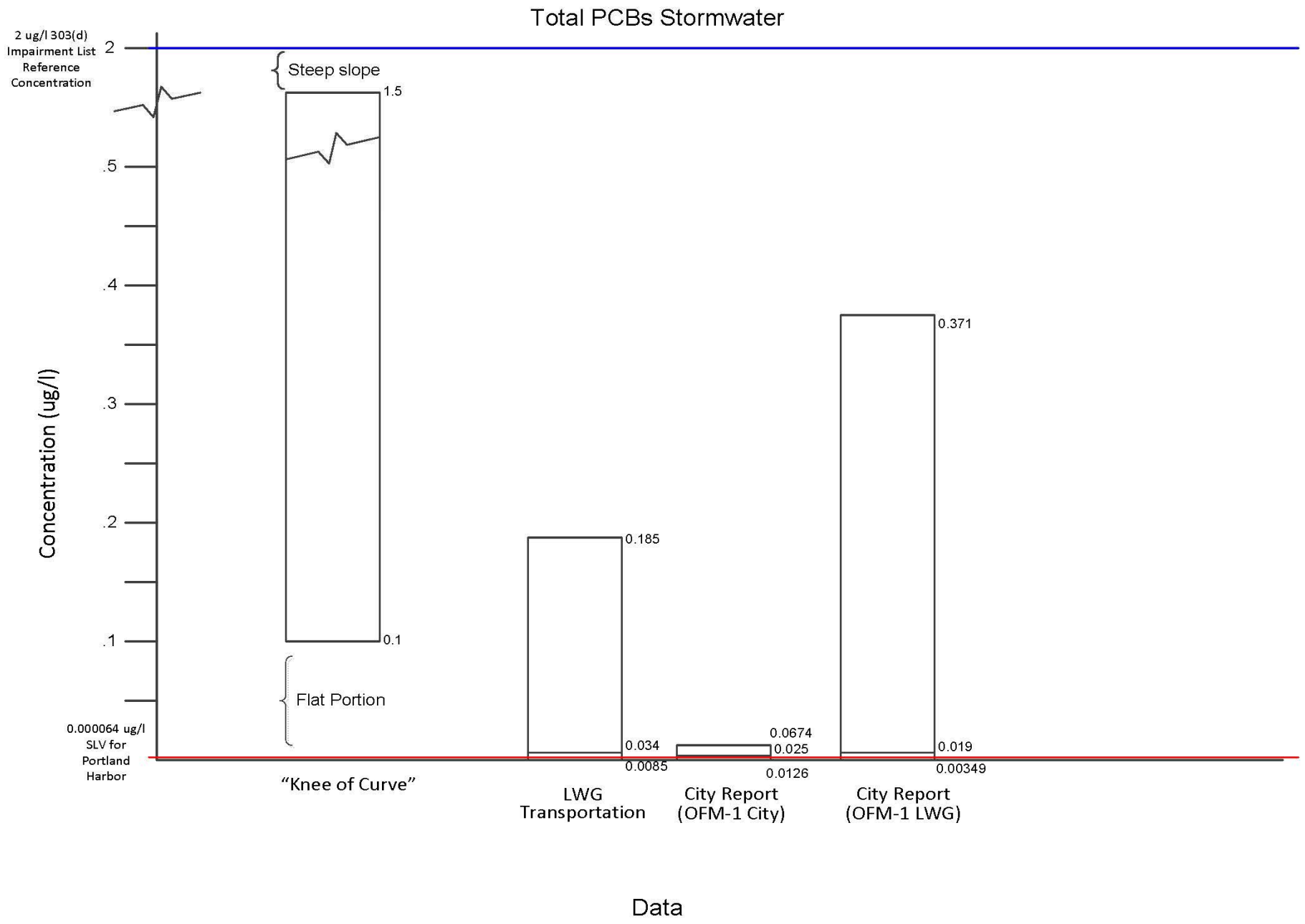
- JSCS SLV of 0.000064 ug/l known to be unrealistic (and often undetectable)
- So, if
  - have implemented all practical BMPs **AND**
  - have achieved "flat portion" of App. E curves (approx. 0.1 ug/l) **AND**
  - loading study shows no likely adverse impact on sediment,
  - then no further treatment required at this time **but** adaptive management required and additional treatment may be required in future.

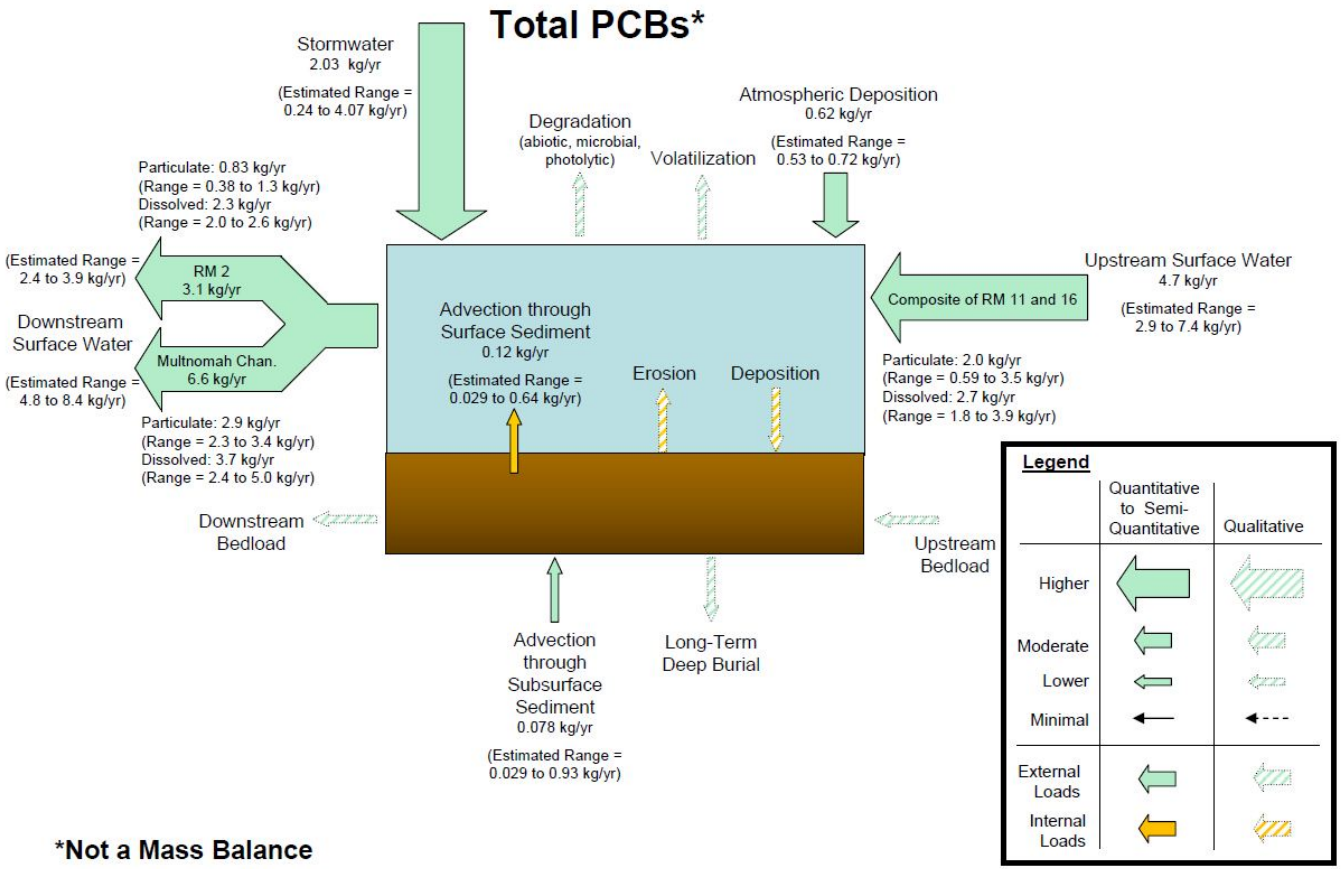
PCBs—Portland Harbor "Knee of Curve"

1200Z 303(d) ref. conc. 2 ug/l



JSCS SLV 0.000064 ug/l


Total PCBs Stormwater
2 ug/l 303(d) Impairment List Reference Concentration
2
.5
.4
.3
.2
.1
Concentration (ug/l)
Steep slope
1.5
0.1
Flat Portion
0.000064 ug/l SLV for Portland Harbor
0.185
0.034
0.0085
0.0674
0.025
0.0126
0.371
0.019
0.00349
"Knee of Curve"
LWG Transportation
City Report (OFM-1 City)
City Report (OFM-1 LWG)
Data



integral consulting inc. LWG LOWER WILLAMETTE GROUP

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DO NOT QUOTE OR CITE
This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Figure 10.2-2
Portland Harbor RI/FS
Remedial Investigation Report
Cross-Media Loading Box-Arrow Diagrams
Total PCBs – Study Area Annual Central Loading Estimate

PCB conclusions

- Legal:
  - EPA— PCBs are impairment pollutant monitored in all Portland Harbor permits so EPA has no CERCLA authority absent violation of permit
  - ODEQ has authority under exception to Oregon permit shield ONLY IF (1) ODEQ Director determines necessary to protect environment OR (2) applied to the deposition or accumulation of PCBs.
    - Easier to determine that "necessary" when RI shows that stormwater is a significant source and PCBs are clear risk driver in Portland Harbor. Relatively insoluble and therefore associated with TSS and does biomagnify.
    - Primary risk pathway is bioaccumulation from sediment, so focus is on deposition or accumulation
    - Still will lead to inequity if Director determines it is "necessary" for a discharger under the Cleanup program to meet more stringent criteria when it is not "necessary" for a neighboring property discharging under the 1200Z NPDES permit to do so.

PCB conclusions

- Practical:
  - RI/FS **will** show PCBs posing unacceptable risk and that stormwater is contributing to it. IF loading study suggests a particular stormwater outfall could be materially contributing to that risk, then further controls will be required by ODEQ.
  - Need way (loading studies?) to determine what level of PCB control necessary to prevent recontamination based on site-specific and river hydrodynamic specific factors
  - MS-4 discharges (which include transportation corridors) also need to be subject to same process to determine what controls are necessary to prevent unacceptable risk from deposition