Sediment Management Work Group
2014 Fall Members Meeting

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Discussion With Senior U.S. EPA Representatives from OSWER and OSRTI

"Obstacles to Achieving National Consistency in Remedy Selection and Potential Solutions"

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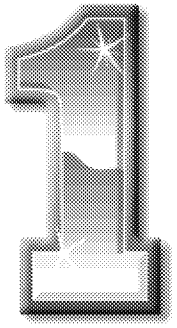
Impact of the Problem

- Examples of sediment "mega" Superfund sites
  - Lower Duwamish Waterway (Proposed Plan 2013, Region 10)
    - Sediment remedy = $305 million
  - Gowanus Canal (Record of Decision 2013, Region 2)
    - Sediment remedy = $506 million
  - Lower Passaic River (Proposed Plan 2014, Region 2)
    - Sediment remedy = estimated to be $1.7 billion
  - Fox River OUs 2-5 (Amended ROD 2006, Region 5)
    - Sediment remedy = $390 million, now $700 million
  - Newtown Creek / Portland Harbor – pending and each potentially >$1 billion

Key Objective

- Implement cost effective remedies that will control sources and achieve long-term protection while minimizing short-term impacts
- Regions should select remedies that control sources and achieve long-term protection while minimizing short-term impacts and being cost-effective (2005 Guidance, p. 7-17).



Impediments

- Scope and technical complexity of contaminated sediment sites
- Uncertainty
  - Site characterization
  - Exposure & effects assessments
  - Estimating the effect and effectiveness of remedial actions
  - Models (including structure, parameters, output, etc.)

Manifestation of Difficulties

- Long, expensive remedial investigations
- Disputes over risk assessment
- Battles among experts over models
- Debate and deliberation over establishing appropriate remediation goals
- Inefficient use of limited resources
- Agency discomfort with uncertainty draws out process and increases cost
- While grappling with the above, potential risks are on-going and expenses mount

Key to Progress: National Application of Existing Sediment Guidance

- Nationally consistent sediment programs across contaminated sediment sites would
  - result in quicker, more effective, and more permanent risk reduction;
  - facilitate alignment between USEPA, PRPs, and stakeholders; and
  - eliminate unsustainable use goals.
- Outcomes
  - Faster, better risk reduction
  - Greater transparency and increased public trust

Key to Progress: National Application of Existing Sediment Guidance (con't)

- USEPA Superfund guidance acknowledges the "critical importance of maintaining appropriate national consistency in the remedy selection process."
- "Appropriate consistency" means "applying decision-making processes recommended in national policies and guidance, using the criteria they lay out, and exercising the built-in flexibility as appropriate to address site-specific circumstances."
  - *National Consistency in Superfund Remedy Selection*, OSWER Directive 9200.0-21 (September 25, 1996), p. 2.

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Key to Progress: National Application of Existing Sediment Guidance (con't)

- 2005 USEPA issued a national policy guidance to evaluate contaminated sediment site remedies
  - National policy for all contaminated sediment sites.
  - Reiterates 11 risk management principles in 2002 guidance.
  - Focuses on remedies with source control.
  - Looks to achieve long-term protection while minimizing short-term impacts and being cost-effective.
    - *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*, OSWER Directive 9355.0-85 (December 2005), Chapter 7 (emphasis added).

NRRB/CSTAG Review of Proposed Plans and HQ Role in Remedy Selection

- Regional disregard of NRRB/CSTAG comments on Proposed plans significantly undermines consistent application of national sediment policy.

- This disregard of NRRB/CSTAG recommendations apparently has occurred without any repercussions / accountability

Examples of Regional Disregard of CSTAG/NRRB Comments

- 2012 Comment: "While RAO #1 mentions surface water, the package and presentation did not include any thoroughly analyzed alternatives specifically focused on reducing surface water contamination or discussion of related ARARs compliance"
- The Region included surface water PRGs in the Proposed Plan, but they were not explored nor evaluated in the Feasibility Study

Examples of Regional Disregard of CSTAG/NRRB Comments (con't)

- 2012 Comment: "The Boards recommend that the Region consider developing interim target concentrations in fish tissue for specific scenarios (e.g., central tendency, other meal consumption rates, etc.) for inclusion in its decision documents as interim monitoring measures designed to provide data for cleanup progress evaluation."
- The Region did not respond to this comment.

Examples of Regional Disregard of CSTAG/NRRB Comments (con't)

- 2012 Comment: "The Boards recommend that the Region's decision documents explain how the preferred remedy is consistent with existing agency guidance on the role of background and how final cleanup levels will be set in light of background contamination."
- Response: "To the extent the State standards are potential ARARS, the Region believes some of them may need to be waived."
- The Region has not approved any waivers of ARARs based on State standards.

Examples of Regional Disregard of CSTAG/NRRB Comments (con't)

- 2014 Recommendation: "The Boards note that recontamination could prevent the attainment and maintenance of the [clean up level of the COC] in sediment over time; potential sources of recontamination include, but are not limited to, resuspension caused by the cleanup itself and transport from the yet-to-be remediated parts of the Bay."

- The Region's Conceptual Site Model evaluated only 7 of 32 COPCs and did not adequately account for ongoing source loading and potential for sediment recontamination. No plan for controlling or reducing sources was included.

Examples of Regional Disregard of CSTAG/NRRB Comments (con't)

- 2014 Recommendation: "The Boards recommend that the Region's schedule allow sufficient time to address external peer reviewer's and the CSTAG's comments on the Region's sediment transport, organic carbon, and contaminant transport and fate models before the proposed plan is released."
- Response: Neither the methodology utilized by the Region, nor its specific application (calibration, verification) in the study has undergone external validation or peer review as called for in Section 2.9.4 of the Sediment Guidance and in the NRRB/CSTAG comments.

Examples of Regional Disregard of CSTAG/NRRB Comments (con't)

- The NRRB and CSTAG 2014 Joint Comments noted that the Site's Ecological Risk Assessment "is largely a conservative, literature-based" risk assessment and that such generic risk assumptions were not justified in all cases: "literature-based numerical, chemical-specific ecological preliminary remediation goals (PRGs) do not appear to be necessary for all identified contaminants in this proposed remedial action."

- Yet the Region's Proposed Plan relied on <u>screening</u> <u>level</u> risk assessment approaches rather than developing a site-specific baseline risk assessment.

Examples of Regional Disregard of CSTAG/NRRB Comments (con't)

- Comment: "Site-specific modeling suggests that the preferred alternative may yield post-remedy concentrations that are below background levels post multi-year remedy implementation. The Boards recommend that the Region clearly explain in its decision documents, how, considering EPA guidance, information regarding background was taken into account when developing RAOs, PRGs and final cleanup levels."

- The Region's Proposed Plan included PRGs below anthropogenic background.

NRRB/CSTAG – Potential Solutions

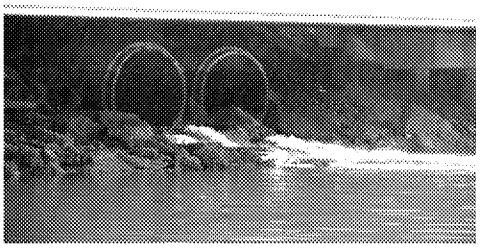
- Restore CSTAG as reviewer of Proposed Plans-advantage of significantly more detailed review by seasoned Agency technical experts
- Strong support needed by senior management at HQ of NRRB/CSTAG recommendations
  - Should require consistency
  - Should require accountability

Consistent Application of National Policy - Potential Solution

- Co-selection of Remedy – Regional Administrators AND the OSWER Director
- OSWER Directive 14-2 Delegation of Authority (2002) provides that CERCLA Remedy Selection Authority is *CO*-delegated to the AA/OSWER and the Regional Administrators
- The fix is available without any new formal process changes

Specific Issue: Source Control

- Characterize and understand contribution of on-going sources, especially in urban areas
- Quantify the impact of ongoing sources, e.g. bioavailability of contaminants in dry/wet weather water inputs and/or air deposition
- Control sources before implementing sediment remedies
- Coordinate CERCLA, CWA, and state programs



Specific Issue: Source Control Examples (con't)

Gowanus Canal (Record of Decision, September 2013)

- » Remedial investigation => more than 250 outfalls.
- » ROD focused on only two sources (identified as most likely to cause ongoing contamination).
- » Other outfalls must be permitted or discontinued.
- » Critical issue is the timing and scope of state programs to control ongoing sources vs. sediment cleanup.
- » Recontamination remains a significant concern.

Specific Issue: Source Control Examples (con't)

Lower Passaic River (FFS 2007 and Proposed Plan 2014)

- » Did not adequately identify potential ongoing sources (e.g. CSOs, SSOs, permitted discharges, or contaminated groundwater)
- » Evaluated potential for on-going sources based on information from other cities and waterways.
- » Only a handful of CSOs evaluated
- » In fact, there are 36 CSO discharges to the river within the area of focus.

Specific Issue: Risk Reduction vs. Mass Removal

- National Policy
  - There are no presumptive remedies at contaminated sediment sites (2005 Guidance, p. 7-16).
  - Regions should not presume "that removal of contaminated sediments from a water body will be necessarily more effective or permanent than capping or MNR" (2005 Guidance, p. 3-16).
  - "Project Managers should keep in mind that deeper contaminated sediment is not currently bioavailable or bioaccessible, and that analyses have shown to be stable to a reasonable degree, do not necessarily contribute to site risks." (2005 Guidance, p. 7-3)

Specific Issue: Risk Reduction vs. Mass Removal Example

- Lower Duwamish Waterway (Proposed Plan, February 2013)
  - Remedy combines dredging with other remedial options (capping, enhanced monitored natural recovery, monitored natural recovery)
    - Alternatives 3 through 6 would achieve approximately the same level of long-term risk reduction
    - The proposed remedy (Alternative 5C Plus) involves
      - additional substantial dredging (+300,000 cy) targeting more mass removal than other protective alternatives
      - extended construction (+4 years), and
      - additional cost (+$105M)
      - Additional dredging is likely to increase constituents of concern into the water and is likely to lead to increased COC concentrations in fish tissue for many years.

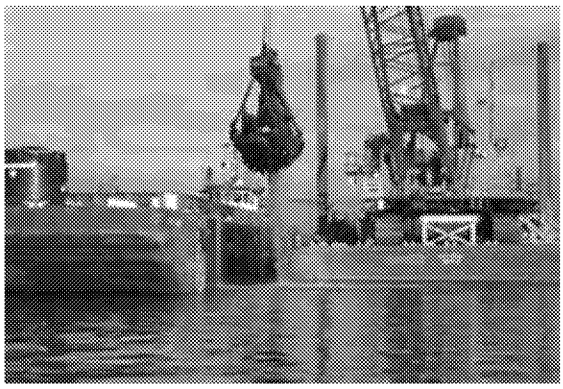
Specific Issue: Appropriate and Achievable Cleanup Standards

- At many sites, the risk-based cleanup standard is below background.
- CERCLA then defaults to use of background as the standard [Role of Background at Superfund sites, OSWER 9285.6-078 (April 2002)].
- Significant lengthy and costly disputes on cleanup standards and/or appropriate "background" have slowed progress at many medium to mega sites.

Specific Issue: Appropriate and Achievable Cleanup Standards Example

Lockheed West (ROD, Aug 2013); (**Duwamish** PP, 2/13)

- Risk-based sediment cleanup level < natural background
- MTCA: cleanup level = practical quantification limit or natural background, whichever is higher
- Natural background concentration less than anthropogenic background
- In contrast, an ambient water quality ARAR was waived as "technically impractical."
- ARARs that cannot be achieved, should be waived.



Solution - Achievable Cleanup Standards/Realistic Background

- Establish realistic anthropogenic background concentrations, especially for urban waterways
- Establish legitimate and realistic (not overly-conservative) reference conditions
- Develop and implement a consistent, technically and scientifically acceptable approach

Appropriate Application of National Policy Would Reduce the Significant Adverse Impact of Pervasive Ultraconservatism and Uncertainty Paralysis

- Ultra conservatism and fear of uncertainty continue to have a significant adverse impact on timely remedy implementation, cost and the inability to select appropriate risk-based remedies

Conservatism and Uncertainty Paralysis Lead to an Unnecessarily Lengthy and Costly RI/FS Process

- Examples
  - Passaic River $100M plus
  - Willamette River $110M plus
  - Duwamish River $50M plus
  - Others . . .

Decision-Making in the Face of Uncertainty

- "Management decisions must be made, even when information is imperfect. There are uncertainties associated with every decision that need to be weighed, evaluated, and communicated to affected parties. Imperfect knowledge must not become an excuse for not making a decision." Sediment Guidance p. 7-1, quoting the NRC 2001 Report on Risk Management Strategy for PCB-Contaminated Sediments.

Natural Resource Trustees Role

- Another increasing obstacle to efficient progress at Superfund Sediment Sites is the increasing role being asserted by Natural Resources Trustees
- Although given a place at the table as a stakeholder, site remedial decisions were not intended to be controlled by the Resource Trustees, another complicating factor, especially at complex and larger sites

Use of the Adaptive Management Tool at Complex Sites

- Use of the Adaptive Management Tool when all agree can be an effective way of reasonably addressing uncertainty and moving ahead with a remedy

Key Concept – Use of Sequential Risk Management for Remedy Selection

1. Source Control Evaluation
2. Acknowledge No Action Alternative
3. Sequential Development of Alternatives
4. Quantify Δ Risk Reduction & Δ Cost
5. Evaluate Alternatives Using 9 Criteria
6. Apply Risk Management Principles to Selected Remedy

Sequential Risk Management

MNR

+

Internal Source Control

+

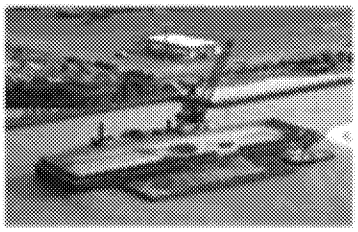
Enhanced Natural Recovery Components

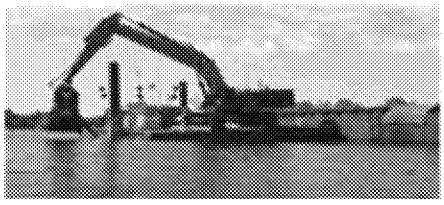
+

Engineered Capping/In-Situ Amendments

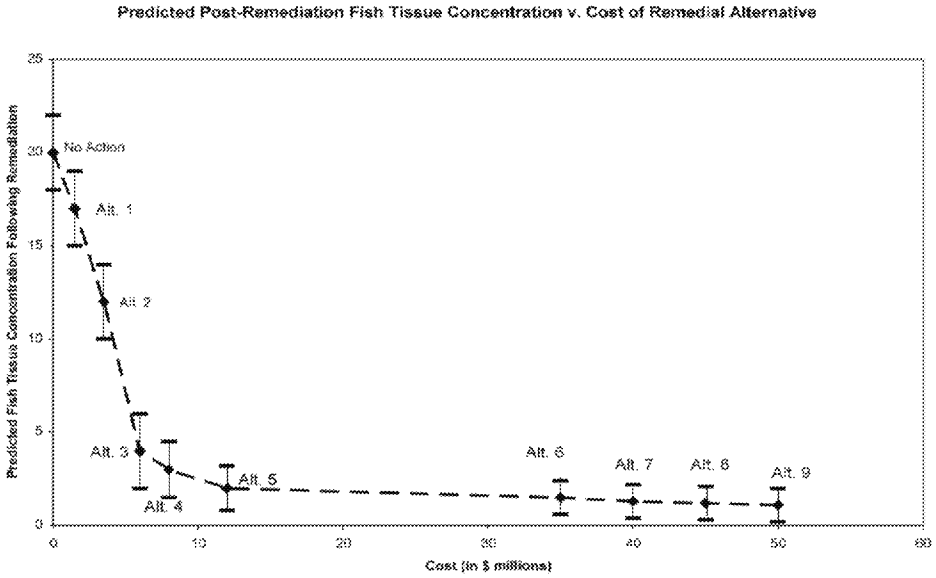
+

Dredging/Excavation





Sequential Risk Management Example



Key Issue – CERCLA's Cost-Effectiveness Requirement

- National Policy:
  - Remedies must be cost-effective. Cost-effective means that costs must be proportional to the overall remedial effectiveness.
    - *40 CFR §300.430 (f)(1)(ii)(D)*
  - "[I]f the difference in effectiveness is small but the difference in cost is very large, a proportional relationship between the alternatives does not exist."
    - *Preamble to the NCP, 55 Red Reg 8728 (March 8, 1990)*
  - Regions must select remedies that are cost-effective (2005 Guidance, p. 7-17).

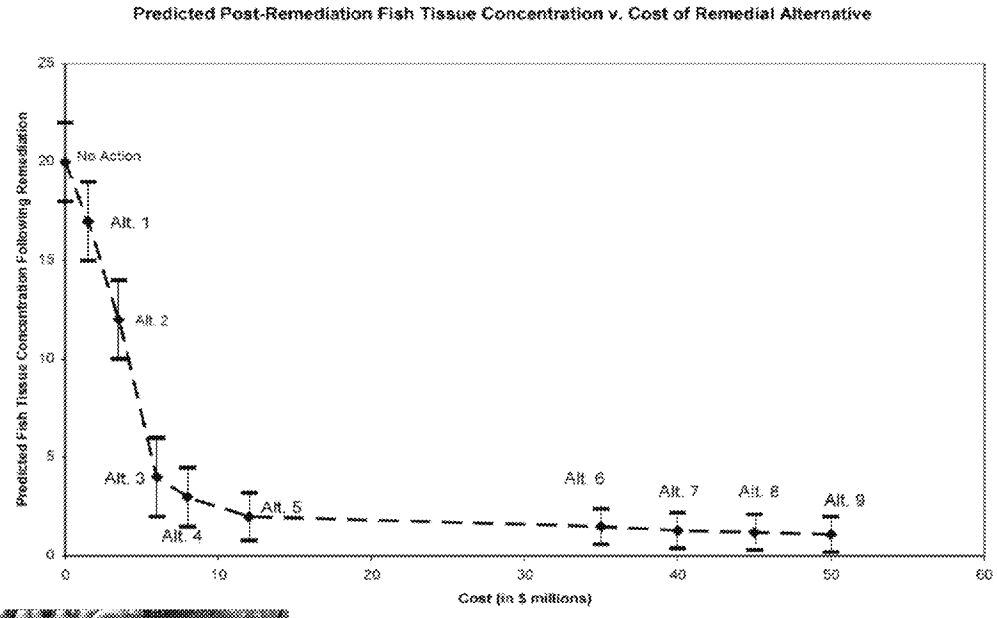
Cost-Effectiveness Example

- Lower Duwamish Waterway (Proposed Plan, February 2013)
  - Cost of the remedy is not proportional to the incremental effectiveness it offers compared to other available remedies.
    - Three alternatives would achieve approximately the same level of long-term risk reduction.
    - The proposed alternative would achieve almost the same risk reduction for $105 million more than another, equally protective alternative and has 4 additional years and 300,000 cy. of additional dredging.

Cost-Effectiveness Example

- Lower 8 Miles of the Passaic River (Proposed Plan, April 2014)
  - 48% of dredging ($850 million) for navigation, not remediation
  - Confined Aquatic Disposal Facility (potential savings $700 million) was <u>not</u> considered
  - Benefits of the “bank to bank” dredging alternative were overstated because the plan did not take into account risks created by the dredging remedy itself

Remedy/Cost-Effectiveness Proportionality



Summary – National Sediment Policy

- A nationally consistent program implementation is critical.
- Remedy selection should focus on risk reduction and not mass removal.
- Source control must be critically evaluated and considered.
- Cleanup goals must be technically appropriate and incorporate realistic “background.”

Summary – National Sediment Policy (con't)

- CSTAG should be restored and enhanced as the Board primarily responsible for review of sediment site Proposed Plans.
- The NRRB/CSTAG recommendations must be supported and enforced by senior HQ.
- CERCLA, NCP and Sediment Guidance cost-effectiveness proportionality requirements <u>must</u> be followed