Testing and Evaluation for Upland Placement of Dredged Material

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Unique Challenge to Great Lakes Dredged Material Management:

3% of total dredging volume with some of the greatest restrictions on disposal and placement
Issues

- Restrictions on open water placement
- Confined disposal option no longer the solution due to declining capacity and cost
- Upland beneficial use challenges:
  - Authority for permitting
  - Process not specific for dredged material
  - Liability
  - Cost for handling and transport – expensive and who pays?
Two Regulatory Paths for Upland Placement

- Confined with permitting under the CWA for return flow to waters of the U.S.
  - Water quality certification or waiver
- Confined or unconfined with no return flow with permitting under RCRA/Solid Waste
  - Dredged material treated as solid waste as defined by jurisdictional state where placed
Governing Framework

- Regulatory
  - Clean Water Act (CWA)

- Technical
  - USACE/EPA Technical Framework
    - Federal Standard
  - Upland Testing Manual (UTM)
USEPA/USACE Technical Framework

- Guidance (not regulatory)
- Articulates NEPA, CWA requirements
- Alternatives screening
  - Open water
  - Confined disposal
  - Beneficial use
- Environmental impacts of alternatives
Conceptual Model - Contaminant Pathways

- **Birds/Wildlife**
- **Precipitation**
- **Volatilization**
- **Surface Runoff**
- **Leachate**
- **Infiltration**
- **Unsaturated**
- **Saturated**
- **Dike**
- **Effluent**
- **Surface Water**
- **Air Quality**
- **Plant/Animal Uptake**
- **Seepage**

**Ground Water**
Upland Testing Manual

- Guidance (not regulatory)
- Evaluation of contaminant migration from CDF
- Determines the need for management or controls
- Document pathway exposure/effects assessment to support decision making
  - Management requirements
  - Engineering alternatives analysis
Tiered Testing Approach

- Tier I – Existing info, material determined inert
- Tier II – Compare DM chemistry to screening level
  - Pass: no further contaminant evaluation
  - Fail: Further evaluation
- Tier III - Physical and biological tests for bioavailability
  - Biological exposure for bioavailability or site specific use
- Tier IV - Risk assessment
<table>
<thead>
<tr>
<th>Tier</th>
<th>Evaluation Type</th>
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<tr>
<td>Tier I</td>
<td>Existing Info</td>
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<td>Tier II</td>
<td>Screening Evaluations</td>
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<tr>
<td>Tier III</td>
<td>Effects-Based Testing and Evaluations</td>
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<tr>
<td>Tier IV</td>
<td>Case Specific Studies/Risk Assessment</td>
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</tbody>
</table>
Upland Beneficial Use Suitability
Wetland Habitat and Shoreline Protection
Island Habitat
Construction Fill

Dike 10B, Cleveland
Agriculture/Forestry

CO₂ Credits
Recreation
Mineland Reclamation

Coastal LA: How did this rock get here?

NY Harbor Dredged Material, Bark Camp

75 m

Erie Pier CDF

Taconite Mines
Construction Materials

[Image of a garden fountain with flowers and welcome stones]
Blending to Meet Needs

- Cellulose
  - Yard wastes, paper wastes
- Biosolids
  - Sewage sludge, animal wastes
- Industrial by-products
  - Red mud, fly ash
Dredged Material to Landscapes
Grand Haven, MI
Dredged Material Recycling
ISSUES

- Perceptions w/o scientific basis
- Lack of clear regulatory guidance
- **Uncertainty** dealing with contaminants
- Fear of product liability
Why is BU Such a Challenge?

- Great Lakes Beneficial Use Task Force, 2001
  - Lack of regulatory guidance obstacle to BU

State regulations continue to evolve.

Risk-based evaluation needed to define suitability for BU and assist in effective least cost determination.
Testing Manual for Beneficial Use of Dredged Sediments

**Purpose:** Provide guidance for determining suitability of dredged material for aquatic, nearshore, wetland, and upland beneficial uses

- **Physical suitability**
  - Does the material meet the performance standards for the proposed use?

- **Environmental/human health risks**
  - Do contaminants pose a risk when the proposed use is selected?
Goals

- One-Stop, Web-based Guidance
- Standardized risk-based testing methods
- Consistency in interpretation
- Updated regulatory guidance applicable to Great Lakes States
- Regional, cost-effective approach to unique sediment management needs of the Great Lakes
Suitability Quality Defined

- **Sand Quality** – Physical standard – unless certain COCs present

- **Sediment Quality** – Exposure = Acceptable Risk
  - Suitable for aquatic use – aquatic habitat, aquatic fill, beach/littoral nourishment

- **Soil Quality** – Exposure = Acceptable Risk
  - Suitable for confined or unconfined upland use – habitat, green space, landscaping, crop production

- **Unrestricted Fill** – Exposure = Acceptable Risk
  - Suitable for unrestricted fill, material use

- **Restricted Fill** – Exposure = Unacceptable Risk
  - Suitable for restricted industrial fill, landfill cover, material

- **Impaired** – Unacceptable Risk without Treatment
  - Requires treatment to render suitable
    - Landfill or confined disposal
Physical Suitability

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<tr>
<th>Beneficial Use Options</th>
<th>Rock</th>
<th>Gravel &amp; Sand</th>
<th>Consolidated Clay</th>
<th>Silt/Soft Clay</th>
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Environmental Suitability
Application
Where We Came From, Where We Were Going, Where We Have Arrived

The June 1969 report of the Corps Buffalo District on the pilot study was tentative and ambiguous. This report did not find that there was "hard evidence" of adverse effects on lake water quality resulting from deep water disposal. It admitted, however, that aquarium tests showing that heavily polluted dredged materials could kill small forms of animal life found in the lake and stimulate growth of nuisance algae were probably significant (127). The report firmly recommended further research on dredging spoil disposal management (128), but also tentatively suggested, if Congress should find it economically warranted, a 10-year program of land disposal of dredgings from 35 especially polluted harbors (129).

However, events of the latter half of 1969 pushed the Corps onto an environmentally protective course. As a result of the pilot study, public hearings, and comments of Federal agencies and affected States, the Corps developed a proposal to authorize a program of land disposal for Great Lakes harbors and channel dredgings. The proposed program was recommended to Congress by President Nixon in April 1970 (130), and ultimately resulted in the inclusion of section 123 in the Rivers and Harbors Act of 1970.

29 It was assumed that 10 years of treatment of municipal and industrial wastes at their sources would make sediments in harbors and channels Clean enough for lake disposal.
FINDING OF NO SIGNIFICANT IMPACT AND ENVIRONMENTAL ASSESSMENT
OPERATIONS AND MAINTENANCE
OPEN-LAKE PLACEMENT OF MATERIAL DREDGED FROM CLEVELAND HARBOR FEDERAL NAVIGATION CHANNELS IN THE UPPER CUYAHOGA RIVER
CLEVELAND HARBOR
CUYAHOGA COUNTY, OHIO

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Questions??

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