

MANAGEMENT OF CONFINED DISPOSAL

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E2D2 Keywords: Technical Framework, Manual



Confined Disposal Facilities

- CDFs used because:
 - More economical for some projects
 - Most common option for material unsuitable for open water
- Regulated under CWA
 - discharge to US waters by definition
 - 404 permit
 - 401 State water quality certification

Confined Disposal Facilities

FACTORS:

- Operational considerations
- Engineering design
- Contaminant pathways and controls
- Long-term management
- Monitoring

Operational Considerations

- Method of filling
 - Hydraulic
 - Mechanical
- Frequency and duration of filling
- Surface water management
- Long-term management strategy





CDF Engineering Design

- Dike Design
- Sizing for Initial Storage and Solids Retention
- Outlet Weir Design

CDF Dikes

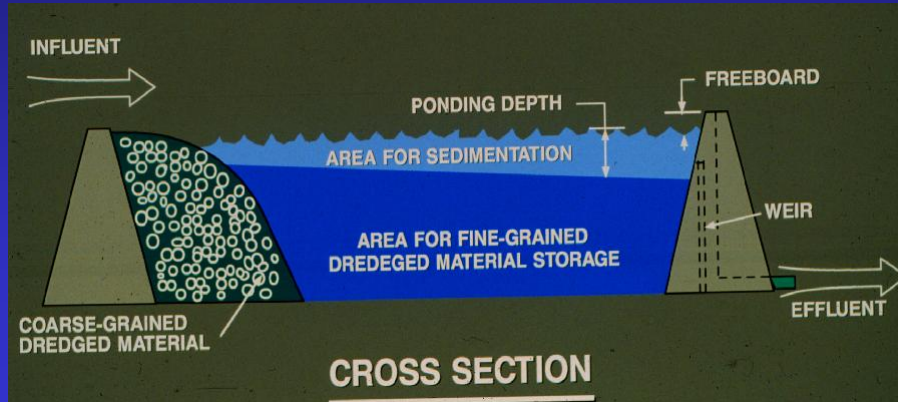
- Planning
 - Design life/ Total volume
 - Staged construction vs one-time construction
- Design
 - Geotechnical
 - Coastal (overtopping and erosion)
- Construction
 - Conventional earthwork
 - Special methods (soft foundations)

CDF Design Objectives

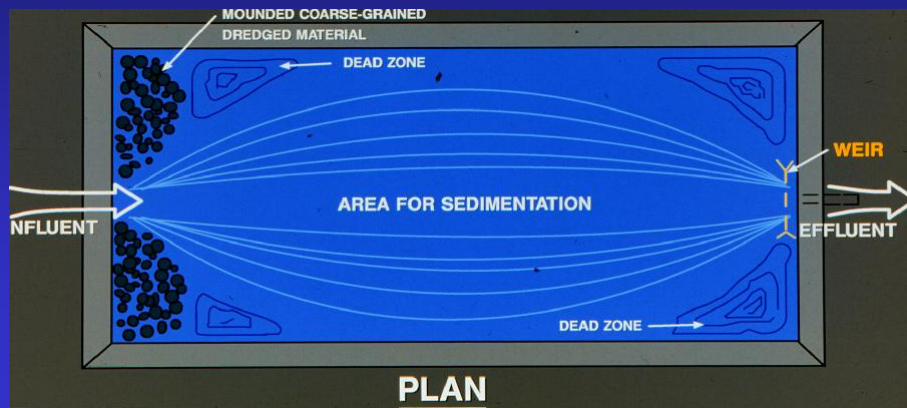
- Retain solids during placement by providing adequate ponded area and ponded volume for clarification
- Provide adequate volume storage for the project
- Contain contaminants



Concept of a dredged material settling basin



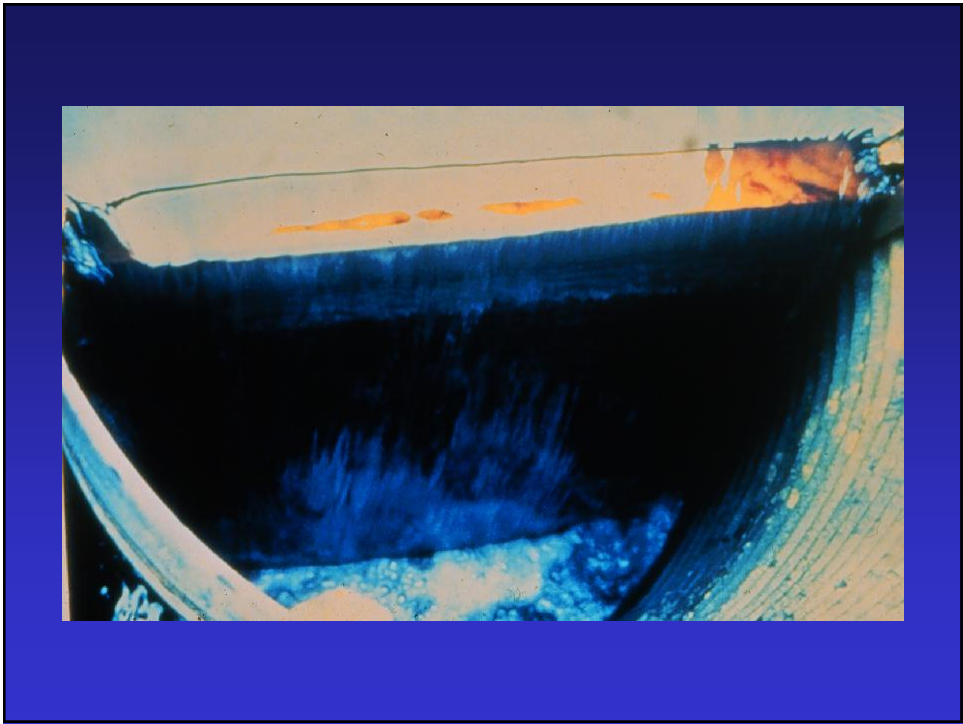
Concept of dredged material settling basin





Outlet Weir Design

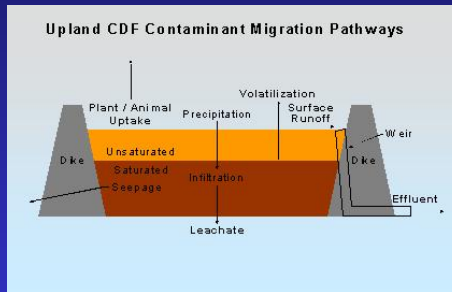
- Structural Design
 - Long-term fill height
 - Flowrate
 - Flotation
- Weir crest length for effective withdrawal
- Ease of operation
- Drawdown after disposal



CDF Contaminant Pathways

- Effluent During Filling
- Surface Runoff
- Leachate to groundwater
- Direct uptake by plants/animals
- Volatilization to air

Evaluated using Upland
(CDF) Testing Manual



CDF Pathway Controls

- Operational (During filling)
- Treatment of Discharges (Removal, Phase Transfer, or Degradation)
- Engineered Controls (Containment or Isolation)
- Site Management (After Filling)

Long Term Storage and Dewatering

- Prediction of consolidation/ desiccation rates
- Site management for dewatering
- Dewatering equipment and operations







Em 1110-2-5027 Confined Disposal of Dredged Material

- Field investigations and sampling
- Site selection to avoid groundwater impacts
- Settling tests for evaluation of solids retention
- Consolidation tests for evaluation of long-term storage
- Design for solids retention
- Design for storage during filling
- Weir design
- Design of chemical clarification systems
- Prediction of dredged material consolidation
- Dredged material dewatering operations
- Design and construction of dikes
- Operation and management activities
- Long-term management plans

Design and Management of CDFs ADDAMS Programs

- SETTLE - Initial Storage and Solids Retention
- PSDDF - Long Term Storage and Dewatering
- D2M2 - Planning for multiple sites