

# Cleveland Harbor Dredged Material Management Beneficial Use Placement Options

Beneficial Use of Dredged Material

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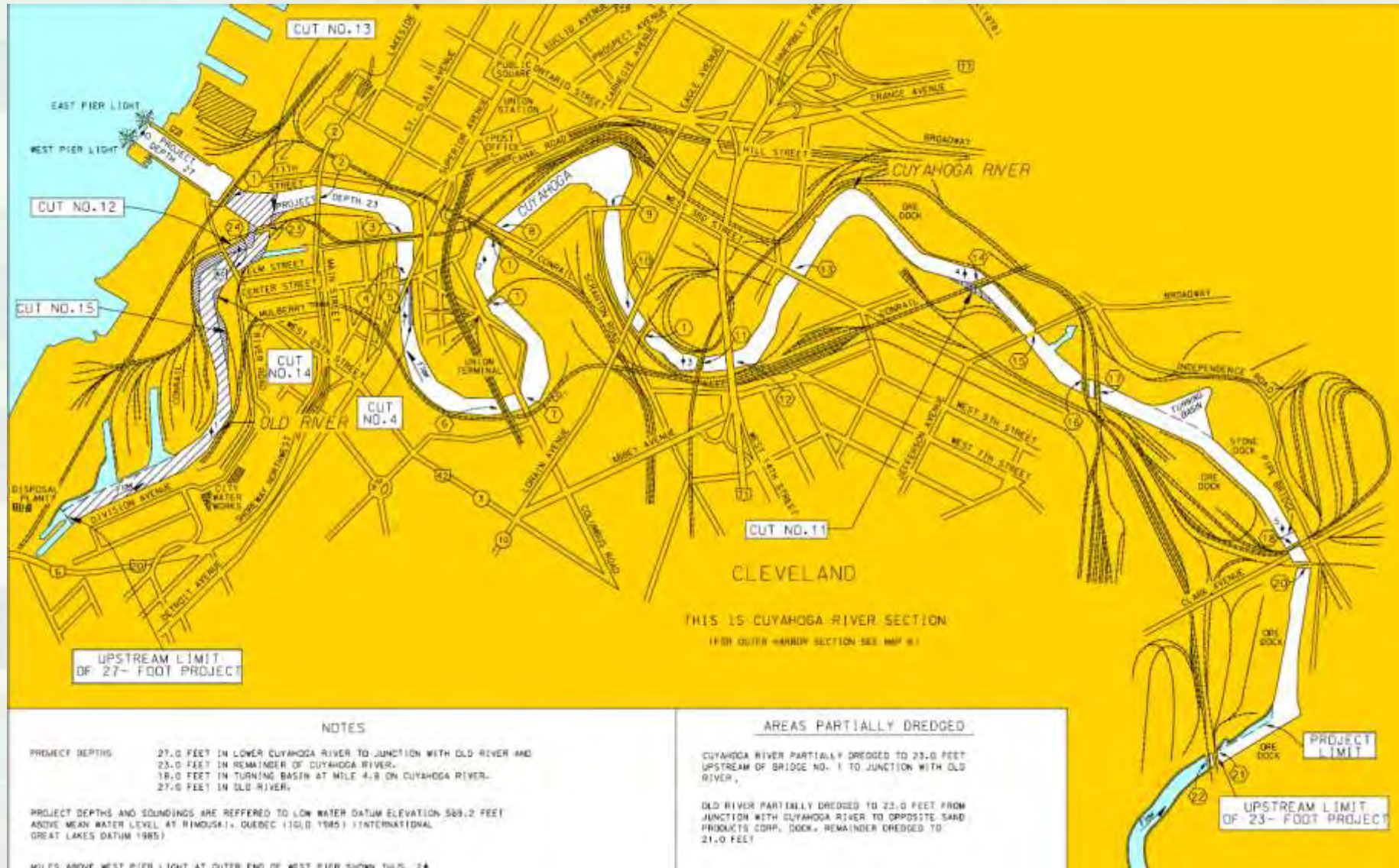
# Presentation Overview

- Cleveland DM management: historical & regional perspectives
- Beneficial use projects using previously dredged material:
  - CVIC (CDF 10B)
  - Dike 14
- Beneficial use evaluation for newer dredged material: ERDC's 2011 BU report
- Current DM placement evaluation: USACE 2013-4 FONSI/EA
- Potential aquatic placement options: Beneficial use for ecosystem restoration (Section 204 projects)
- Port of Cleveland's Healthy Lake Erie (State of Ohio) grants
  - Bedload interceptor
  - CDF 12 preparations

- **DISCUSSION**

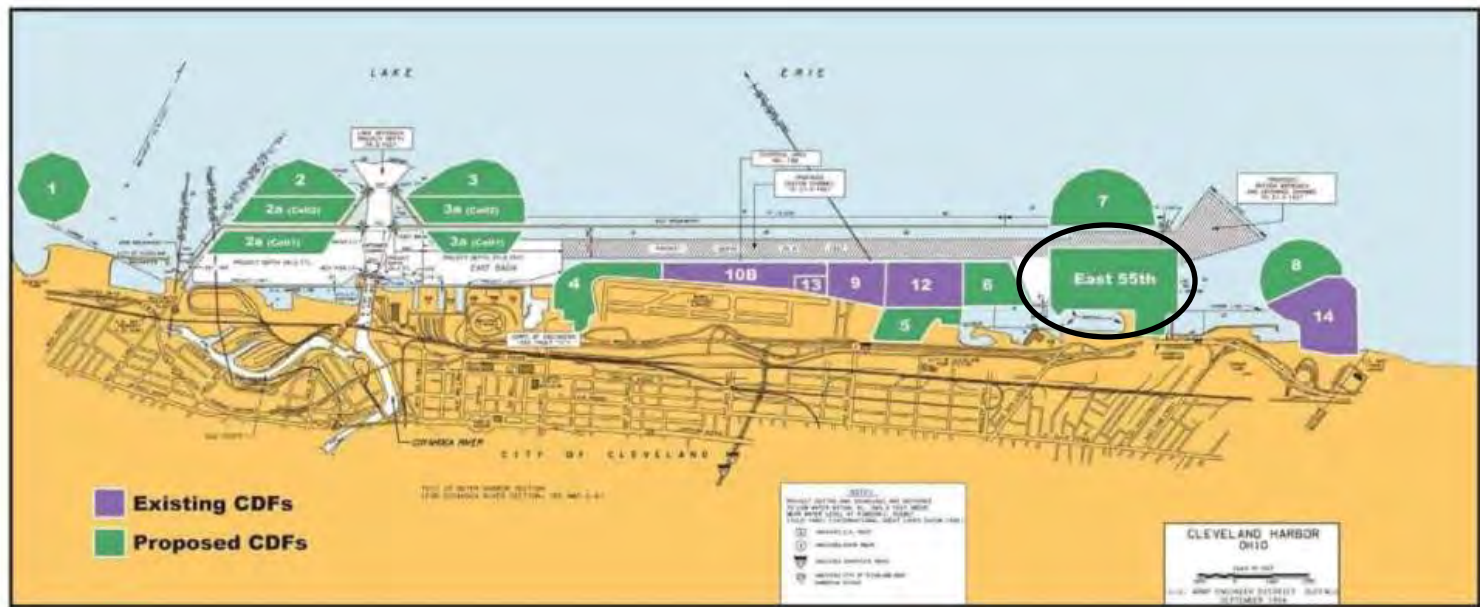


# Cleveland Harbor and Cuyahoga River



## Draft DMMP released 2009

- Identified new CDF to be constructed
- Annual average cost ~ \$17 - 19 M
- Total construction cost over \$300 M
- Non-federal sponsor unable to support cost sharing requirements



# Cleveland Harbor DM Management: Regional Perspective

## *Current Ohio Harbor Needs and Status*

Harbor (Commercial Only)	Annual Dredge Need (CY)	Current Disposal	CDF Availability	Remaining CDF Capacity
Ashtabula	50,000	Open Lake	No	0
Cleveland	225,000	CDF	Yes	300,000 CY
Conneaut	40,000	Open Lake	No	0
Fairport	75,000	Open Lake	No	0
Huron	95,000	Open Lake	Yes	670,000 CY
Lorain	75,000	Open Lake*	Yes	300,000 CY
Sandusky	140,000	Open Lake	No	0
Toledo	800,000	Open Lake*	Yes	2,000,000 CY
Totals	1,500,000			3,270,000 CY

\*Small (seldom dredged) areas in Lorain and Toledo harbors still require CDF disposal.



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# Mining of material from CDF 10B for placement at Cuyahoga Valley Industrial Center Brownfield Project



CDF 10B

Cuyahoga River

CVIC Site

- 300,000 CY of DM from CDF 10B used as fill at former coke plant site (brownfield reclamation)
- Created ready-to-build site to generate investment, jobs, and tax revenue
- DM moved between July – September 2010
- Funded by 2010 ARRA (stimulus) funds (~ \$7 M) : Public-private partnership



# Mining of material from CDF 10B for placement at Cuyahoga Valley Industrial Center Brownfield Project



- Dredged Material Management Plan
  - Evaluation of Human Health and SW Impacts
  - Source and Placement Material Observation and Documentation Protocol
- Human health evaluation: compared the data to U.S. EPA Industrial Regional Screening Levels for direct contact with soil
- Cumulative non-cancer hazard index of 1 and cancer risk goal of  $1 \times 10^{-5}$  are met for commercial/industrial land use



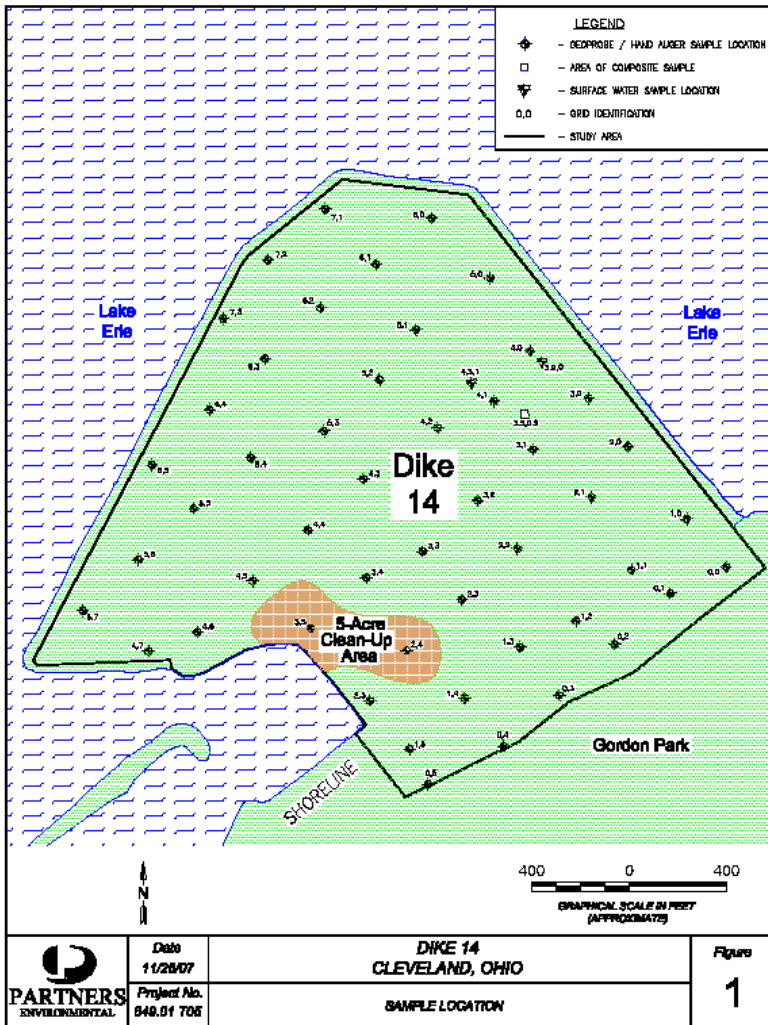


# Dike 14 Brownfield Assessment (Cuyahoga SWCD, Ohio EPA)



## Brownfield Assessment included:

- Voluntary Action Program (VAP) Phase I Property Assessment
- Wetlands Delineation
- VAP Phase II Property Assessment
- Human Health Risk Assessment
- Ecological Risk Assessment
- Background Soil Determination



# Dike 14 Renamed Cleveland Lakefront Nature Preserve



Brownfield Assessment Results showed:

- Dike 14 can be used safely as a Nature Preserve.
- 40,000 cubic yards of CDF 10B dredge material placed as soil cap over 5 acre former landfill area (USEPA grant, ~ \$600,000)



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# Comprehensive evaluation of suitability of newer dredged material for full range of potential beneficial uses

ERDC/EL Project Report



Environmental Laboratory

 US Army Corps of Engineers  
Engineer Research and Development Center

**Evaluation of Beneficial Use Suitability for Cleveland Harbor Dredged Material: Interim Capacity Management and Long-Term Planning**

Joseph P. Pfeiffer, Richard A. Price, Thomas D. Bermanian,  
Alan J. Kennedy, Dennis L. Brandon, and Michelle Bourns

July 2011



- Upland and Aquatic placements
- Human Health and Ecological Effects



Figure 2-2. Area locations of beneficial use opportunities and material handling sites.

# Environmental Suitability

## 1. Human Health Risk – OEPA guidance and USEPA screening levels

- ▶ **Industrial/Commercial** - acceptable
- ▶ **Recreational** – depends on recreational use
- ▶ **Residential** – not acceptable\* (PAHs)
- ▶ **Groundwater** - no impact to quality

*\*Note: Contaminant levels typical or lower than Cleveland's urban soils*



## 2. Ecological Risk

- ▶ **Terrestrial toxicity** – acceptable risk
- ▶ **Aquatic toxicity** – acceptable risk Upper River sediment; some toxicity measured in sediment from Middle/Lower River.
- ▶ **Bioaccumulation** - No significant risk to terrestrial / aquatic organisms



# Physical Suitability

Dredged material dominated by fine grained material (fine sand, silt and clay) that varies with storm events year to year

- Soil for urban restoration,
- Construction site landscaping ➤ Fertile silt loam to silty clay loam soil
- Landfill cover
- Wetland restoration
  
- Compacted fill ➤ Likely requires segregation of fine from coarse grained material during dredging
- Embankment material
- Landfill caps
  
- Construction aggregate ➤ High percent of fines makes material unsuitable even with segregation in some years.
- Beach nourishment

*Navigation channel sediment makes fertile soil*



*Yellow nutsedge in 10B dredged material*



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# USACE 2014 FONSI / EA

Sediment placed in a CDF  
(approx. 20% of dredging)

Sediment suitable for  
open lake placement  
(approx. 80% of dredging)

Arcelor  
Mittal

- New federal standard for 80% of the DM: Open-lake placement.
- However, Ohio EPA does not agree that the material from the Upper River is suitable for open-lake placement. The Ohio EPA would not issue a Water Quality Certification for open-water placement of the DM.





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# Beneficial use of dredged material

- Ongoing Section 204 Study evaluating options for restoring habitat at waterfront areas
- Non-Federal sponsor is City of Cleveland
- Options made possible by open lake suitability
- Volume range 66,000 cy - 346,000 cy
- Preliminary incremental cost range \$2.37M - \$12.1M subject to \$5M Federal limit
- 2015 - complete feasibility study, if a cost-shared sponsor is identified for design and implementation



2017 - Earliest construction start



# Cleveland Section 204 Alternatives

Site	Project Site	Estimated Cubic Yards	Estimated Cost	Cost/CY
1	Edgewater Park - West	122,200	\$10.3M	\$84
2	Edgewater Park - East	93,700	\$8.5M	\$91
3	Whiskey Island	66,000	\$6.6M	\$100
4a	Cleveland Lakefront Park	345,900	\$12.1M	\$35
4b	Cleveland Lakefront Park	150,200	\$2.4M	\$16
5	Dike 14 SW Corner	91,500	\$9.5M	\$104
<b>TOTAL</b>		<b>869,500</b>	<b>\$49.4M</b>	<b>\$57</b>
<b>Federal Standard Cost/CY</b>				<b>\$10</b>

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# The Port of Cleveland has been awarded 2 grants totaling over \$2.6 million for sediment handling / management

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Additional Funding to Improve Water Quality

# Port of Cleveland's 2 Sediment Handling Initiatives

## (1) Bedload interceptor (\$1.2 M):

- Sediment trap to be placed upstream of the navigation channel in the Cuyahoga River.
- Expected to remove ~ 30 – 40,000 CY/year of cleaner, coarser grained material
- Demonstration (3 year) permit granted

## (2) Use of CDF 12 (\$1.45 M)

- Grant would fund capital improvements to CDF to accept material in 2015 as part of DMM bridging strategy
- The Port's goal is to set up sluicing system like at Erie Pier to grade DM for subsequent removal and re-use
- The local land bank is one potential end-user of DM identified by the Port



# Questions, Comments?

