NJ Department of Transportation
Office of Maritime Resources

In-situ Stabilization of Contaminated Sediments for Remedial Dredging: A Pilot Study

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Dredging Program Manager

February 19, 2004
RTDF Meeting
Baltimore, MD

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Department of Transportation

Outline

- NY/NJ Harbor Overview
- The Passaic River Remediation
- Technology Issues
- Deep Soil Mixing
- In-situ Stabilization Pilot
- Potential Additional Studies

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PORT OF NEW YORK AND NEW JERSEY

- 15 Million People
- Largest Port on East Coast
- Largest Petroleum Port
- Naturally Shallow, 250 miles of engineered waterways
- 4-7 mcy/year dredging
- Oldest Industrialized Watershed
- 2-4 mcy/year contaminated sediment

Regional Dredged Materials Management Plan (DMMP)

- Reduce Need to Dredge
- Reduce Contamination
- Beneficially use as much as possible
- Dispose of only what cannot be used

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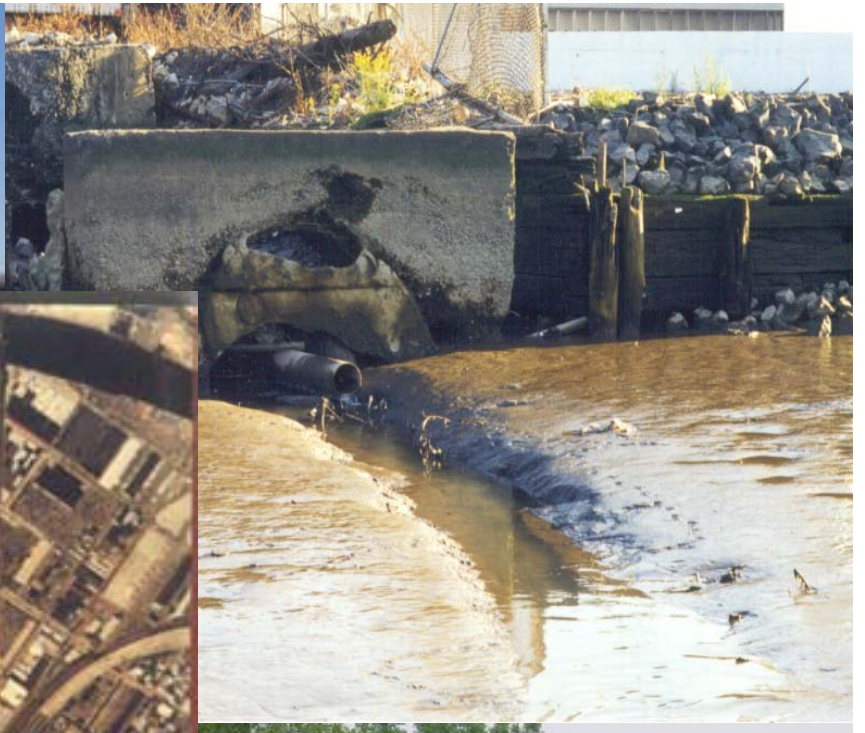

Legacy Contamination in Sediments: PCBs, Dioxins, PAHs, Pesticides, Metals

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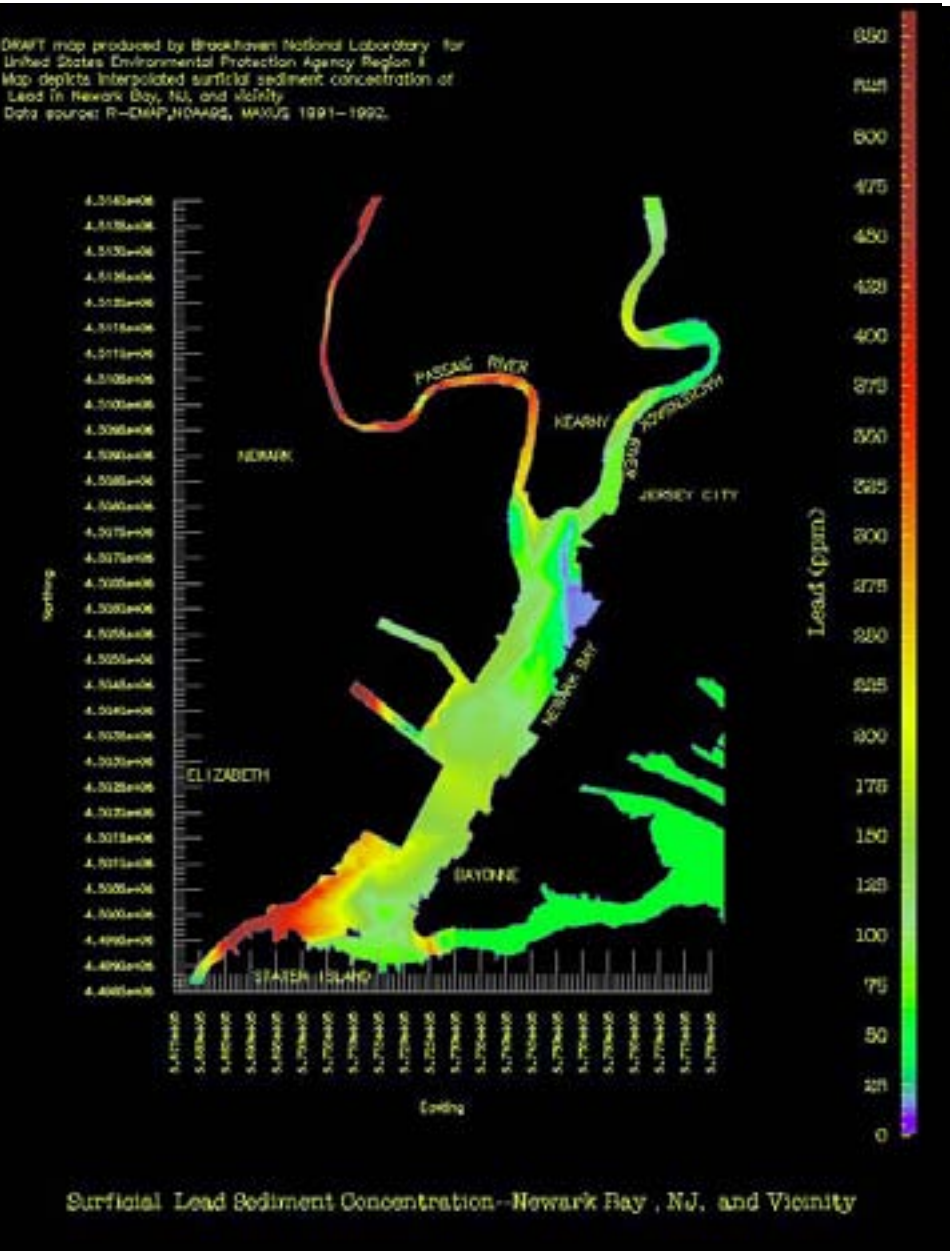
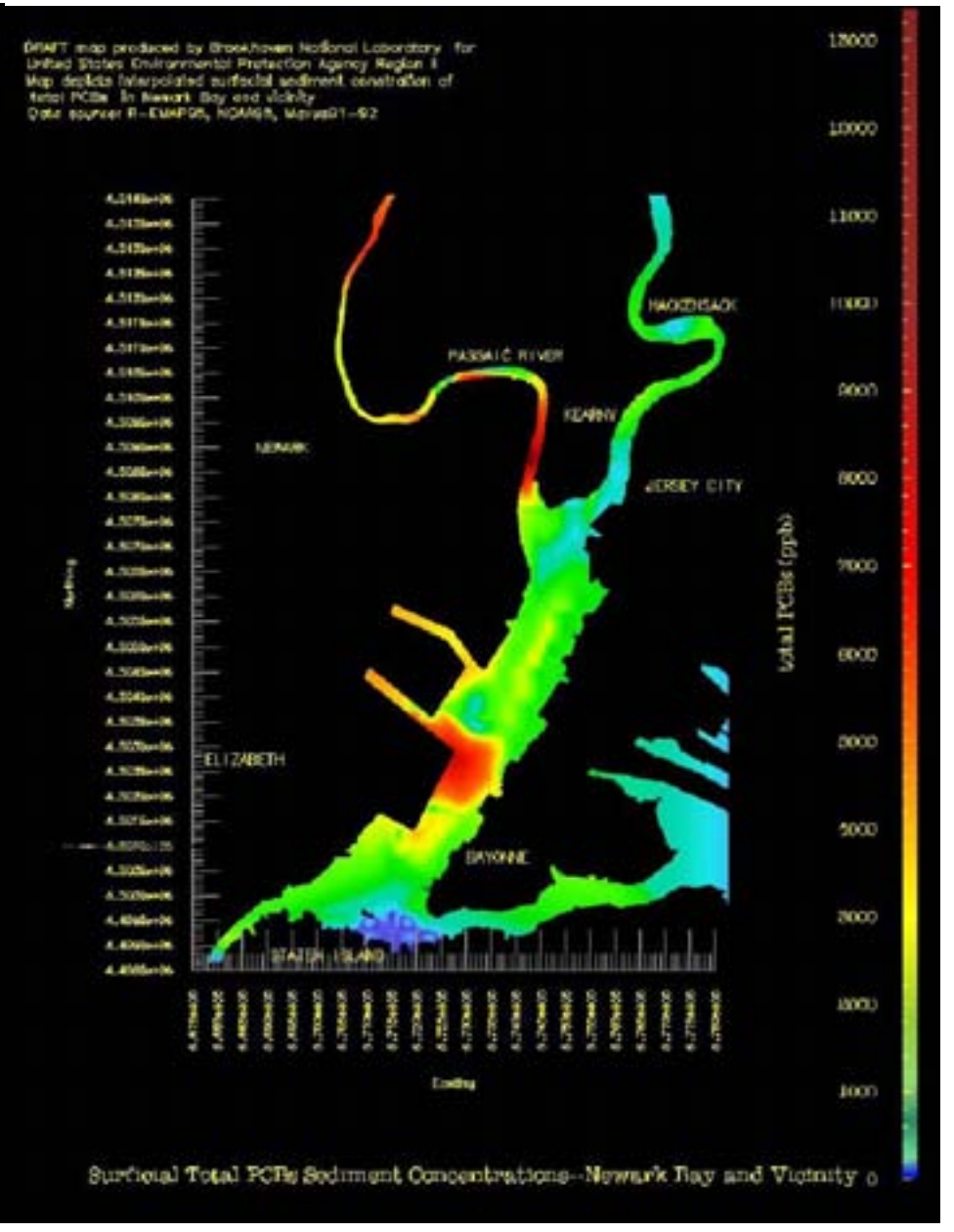
Newark Bay Lead



Newark Bay PCBs



Diamond Alkali

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Passaic River Contamination

- Mercury: up to 29,600 ppb
- Lead: up to 18,000 ppm
- 2,3,7,8-TCDD: up to 5,300 ppb
- Total PCB: up to 47,000 ppb
- Total DDT: up to 19,000 ppb
- Total PAH: up to 7,750 ppb

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IMTT-Bayonne Demonstration Site

BioGenesis Pilot Project - 1999

"Black Mayonnaise"

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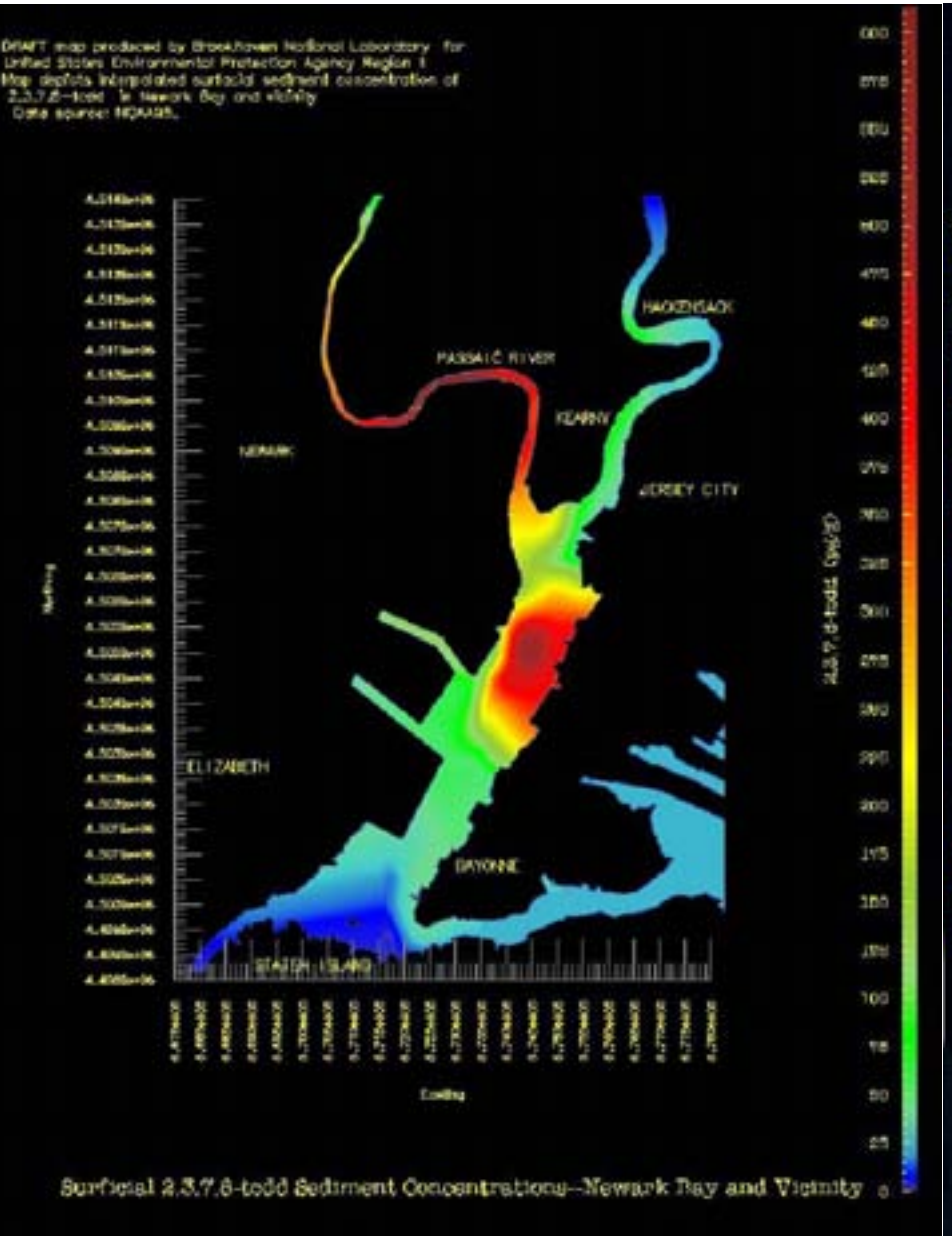
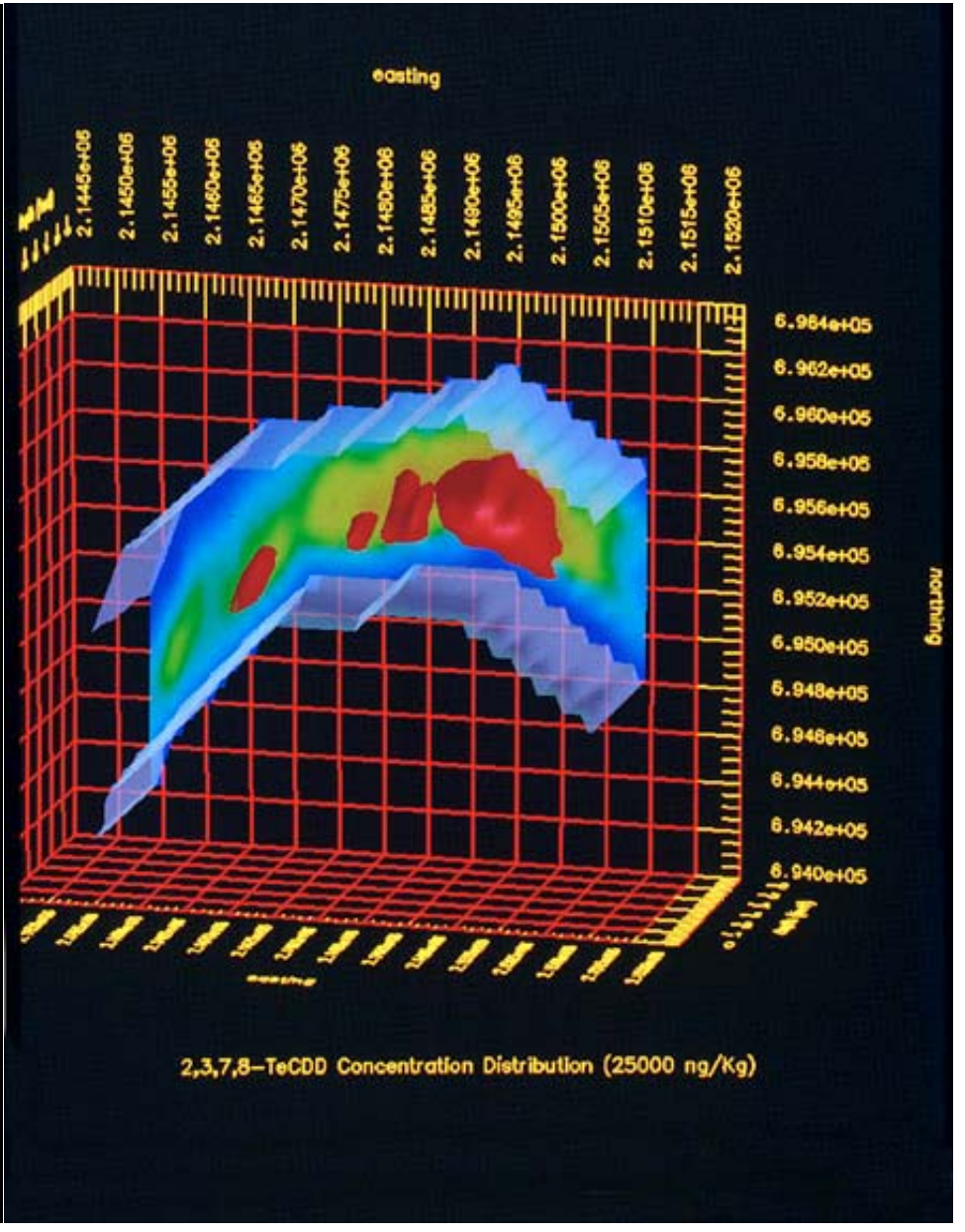
AMERICA

Conventional Equipment

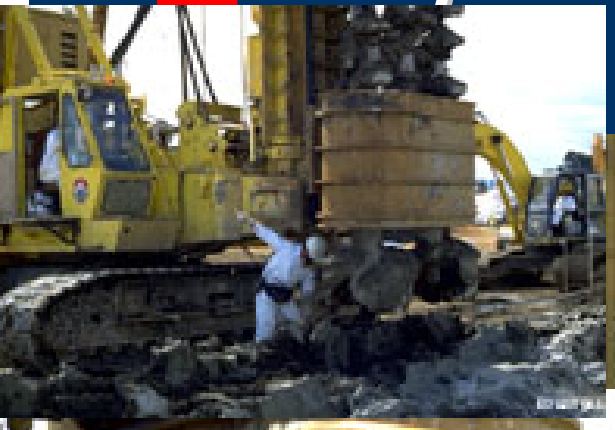
Dredged Material Management is "messy"

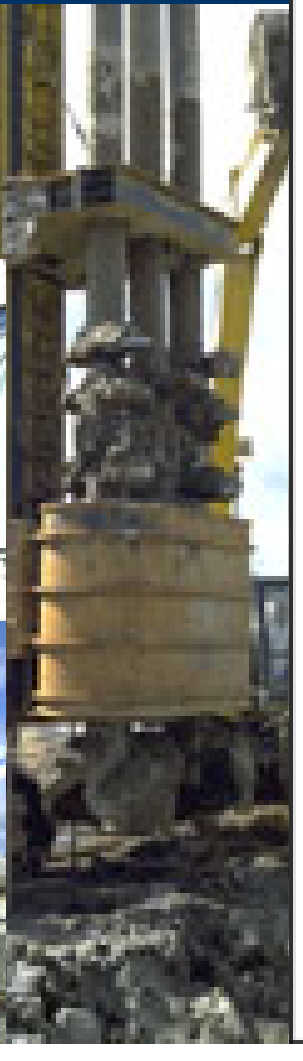
2,3,7,8-TCDD Distribution

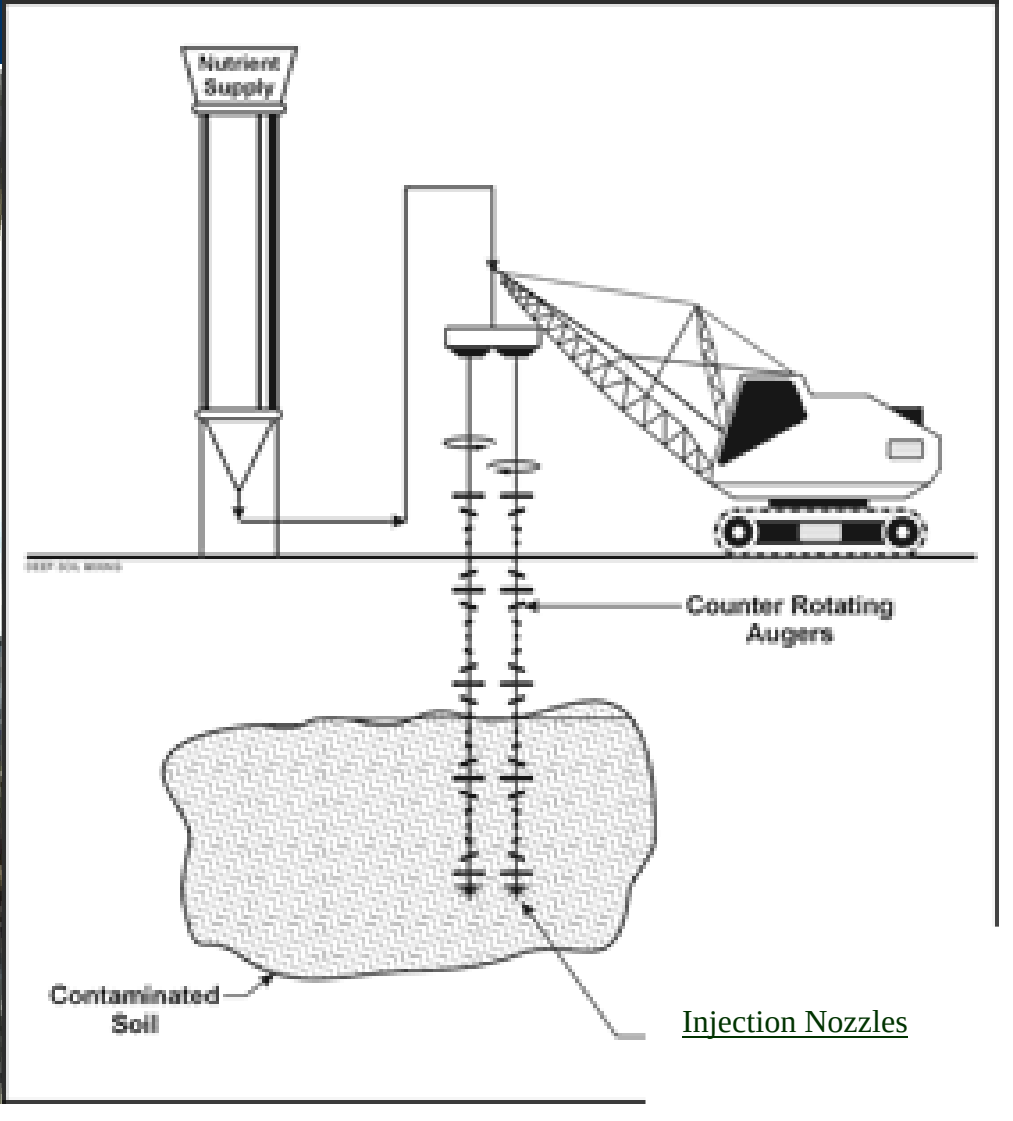




Deep Soil Mixing Technology



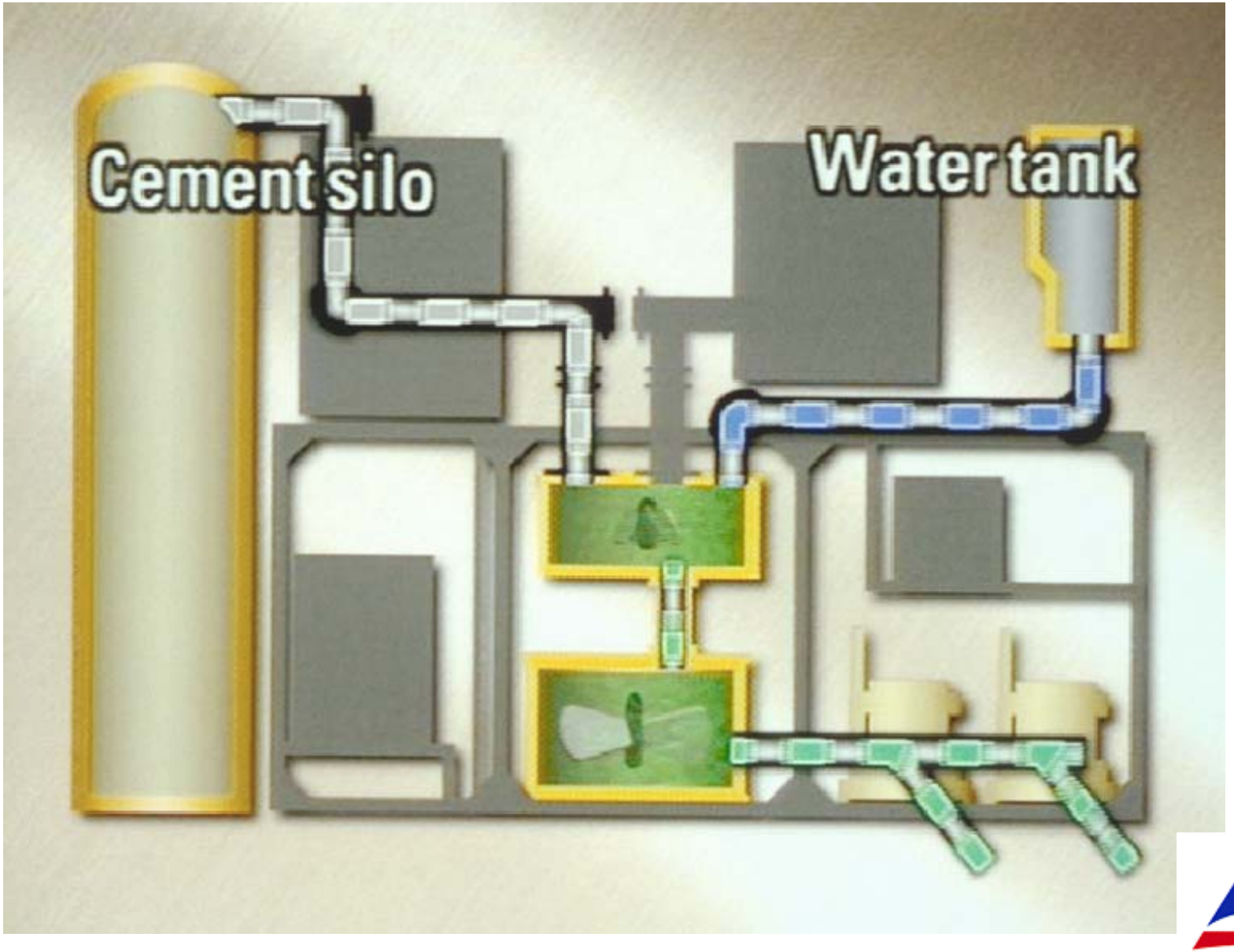




Injection Nozzles


Raito

Slurry Preparation



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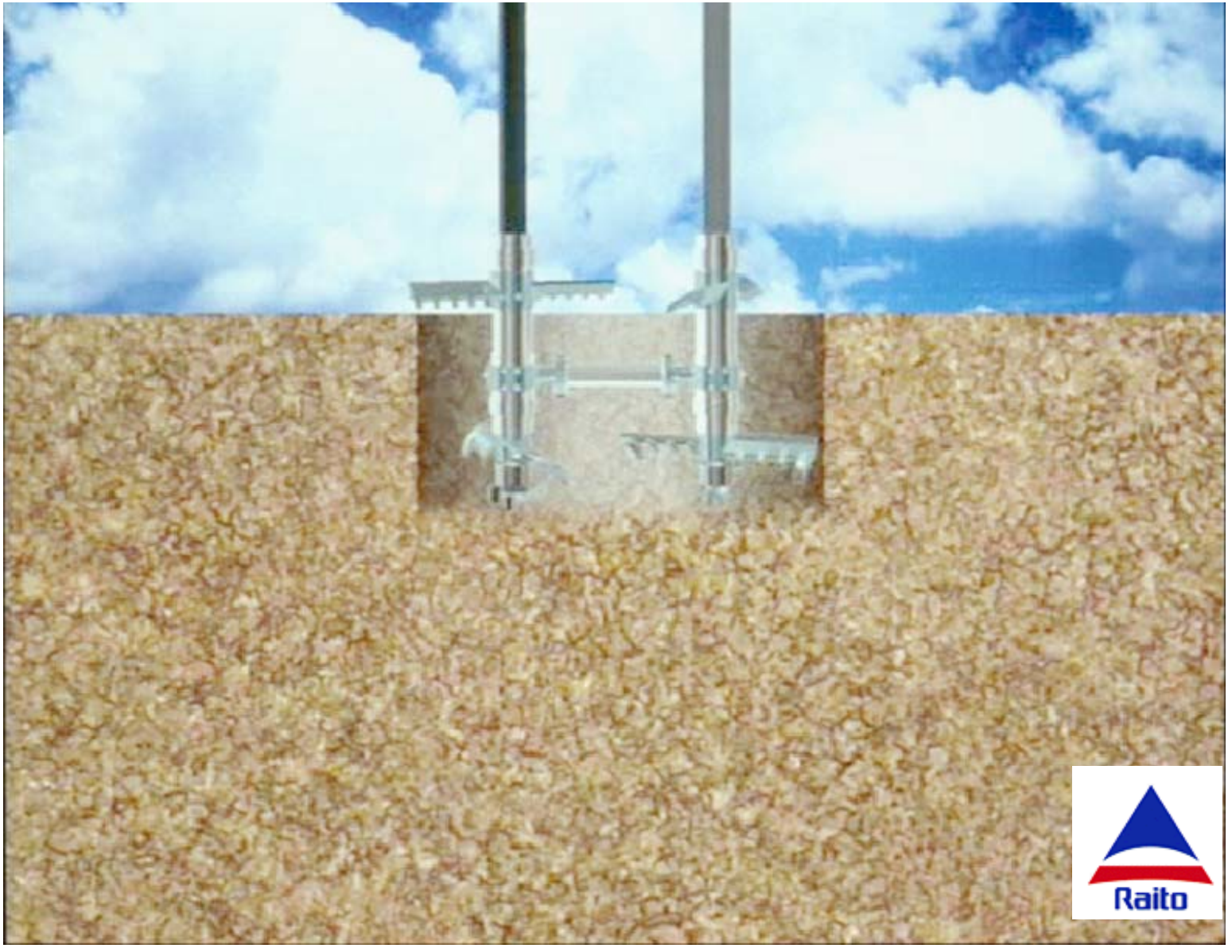
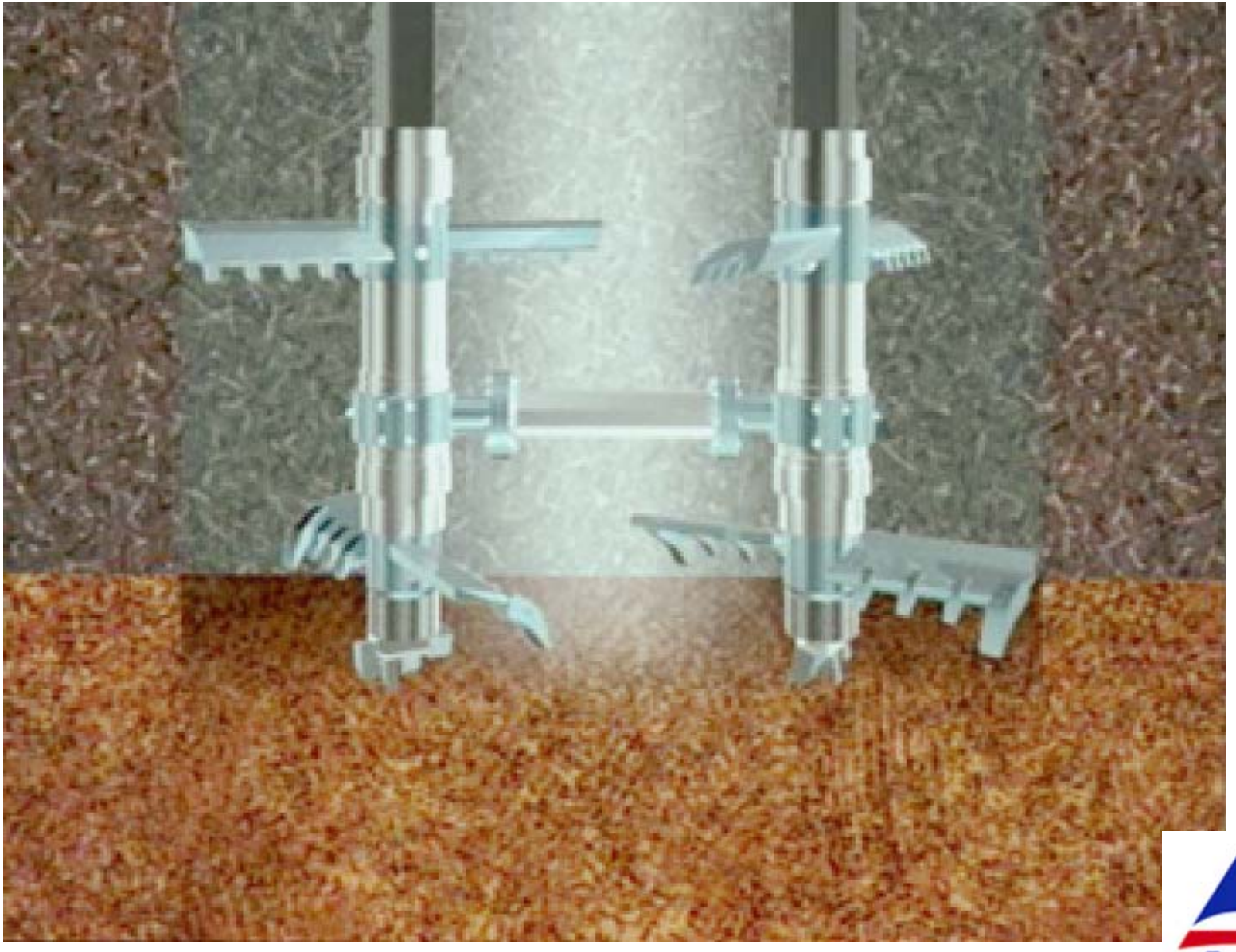
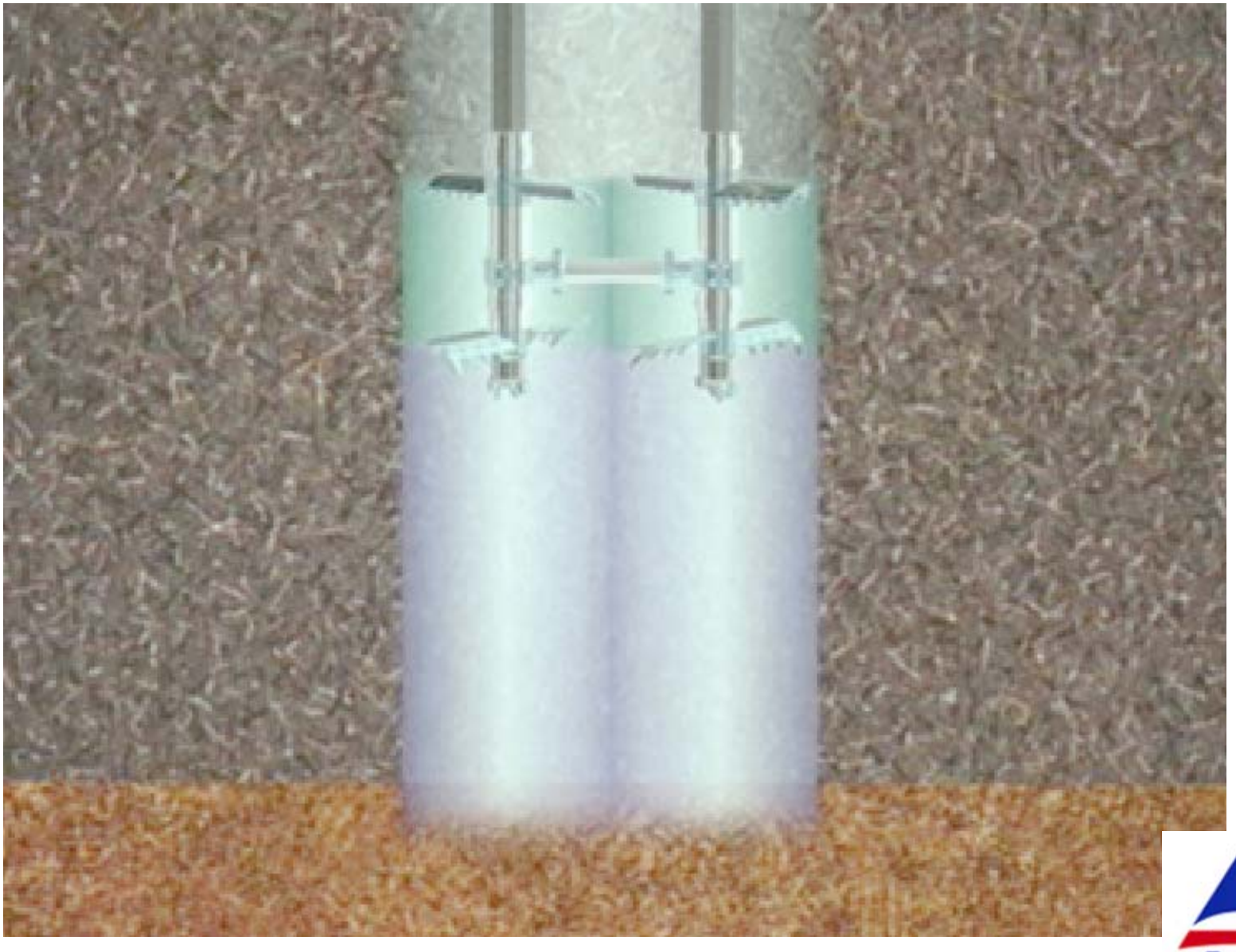

Raito

Raito





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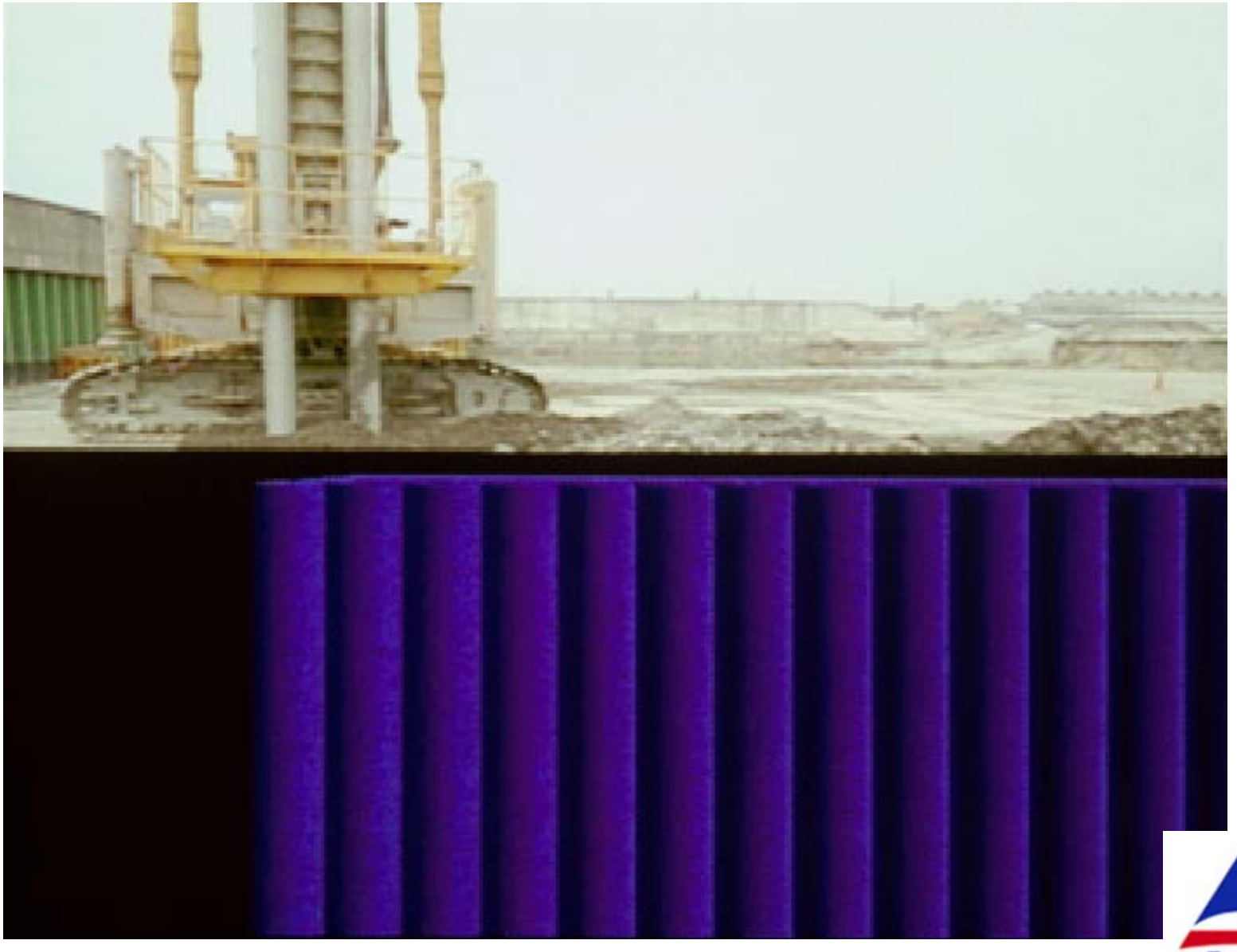

CDSM

SOIL STABILIZATION

FOR

BERTH CONSTRUCTION

AT

PORT OF OAKLAND

Raito

Sea Floor Stabilization in Deep Water

Pilot Project Objectives

- Determine optimum slurry ratio
- Determine optimum curing time
- Show that hardened sediments can be efficiently excavated using conventional dredging equipment
- Show that minimal loss of sediments occurs with this methodology
- Document improved handling characteristics of hardened sediments

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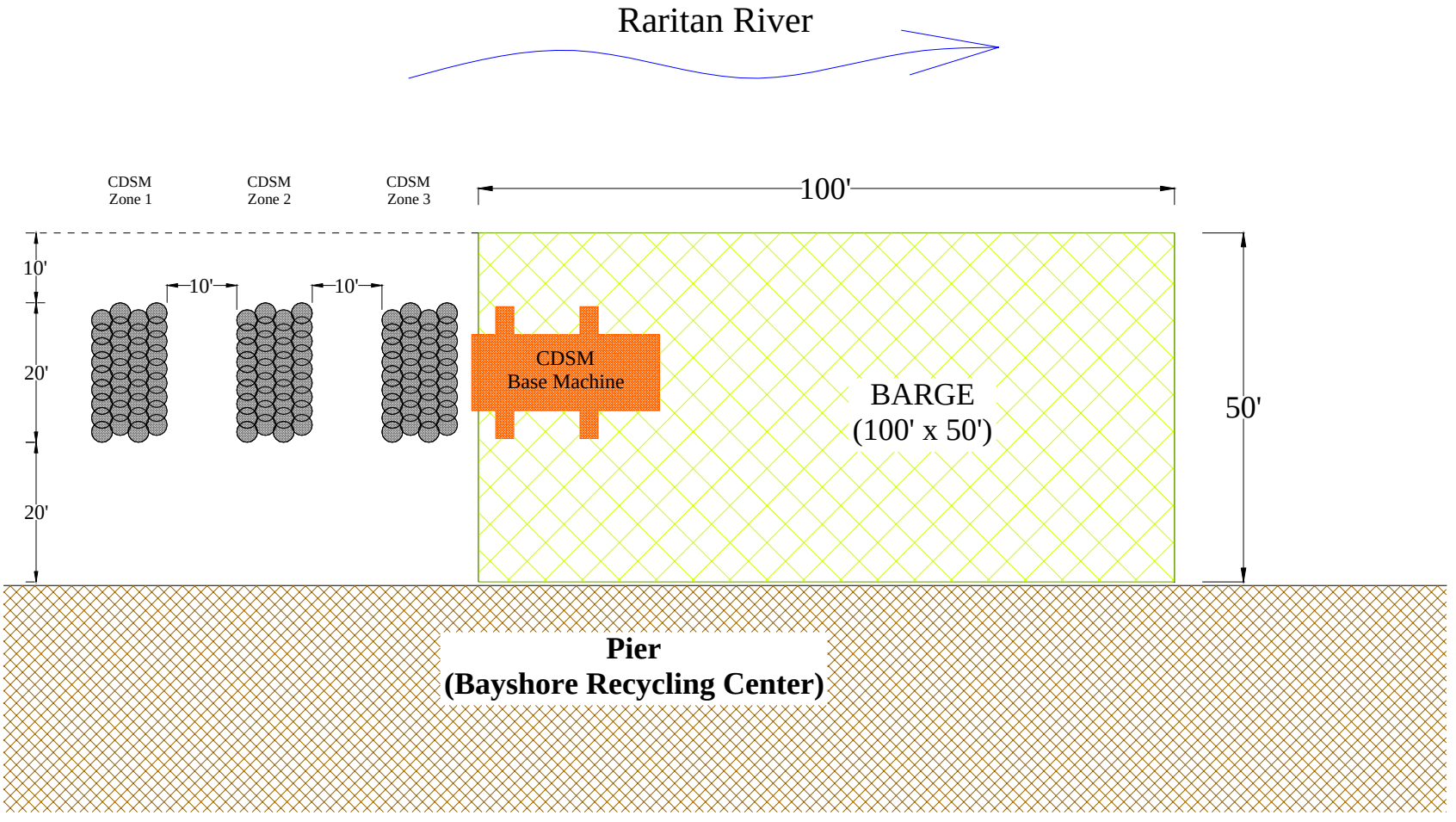

Test Section Plan

Potential Additional Studies

- Volatilization of organics/mercury from exothermic pozzolanic reaction
- Resuspension of sediments during application of cement slurry
- Treatability of hardened sediments by sediment decontamination technologies in Harbor

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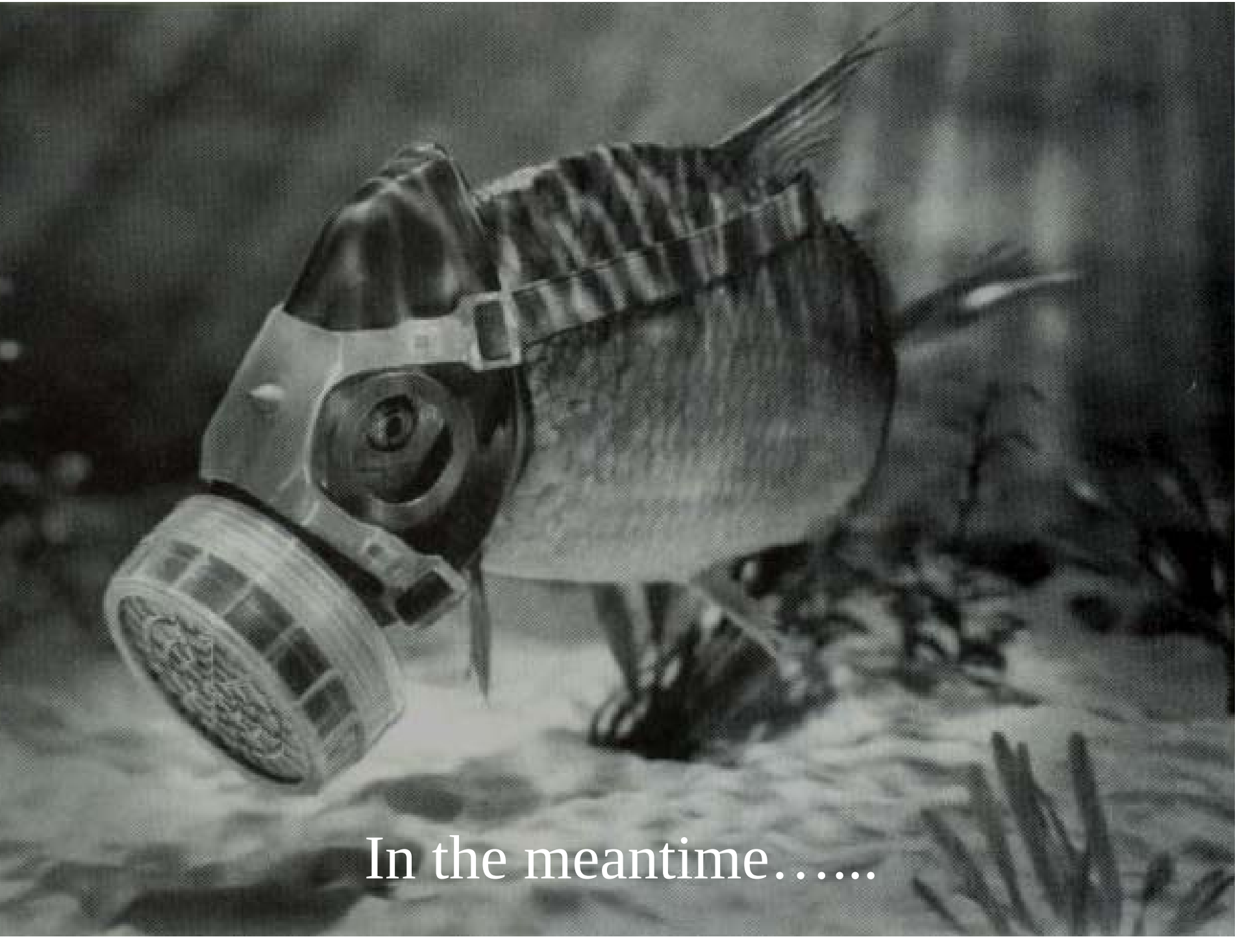
In the meantime……