Cleveland Harbor Open Lake Placement

The U.S. Army Corps of Engineers, Buffalo District's Environmental Assessment / Finding of No Significant Impact Open Lake Placement of Material Dredged from Cleveland Harbor Federal Navigation Channels in the Upper Cuyahoga River proposes to place suitable dredged sediment at the open lake placement areas, while dredged sediment that is not suitable for open lake placement would continue to be placed in a confined disposal facility.

- ***The dredged sediment of the upper Cuyahoga River channel meets Federal Clean Water Act guidelines for open lake placement.***
- ***Placement of the sediment in the open lake complies with applicable, numeric Ohio water quality standards for the protection of aquatic life and human health, as well as applicable Safe Drinking Water Act standards.***

How does sediment get in the river and how is it sampled?

- Sediment is comprised of gravel, silt, sand, and clay that have eroded from the watershed upstream of the federal navigation channel.
- Surface grab samples were collected in accordance with the Federal Clean Water Act guidance.
- Per Federal Clean Water Act guidance, sediment deposits that are a foot or two in thickness, have accumulated rapidly, or have existing information suggesting that they are vertically homogenous, can usually be sampled using grab sampling equipment.

Is dredged sediment suitable for open lake placement?

- Sediments are routinely sampled, tested, and thoroughly evaluated against strict Federal requirements to determine if they are either suitable or not suitable for open lake placement.
- Sediments proposed to be placed into the open lake, have been determined to be non-toxic, and very similar to the sediments already in Lake Erie.

Why drinking water will remain safe?

- Extensive sampling, analysis, and modeling efforts were undertaken to determine whether the placement of dredged sediment at either proposed open lake placement area would have the potential to adversely affect the quality of public water supply sources.
- Further, placement of the sediment in the open lake complies with applicable, numeric Ohio water quality standards for the protection of aquatic life and human health, as well as applicable Safe Drinking Water Act standards.
- The closest distance between a proposed placement area and any potable water intake is three miles. There is no potential for open lake placement at these areas to have any significant influence on the quality of water at the potable water intakes.

Why open lake placement will not stimulate harmful algal blooms?

- Water temperatures are too cold during placement operations.
- Light penetration is insufficient at the depth of phosphorus releases during placement operations to support algal bloom growth at the placement site.
- Phosphorus releases are rapidly diluted to concentrations insufficient to stimulate a harmful algal bloom.

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Dredged Sediment Placement – Ohio Harbors

- Sediment throughout the Great Lakes has shown significant improvement since the Clean Water Act was enacted in 1972, and associated industrial and municipal discharges were regulated.
- Toledo Harbor, Lorain Harbor, and Huron Harbor are examples of Ohio harbors where dredged sediment previously required CDF placement, but where it is now placed into permitted open lake placement areas, because it now meets Clean Water Act standards.

Dredged Sediment Placement – Cleveland Harbor

- The USACE dredges 5.8 miles of Federal channel on the Cuyahoga River.
- About 225,000 cubic yards of sediments will be dredged in 2014, approximately 80% coming from the upper Cuyahoga River Federal navigation channel.
- The upper Cuyahoga River Channel is the most frequently dredged Federal navigation channel on the Great Lakes.

Beneficial Use of Dredged Sediment

- The Corps of Engineers has led beneficial use efforts in recent years and continues to make real progress with our partners on options for the future.
- Since 2010, the Corps of Engineers has screened alternatives, prepared a comprehensive beneficial use report, and demonstrated success in reclaiming a brownfield site in the city of Cleveland.
- Keys to beneficial use are local leadership and financial commitments for cost sharing.

How can I submit a comment on the Environmental Assessment Finding of No Significant Impact?

- Comments can be submitted in three forms:

Postal Service:

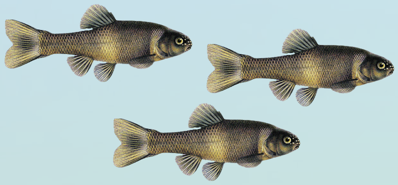
U.S. Army Corps of Engineers, Buffalo District
Attn: Environmental Analysis Team
1776 Niagara Street
Buffalo, NY 14207-3199

E-mail:

clevelandEA@usace.army.mil

Fax:

716-879-4225



Comments due April 9, 2014

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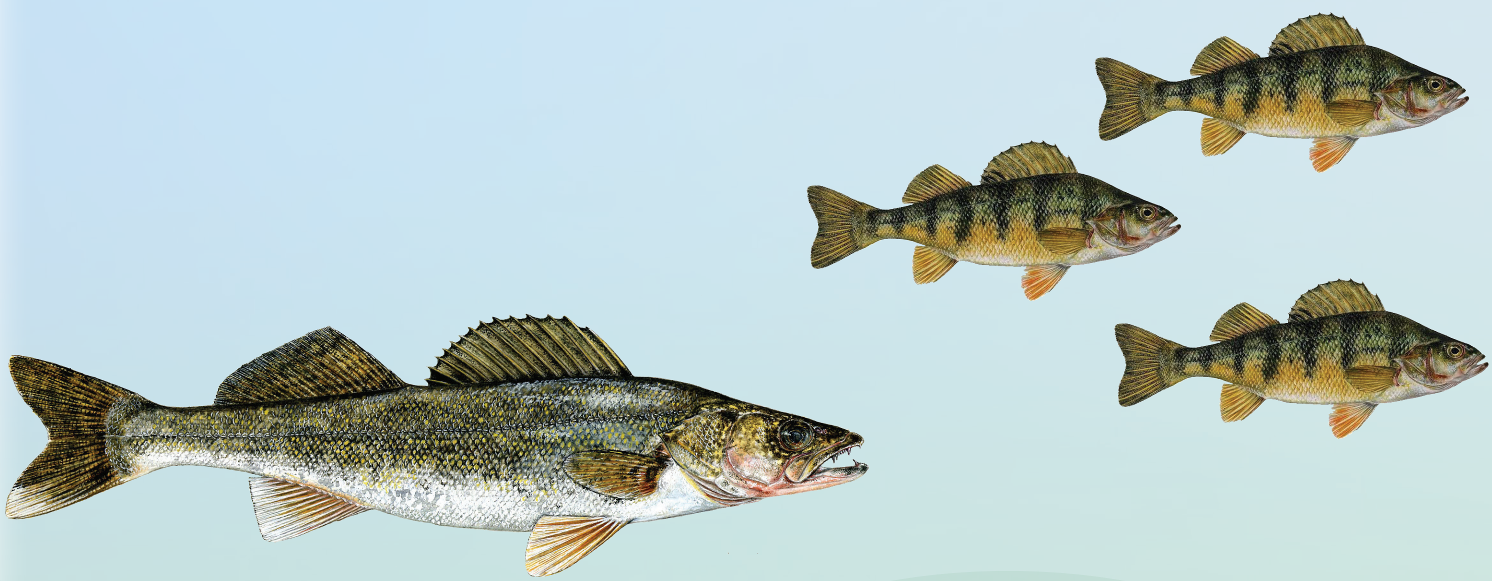
Why Open Lake Placement of this Cuyahoga River Dredged Sediment is Safe for Organisms Living on the Lake Bottom, and Fish

There are two required groups of tests with their own specific criteria:

1: Laboratory tests required by USEPA/USACE designed to determine if the dredged sediment would be toxic to organisms living on the lake bottom

Species	Criteria: Statistical comparison to survival in lake reference sediment		Pass?
	Test results: Survival rates (%)		
	Dredged sediment	Lake reference sediment	
Scud	82 to 94 (average of 90)	84 to 92 (average of 88)	Yes
Midge fly	80 to 90 (average of 85)	88 to 90 (average of 89)	Yes

Species	Criteria: Direct comparison to growth threshold		Pass?
	Test results: Growth in dredged sediment (grams)	Growth threshold (grams)	
Midge fly	2.17 to 3.51 (average of 2.66)	0.6	Yes



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2a: Laboratory tests required by USEPA/USACE to evaluate uptake of polychlorinated biphenyls (PCBs) from dredged sediment by organisms living on the lake bottom (also analyzed DDT uptake)

Dredged material management unit (MU)	Criteria: Statistical comparison to average PCB concentration in worms in dredged sediment vs. lake reference sediment (CLA), or MU/CLA<2					Comment
	Test results: Average PCB concentration in worms (µg/kg)					
	Dredged sediment	CLA-1	Pass?	CLA-4	Pass?	
MU-1	72	48	Yes, MU/CLA<2	19	No	Use of CLA-4 required additional evaluation (see 2b below)
MU-2a	51	48	Yes, same*	19	No	
MU-2b	52	48	Yes, same*	19	No	

* No statistical difference between dredged sediment and lake sediment

2b: Application of a conservative exposure screening model to evaluate whether increased PCB concentrations in lake bottom organisms in dredged sediment would result in significant impacts to fish (yellow perch and walleye)

Dredged material management unit (MU)	Model results	Criteria: Comparison to general analytical variability**		Comment
	BEF*	BEF	Pass?	
MU-1	1.1 to 1.2	1.2	Yes	Use of CLA-4 would not result in a significant increased exposure of fish to PCBs
MU-2a	1.1 to 1.2	1.2	Yes	
MU-2b	1.1 to 1.2	1.2	Yes	

*BEF=Bioaccumulation exposure factor

**Assumed to be 20%; lower limit of measurable criterion for change

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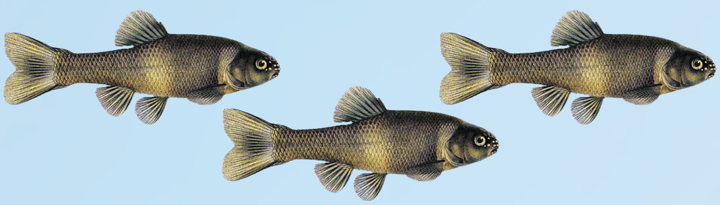
Why Open Lake Placement of this Cuyahoga River Dredged Sediment is Safe for Organisms in the Water Column

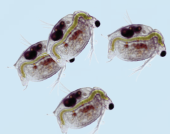
There are two required groups of tests with their own specific criteria:

1: Laboratory tests required by USEPA/USACE

Species	Criteria: Statistical comparison to survival in clean water		Pass?
	Test results: Survival rates (%)		
	Dredged sediment elutriate	Clean water	
Minnow*	96 (average of 96)	100 (average of 100)	Yes
Water flea	76 to 100 (average of 87)	80 to 92 (average of 86)	Yes

*Dredged sediment survival rate after ammonia rapidly dissipates.

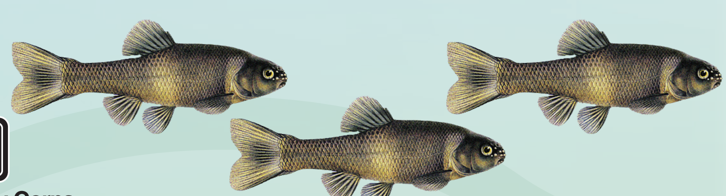




2: Laboratory tests required by USEPA/USACE to demonstrate compliance with numeric Ohio water quality standards for the protection of aquatic life and human health - ALL tests passed. For example:

Contaminant	Test results	Criteria: Ohio water quality standards		Pass?
	Highest concentration released from dredged sediment (µg/L)	Aquatic life (µg/L)	Human health* (µg/L)	
Chromium	1.3	1323	140	Yes
Zinc	7.6	274	5000	Yes
Cyanide	10	4400	600	Yes
Pyrene	0.12	83	15	Yes

*Chronic standards, so evaluation is very conservative.



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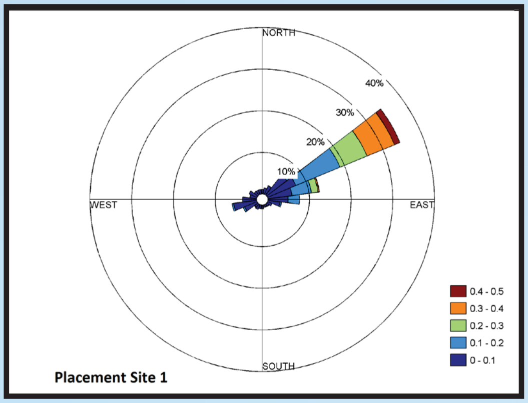
Why Open Lake Placement of this Cuyahoga River Dredged Sediment is Safe for Dinking Water

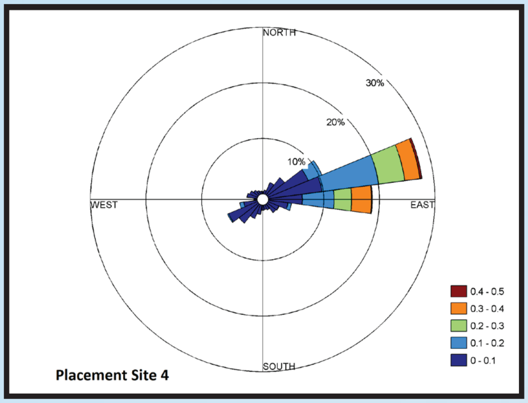
Potential Concerns: Total Suspended Solids (TSS) and Dissolved Constituents reaching Potable Water Intakes (PWIs) and impacting operations and drinking water quality

Evaluation Procedures: Hydrodynamic Modeling of Circulation Velocities and Storm Shear Stresses, Plume Modeling during Placement Operations, and Resuspension/Erosion of Deposited Sediment during Storm Events

1: Currents

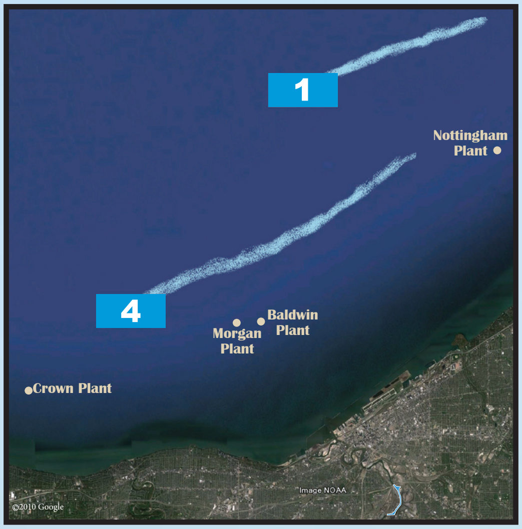
Currents are predominantly to the ENE and below 0.6 ft/sec.

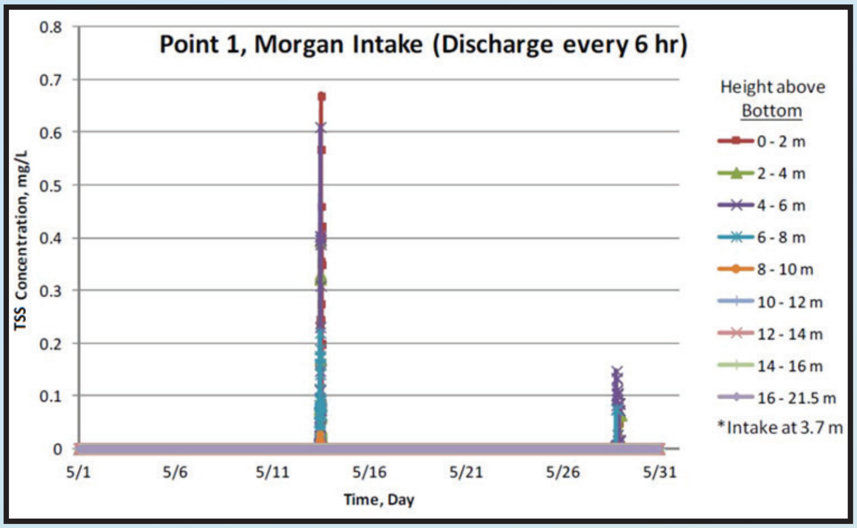




2: TSS Plumes

Concerns: Large increase in TSS concentrations increases operating costs and affect settling and filtration operations at the water treatment plant.





Dominant plumes during placement miss the PWIs by more than 1.5 miles.

No circulation from CLA-1 to any PWI.

Limited circulation from CLA-4 to Morgan and Baldwin PWIs.

Modeling Results: Predicted maximum TSS contributions at the most impacted PWI are less than 1 mg/L, small compared to background concentrations that are normally about 6 mg/L. Contributions occur only about 1% of the time during six weeks of annual placement operations. Large natural variations in background TSS occur; TSS concentrations greater than 40 mg/L occur multiple times in most months.

TSS plumes from individual discharges grow to about 1500 ft long and 800 ft wide. Individual discharges occur about once every 6 hours. All particles settle rapidly except during severe storms when dispersed clay and silts will remain in suspension at concentrations of about 20 mg/L. Background concentrations during severe storms are greater than 50 mg/L.

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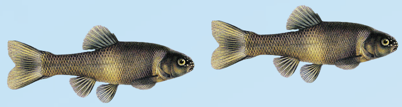
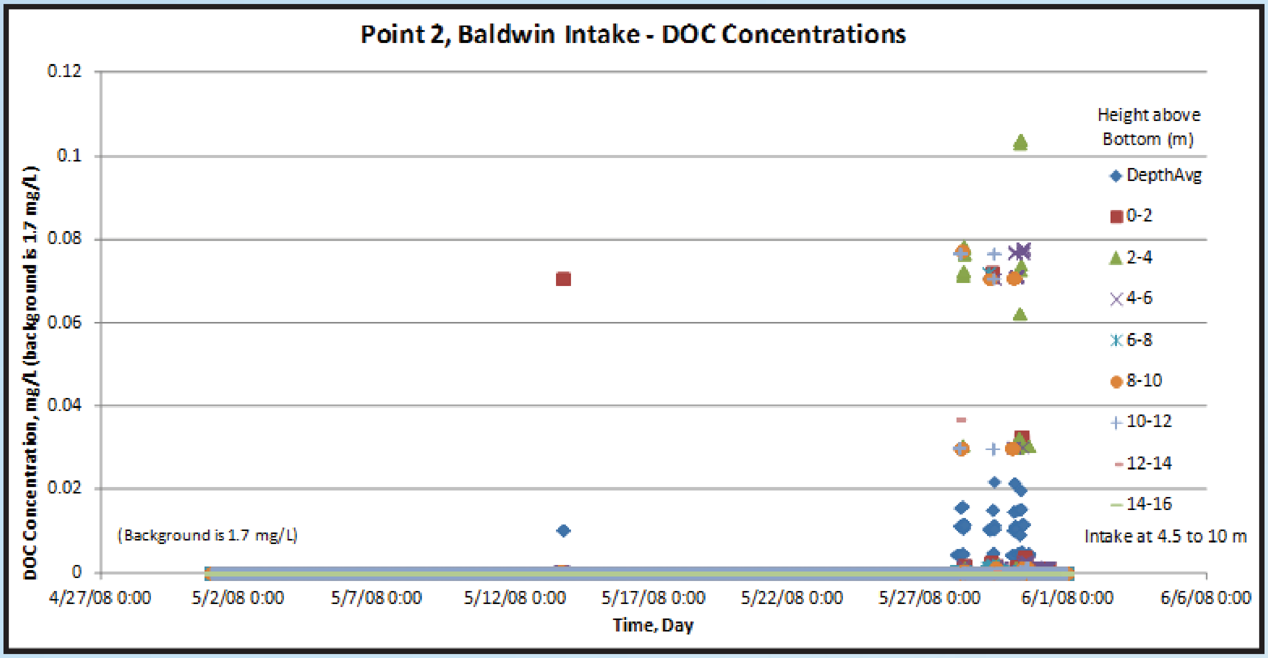
3: Dissolved Concentrations Plumes

Concerns: An increase in dissolved organic carbon (DOC) concentration in the lake water may increase harmful disinfectant by-products, required disinfectant dosage and operating costs. Similarly, an increase in ammonia concentration in the lake water may increase required disinfectant dosage and operating costs. Lastly, the discharge plume may increase dissolved contaminant concentrations in the lake water, potentially requiring an additional treatment process.

Testing and Modeling Results:





Sediment Source	DOC (mg/L)			Ammonia (mg/L)		
	Elutriate	PWI	Background	Elutriate	PWI	Background
MU 1	12.6	0.011	1.7	7.1	0.0057	0.03
MU 2a	53.2	0.043	1.7	16.8	0.0136	0.03
MU 2b	74.3	0.060	1.7	10.6	0.0086	0.03

Predicted increase in DOC is less than 4% and increases occur only about 1% of the time during six weeks of annual placement operations. Predicted increases in ammonia are less than background, which are insignificant.

All contributions of dissolved contaminants are predicted to be well below all drinking water standards.

4: Resuspension during Storms

Concerns: Large increase in TSS concentrations increases operating costs and affect settling and filtration operations at the water treatment plant.

Modeling Results: Water depth at placement sites is great enough to prevent large shear stresses on the bottom sufficient to resuspend anything but fluff (poorly settled fine clays and organic matter) during most common storm events. Severe storms like Super Storm Sandy in 2012 would generate circulation currents as high as 1.5 ft/sec, which would resuspend dispersed clay and silt particles that settled predominantly within 2 miles of the discharge point in a layer about 1/10 to 1/5 of an inch. This is predicted to increase the background TSS concentration about 15 mg/L for a fraction of a day when background concentrations were measured to be greater than 100 mg/L for several days. Due to the infrequent occurrence and small contribution relative to background, the impacts is deemed to be insignificant.