



Pacific Chapter



## **Advancements for Removal of Impacted Sediments and Placement of Amended Caps**

*October 21, 2016*

**Efficiency  
Quality**



# Sediment Removal



26

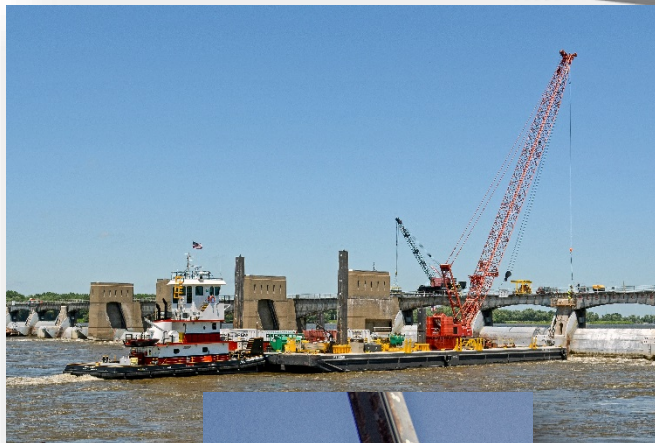


10



# Brennan

- What we do:
  - Marine Construction
  - Environmental Remediation
  - Harbor Management
- A Family Company
  - Founded 1919
  - Many multi-generational employees
  - Focus on CULTURE & INNOVATION
  - Innovation to reduce industry costs
- Work throughout the United States







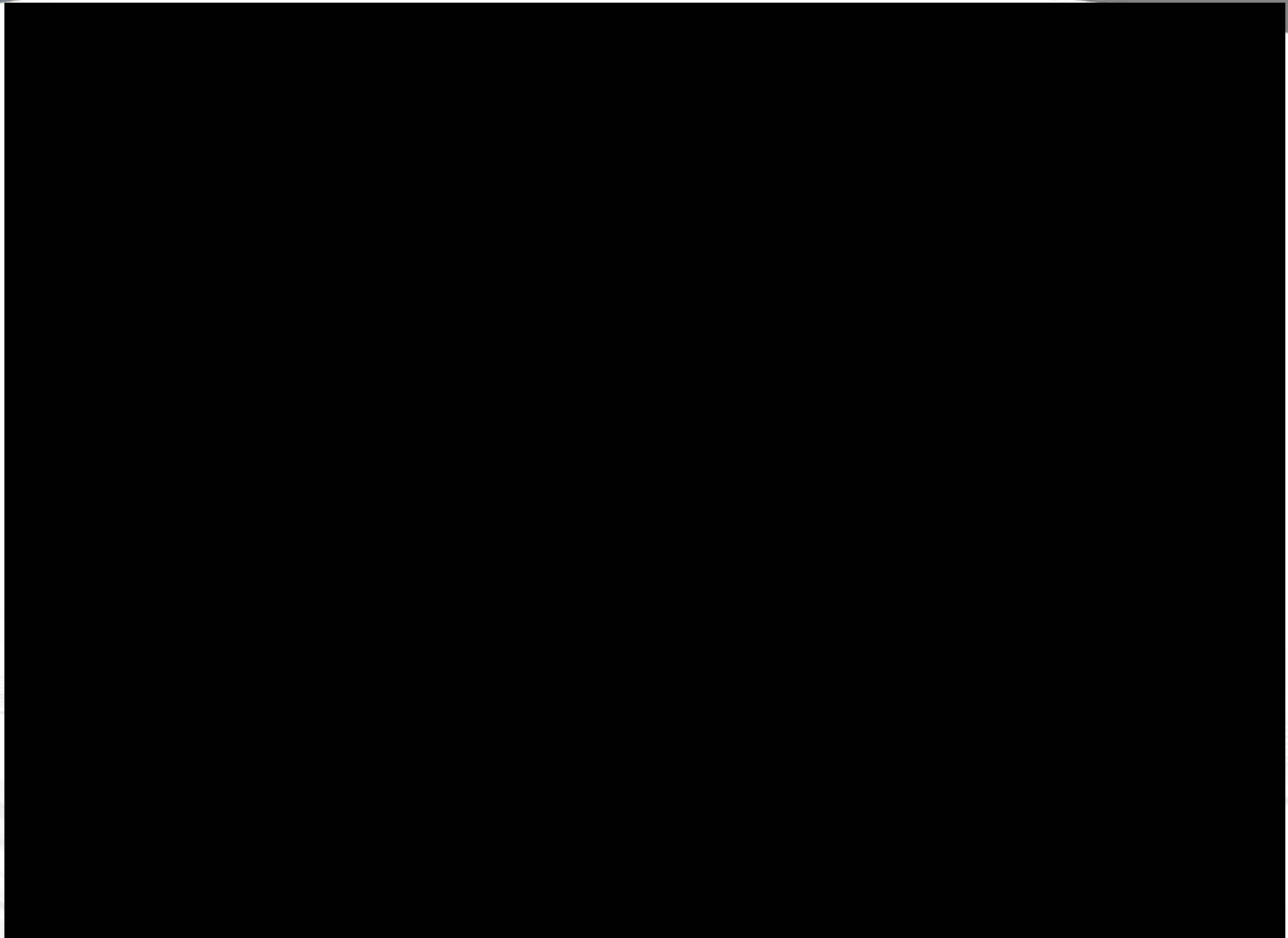
# Sediment Removal

- Standard Removal Procedures
  - Contour specific hydraulic dredging
  - Articulate for accuracy
  - Four to six inch over-cut





# Sediment Removal







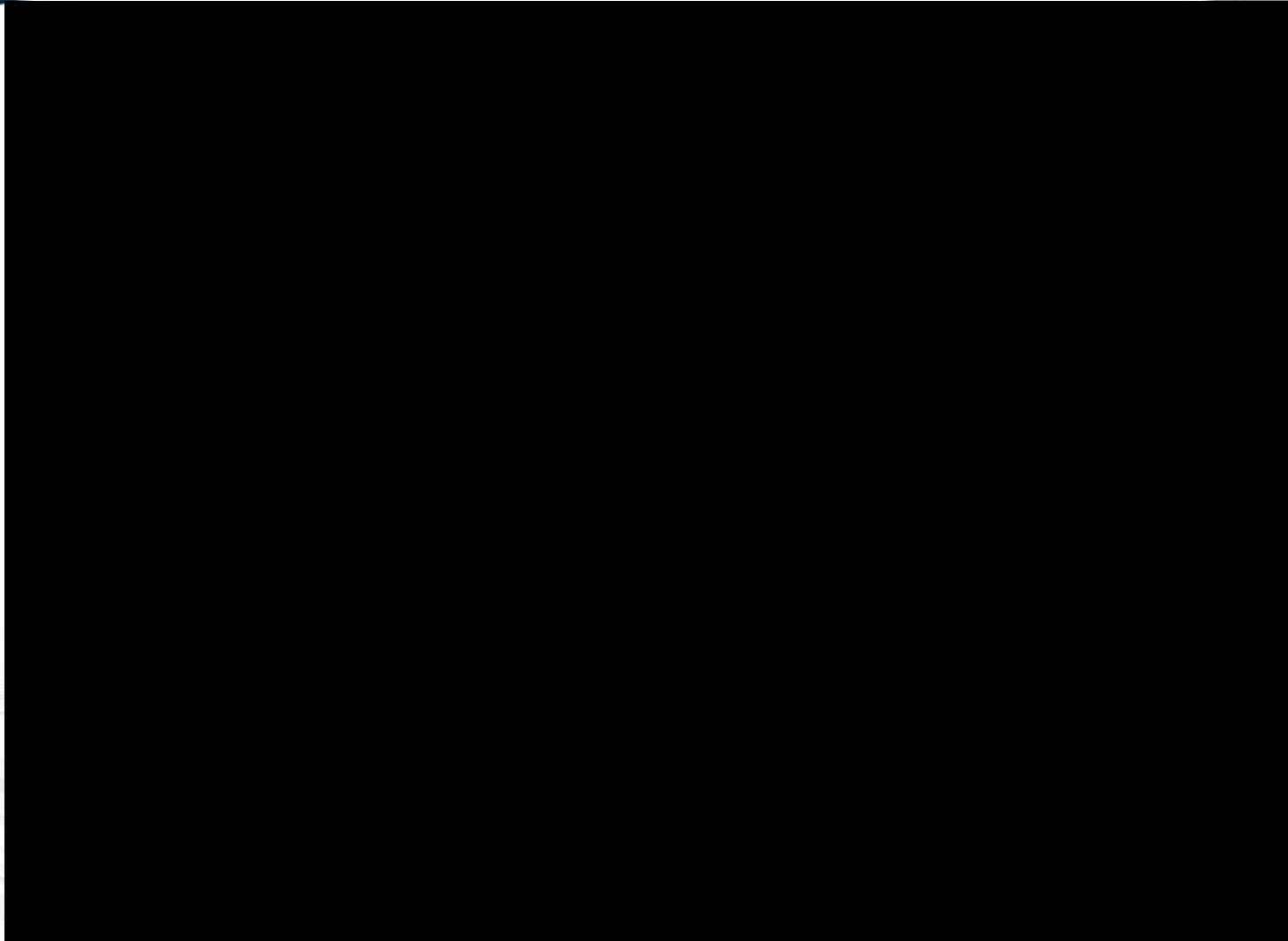
# Sediment Removal

- Thin Layers of Soft Sediment Over Hard Clay or Rock
  - Traditional dredge methods, mechanical or hydraulic are not as effective.
  - Articulate with open suction- Vic Vac.
  - Reduce or eliminate capping- has been shown to remove greater than 90% of concentrations.
  - Deployment
    - Ashtabula River
    - Fox River OU 1-5
    - Ottawa River
    - River Raisin
    - Lake Superior
    - Waukegan Harbor





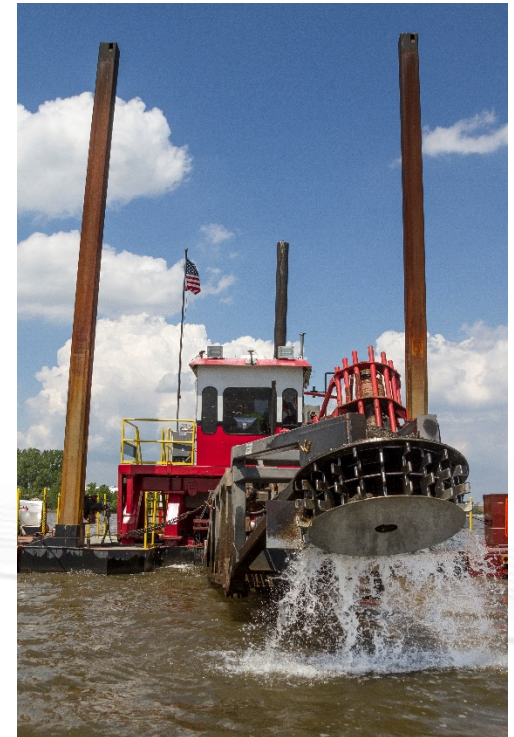
# Sediment Removal





# Sediment Removal

- Thin Layers of Soft Sediment Over Soft Sediment
  - Traditional dredge methods can be effective.
  - However- The benefits of open suction are not readily available with traditional methods.
  - Improved accuracy- gentle contours
  - Articulate WITHOUT open suction- Disc Cutter.







# Sediment Removal

- Impacted Sediment Above and Adjacent to Critical Infrastructure
  - Traditional dredge methods can be detrimental or pose a safety risk.
  - Diver dredging offers non-aggressive removal.
  - Normally acceptable accuracy.
  - System feeds a small dredge pump in close alignment to removal area.







# Broadcast Capping System

- Application that minimizes disturbing underlying layers
- **Accurate and precise**
- Unmatched Flexibility
  - Material size
    - Rock armament up to 3" in diameter
    - Sand
    - Gravel
  - Amendments
    - Aquagate™
    - Organoclay®
    - Activated Carbon
  - Material transport
    - Hydraulic
    - Mechanical





# Broadcast Capping System

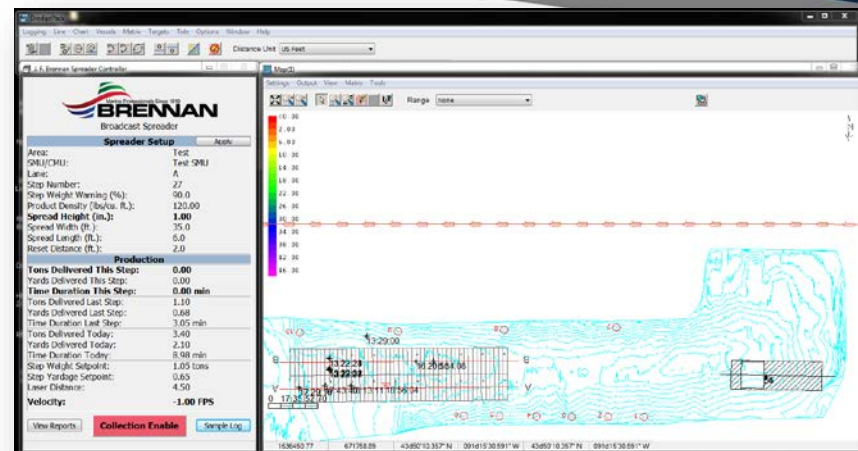






# Quality Control

- Customized Software
  - Applies design thicknesses
  - Integrates belt scales
  - Records sample collections
  - Logs all data



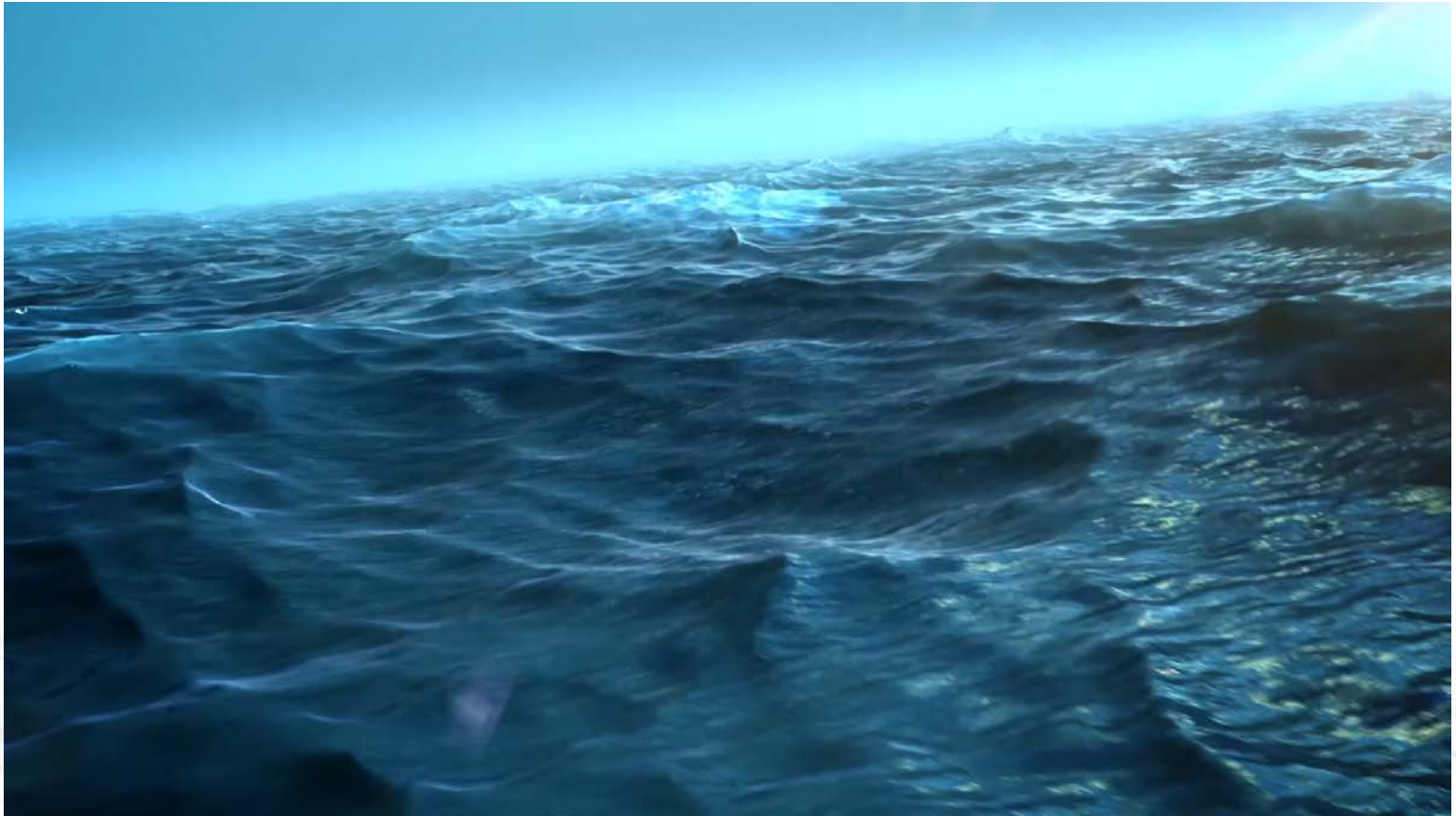
**BRENNAN**  
The Fine Professionals Since 1918

Start Date: 10/5/2015 End Date: 10/6/2015

Sample ID	Date/Time	Area	SMU/CMU	Lane	Step	Port	Port/Cente	Center	Stbd/Cent	Stbd	Notes
1	10/6/2015	Test	Test SMU	B	0	0.0	0.0	0.0	0.0	0.0	DELETE
2	10/6/2015	Test	Test SMU	B	0	0.0	0.0	0.0	0.0	0.0	DELETE
3	10/6/2015	Test	Test SMU	B	10	0.0	3.0	0.0	2.5	0.0	BUCKET
4	10/6/2015	Test	Test SMU	B	17	0.0	0.0	0.0	0.0	0.0	BUCKET
5	10/6/2015	Test	Test SMU	B	16	3.0	3.5	4.0	4.0	4.0	POLE
6	10/6/2015	Test	Test SMU	B	24	0.0	6.0	0.0	5.0	0.0	BUCKET
7	10/6/2015	Test	Test SMU	B	27	0.0	6.0	0.0	5.5	0.0	BUCKET
8	10/6/2015	Test	Test SMU	B	21	5.0	6.0	5.5	6.0	4.0	POLE
9	10/6/2015	Test	Test SMU	A	2	0.0	5.5	0.0	5.0	0.0	BUCKET
10	10/6/2015	Test	Test SMU	A	8	0.0	4.5	0.0	4.8	0.0	BUCKET
11	10/6/2015	Test	Test SMU	A	4	6.0	6.0	6.5	6.0	5.8	POLE
12	10/6/2015	Test	Test SMU	A	14	0.0	4.5	0.0	4.5	0.0	BUCKET
13	10/6/2015	Test	Test SMU	A	9	6.0	5.5	5.5	5.5	4.5	POLE



# Amended Caps and Covers





**Thank You**





# Broadcast Capping System



- **Deployment**
  - Over 1,200 acres to date
  - 6 Different river systems
- **Constantly improving**
  - Efficiency
  - Accuracy
  - Positioning
  - Quality control methods

