Maintenance Dredging of Shark River Channels and Spur

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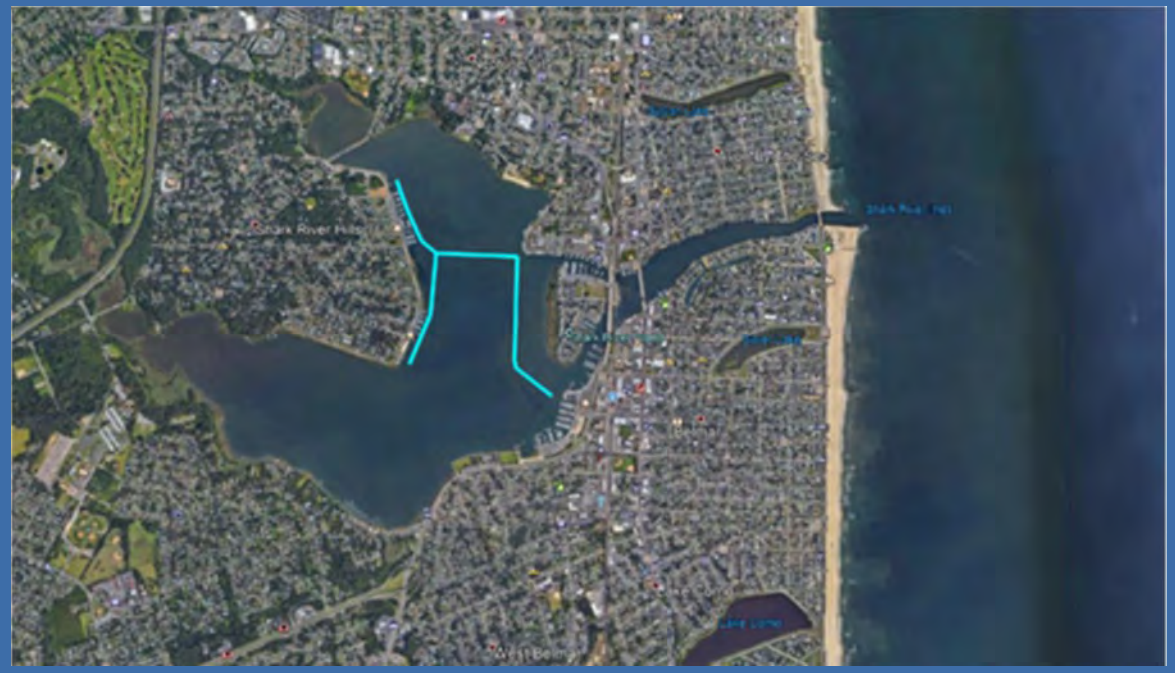
Western Dredging Association: WEDA Dredging Summit and Expo
June 2021

Project Location

- Monmouth County, New Jersey
- Township of Neptune, Boroughs of Neptune City and Belmar
- Last dredged in 1985



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Pre-Superstorm Sandy
April 2011

Post-Superstorm Sandy
April 2013

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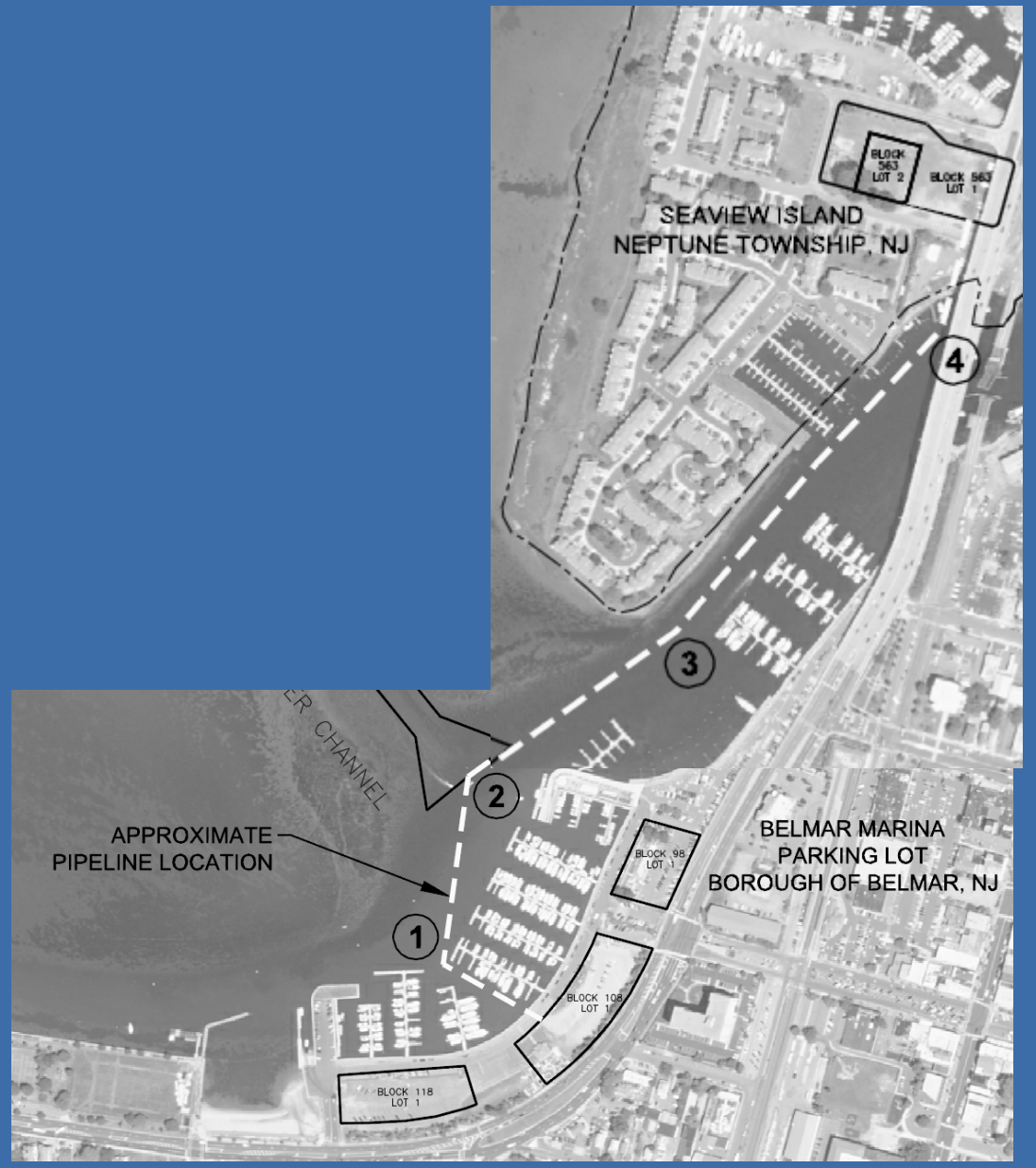
Project Description / Channel Specifications

Shark River Channels and Spur Length:	1.6 miles
Channel Design Width:	100 feet
Channel Template Dredge Depth:	-6 feet Mean Low Water (MLW)
Channel Allowable Over-dredge Depth:	-7 feet Mean Low Water (MLW)
Total available pay volume:	66,000 template, 36,000 over dredge

Challenges

- Dewatering Site Options:
  - A 1.3 acre gravel parking lot at Belmar Marina
  - A 2.5 acre open area at Seaview Island Park in Neptune Township
- Permit Conditions
  - July 1 to Dec 31 (high boat traffic from July 1 to Labor Day)
  - Discharge water quality could not exceed background for PCB, pesticides and metals (As, Hg and Cu)



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Challenges

- Placement Site Options
  - Fine Grained Material
    - Monmouth County Resource Recovery Center
    - Daily Landfill Cover
    - 9 miles by truck
  - Coarse Grained Material
    - Small local bayside beach
    - Adjacent to Belmar dewatering site
- Procurement
  - Long evaluation period for technically challenging project
  - Permit and contract approval took longer than expected
  - NTP not received until late 2015

Contractor Strategy – Active and Passive Dewatering

- Season 1:
  Passive dewatering using geotubes in sandier areas
- Season 2:
  Active dewatering using hydrocyclones and belt filter presses for remainder of project

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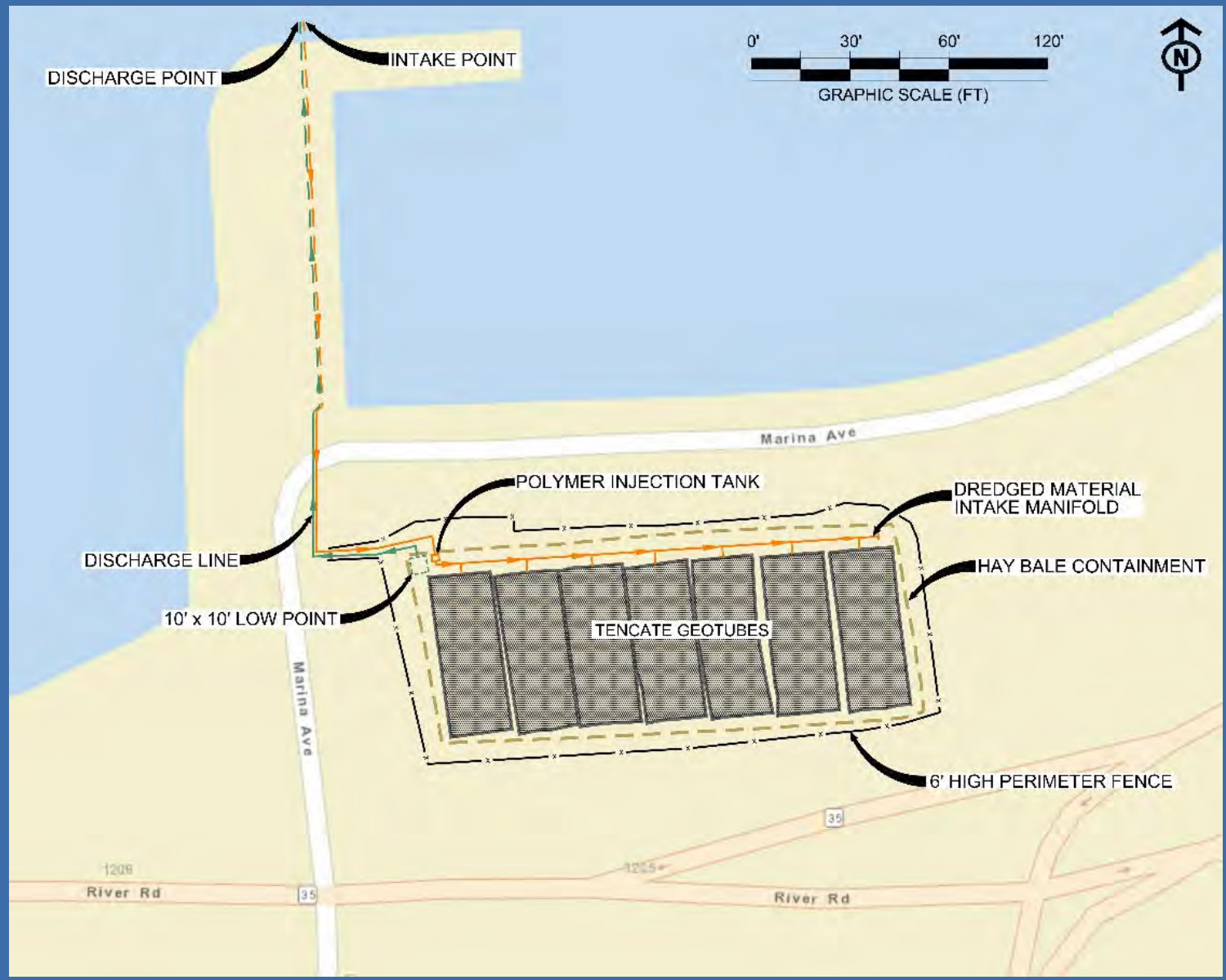
Season I – Passive Dewatering

Phase I Dewatering Site Layout

- Belmar Marina
- 7 geotubes linked by manifold
- 40 x 100 ft
- SNF Polymer 331 (4lb/T)
- Effluent discharged to curtained area in bay



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Dredging of Shark River – Season I with Geotubes

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Dredging of Shark River – Season I with Geotubes

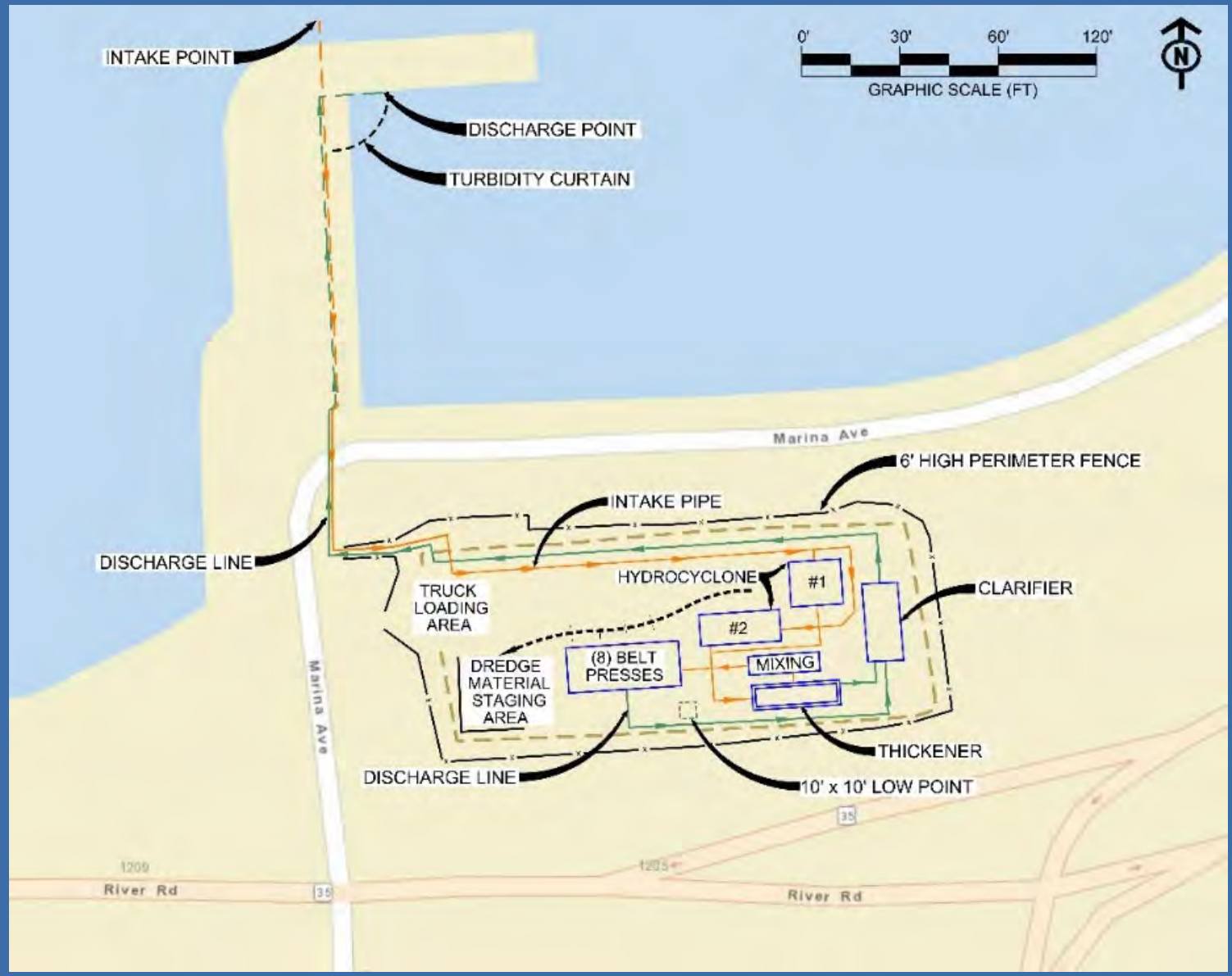
Results – Season 1

- 4,011 cubic yards dredged over 15 dredging days
- Dredging was slowed considerably due to freezing weather
- 4,011 cubic yards processed in geotubes over 178 days
- 4,830 tons of material trucked to MCRRC
- Cost: $253,617 ($63.23/CY dug)
- Channel was 6’ deep, 100’ width, 0.25 miles

Season 2 – Active Dewatering

Phase II Dewatering Site Layout

- Belmar Marina
- 2 hydrocyclones
- 5-8 belt filter presses
- Thickening and Mixing tanks
- SNF Polymer 3310 at 2lb/T
- 0.8 acre equipment footprint
- Material storage/loading
- Clarifying area



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Maintenance Dredging of Shark River Channel – Season II

Maintenance Dredging of Shark River Channel – Season II

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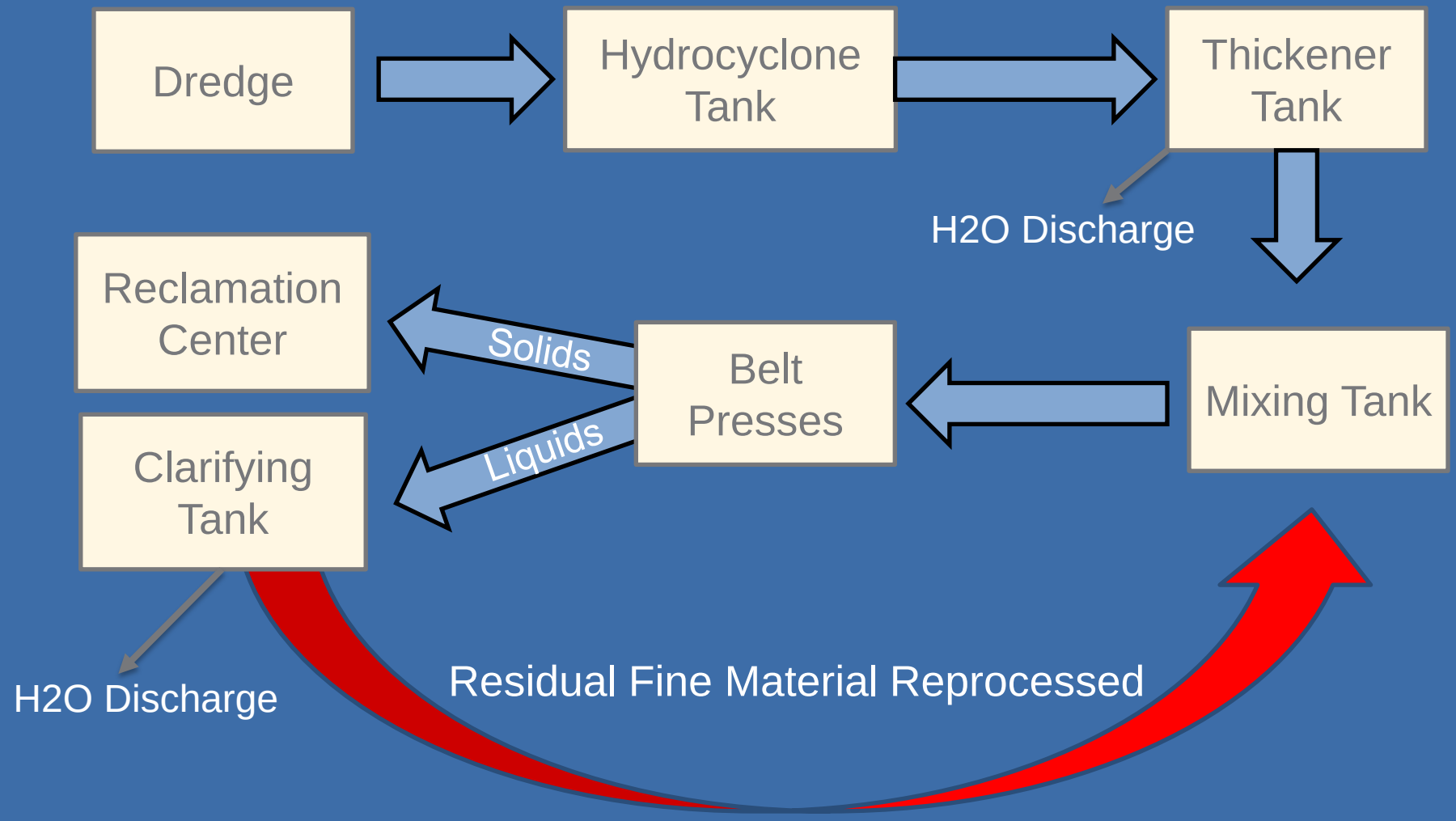
Mechanical Dewatering Process



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Debris and Sand Produced by Hydrocyclone Tanks

Sand on Neptune City's Beach Located on Shark River

Beach Placement after Sand was Spread by the Local DPW

Fines Produced by Belt Press

Fines Produced by Belt Press

View of the Discharge Point – Final Polishing Step

Trucks Being Loaded with Fines Material

Monmouth County Reclamation Center where Fines Were Used for Daily Landfill Cover

Results Season 2

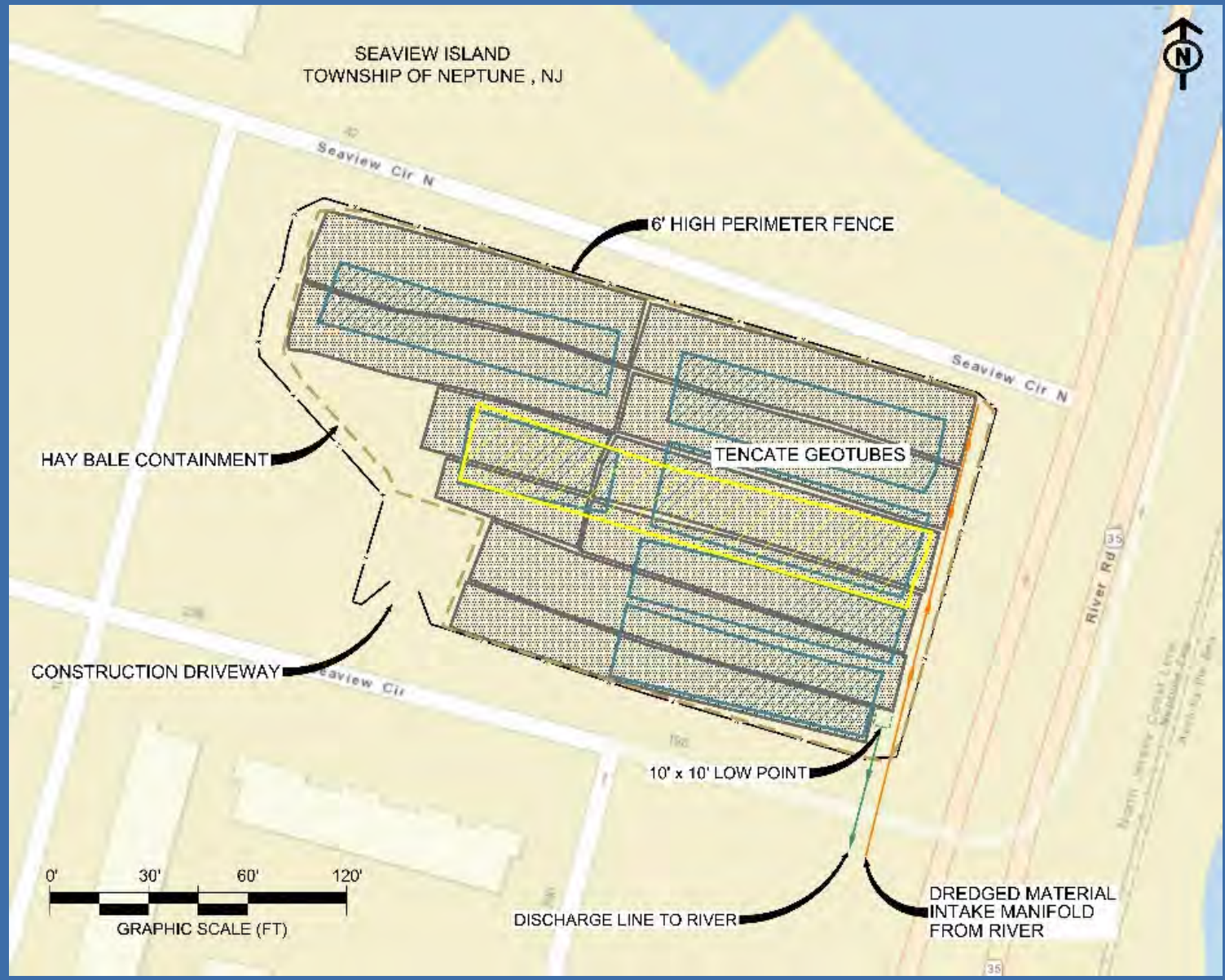
- Did not begin dredging again until September 7
- 43,798 cubic yards dredged over 69 dredging days
- Cold weather again slowed dredging in December
- 43,798 cubic yards processed
- 658 tons of sand placed on beach
- 46,888 tons of fines trucked to MCRRC
- Cost: $4,317,920 ($98.59/CY dug)
- Channel was 6’ deep throughout, but not full width

Season 3 – Passive Dewatering

Seaview Island Pre-existing Site

Phase III Dewatering Site Layout

- Seaview Island
- 18 geobags 60 to 80 ft wide by 72 to 256 ft long
- SNF Polymer 331 at 4lb/T
- 3 stacked layers
- Effluent discharged to curtained area in bay



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Site Preparation

Containment Area Construction

Geotubes in Use

Geotubes in Use – Three Layers

Aerial View of Geotube Layers

View of Discharge Pipe – Final Polishing Step

Trucking Operations

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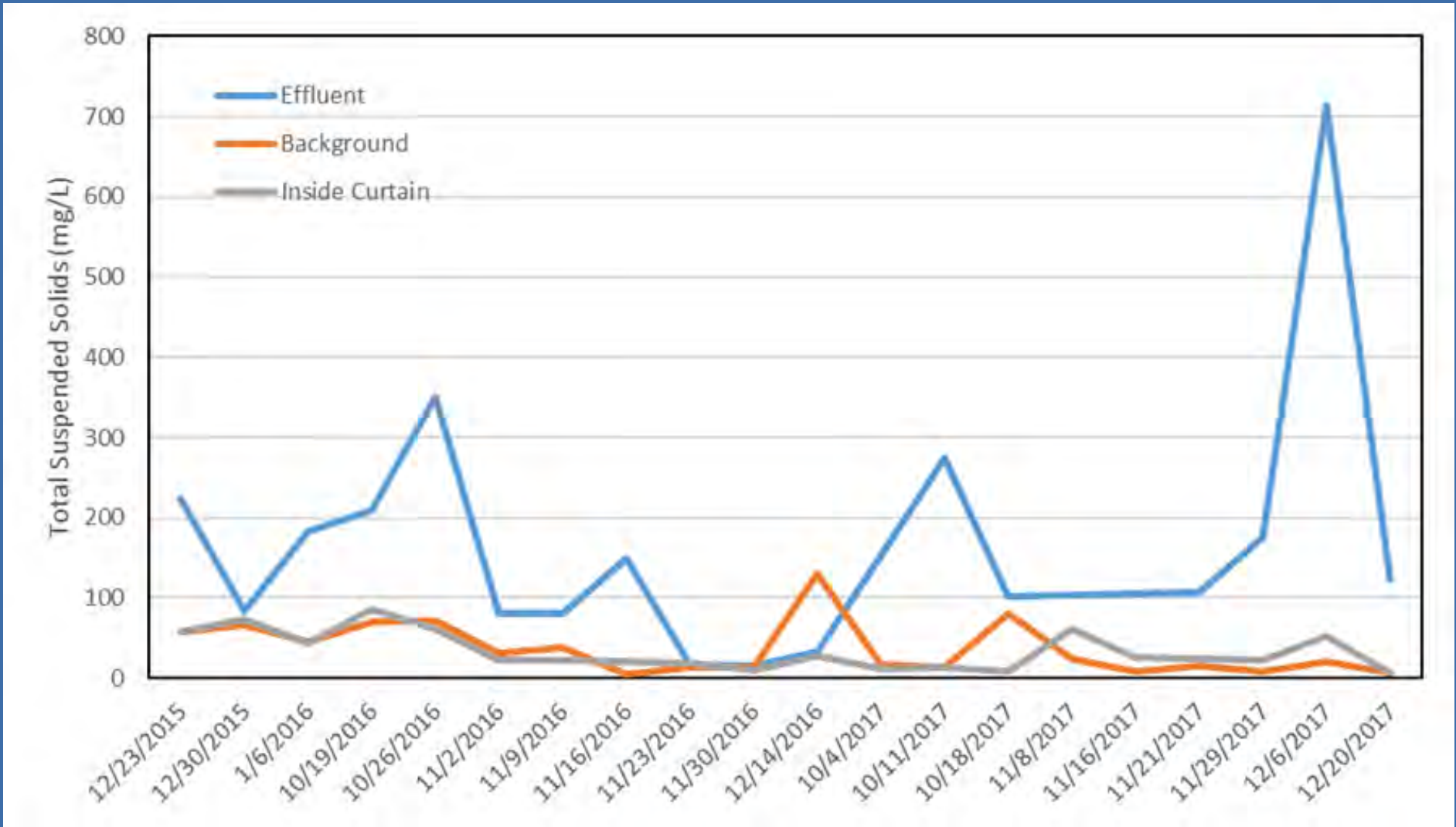
Neptune Stockpile

Post Project Site Conditions

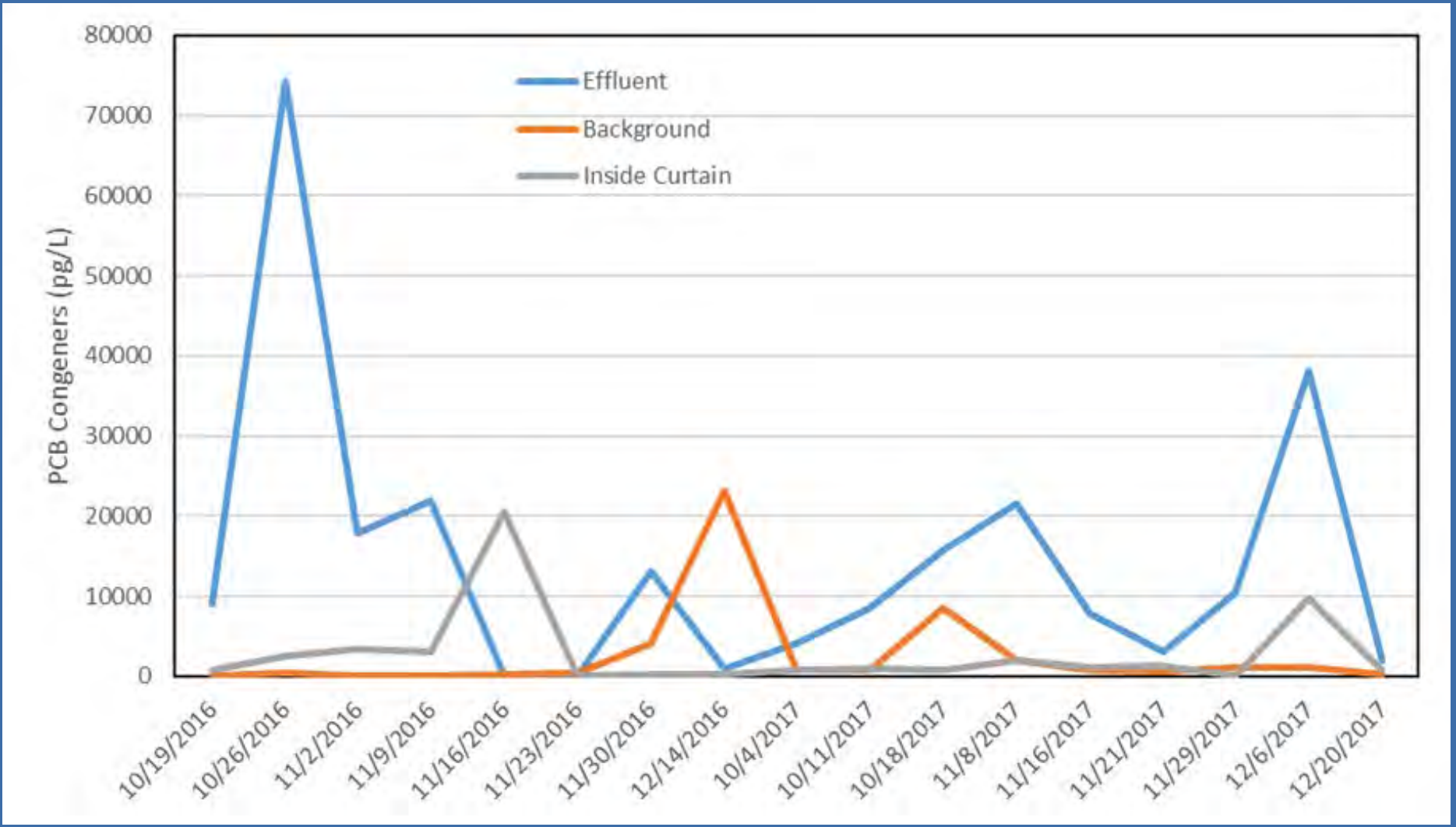
Results Season 3

- 20,608 cubic yards dredged over 49 dredging days
- 20,608 cubic yards dewatered in geotubes
- 12,048 tons trucked to MCRRC, remainder left on site for future beneficial use by Neptune Township
- Cost: $2,776,819 ($134.74/CY dug)
- 6’ deep channel, 100’ wide

Total Suspended Solids Monitoring



PCB Congener Monitoring



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Overall Results

- 68,417 cubic yards dredged over three seasons from December 2015 to November 2018.
- A final grade of –6ft MLW achieved across entire channel
- All material beneficially used
- Water quality inside polishing area was at or below background concentrations
- Total cost of $7,348,356 ($107/CY, not including engineering and oversight)
- Additional information available in our paper published in WEDA Journal of Dredging Vol 18, No.1.

Post-dredging Results

April 2011 April 2013 January 2017

Shark River at Low Tide

Thank You!

- Questions? Comments?
- Contact:

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