



## *Now We're In Over Our Heads!*

# The New Deep Outfall at the Kingston WWTP

Erin K. Moore, PE, BCEE (Tighe & Bond)

David M. Railsback, PE (Schnabel Engineering)

David Seche (Tighe & Bond)

with contributions from:

John Schultheis, PE (City Engineer, Kingston, NY)

Allen Winchell (Senior Operator, Kingston WWTP)

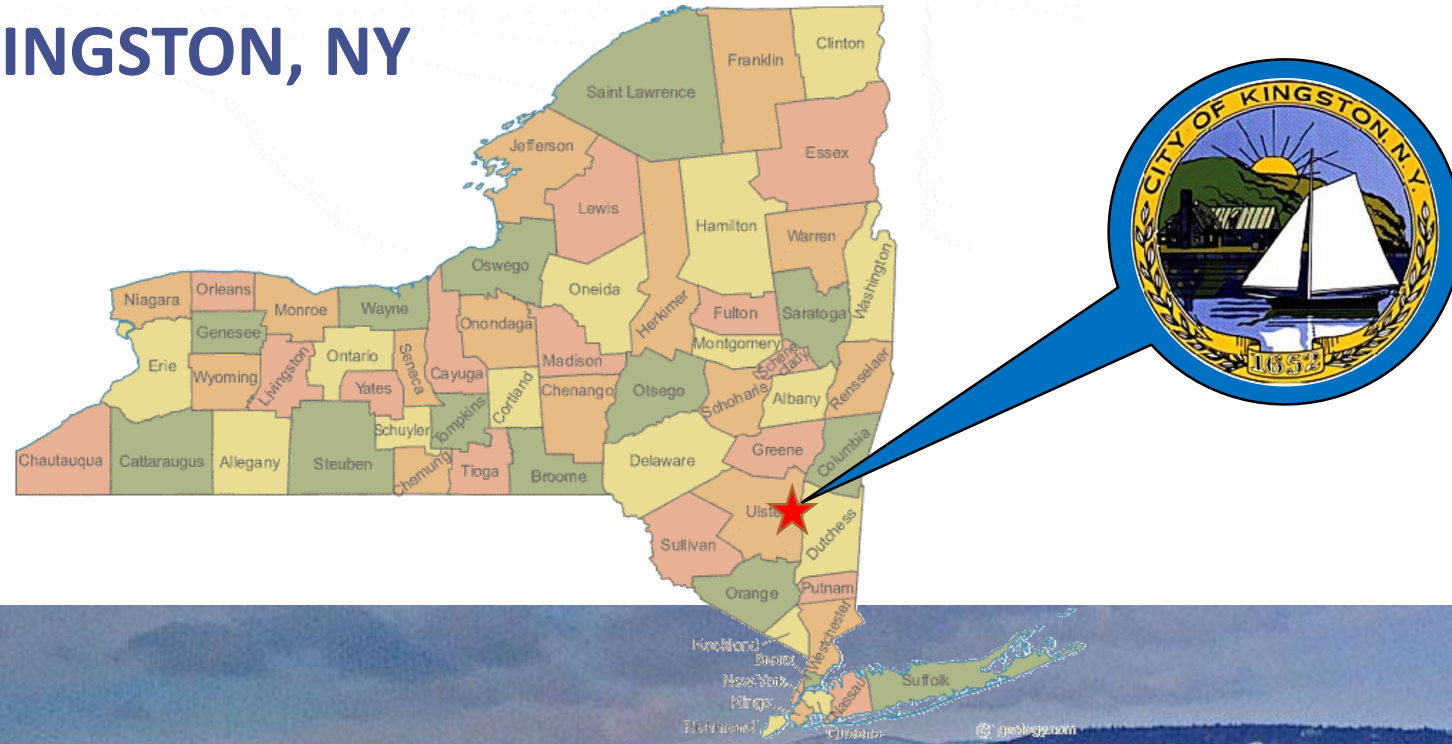


**Tighe&Bond**



Build Better. Together.

# CITY OF KINGSTON, NY



# CITY OF KINGSTON WWTP



Headworks

Primary Clarifiers

Infection

Outfall

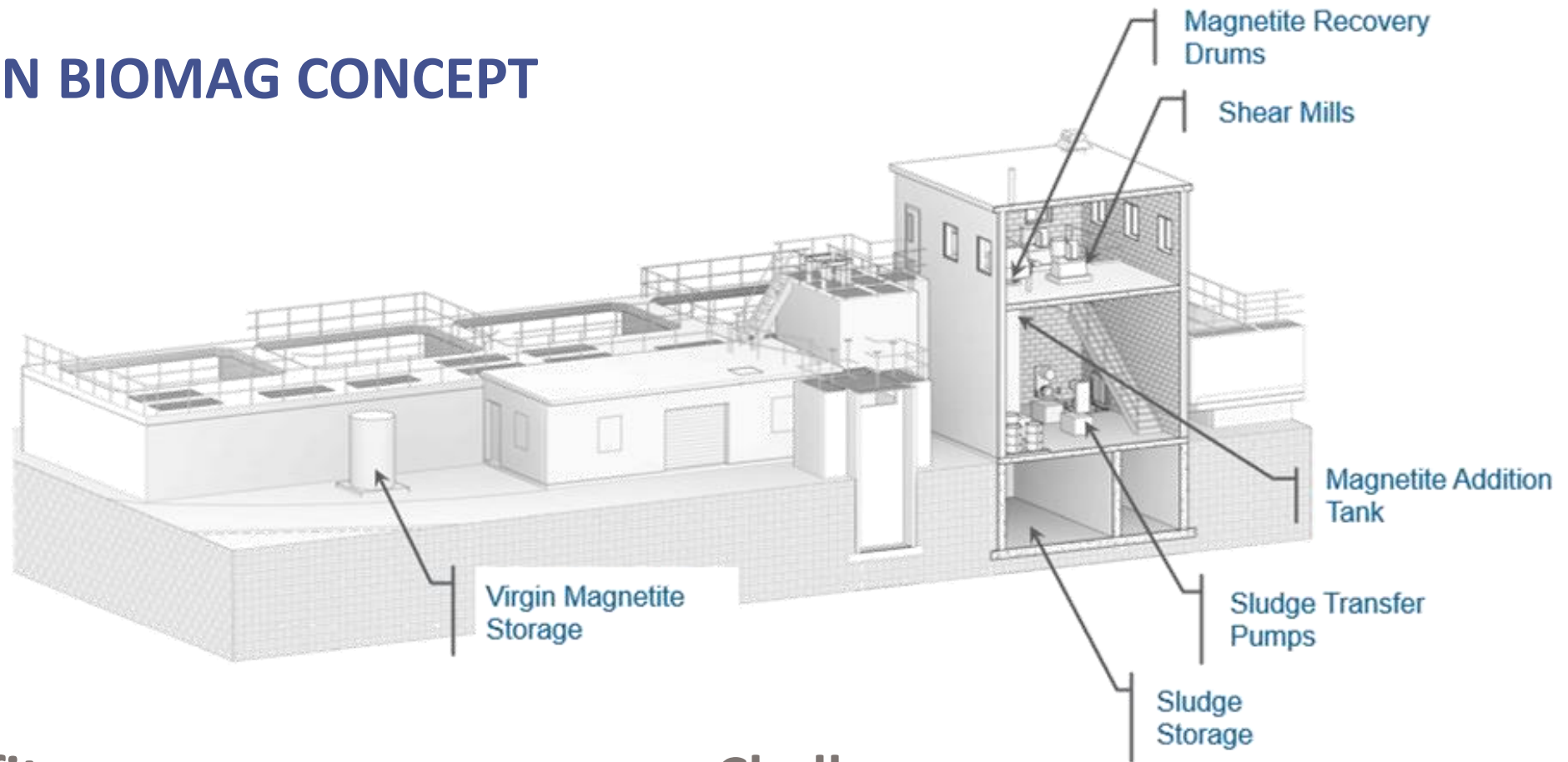
Secondary Clarifiers

# NEW PERMIT LIMITS

- New SPDES Limits
- NH<sub>3</sub>-N Summer: 5.9 mg/l
- NH<sub>3</sub>-N Winter: 9.0 mg/l
- Outfall and WWTP improvements considered



# KINGSTON BIOMAG CONCEPT



## Benefits

- High MLSS = Compact Footprint
- Nitrification/Denitrification Possible In Existing Tanks
- Highly Scalable Based On Ballast Concentration
- Resilient To High Flow Events

## Challenges

- Additional Building on Small Site
- More Operation & Maintenance Demands
- Electrical Usage
- Continuous Wasting Requires Thickening Change
- Ballast Adds 100,000 LBS To Aeration Tanks

# KINGSTON WWTP OUTFALL – ANOTHER TRY?



# SITE LOCATION MAP (40,000 FT)



# SITE LOCATION MAP (20,000 FT)





# KINGSTON'S OUTFALL AT FIRST GLANCE

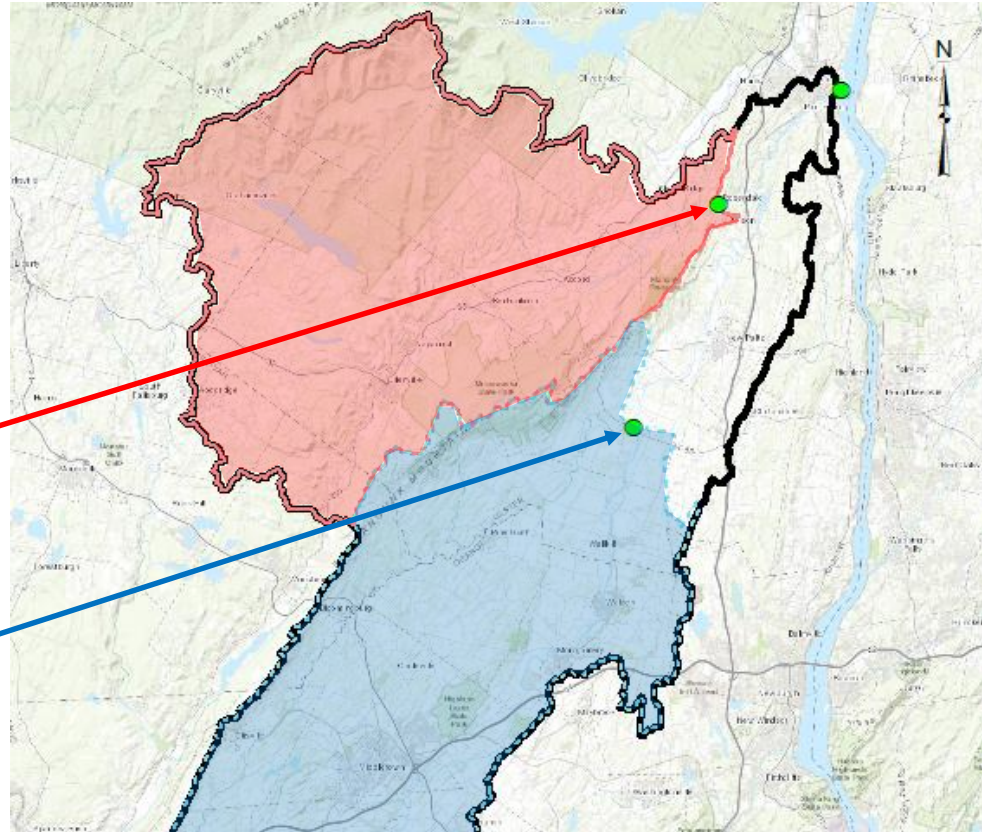


# THE ASSUMPTION OF FULL MIXING



# FLOW FROM THE RONDOUT CREEK





Rondout Creek at Rosedale  
(USGS 01367500)

Walkkill River at Gardiner  
(USGS 01371500)

Location	Watershed Area (sq - mi)	Percent of Total Watershed
Roundout Creek at Kingston WWTP Outfall	1190	100%
Roundout Creek at Rosendale (USGS 01367500)	383	32%
Walkkill River at Gardiner (USGS 01371500)	695	59%
Ungaged Watershed Area	112	9%

# **Low-Flow Frequency Analysis of Streams in New York**

Prepared by

**UNITED STATES DEPARTMENT OF INTERIOR**

**GEOLOGICAL SURVEY**

in cooperation with

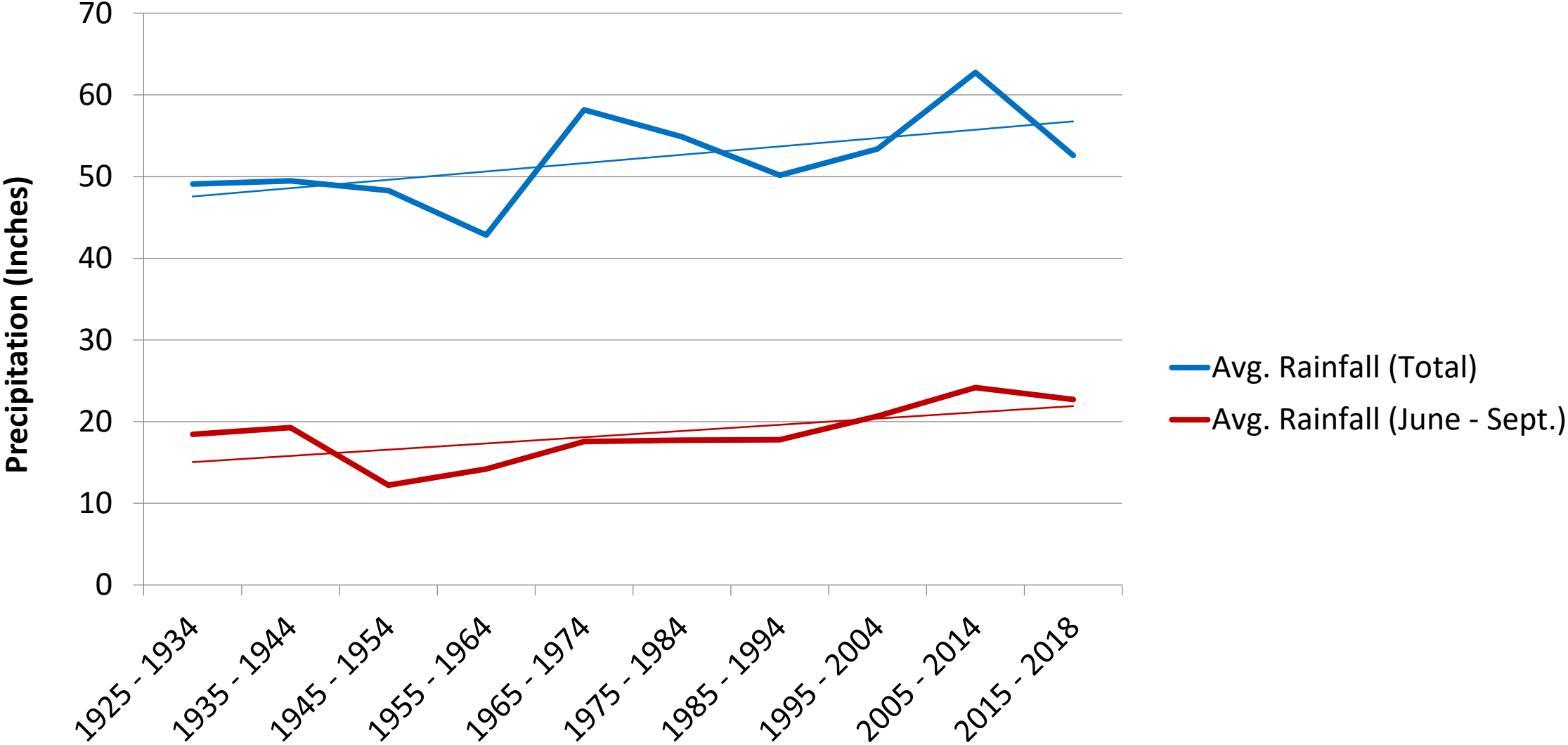
**NEW YORK STATE**

**DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

**BULLETIN 74  
1979**

# Precipitation Trends 1925 - 2018

## 10-Year Averages



# WATERSHED LOW-FLOW

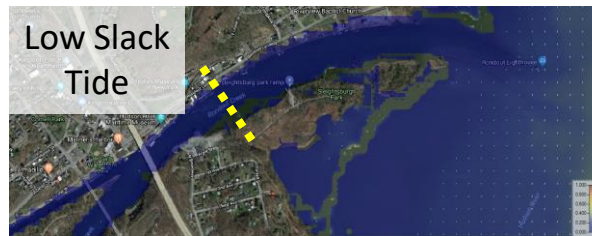
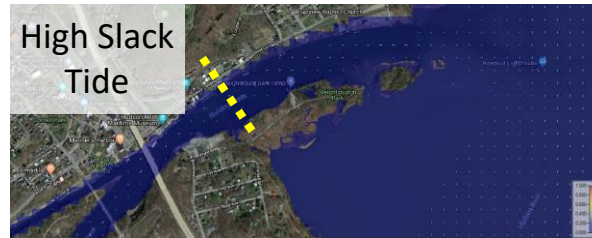
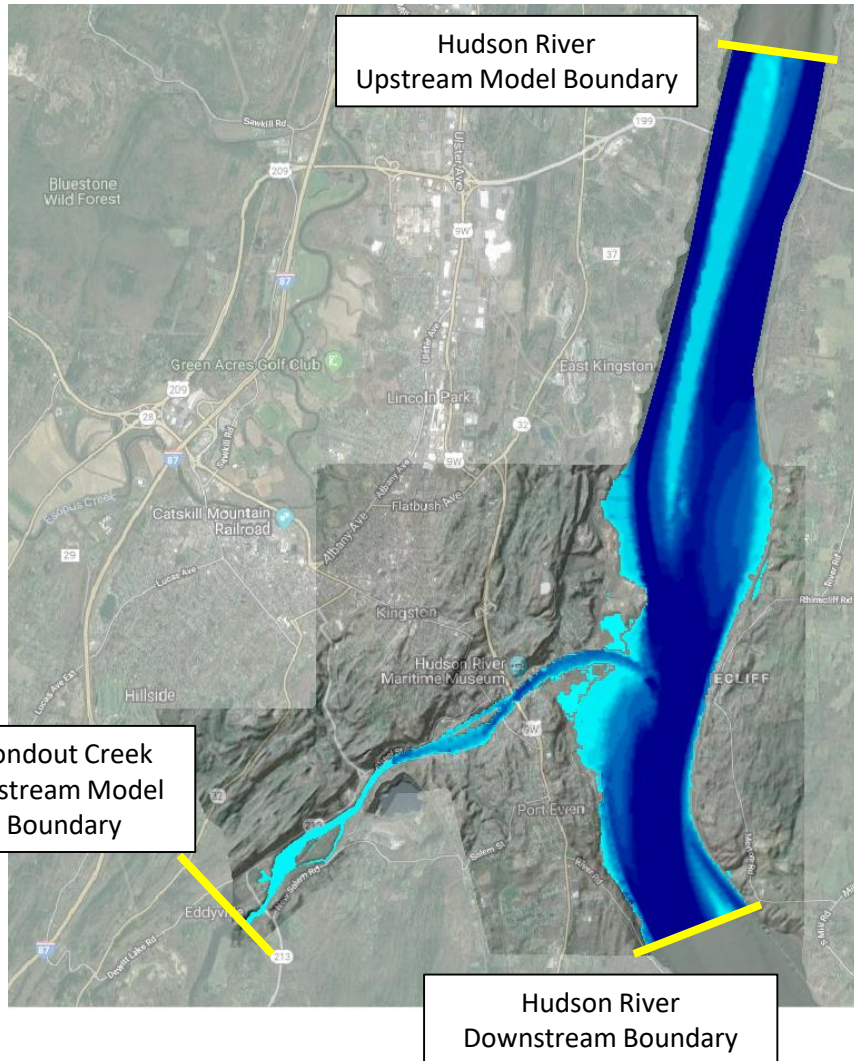
Location	Watershed Area		USGS Bulletin 74		Updated Analysis	
	sq-mi	%	Date Range	7Q10 (cfs)	Date Range	7Q10 (cfs)
Rondout Creek at Rosendale (USGS 1367500)	383	32%	1952 - 1975	20	1952 - 2018	28.4
Wallkill River at Gardiner (USGS 01371500)	695	58%	1925 - 1975	31	1925 - 2018	31.2
<b>Subtotal for Gaged Watershed Areas</b>	<b>1078</b>	<b>90%</b>	-	<b>51</b>	-	<b>59.6</b>
Additional Ungaged Watershed Area	112	10%	-	-	-	6.2
<b>Total Watershed</b>	<b>1190</b>	<b>100%</b>	-	-	-	<b>65.8</b>

51 cfs x 0.7 = 35.7 cfs vs. 65.8 cfs

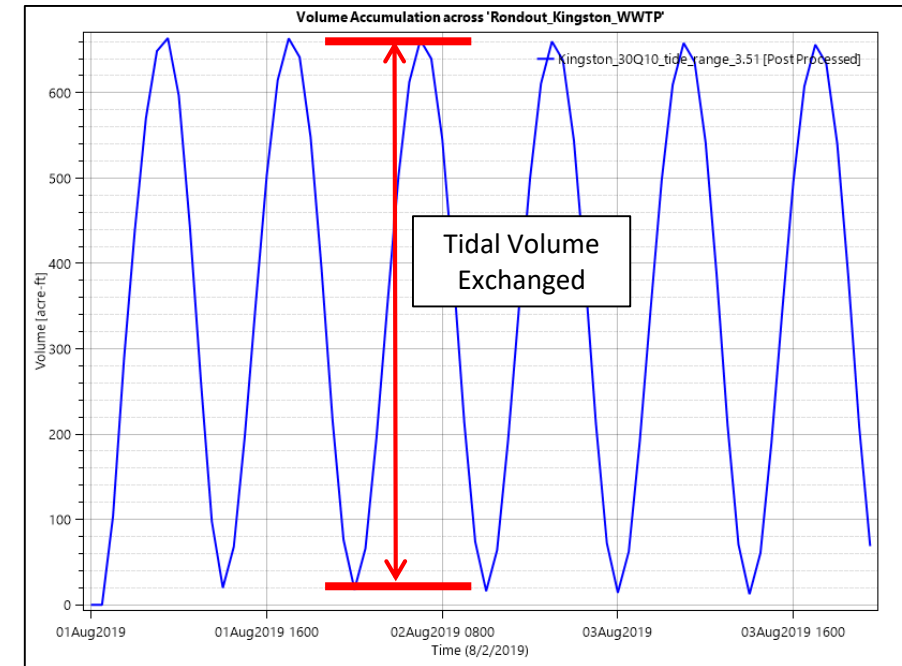


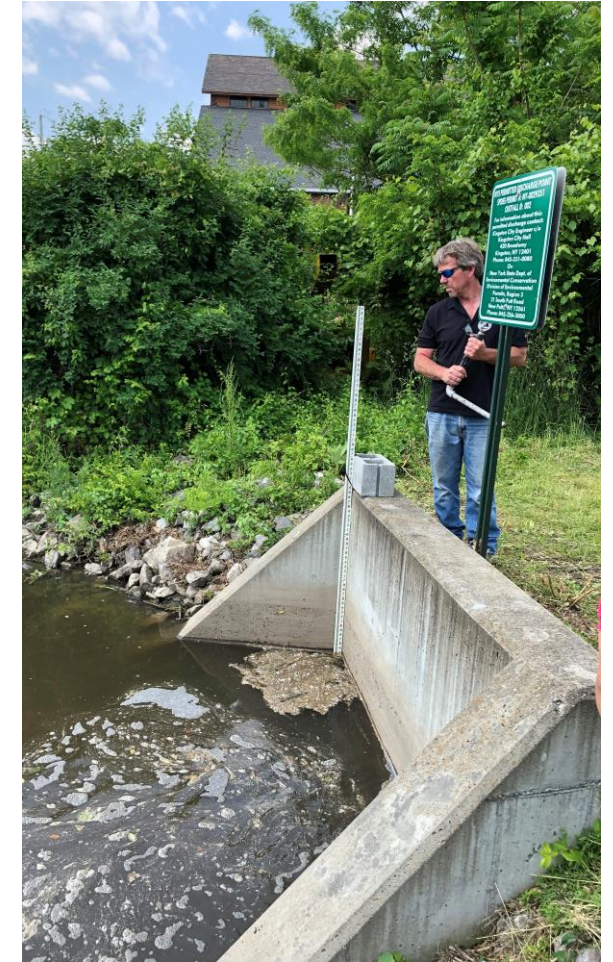


# HEC-RAS MODEL OF TIDAL FLUSHING



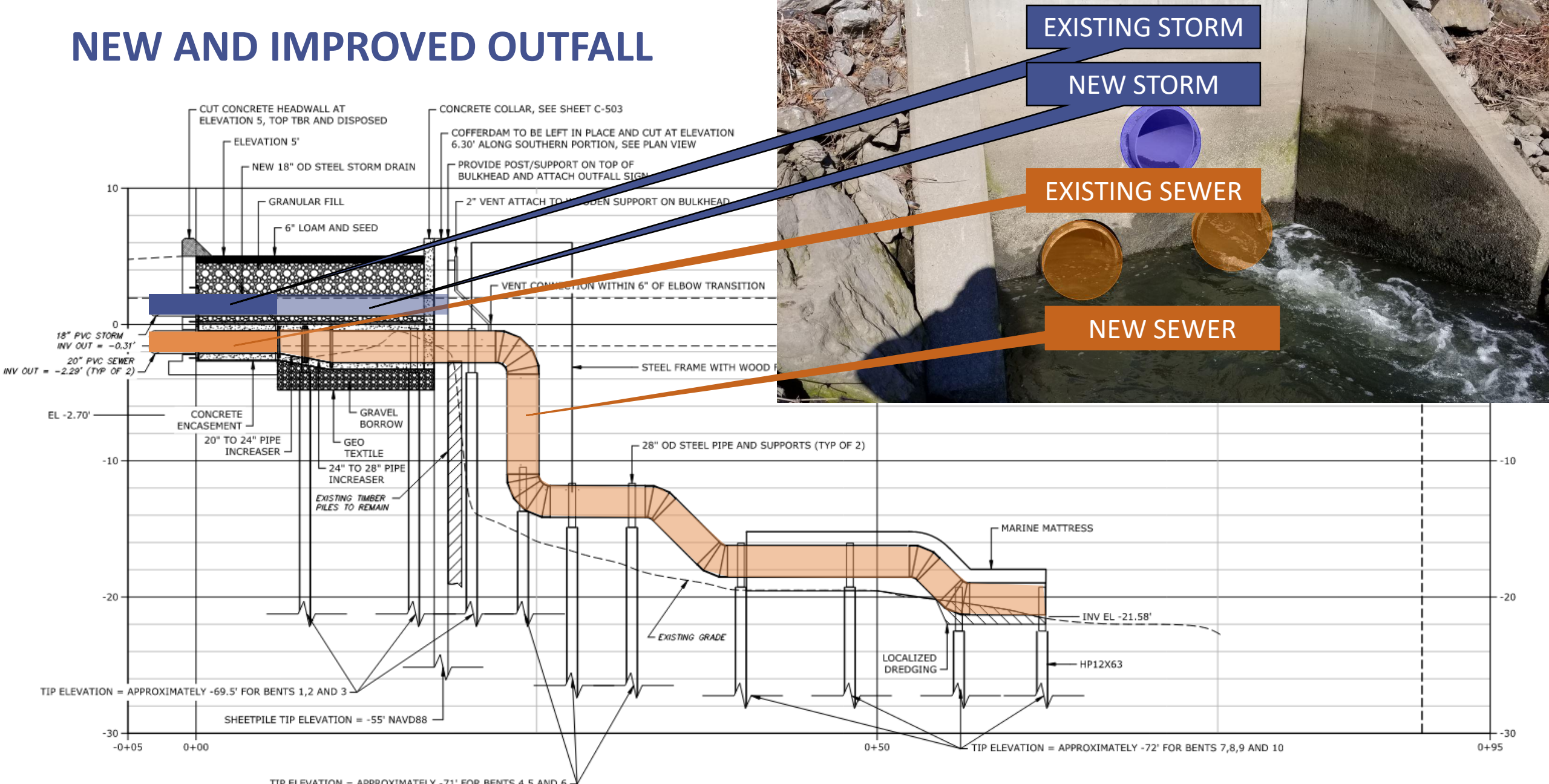
Tidal Cycles in the Hudson River and Rondout Creek (Velocities)







# NEW AND IMPROVED OUTFALL



**WWTP OUTFALL HEADWALL AND RONDOUT CREEK PROFILE**

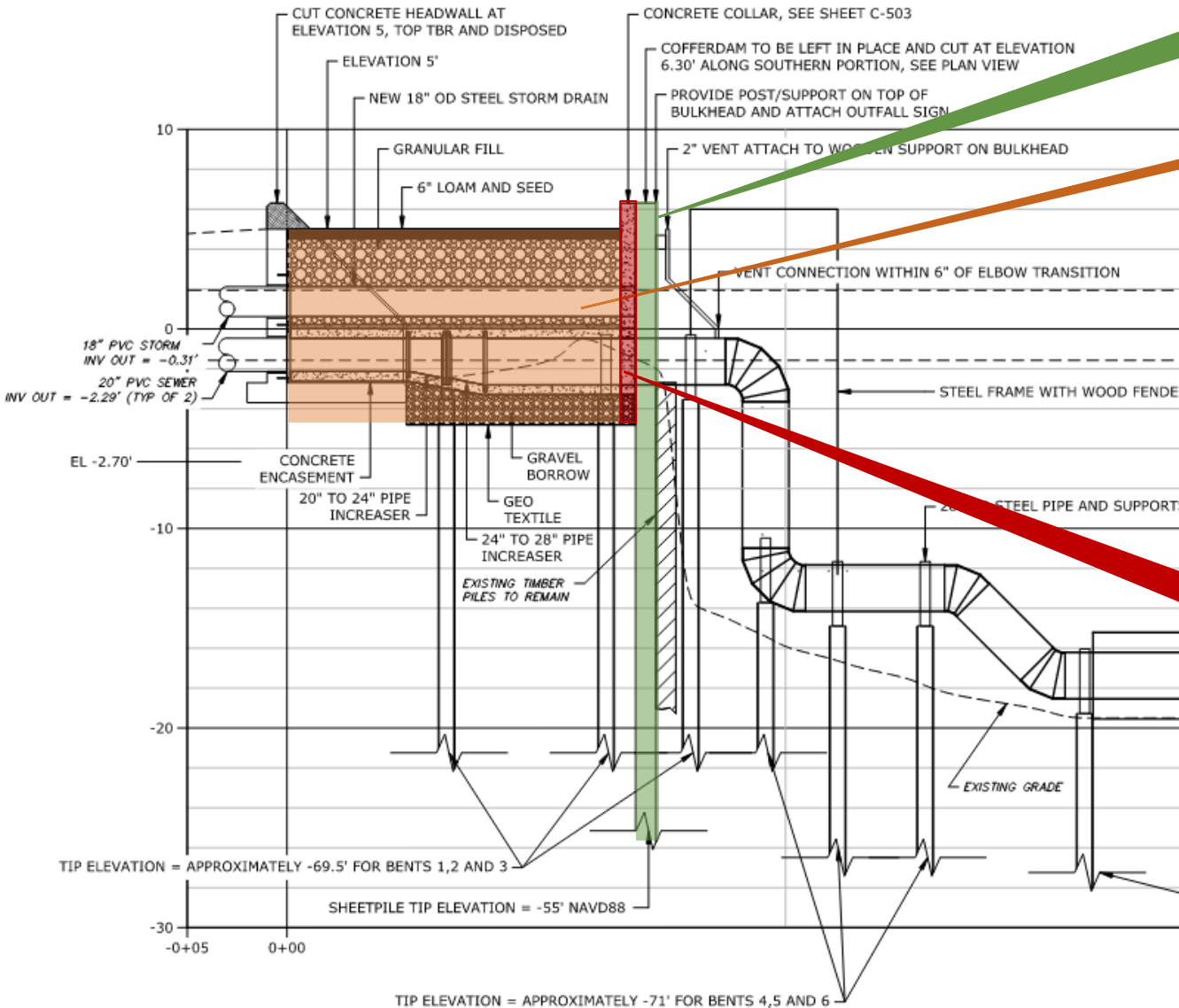
NOTE:  
1. STEEL FRAME AND TIMBER FENDER NOT SHOWN FOR CLARITY



60  
HO  
HI-21

NJ 4910

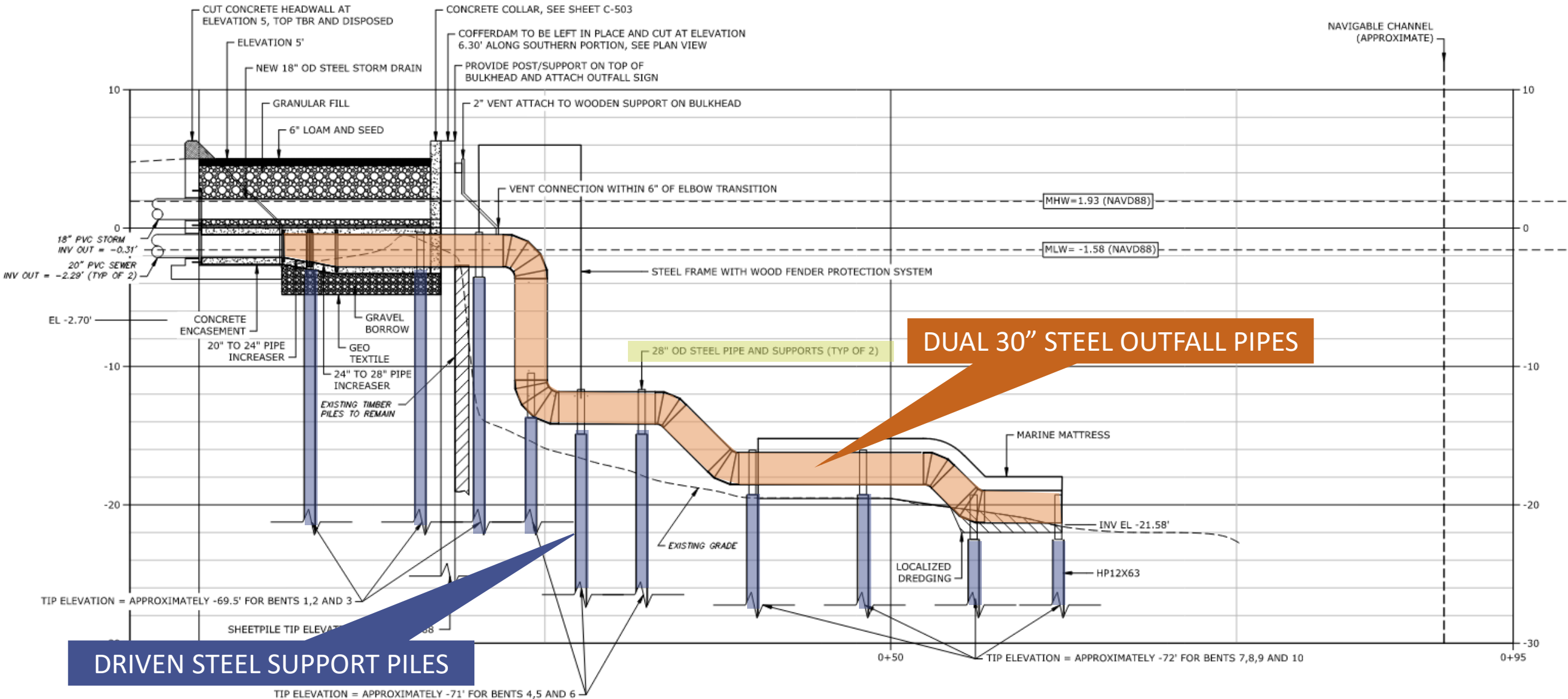
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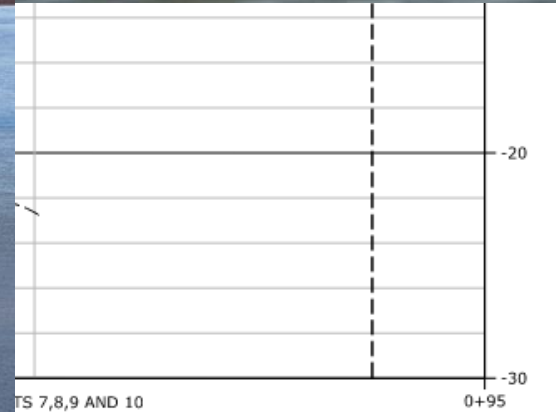
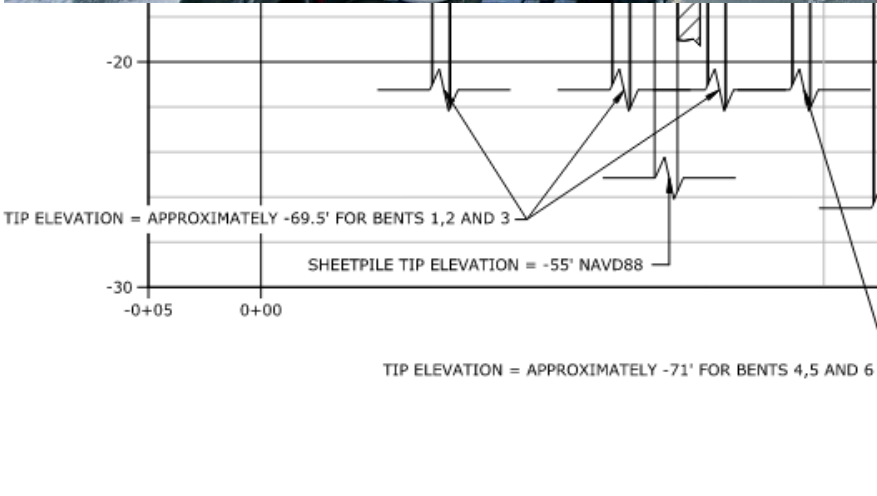
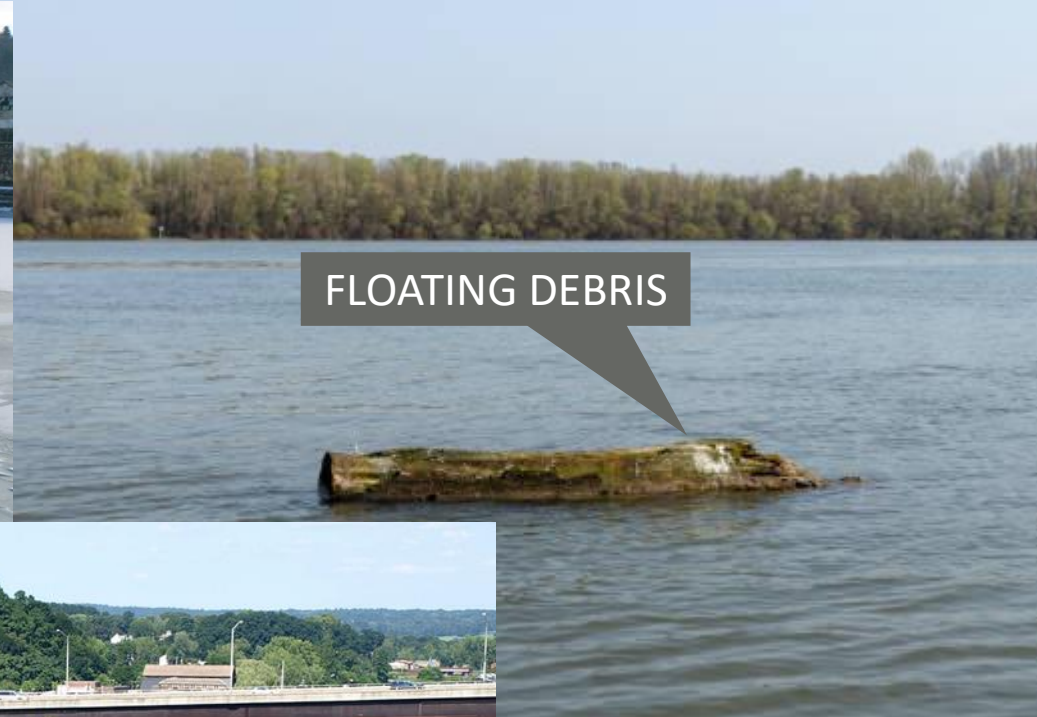


**DRIVEN STEEL SUPPORT PILES**

## WWTP OUTFALL HEADWALL AND RONDOUT CREEK PROFILE

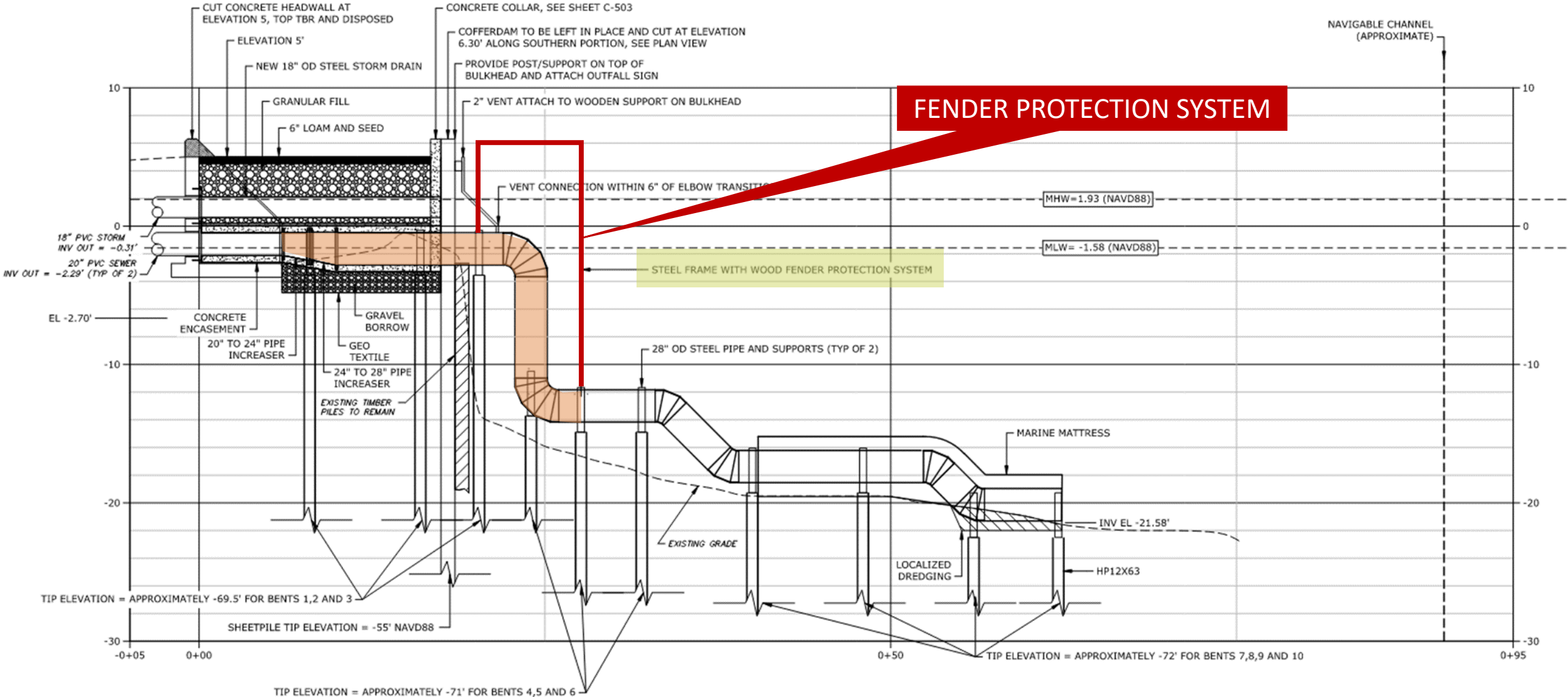
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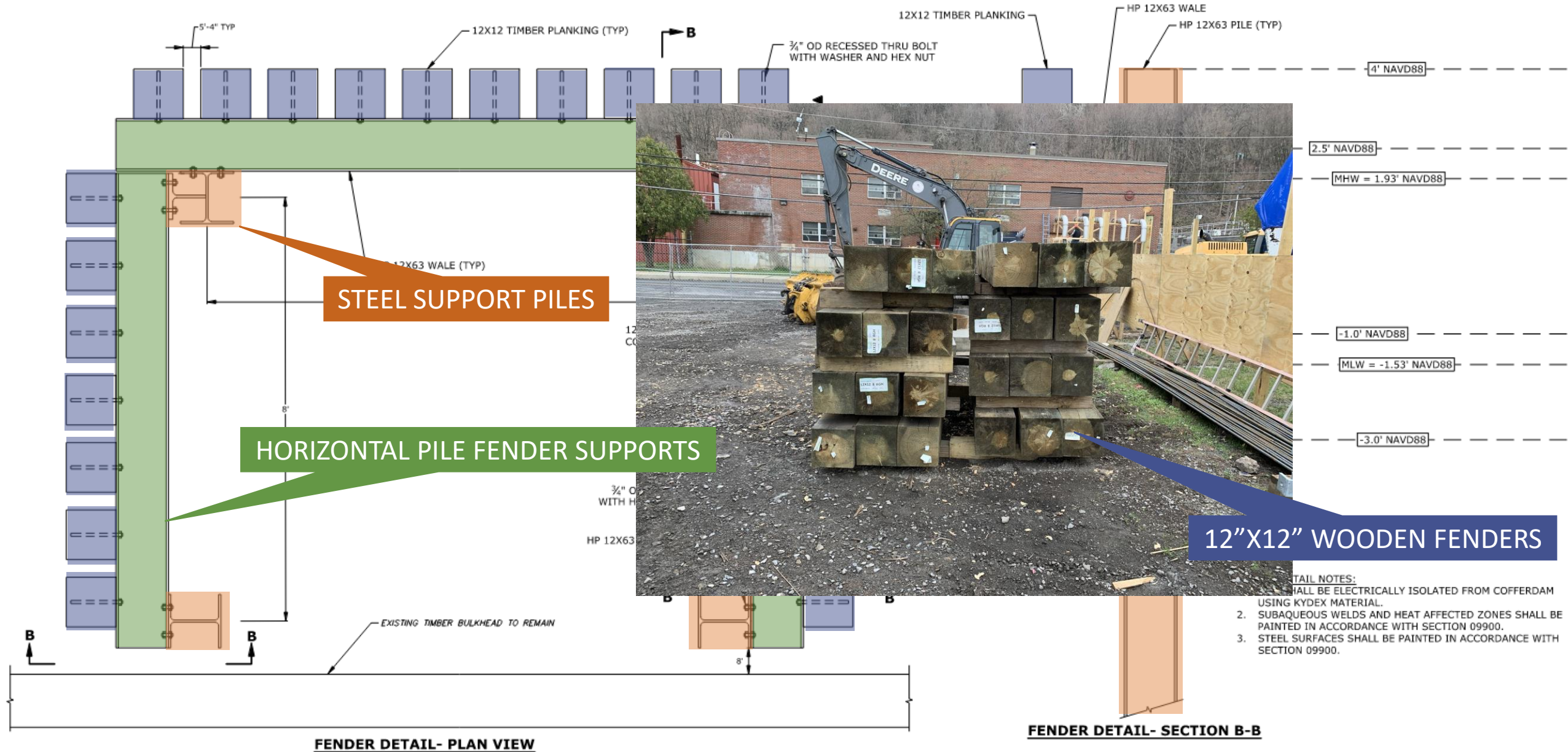
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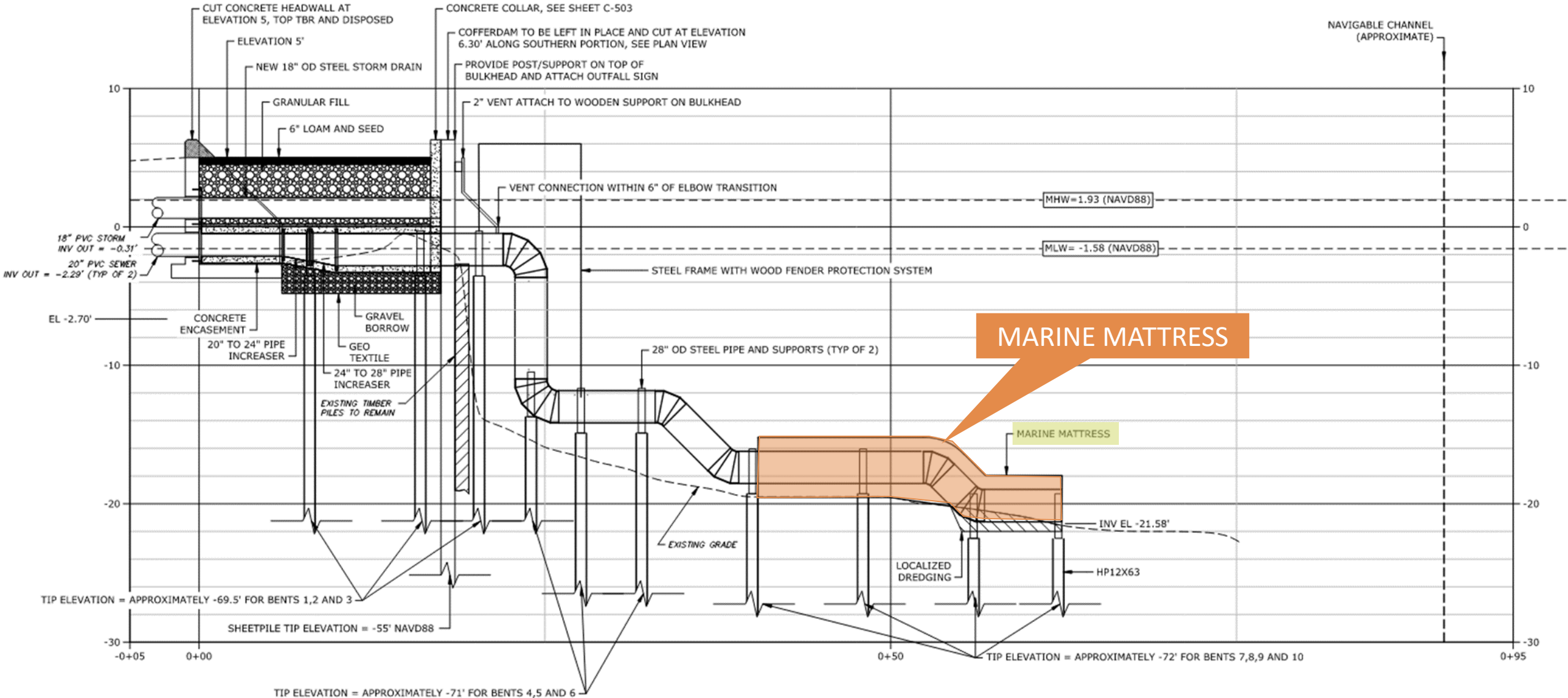
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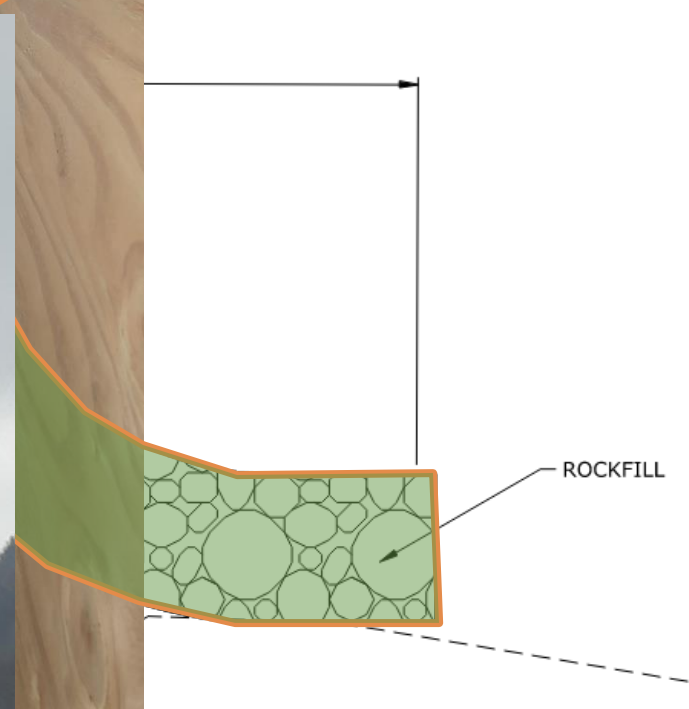


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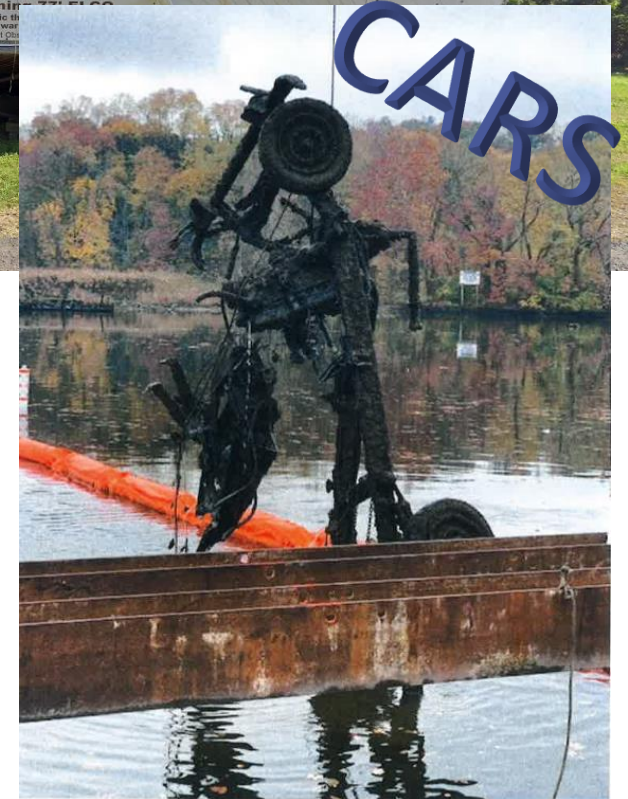
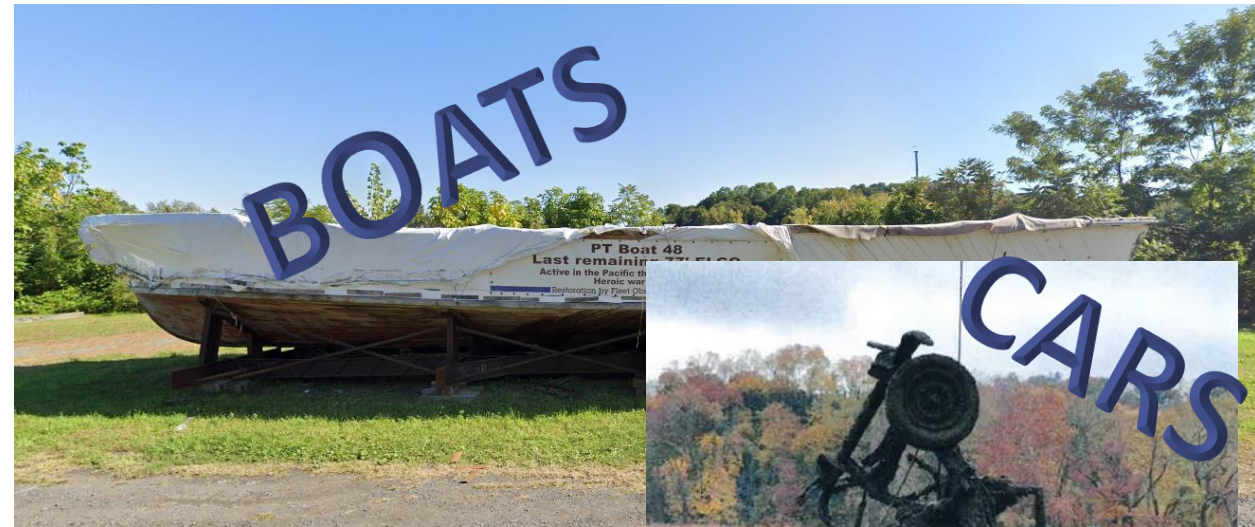


# NEW AND IMPROVED OUTFALL

David Railsback, Schnabel Engineering



Construction Notice to Proceed Issued April 28, 2022

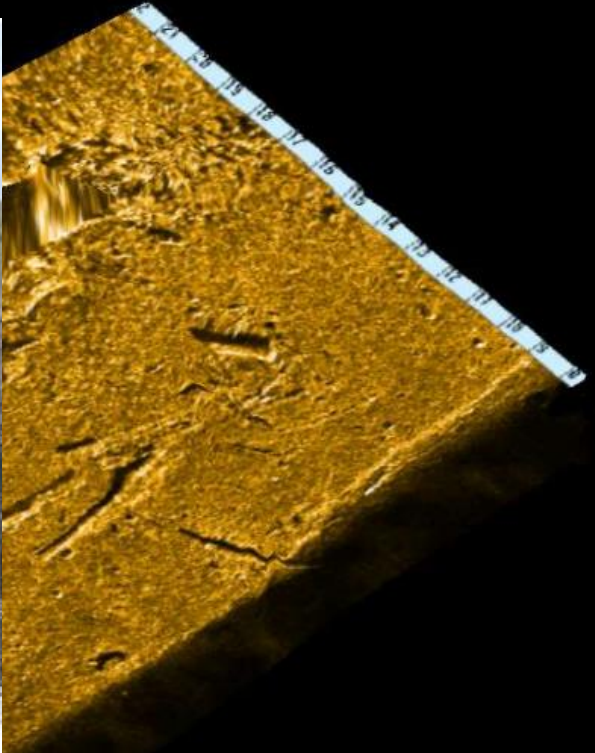


# NEW AND IMPROVED OUTFALL



# NEW AND IMPROVED OUTFALL

SUNKEN



# NEW AND IMPROVED OUTFALL

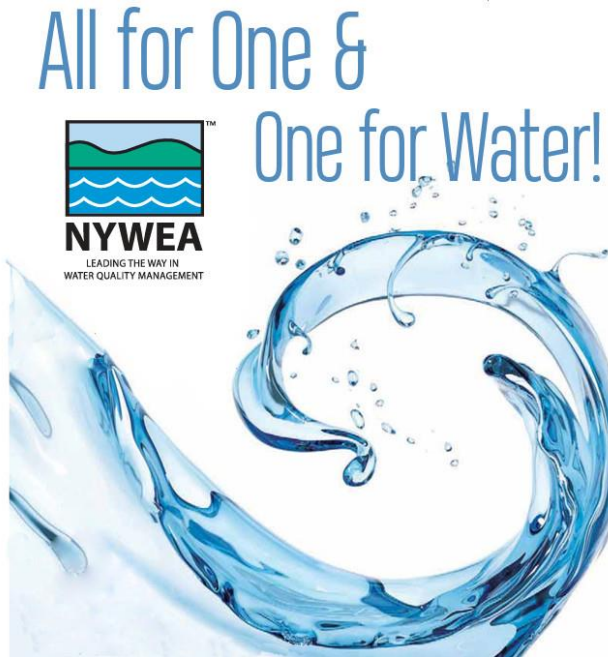




# A NYWEA STORY!



Capital Chapter Fall Picnic



Canal Clean Sweep



YP Reception at the Annual Meeting



Erin K. Moore, PE, BCEE  
Tighe & Bond  
EKMoore@tighebond.com  
845-516-5835



David Seche  
Tighe & Bond  
DTSeche@tighebond.com  
845-516-5837



David M. Railsback, PE  
Schnabel Engineering  
drailsback@schnabel-eng.com  
978-895-3220



[schnabel-eng.com](http://schnabel-eng.com)