Conversion of a Conventional Activated Sludge Facility to EBNR and Effluent Quality that will Surprise

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CDM Smith

Since 2004, UBWPAD has Spent $180 Million to Upgrade and Expand Wastewater Treatment Facility

In 2009, Upgrades Were Put On-Line On Schedule
In 2012, District Received NACWA Peak Performance Award

	2001 Permit	Actual (FY2012)
Flow (mgd)	56*	33.1
Total Phosphorus (mg/L)		
Summer	0.75	0.54
Winter	Report	0.44
Total Nitrogen (mg/L)		
Summer	No limit	4.1
Winter	No limit	4.3

* Facility designed for an average daily flow of 45 mgd

Peak Performance AWARDS
NATIONAL ASSOCIATION OF CLEAN WATER AGENCIES

A Success Story……?

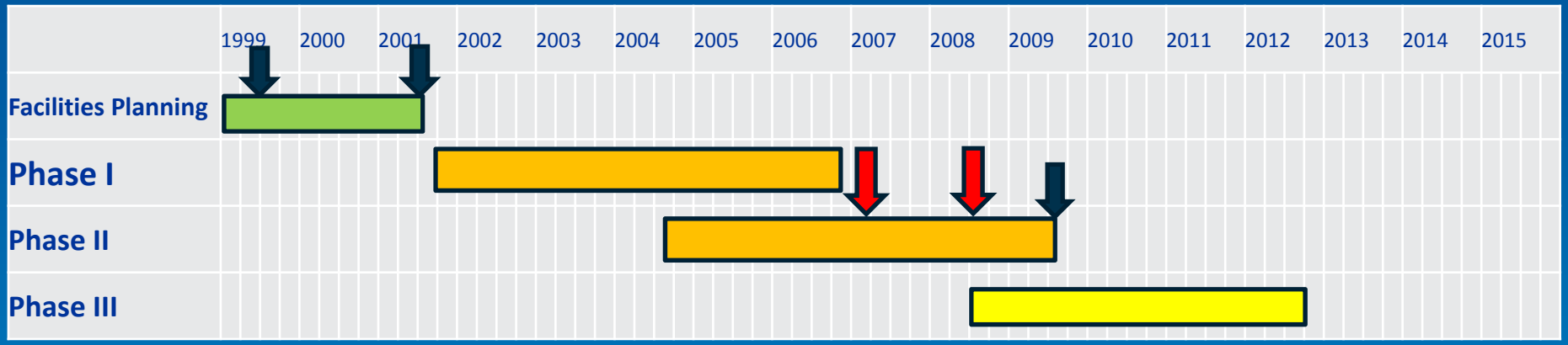
But…..In the Midst of Construction EPA Issued New NPDES Permit with Extreme Nutrient Limits

	2001 Permit	2008 Permit
Flow (mgd)	56*	56*
Total Phosphorus (mg/L)		
Summer	0.75	0.1
Winter	Report	1.0
Total Nitrogen (mg/L)		
Summer	No limit	5
Winter	No limit	No limit

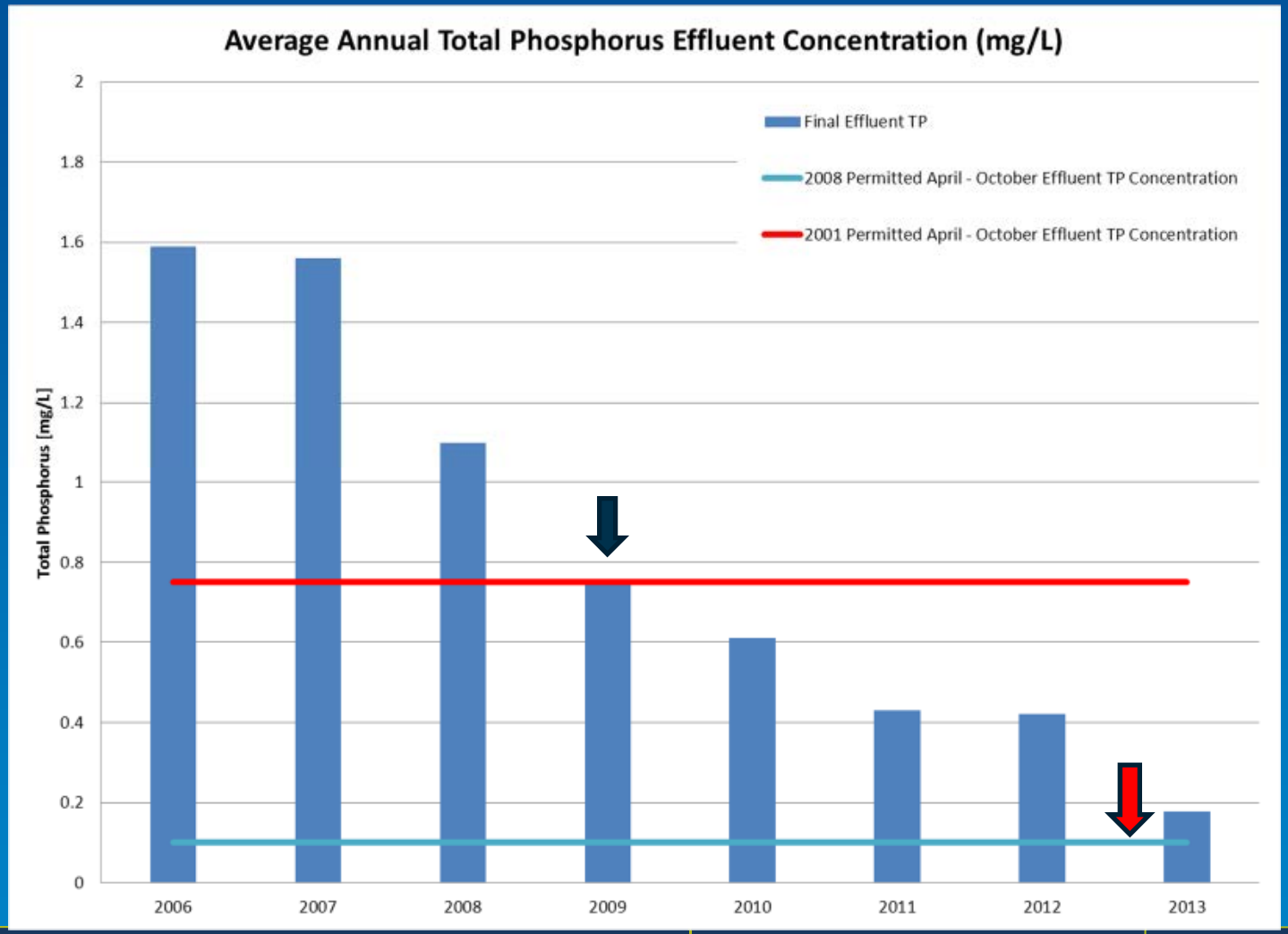
* Facility designed for an average daily flow of 45 mgd

- District Contested
  - Timing of the permit was Illogical
  - No scientific basis for permit limits
  - Meeting limits would result in extreme economic and environmental impacts

Schedule – Timing of the Permit was Illogical



District Continues to Improve Performance of Biological Nutrient Removal (BNR) Process



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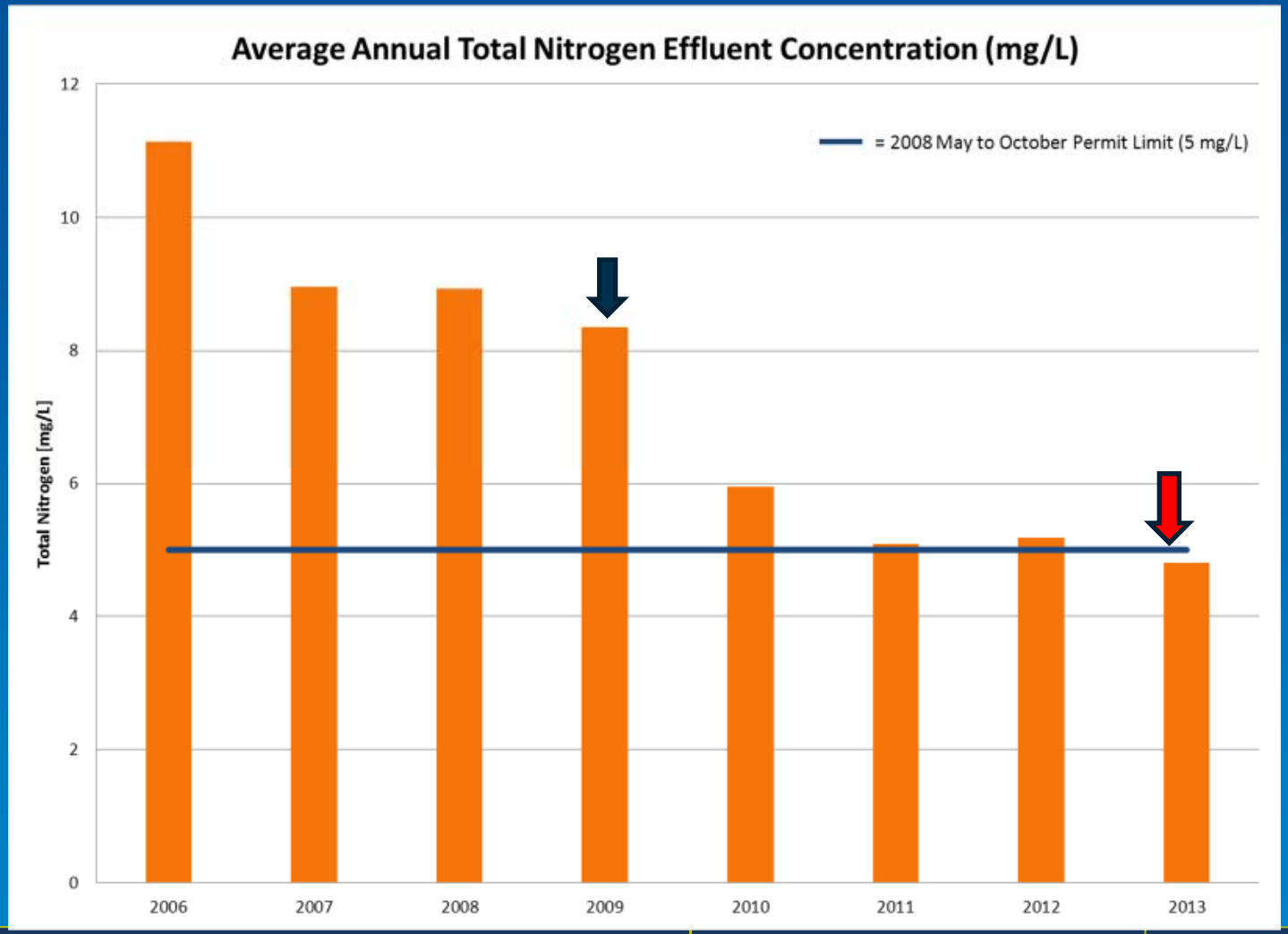
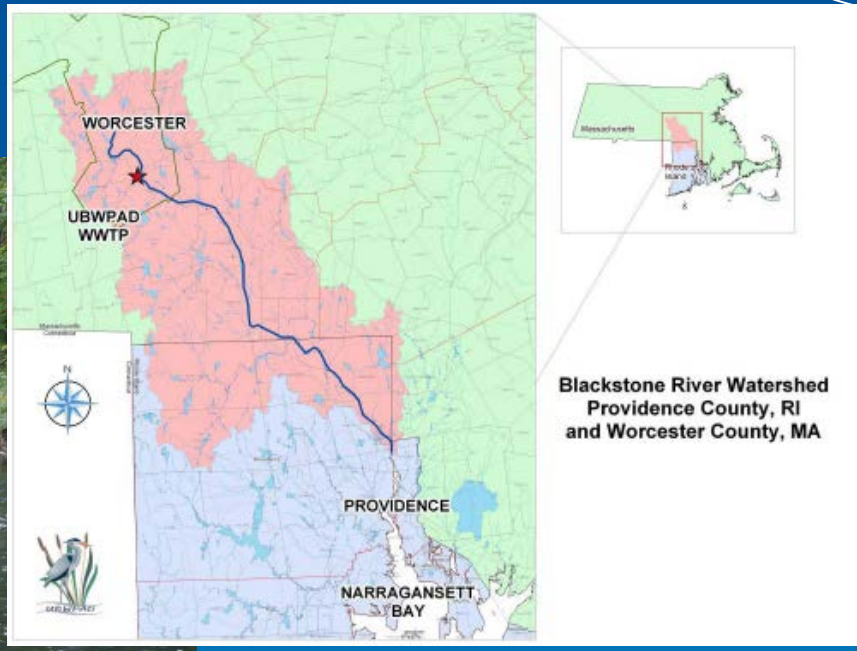
Total Nitrogen Limit Established in 2008 Permit Nearly Being Met



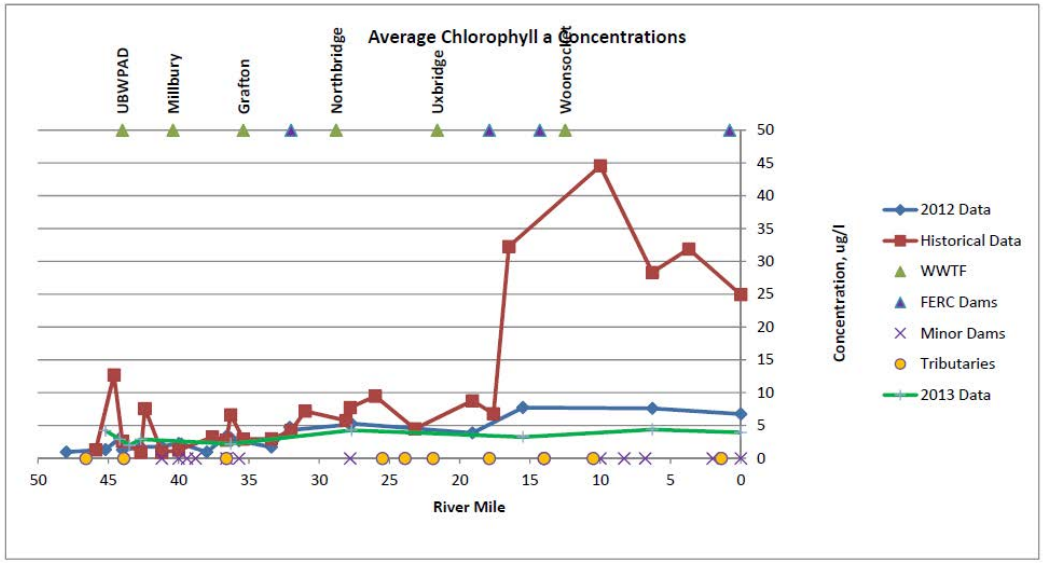
EPA's 2008 Permit Had No Scientific Basis, District's Model Showed NPS and Dams Drive Water Quality

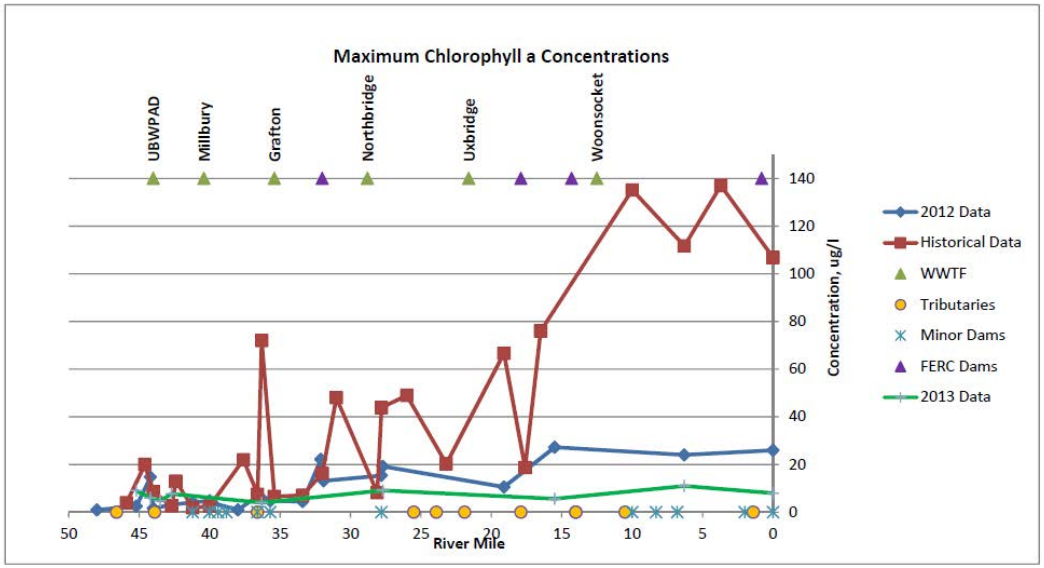


River Response

In-stream Chlorophyll a Concentrations Have Reduced in Response to Improved Effluent Quality

2013 Sampling Data Through 9/25/2013





In 2007 Estimated Extreme Economic and Environmental Impact of Necessary Improvements

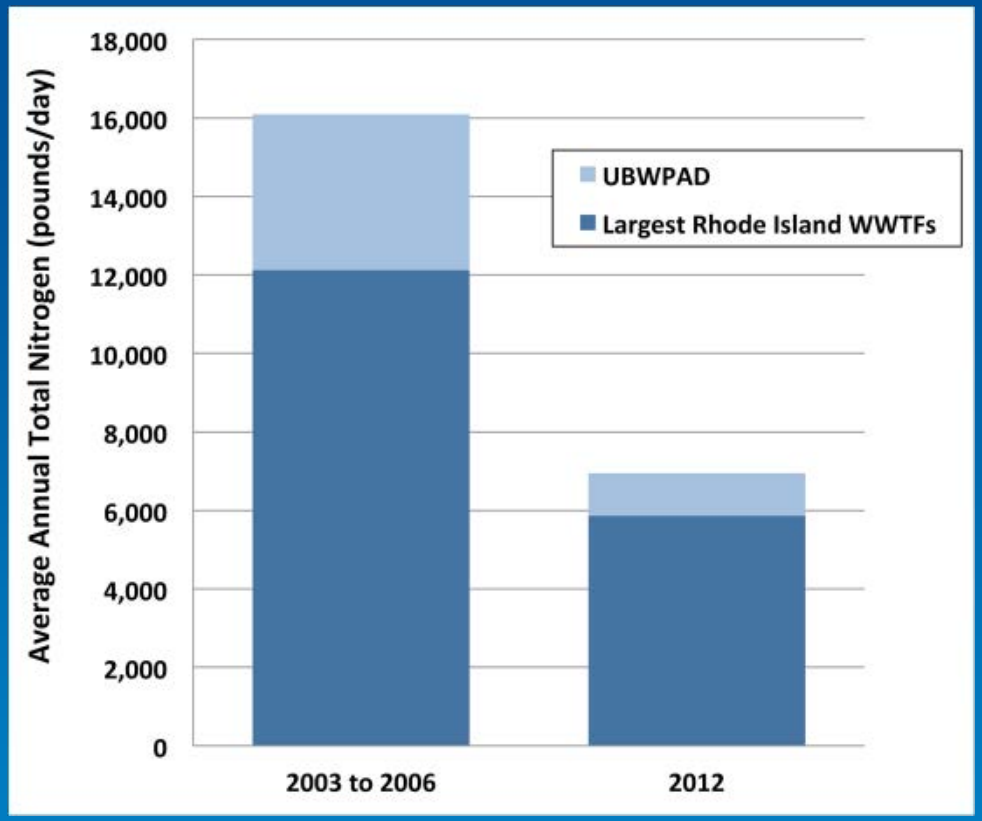
- $200 Million Capital Cost
- $5 million O&M cost
- 20% increase in power consumption
- 50% increase in sludge production
- Four-fold increase in ash production
- 5 additional 8,000-gallon tanker truck deliveries daily
- 14% increase in NOx production

The District Currently Commencing Piloting of Sustainable Solutions to Meet 2008 Permit

- Operational Modifications
  - Step Feed
  - Real-time Control
  - Magnesium Hydroxide for Alkalinity Control
  - 5-stage Bardenpho
- Targeted Chemical Addition
  - Supplemental carbon
  - Ferric prior to dewatering
- Algae Treatment

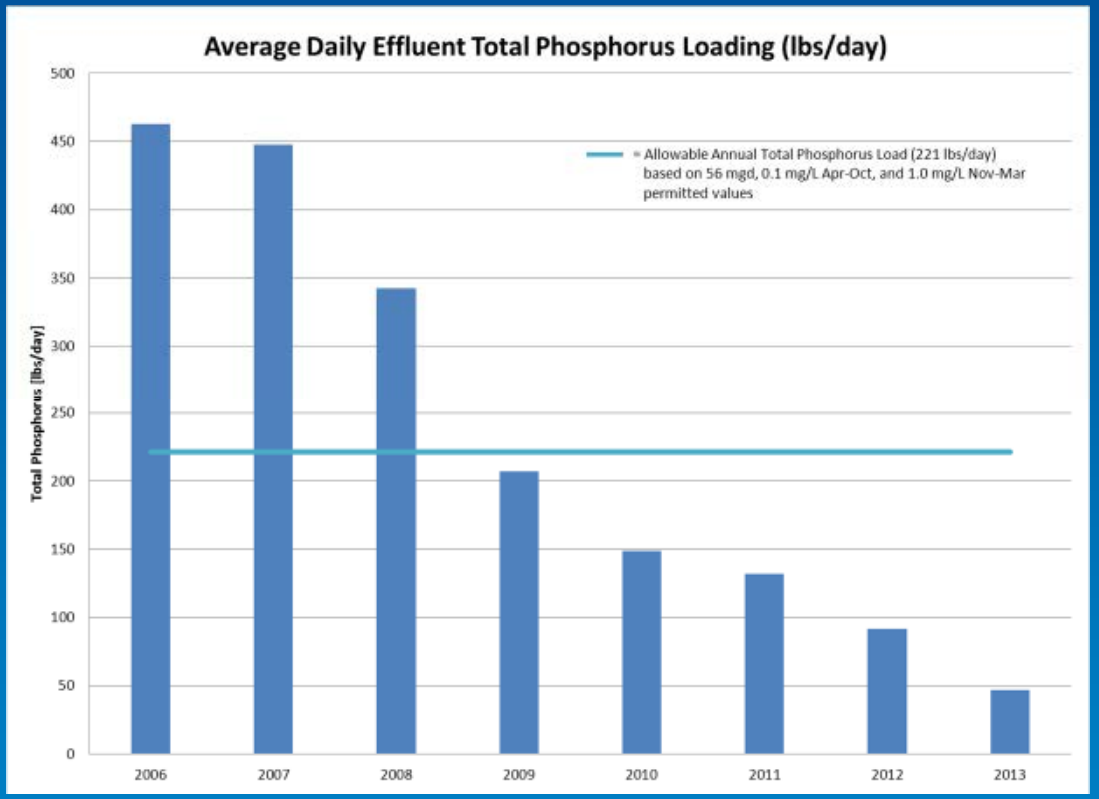
Lessons Learned

- Negotiate no change in limits for the term of the Administration Order
- Establish water quality criteria that need to be achieved with regulators prior to setting limits



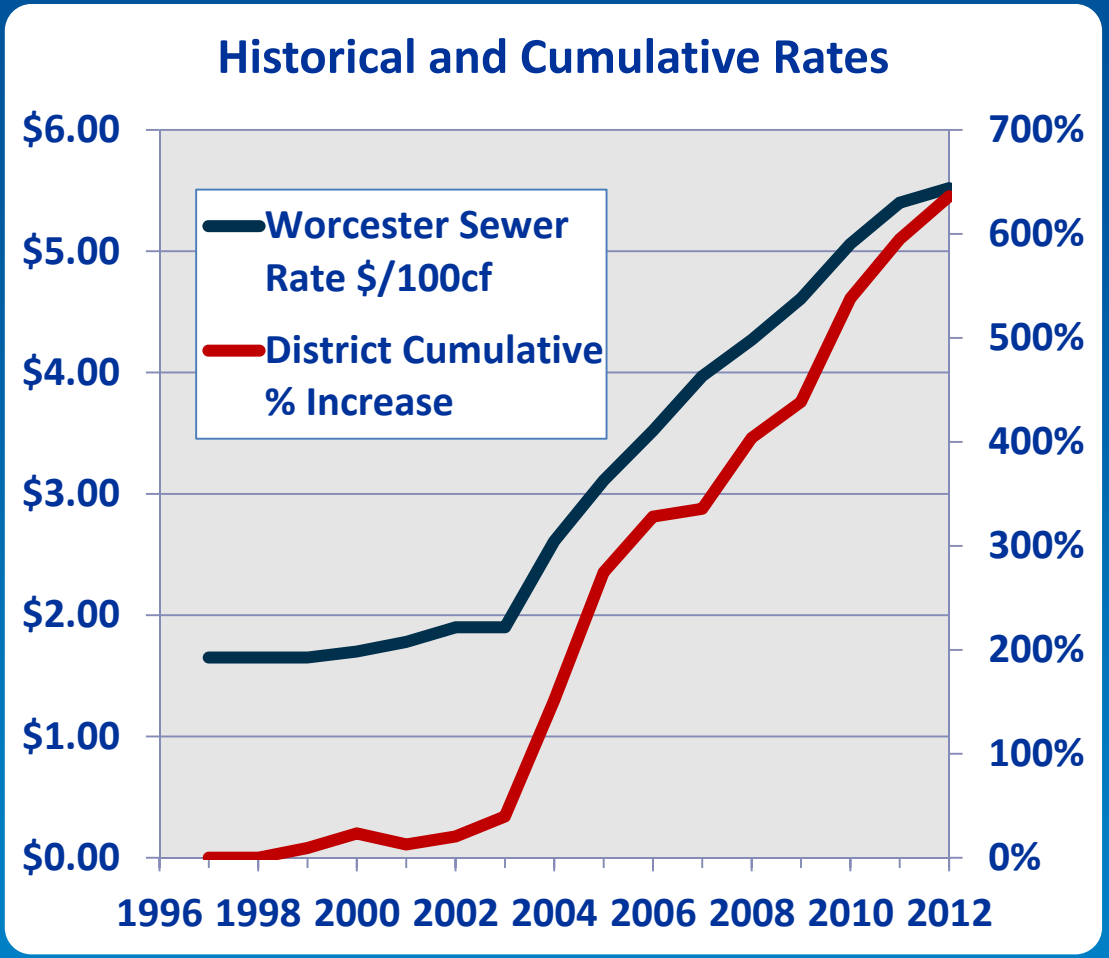
Lessons Learned

- Take an active role in river modeling and engage the regulators
- Understand how permit limits are written, as this can significantly impact compliance



Lessons Learned

- Educate EPA with respect to cost-benefit of suggested permit limits (including environmental cost)
- Push for the use of Integrated Planning to prioritize improvements and spend money in the right place



Questions/Discussion