
CHAMBERSBURG SEWER DEPARTMENT

Summary

Wastewater Treatment Plant and Collection/Conveyance Projects

March 25, 2013



CET
ENGINEERING
SERVICES

A Subsidiary
of



CLIENTS | PEOPLE | PERFORMANCE



STATUS OF PROJECT COSTS

WWTP Project Bidding Schedule

- 3/25/2013: Advertisement #1
- 3/29/2013: Advertisement #2
 - Advertised in the Chambersburg Public Opinion, Baltimore Sun
- 4/17/2013: Mandatory pre-bid meeting at WWTP
- 5/1/2013: Last day for bidder questions
- 5/7/2013: Last major addendum to bidders
- 5/14/2013: Bid opening
- 6/10/2013: Council approval to award

WWTP Engineer's Estimate

Project 1: UV Upgrade/New Forcemain & Yard Piping Installation

Project 1 Preliminary Opinion of Probable Construction Cost Estimate: **\$1,388,800**
20% (Before Grant Reduction) for Engineering, Legal, Admin. and Financial Services*: **\$277,760**
Associated H2O Grant Allocation: **(\$1,000,000)**
Preliminary Opinion of Probable Capital Cost for Project 1: **\$666,560**

Project 2: Main Upgrade Project

New Headworks/Influent Pump Station	\$8,500,000
Grit Removal	\$500,000
Existing VLR Tank Modifications	\$700,000
New Process Tanks, Equipment, and Associated Piping	\$7,000,000
New Secondary Clarifiers and Flow Splitter Box Modifications	\$3,000,000
New RAS Pump Station	\$800,000
Solids System Improvements	\$2,700,000
Chemical Feed Systems and Associated Safety Provisions	\$500,000
Electrical	\$4,500,000
SCADA	\$800,000

Main Upgrade Project Preliminary Opinion of Probable Construction Cost Estimate: **\$29,000,000**
20% for Engineering, Legal, Admin. and Financial Services: **\$5,800,000**
Associated H2O Grant Allocation: **(\$1,000,000)**
Preliminary Opinion of Probable Capital Cost for Project 2: **\$33,800,000**

Total Preliminary Opinion of Probable Capital Costs for Projects 1 & 2 : \$34,466,560



Grant Money for Sewer Projects

- H2O PA – Water & Sewer Grant
 - \$1,000,000 awarded July 2009
 - \$1,000,000 awarded June 2011
 - Used to cover:
 - equipment, construction, engineering and legal costs
 - Grant will cover 66.6% of costs submitted to the grant amount.
 - 1st H2O Grant applied toward 2012 projects
 - UV Project ~ \$1,000,000
 - Forcemain ~ \$430,000
 - Motor VFD's ~ \$70,000

O&M Decrease in Cost

- Higher energy efficiency equipment and design
 - Headworks / influent pump station
 - Pump motors and associated VFDs will make influent pumping more energy efficient
 - Digestion System
 - Conversion to completely anaerobic digestion is more energy efficient than part anaerobic and part aerobic solids processing system
 - Denitrification
 - Reduces aeration requirement for BOD removal
 - Aeration diffusers
 - Fine bubble diffusers are more energy efficient than coarse bubble diffusers
 - Blowers
 - Post aeration and re-aeration blowers are energy efficient

O&M Decrease in Cost

- **Maintenance Savings**

- Self cleaning wet well will reduce grit build-up related maintenance
- Second UV system will make overall UV system maintenance easier

- **Decreased electric costs**

- Rates decreased 7.5% in July 2010 and an additional 7.5% in November 2010.
- A further 10% decrease is projected in 2013.

- **New management**

Nutrient Trading

- Previous = \$2,724,000 over three years
 - 124,000 Total Nitrogen (TN) credits at \$5 per credit per year
 - 32,000 Total Phosphorus (TP) credits at \$9 per credit per year
 - Admin, Contingency, and Legal not included
- Current = \$600,000 over three years
 - Decrease of over 75%
 - Local Agricultural Credit Generation Program
 - Cover crop and conservation tillage BMPs
 - Cumberland and Franklin Counties
 - \$40 per acre at ~ 40 credits per acre = \$1 per credit
 - \$150,000 per year to Operators
 - \$20,000 per year to Conservation Districts (\$10,000 each)



CLIENTS | PEOPLE | PERFORMANCE



Nutrient Trading

- **USDA Conservation Innovation Grant**
 - Awarded September 2012
 - 50% of program costs funded through the grant
 - Award amount: \$336,150
- 59 total grants awarded nationally
- Chambersburg was the only local government within the Chesapeake Bay Watershed to receive a grant

Conveyance System Improvements

- Previous estimated cost= \$27,506,000
- CET-GHD estimated cost = \$1,975,000
 - Cost breakdown:

Alternative	Cost
Plant Approach Interceptor Pipe Replacement	\$460,000
East Conococheague Pipe Replacement	\$1,140,000
Investigation of Contributing I/I Sources	\$124,000
5 year I/I Management Program	\$243,000

Summary of Cost Reduction

Items	Previous	Today	Change in Cost	Cost Reduction Percent
WWTP Expansion	\$39,144,800	\$34,466,560	\$18,226,928	34.6%
CPI Adjustment (2% a year for 3 years)	\$2,348,688			
New Headworks	\$10,000,000			
UV System Upgrade	\$1,200,000			
Nutrient Credits	* \$2,724,000	\$336,150	\$2,387,850	87.7%
Interceptors	\$27,507,600	\$1,975,000	\$25,532,600	92.8%
TOTAL	\$82,925,088	\$36,777,710	\$46,147,378	55.7%

Note: All above based upon estimated costs

* at \$5 per Nitrogen credit and \$9 per Phosphorus credit for 3 years

**WWTP UPGRADE
DESIGN FLOWS
“HOW DID WE GET TO 11.28 MGD?”**

WWTP Design Flows

- Design Flow = 11.28 mgd
 - Chambersburg – 3.42 mgd
 - Hamilton – 2.03 mgd
 - Greene – 3.71 mgd
 - Guilford – 2.12 mgd
- Maximum Monthly Average Flow = 14.66 mgd
- Peak Treatment Design Flow = 28.20 mgd
- Peak Instantaneous Hydraulic Flow = 33.5 mgd

IMA Exhibit B: Rated Capacity

EXHIBIT B

FLOW	EXISTING ALLOCATION		PROPOSED ALLOCATION					
	Flow (MGD)	Percentage	Requested Flow	Interceptor Infiltration	Allocation	Allocation Percentage	Flow Increase	Percent Increase*
Chambersburg	2.73	40.15%	3.39	0.03	3.42	30.32%	0.69	15.40%
Hamilton	0.76	11.18%	2.00	0.03	2.03	18.00%	1.27	28.35%
Greene	1.84	27.06%	3.68	0.03	3.71	32.89%	1.87	41.74%
Guilford	1.47	21.62%	2.09	0.03	2.12	18.80%	0.65	14.51%
	6.8	100.00%	11.16	0.12	11.28	100.00%	4.48	100.00%

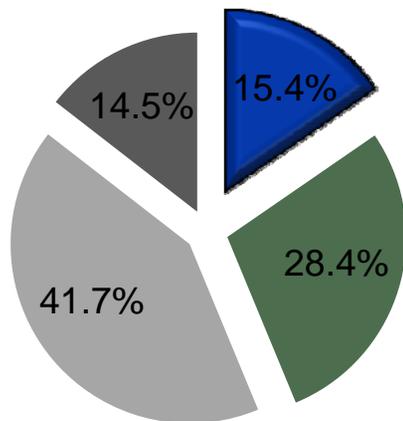
*Percent Increase will be used to determine each Party's share of the capital cost associated with the plant expansion & upgrade.

WWTP Shared Costs

- Cost sharing as defined by the Intermunicipal Agreement:

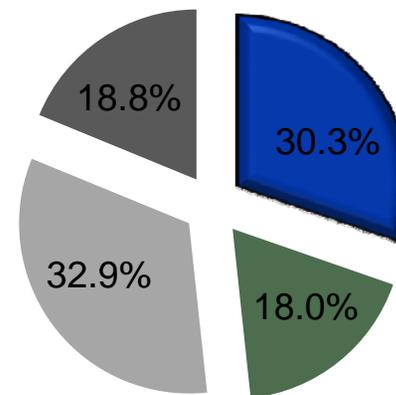
Construction Costs

■ Chambersburg ■ Hamilton
■ Greene ■ Guilford



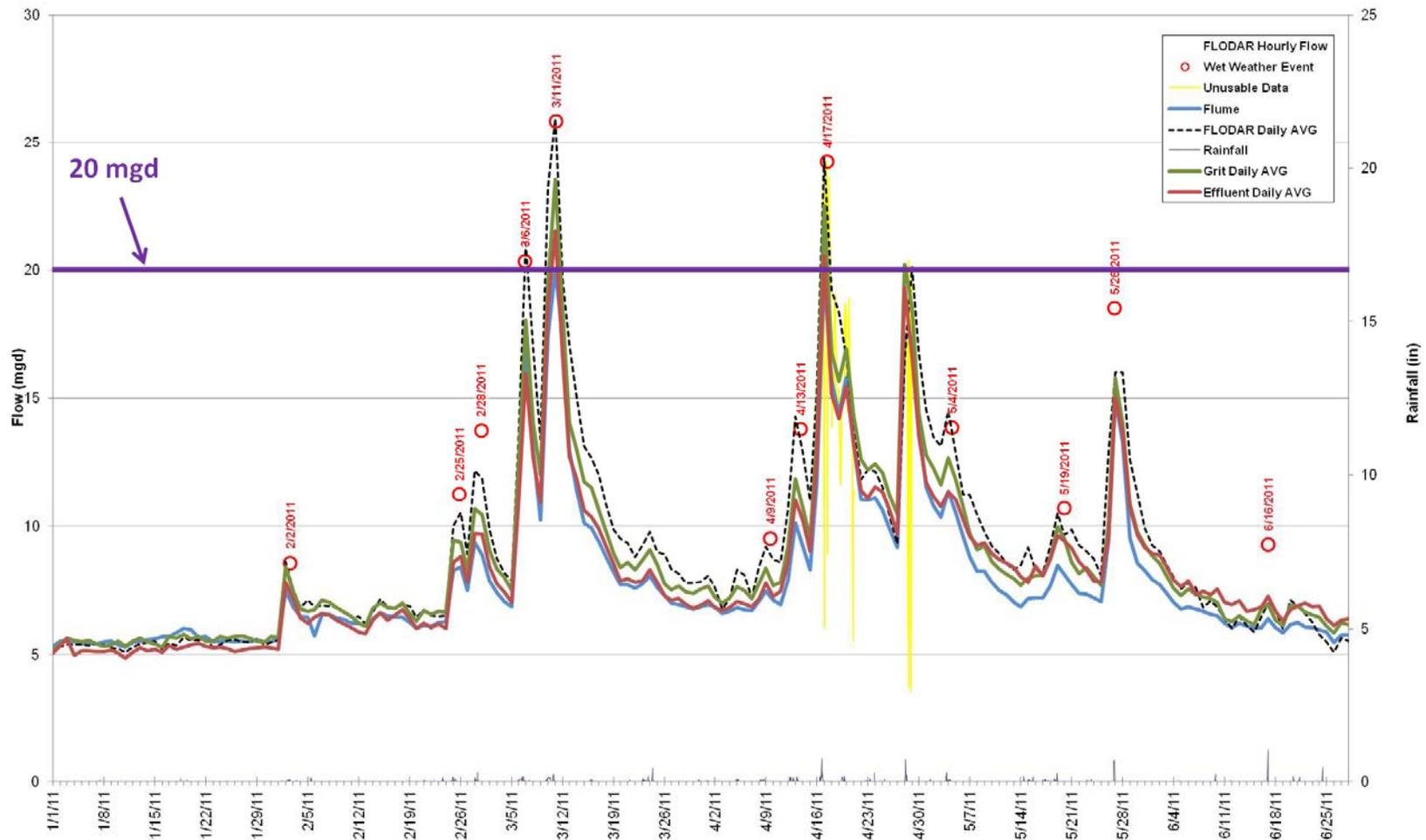
Approximate O&M Costs

■ Chambersburg ■ Hamilton
■ Greene ■ Guilford



WWTP HEADWORKS

WWTP Flows - 2011



New Headworks

- Will provide pumping capacity to accommodate the full 33.5 mgd conveyance system capacity. Current capacity is 22 mgd.
- Will provide exceptional screenings treatment. Currently there is none.
- Designed with a low-maintenance “self-cleaning” trench wet well
- New technology and equipment, energy efficient pumps and motors. Current equipment is 30+ years old

CONVEYANCE SYSTEM: ACT 537 PLAN

Collection/Conveyance 537 Plan

- Plan submitted to DEP May 15, 2012
- DEP approved the plan September 5, 2012
- Total estimated cost: \$1,975,000

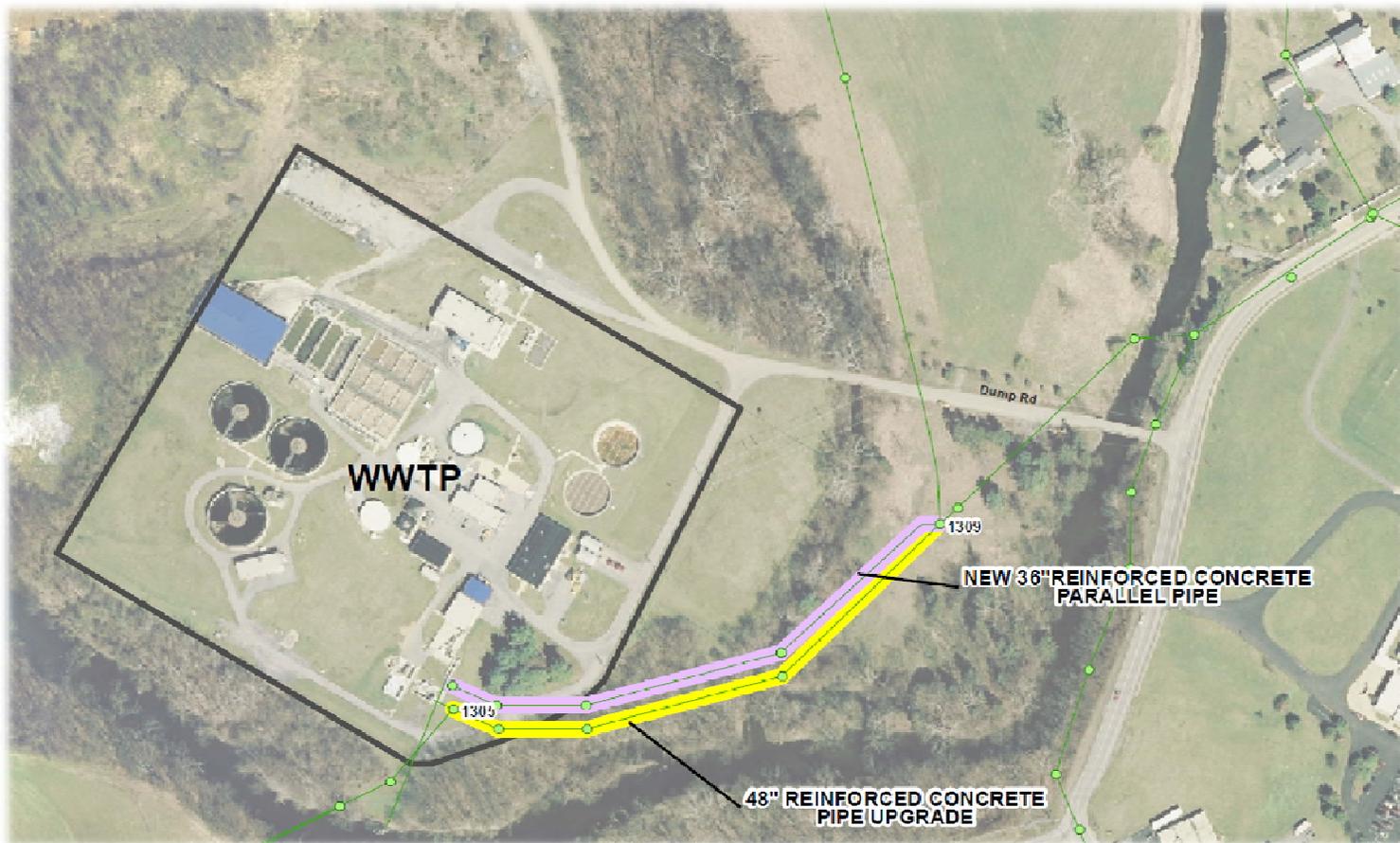
Implementation Schedule	
Activity	Anticipated Time Frame
Submit Act 537 Plan to DEP	May 2012
EIIC Alternative 3 - Investigation of Contributing I/I Sources	December 2012
Implementation of EIIC Alternative 2 - Plant Influent FIODAR Replacement	Septmeber 2014
Complete Construction of PAI Alternative 1/EIIC Alternative 1 - Pipe Upgrade	September 2014
Complete Construction of ECI Alternative 1 - Pipe Upgrade	November 2016
Implementation EIIC Alternative 3 - I/I Management Program	Ongoing program reported annually
- WAI Alternative 1 - Periodic Monitoring	2016, 2021, 2026
- Plant Design Capacity Alternative 1 - Monitoring	Reported annually



CLIENTS | PEOPLE | PERFORMANCE



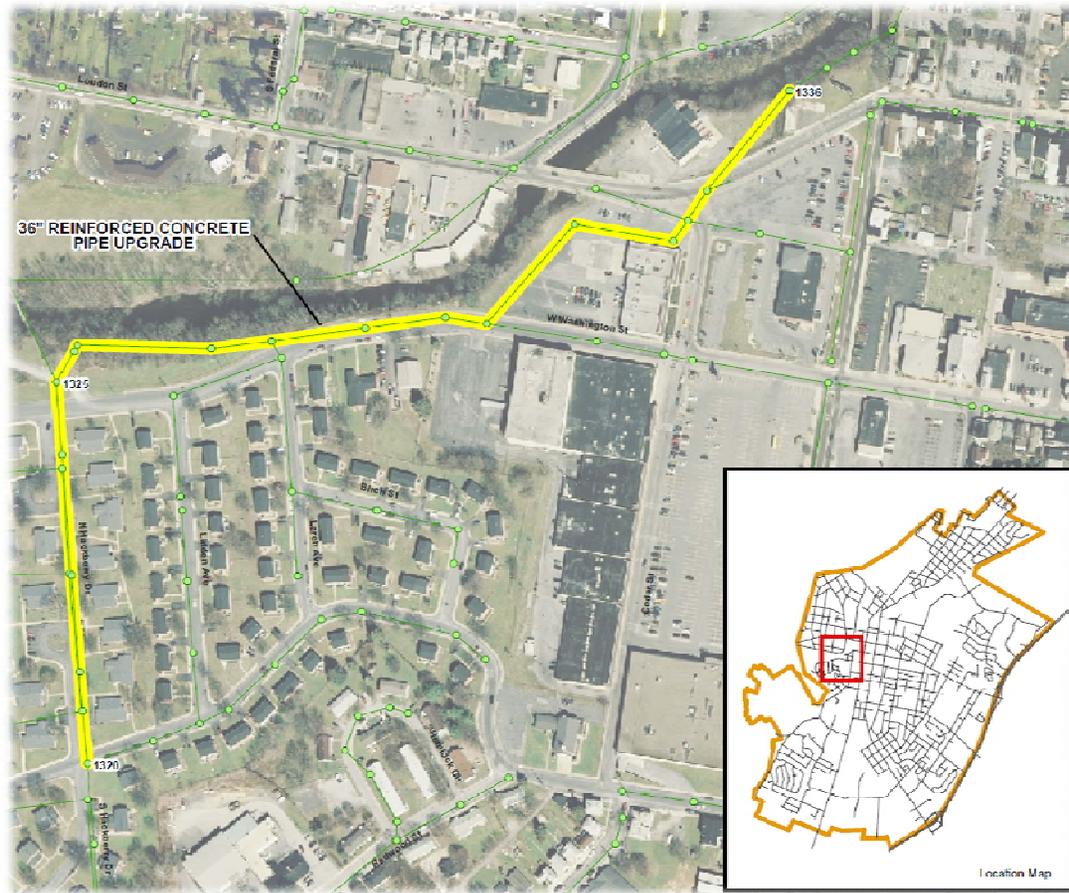
Plant Approach Interceptor



CLIENTS | PEOPLE | PERFORMANCE



East Conococheague Interceptor



CLIENTS | PEOPLE | PERFORMANCE



PROJECT SUMMARIES

Project Summaries

- **WWTP Upgrade**
 - Design flow expansion to 11.28 mgd
 - Nutrient removal to meet Chesapeake Bay Tributary Strategy
 - Cost estimate: \$34,466,560

- **Collection/Conveyance Act 537 Plan**
 - Plant Approach & East Conococheague Interceptor Upgrades
 - Continued investigation of inflow and infiltration (I&I)
 - Cost estimate: \$1,975,000

Summary of Cost Reduction

Items	Previous	Today	Change in Cost	Cost Reduction Percent
WWTP Expansion	\$39,144,800	\$34,466,560	\$18,226,928	34.6%
CPI Adjustment (2% a year for 3 years)	\$2,348,688			
New Headworks	\$10,000,000			
UV System Upgrade	\$1,200,000			
Nutrient Credits	* \$2,724,000	\$336,150	\$2,387,850	87.7%
Interceptors	\$27,507,600	\$1,975,000	\$25,532,600	92.8%
TOTAL	\$82,925,088	\$36,777,710	\$46,147,378	55.7%

Note: All above based upon estimated costs

* at \$9 per Nitrogen credit and \$5 per Phosphorus credit for 3 years



QUESTIONS?