Piscataway WRRF Bioenergy Project

A. Identification and Coding Information

Agency Number	Project Number	Update Code
S-103.02	153802	Change

PDF Date	October 1, 2018
Date Revised	

Pressure Zones	
Drainage Basins	
Planning Areas	Bi-County;

B. Expenditiure Schedule (000's)

Cost Elements	Total	Thru FY'18	Estimate FY'19	Total 6 Years	Year 1 FY'20	Year 2 FY'21	Year 3 FY'22	Year 4 FY'23	Year 5 FY'24	Year 6 FY'25	Beyond 6 Years
Planning, Design & Supervision	**42,290**	11,030	4,950	**26,310**	9,150	9,250	5,540	1,420	950		
Land											
Site Improvements & Utilities											
Construction	**207,750**		23,800	**183,950**	46,200	55,500	55,450	17,900	8,900		
Other	**11,953**		1,438	**10,515**	2,768	3,238	3,050	966	493		
Total	**261,993**	**11,030**	**30,188**	**220,775**	**58,118**	**67,988**	**64,040**	**20,286**	**10,343**		

C. Funding Schedule (000's)

WSSC Bonds	**257,923**	10,460	29,688	**217,775**	56,618	66,488	64,040	20,286	10,343		
Federal Aid	**570**	570									
State Aid	**3,500**		500	**3,000**	1,500	1,500					

D. Description & Justification

DESCRIPTION

This project will develop a comprehensive program for the engineering, design, construction, maintenance, and monitoring and verification necessary to add sustainable energy equipment and systems to produce biogas and electricity at Piscataway WRRF. It will provide a reduction in operations, maintenance, chemicals, biosolids transportation, and biosolids disposal costs. It will also enhance existing operating conditions and reliability while continuing to meet all permit requirements, and ensure a continued commitment to environmental stewardship at WSSC sites. The scope of work includes, but is not limited to, the addition of anaerobic digestion equipment; thermal hydrolysis pretreatment equipment; gas cleaning, storage and upgrade systems; tanks; piping; valves; pumps; biosolids pre- and post dewatering; cake receiving and blending; cake storage; effluent disinfection systems; instrumentation; flow metering; power measurement; and combined heat and power generation systems.

JUSTIFICATION

In March 2009, the WSSC received approval for a federal Department of Energy grant of $570,900 for the feasibility study/conceptual design phase. On June 16, 2010, the WSSC awarded the study contract to AECOM Technical Services, Inc., of Laurel, Maryland. The study was completed in December 2011, and the Thermal Hydrolysis/Mesophilic Anaerobic Digestion/Combined Heat & Power facility was recommended to be constructed and was presented to the Commission in April 2012.

The EPA is urging wastewater utilities to utilize this commercially available technology (anaerobic digestion) to produce power at a cost below retail electricity, displace purchased fuels for thermal needs, produce renewable fuel for green power programs, enhance power reliability for the wastewater treatment plant to prevent sanitary sewer overflows, reduce biosolids production and improve the health of the Chesapeake Bay, and to reduce greenhouse gas (GHG) and other air pollutants. In April 2009, the EPA announced that greenhouse gases contributed to air pollution that may endanger public health or welfare, and began proceedings to regulate CO2 under the Clean Air Act. In June 2014, the EPA announced a proposed rule to reduce carbon emissions from power plants by 30% by 2030, compared to the levels in 2005. Based on AECOM's feasibility study work as of May 2011, a regional/centralized plant at a location to be determined based on a Thermal Hydrolysis/Mesophillic Anaerobic Digestion/Combined Heat & Power (TH/MAD/CHP) process supplemented by restaurant grease fuel design was recommended.

The environmental benefits are estimated as follows: Recover approximately 2 MW of renewable energy from wastewater biomass; reduce Geenhouse Gas production by 11,800 tons/year; reduce biosolids output by 50 - 55% of current output; reduce lime demand by 4,100 tons/year; maintain permitted nutrient load limits to the Chesapeake Bay; reduce 5 million gallons/year of grease discharge to sewers; produce pathogen-free Class A Biosolids.

The economic benefits are estimated as follows: Recover more than $1.5 million of renewable energy costs/year; reduce biosolids disposal costs by ~ $1.7 million/year; reduce chemical costs by ~ $500,000/year; hedge against rising costs of power fuel and chemicals; provide a net payback over time.

E. Annual Operating Budget Impact (000's)

		FY of Impact
Staff		
Maintenance		
Other Project Costs		
Debt Service	$16,778	25
Total Cost	$16,778	25
Impact on Water and Sewer Rate	$0.38	25

F. Approval and Expenditure Data (000's)

Date First in Program	FY 15
Date First Approved	FY 10
Intial Cost Estimate	345
Cost Estimate Last FY	248,677
Present Cost Estimate	261,993
Approved Request Last FY	40,310
Total Expense & Encumbrances	11,030
Approval Request Year 1	58,118

G. Status Information

Land Status	Public/Agency owned land
Project Phase	Design
Percent Complete	12%
Est Completion Date	August 2023

Growth	
System Improvement	100%
Environmental Regulation	
Population Served	
Capacity	

H. Map

MAP NOT AVAILABLE

Piscataway WRRF Bioenergy Project

Plans & Studies: Appel Consultants, Urban Waste Grease Resource Assessment-NREL (November 1998); Environmental Protection Agency (EPA), Opportunities For and Benefits Of Combined Heat and Power at Wastewater Treatment Facilities (December 2006); Brown & Caldwell, Anaerobic Digestion and Electric Generation Options for WSSC (November 2007); Metcalf & Eddy, WSSC Sludge Digestion Study for Piscataway and Seneca (December 2007); Black & Veatch, WSSC Digester Scope and Analysis (December 2007); JMT, Prince George's County Septage (FOG) Discharge Facility Study (February 2008); JMT, Western Research Institute (WRI) Biogas Feasibility Study Scope of Work - WSSC (April 2008); JMT, Montgomery County Septage (FOG) Discharge Facility Study (January 2010); Facility Plan for the Rock Creek Wastewater Treatment Plant (January 2010); AECOM Technical Services, Inc., Anaerobic Digestion/Combined Heat & Power Study (December 2011, Executive Summary Revised May 2013). HDR Inc. Design Development Report (March 2017). HDR Inc. Design Criteria Report (July 2017).

COST CHANGE

Cost increased to reflect recent market trends in construction industry escalations for costs of labor, steel, diesel, miscellaneous metals, concrete, electrical and process equipment, and other materials.

OTHER

The project scope has remained the same. The Commission has a defined scope and estimated capital cost, and is able to proceed with the detailed design and construction of the anerobic digestion, biomass, and combined heat and power generation system facilities for treating all biosolids from WSSC's Damascus, Seneca, Parkway, Western Branch and Piscataway WRRFs. The Montgomery and Prince George's County Councils were briefed and approved the project by resolution on November 25, 2014, and September 9, 2014, respectively. In April 2017 the Maryland Energy Administration notified WSSC of approval of grant funding up to $500,000. In June 2017 WSSC was approved for a $3 million grant through the Maryland Department of the Environment's Energy Water Infrastructure Program (EWIP). WSSC has also applied for grants from the local power utility. WSSC will continue to apply for other available funding sources. The Commission retained the following consulting services: in 2015 - Hawkins, Delafield and Wood - procurement; Raftelis Financial Consultants - financial; in 2016 - HDR Inc for program management and construction management for the Bio-Energy project. In Sept 2017 WSSC issued a Request For Proposals (RFP) to two design--build entities for a progressive design-build delivery of the Bio-Energy Project. Transporting of biosolids from Western Branch WRRF to Piscataway was included in FY2019 program update. A portion of this project will be financed by low interest loans through the Maryland Department of the Environment's Water Quality Administration State Revolving Loan Program.

COORDINATION

Coordinating Agencies: Montgomery County Government; Prince George's County Government; Maryland-National Capital Park & Planning Commission; (Mandatory Referral Process); Montgomery County Department of Environmental Protection; Maryland Department of the Environment; Chesapeake Bay Critical Areas; Maryland Energy Administration Washington Gas Light Company; SMECO

Coordinating Projects: S-96.14-Piscataway WRRF Facility Upgrades; S-170.08-Septage Discharge Facility Planning & Implementation;