Grant Proposal for the
Ray Stoyer Water Recycling Facility
Energy Recovery Project

Prepared for
Padre Dam Municipal Water District
9300 Fanita Parkway, Santee, CA
December 12, 2014

PADRE DAM
Municipal Water District

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List of Abbreviations

AFY	acre-feet per year
AWT	Advanced Water Treatment
DAC	designated disadvantaged community(ies)
GHG	greenhouse gas
MG	million gallons
MGD	million gallons per day
Padre Dam	Padre Dam Municipal Water District
SCFM	Standard Cubic Feet per Minute
SDLS	San Diego Landfill Systems
WEGP	Water-Energy Grant Program
WRF	Water Reclamation Facility

Executive Summary

Introduction

Padre Dam Municipal Water District (Padre Dam) is submitting a project proposal for the California Department of Water Resources' 2014 Water-Energy Grant Program (WEGP). The project proposal consists primarily of a co-digestion facility to be located at the Sycamore Landfill. This WEGP application has been structured in accordance with the 2014 WEGP Guidelines and Proposals Solicitations Package.

Padre Dam is a Special District that provides water, wastewater, recycled water, and recreation services in east San Diego County. As part of its strategic plan, Padre Dam identified the goal of increasing water, wastewater and energy independence. In the near future, Padre Dam will install an Advanced Water Treatment (AWT) Demonstration Project at its Ray Stoyer Water Reclamation Facility (WRF) as part of an Indirect Potable Reuse Project. The AWT Process, while beneficial to increasing local water supplies, is also energy intensive.

To offset the increased energy demand from the AWT Demonstration Project and to move towards energy independence, Padre Dam is proposing an innovative program to incorporate biomass energy generation into its water and wastewater management. To this end, Padre Dam will partner with a neighboring landfill to maximize potential biomass energy generation through the production of biogas for renewable energy generation from the biological decomposition of organic waste and biosolids by a process called anaerobic digestion. Self-generated electricity will be produced from the biogas thus reducing power consumed from current non-renewable sources. The power produced from the renewable energy sources like biogas will reduce greenhouse gas (GHG) production by Padre Dam. This project will divert biosolids and organic waste normally disposed of in the landfill for beneficial use, reducing GHG associated with decomposition of these wastes in the landfill and preserving landfill capacity. In addition, this project will reduce water consumption by providing brine from the AWT Demonstration Project process to the landfill for dust suppression and landfill cover compaction.

Project Overview

Padre Dam, in cooperation with San Diego Landfill Systems (SDLS), a Republic Services company, is proposing to reduce GHG emissions and conserve water and energy through the development of a co-digestion facility that will generate a renewable source of biomass energy. The facility will treat the biosolids from Padre Dam's WRF and organic wastes that would have been disposed of at the landfill. It will be located at the Sycamore Landfill facility, approximately 2.5 miles from the WRF (see Location Map, **Figure ES-1**).

Figure ES-1. Location Map

The proposed project will include the following components (see **Figure ES-2** below for a schematic diagram of the project proposal):

- A co-digestion facility that includes a **1.3 million gallon anaerobic digester** located at the SDLS' Sycamore Landfill facility.
- The municipal biosolids from the WRF will be transported to the landfill facility, mixed with appropriate type and quantities of organic waste for enhanced energy production, and processed in the anaerobic digester. Biogas will be generated in the process.
- The biogas generated (approximately **340 SCFM of bio-digester gas**) will be converted into electricity and used to reduce the amount of power withdrawn from the grid to operate the WRF and the AWT Demonstration Plant. The biogas can also be converted to biofuel for vehicles.
- It is estimated that the co-digestion facility could ultimately generate up to **1.4 megawatts of electricity**.
- Biosolids from the WRF and organic waste is normally disposed in the landfill, and decomposition of these wastes in the landfill results in GHG emissions through leakage to the environment. These wastes will be diverted to the anaerobic digestion process and converted into renewable energy, thus reducing GHG emissions, producing renewable energy, and ultimately preserving landfill capacity.
- Brine from the AWT Demonstration Project reverse osmosis process will be used to replace water currently being used for dust control and cover compaction operations at the landfill site at an estimated rate of **15,000 GPD (16.8 acre-feet per year)**. This reduction in water will offset a portion of the water supply demand for the region. It should be noted that the brine from the AWT Demonstration is considered as a waste stream and would have been disposed in the sewer for eventual, final ocean disposal. This innovative use of a waste product significantly reduces water consumption at the landfill.

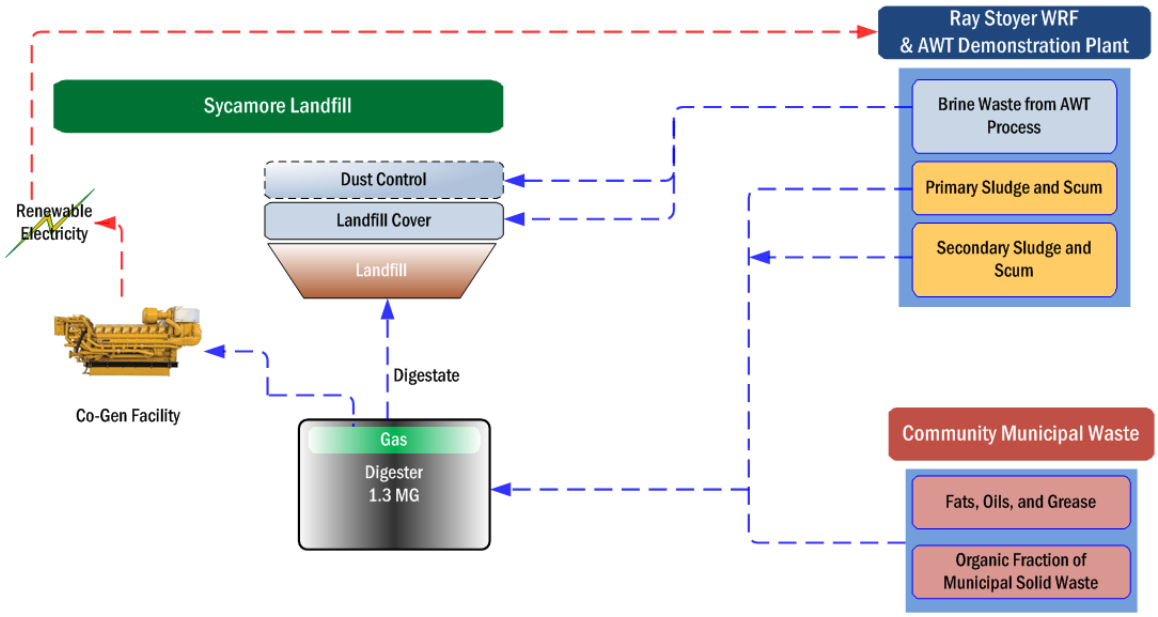

Figure ES-2. Ray Stoyer WRF Energy Recovery Project Process Diagram

Project Energy Benefits

Table ES-1 provides the project savings for Greenhouse Gas Emissions, Water, and Energy. Attachment 2 – Water and Energy Savings and Greenhouse Gas Calculations provides details of the calculated savings.

Table ES-1. Project Energy Savings Benefits

Energy Type	Annual Savings		Lifetime Savings	
Greenhouse Gas Emissions	1,826	kg CO_2e/year	54,780	kg CO_2e
Water Savings	5.48	MG/year	164.25	MG
Energy Savings	6,570	kWh/year	197,100	kWh

Project Budget Table

Table ES-2 provides the project budget. Attachment 5 - Budget provides details of the budget table.

Table ES-2. Grant Budget Table

Item	Line Item	Requested Grant Funding	Cost Share	Total
100	Personnel Services	$0	$433,469	$433,469
200	Land/Easement Acquisition*	$0	$0	$0
300	Grantee Expenses	$0	$2,500	$2,500
400	Equipment	$0	$0	$0
500	Professional and Consulting Services	$0	$788,480	$788,480
800	Construction/Implementation Cost	$2,500,000	$12,500,000	$15,000,000
	GRAND TOTAL	**$2,500,000**	**$13,724,449**	**$16,224,449**