Texas Water Development Board

Stephens Regional Special Utility District

DWSRF GREEN PROJECT RESERVE BUSINESS CASE EVALUATION

STATE FISCAL YEAR 2011 INTENDED USE PLAN

PROJECT NUMBER 21655

COMMITMENT DATE: JANUARY 20, 2011

DATE OF LOAN CLOSING: APRIL 28, 2011

TEXAS WATER DEVELOPMENT BOARD

Green Project Reserve

Green Project Information Worksheets

Work 2011 Intended Use Plan

Drinking Water State Revolving Fund

The Federal Appropriation Law for the current fiscal year Clean Water and Drinking Water State Revolving Fund programs contains the Green Project Reserve (GPR) requirement. The following Green Project Information Worksheets have been developed to assist TWDB Staff in verifying eligibility of potential GPR projects.

TWDB-0163
Prepared 7/14/2010

TEXAS WATER DEVELOPMENT BOARD
DRINKING WATER STATE REVOLVING FUND (DWSRF)
GREEN PROJECT INFORMATION WORKSHEETS

PART I – GREEN PROJECT INFORMATION SUMMARY

Check all that apply and complete applicable worksheets:

Categorically Eligible

- ☐ Green Infrastructure $ _____
- ☒ Water Efficiency $ 600,000
- ☒ Energy Efficiency $ 29,000
- ☐ Environmentally Innovative $ _____

Business Case Eligible

- ☐ Green Infrastructure $ _____
- ☐ Water Efficiency $Click here to enter text.
- ☐ Energy Efficiency $ 121,000
- ☐ Environmentally Innovative $ _____

Total Requested Green Amount $ 750,000

Total Requested Funding Amount $ 5,800,000

Type of Funding Requested:

- ☐ PAD (Planning, Acquisition, Design)
- ☒ C (Construction)

Completed by:

Name: Kirt Harle, P.E. Title: Project Manager

Signature: _____ Date: February 15, 2011

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GREEN PROJECT INFORMATION WORKSHEETS

PART II - CATEGORICALLY ELIGIBLE

Complete this worksheet for projects being considered for the Green Project Reserve (GPR) as categorically eligible. Categorically eligible projects or project components are described in the following sections of the EPA GPR guidance (TWDB-0161):

Green Infrastructure	Part B, Section 1.2
Water Efficiency	Part B, Section 2.2
Energy Efficiency	Part B, Section 3.2
Environmentally Innovative	Part B, Section 4.2

Information provided on this worksheet should be of sufficient detail and should clearly demonstrate that the proposed improvements are consistent with EPA and TWDB GPR guidance for categorically eligible projects. Refer to **Information on Completing Worksheets** for additional information.

Section 1 – General Project Information

Applicant: Stephens Regional SUD PIF #: 8542

Project Name: New Membrane Water Treatment Plant and Treated Water Supply Lines

Contact Name: Phil Taylor

Contact Phone and e-mail: 254-559-6180 / srsud@bitstreet.com

Total Project Cost: $5,800,000 Green Amount: $629,000 (Categorically Eligible)

Brief Overall Project Description:

The project includes the construction of a new membrane surface water treatment plant consisting of pretreatment with microfiltration followed by reverse osmosis. The treatment plant includes construction of off-channel eathern raw water reservoir, raw water intake, WTP building, RO concentrate evaporation ponds, 0.5 MG clearwell and high service pump station.

The project also includes the construction of approximately 60,000 linear feet of treated water supply lines.

Section 3.3- Other Water Efficiency Improvements

Complete this section for water efficiency improvements other than those listed above. Provide reference to the applicable sections of the EPA GPR guidance (TWDB-0161) that demonstrate GPR eligibility. Provide a detailed description of the proposed water efficiency improvements of sufficient detail that clearly demonstrates that the proposed improvements are consistent with EPA GPR guidance (TWDB-0161).

Guidance Reference:
2.2-13

Detailed description of proposed water efficiency improvements (attach additional pages if necessary):

The proposed membrane water treatment plant includes the use of microfiltration as pretreatment for reverse osmosis. Conventional filtration results in an internal plant water loss due to backwashing ranging from 5% to 10%. Internal plant water loss with microfiltration is less than 3%. Therefore, there will be an inherenet water efficiency by utilizing microfiltration as pretreatment as opposed to a conventional filtration system. In addition, with the design of the water treatment plant, it is also proposed that the backwash from the microfilters be recycled back to the raw water reservoir and through the plant. With a combination of the microfiltration pretreatment system and the recycling of backwash waste, the internal plant water loss through the pretreatment process will be less than 1%.

The following provides the projected annual water savings for the proposed 1.0 MGD WTP by using microfiltration in lieu of conventional filtration:

Estimated annual volume of backwash with conventional filtration = 6.5 to 13 MG
Estimated annual volume of backwash with microfiltration = 1.3 MG (though with recycling of backwash it should be less)
Annual volume of raw water saved with proposed microfiltration = 5.2 to 11.7 MG

Green amount associated with water efficiency improvements: $600,000
(Attach detailed cost estimate if necessary)

Section 4.2 - NEMA Premium Efficiency Motors

If NEMA Premium efficiency motors are to be used, provide total motor cost: $29,000
(attach a list of proposed motors to be installed including horsepower and efficiency rating)

Section 4.3 -Other Energy Efficiency Improvements

Complete this section for energy efficiency improvements other than those listed above. Provide reference to the applicable sections of the EPA GPR guidance (TWDB-0161) that demonstrate GPR eligibility. Provide a detailed description of the proposed energy efficiency improvements of sufficient detail that clearly demonstrates that the proposed improvements are consistent with EPA GPR guidance (TWDB-0161).

Guidance Reference:
3.2-3

Detailed Description (attach additional pages if necessary):

As part of the water treatment plant, two raw water intake pumps and three high service pumps will be installed. The specifications will call for NEMA premium high efficiency motors to be installed on each of the five pumps. The pumps will also be vertical turbine pumps with pump efficiency ratings ranging from 78 to 85%. The following is a list of proposed pump motors with horsepower, efficiency ratings and other miscellaneous information:

Raw Water Pumps – 2 pumps / 15 hp / 91.7 % Motor Efficiency / Open Drip Proof / 4-pole
High Service Pumps – 2 Pumps / 30 hp / 92.4 % Motor Efficiency / Open Drip Proof / 4-pole
High Service Pump – 1 Pump / 60 hp / 94.5 % Motor Efficiency / Open Drip Proof / 4-pole

Green amount associated with energy efficiency improvements: $29,000
(Attach detailed cost estimate if necessary)

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GREEN PROJECT INFORMATION WORKSHEETS

PART III - BUSINESS CASE ELIGIBLE

Complete this worksheet for projects being considered for the Green Project Reserve (GPR) as business case eligible. Business case eligible projects or project components are described in the following sections of the EPA GPR guidance (TWDB-0161):

Green Infrastructure	Part B, Section 1.4
Water Efficiency	Part B, Section 2.4 and 2.5
Energy Efficiency	Part B, Section 3.4 and 3.5
Environmentally Innovative	Part B, Section 4.4 and 4.5

Information provided on this worksheet should be of sufficient detail and should clearly demonstrate that the proposed improvements are consistent with EPA and TWDB GPR guidance for business case eligible projects. Refer to **Information on Completing Worksheets** for additional information.

Section 1 - General Project Information

Applicant: Click here to enter text. PIF #: Click here to enter text.

Project Name: _____

Contact Name: Click here to enter text.

Contact Phone and e-mail: Click here to enter text.

Total Project Cost: Click here to enter text. Green Amount: Click here to enter text.
(Business Case Eligible)

Brief Overall Project Description:
Click here to enter text.

Section 4 - Energy Efficiency

Certain energy efficiency improvements may be considered business case eligible for the GPR. Refer to EPA and TWDB GPR guidance for a complete list and description of business case eligible GPR Projects. For all energy efficiency business case eligible projects Section 4.1 must be completed. A common energy efficiency project that may be considered business case eligible is pumping facility improvements. For this type of project complete Section 4.2 of the worksheet. For any other energy efficiency improvement being considered for business case eligibility, complete Section 4.3.

Section 4.1 - System Information

Energy efficiency improvements to be considered for business case eligibility should provide reference to completed planning material such as energy assessments, energy audits, optimization studies and design level project information.

Reference Completed Planning/Design Material:

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

Section 4.2 - Pumping Facility Improvements

Complete for pump and motor upgrades:

Pump Description	Existing Pump			Proposed Pump		
	Pump HP	Efficiency		Pump HP	Efficiency	
		Pump/Motor	Wire to Water		Pump/Motor	Wire to Water
Raw Water Pump #1		/		15	78.5/91.7	71.98
Raw Water Pump #2		/		15	78.5/91.7	71.98
High Service Pump #1		/		30	85.2/92.4	78.72
High Service Pump #2		/		30	85.2/92.4	78.72
High Service Pump #3		/		60	84.2/94.5	79.57
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	

Total estimated energy savings from pump and motor upgrades: 48,304 kW-hr

Total estimated annual financial savings from pump and motor upgrades: $ 4,830.35

If NEMA Premium efficiency motors are to be used, provide total motor cost: $29,000

Total pump and motor upgrade cost: $150,000

List any other energy efficiency improvements to pumping facility (VFDs, lighting, SCADA, etc.):

Component Description	Annual Energy Savings (if known)	Annual Financial Savings (if known)	Component Cost
Total:			

Provide a detailed description on the following page(s) of the proposed energy efficiency improvements. Information should be specific to the equipment being proposed and calculations should be provided demonstrating substantial energy and financial savings.

Detailed Description (attach additional pages if necessary):
As part of the water treatment plant, two raw water intake pumps and three high service pumps will be installed. The specifications will call for NEMA premium high efficiency motors to be installed on each of the five pumps. The pumps will also be vertical turbine pumps with pump efficiency ratings ranging from 78 to 85%. Typically a water system will install horizontal or vertical centrifugal pumps, which operate at pump efficiencies in the range of 55% - 65%. The greater pump efficiencies will greatly cut down on energy consumption.

The annual anticipated pumpage for the raw and high service pumps are 124 MG and 105 MG, respectively.

The minimum specified pump efficiencies are as follows:

Raw Water Pumps – 2 pumps / 78.5% minimum efficiency
High Service Pumps – 2 Pumps / 85.2% minimum efficiency
High Service Pumps – 1 Pump / 84.2% minimum efficiency

The following is a list of proposed pump motors with horsepower, efficiency ratings and other miscellaneous information:

Raw Water Pumps – 2 pumps / 15 hp / 91.7 % Motor Efficiency / Open Drip Proof / 4-pole
High Service Pumps – 2 Pumps / 30 hp / 92.4 % Motor Efficiency / Open Drip Proof / 4-pole
High Service Pump – 1 Pump / 60 hp / 94.5 % Motor Efficiency / Open Drip Proof / 4-pole

Green amount associated with pumping facilities improvements: $121,000
(Attach detailed cost estimate if necessary)

Energy Use / Cost Calculator Proposed Raw Water Pump Station		
Annual Water Pumped	124,000,000	Gal / Year
Pumping Pressure		psi
or Total Dynamic Head	50	feet
Pump-Motor Efficiency	78.5	%
Energy Cost	0.10	$ / kW-hr
Annual Energy Required	**24,813**	**kW-hr**
Annual Energy Cost	**$ 2,481.27**	

Energy Use / Cost Calculator Typical Raw Water Pump Station		
Annual Water Pumped	124,000,000	Gal / Year
Pumping Pressure	0	psi
or Total Dynamic Head	50	feet
Pump-Motor Efficiency	60	%
Energy Cost	0.10	$ / kW-hr
Annual Energy Required	**32,463**	**kW-hr**
Annual Energy Cost	**$ 3,246.33**	

Anticipated Energy Savings	**7,651**	**kW-hr**
Anticipated Energy Cost Savings	**$ 765.06**	

Energy Use / Cost Calculator Proposed High Service Pump Station		
Annual Water Pumped	105,000,000	Gal / Year
Pumping Pressure		psi
or Total Dynamic Head	250	feet
Pump-Motor Efficiency	85.2	%
Energy Cost	0.10	$ / kW-hr
Annual Energy Required	**96,793**	**kW-hr**
Annual Energy Cost	**$ 9,679.27**	

Energy Use / Cost Calculator Typical High Service Pump Station		
Annual Water Pumped	105,000,000	Gal / Year
Pumping Pressure	0	psi
or Total Dynamic Head	250	feet
Pump-Motor Efficiency	60	%
Energy Cost	0.10	$ / kW-hr
Annual Energy Required	**137,446**	**kW-hr**
Annual Energy Cost	**$ 13,744.56**	

Anticipated Energy Savings		**40,653**	**kW-hr**
Anticipated Energy Cost Savings	**$**	**4,065.29**	

Total Anticipated Energy Savings		**48,304**	**kW-hr**
Total Anticipated Energy Cost Savings	**$**	**4,830.35**	