



## **City of Breckenridge**

*DWSRF GREEN PROJECT RESERVE BUSINESS CASE EVALUATION*

*STATE FISCAL YEAR 2012 INTENDED USE PLAN*

*PROJECT NUMBER 62519*

COMMITMENT DATE: July 19, 2012

DATE OF LOAN CLOSING: December 06, 2012



March 9, 2012

Ms. Linda Knight  
City of Breckenridge  
105 N Rose Ave  
Breckenridge, TX 76424

**Re: SFY 2012 Drinking Water State Revolving Fund  
Green Project Eligibility**

Dear Ms. Knight:

The Texas Water Development Board (TWDB) received Green Project Information Worksheets from the City of Breckenridge (City) for project #9189 in response to an invitation letter dated January 18, 2012. The letter states that the City is eligible for loan forgiveness in an amount up to 15% of the green component cost if it can demonstrate that the project has green costs greater than or equal to 30% of the total project cost. After reviewing the worksheets, TWDB staff determined the City does not meet the 30% green cost threshold based on the following:

- The City's Green Project Information Worksheets dated February 2, 2012 requested that \$50,000 of the City's total project cost of \$2,440,000 be considered eligible for the DWSRF Green Project Reserve (GPR). The general element(s) described includes the construction of an additional filter cell, a filter-to-waste system, renovate the existing clarifier, upgrade chemical feed, upgrade SCADA system controls, with green elements including installation of a VFD to one high service pump.
- The Environmental Protection Agency's (EPA's) *Green Project Reserve Guidance for Determining Project Eligibility* (TWDB-0161) lists application of Variable Frequency Drives as business case eligible for the GPR (Part B, 3.5-1), energy efficient retrofitting.
- Therefore, at this time the TWDB considers project costs associated with the Water Treatment Plant improvements in the amount of \$50,000 to be eligible for the DWSRF GPR. This includes estimated construction costs for the item.
- Please note that the City's application for financial assistance must be consistent with the project scope presented on the Green Project Information Worksheets. Inclusion of the green elements within the project will be verified prior to Board commitment. If the project scope or budget related to the approved green components changes during

**Our Mission**

**Board Members**

To provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas

Edward G. Vaughan, Chairman  
Joe M. Crutcher, Vice Chairman

Thomas Weir Labatt III, Member  
Lewis H. McMahan, Member

Billy R. Bradford Jr., Member  
Monte Cluck, Member

Melanie Callahan, Executive Administrator

application review, the City should update and resubmit the Green Project Information Worksheets as necessary.

For SFY 2012, the TWDB is required by federal law to allocate no less than 20% of the capitalization grant toward green component costs (also referred to as the Green Project Reserve). Therefore, the TWDB gives first preference for invitations to entities that have a documented percentage of green component cost of at least 30% of the total project cost. At this time, the TWDB anticipates there will be sufficient interest from other invited entities to satisfy the federal Green Project Reserve requirement. Therefore, the City is relieved of the requirement to meet the 30% green cost threshold. A letter dated January 18, 2012 was sent inviting the City to apply for Disadvantaged Community funding.

If you have any questions regarding green project eligibility, please feel free to contact John Muras, Project Engineer, by phone at 512-463-1706 or by email at [john.muras@twdb.texas.gov](mailto:john.muras@twdb.texas.gov).

The TWDB appreciates the City of Breckenridge interest in the DWSRF.

Sincerely,



Stacy L. Barna  
Director of Program Development  
Project Finance Division

SB:rf

- Attachments: 1. Green Project Information Worksheets, Approved  
2. Green Project Cost Summary

# Green Project Reserve

---

## Green Project Information Worksheets

**Drinking Water State Revolving Fund  
Intended Use Plan**

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.

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 \$ \_\_\_\_\_
- Energy Efficiency \$ \_\_\_\_\_
- Environmentally Innovative \$ \_\_\_\_\_

**Business Case Eligible**

- Green Infrastructure \$ \_\_\_\_\_
- Water Efficiency \$ \_\_\_\_\_
- Energy Efficiency \$ 50,000 \_\_\_\_\_
- Environmentally Innovative \$ \_\_\_\_\_

Total Requested Green Amount \$ 50,000 \_\_\_\_\_

Total Requested Funding Amount \$ 2,440,000 \_\_\_\_\_

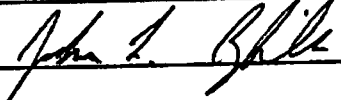
**Type of Funding Requested:**

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

Completed by:

Name: Joshua L. Berryhill, P.E.

Title: Project Manager

Signature: 

Date: 2/4/12

**TEXAS WATER DEVELOPMENT BOARD  
DRINKING WATER STATE REVOLVING FUND (DWSRF)  
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: City of Breckenridge PIF #: 9189

Project Name: Water Treatment Plant Improvements

Contact Name: Linda Knight

Contact Phone and e-mail: (254) 559-8287 city@wtconnect.com

Total Project Cost: \$2,440,000 Green Amount: \$50,000  
(Business Case Eligible)

**Brief Overall Project Description:**

Following a 2008 mandatory Comprehensive Performance Evaluation (mCPE) of the City's WTP by the TCEQ, several key WTP system improvements were identified, including construction of an additional filter cell, construction of a filter-to-waste system, renovation of the existing clarifiers, upgrade of the chemical feed systems, upgrade of the SCADA WTP controls and addition of a VFD to one of the high service pumps.

The green project involves the addition of a VFD to one of the existing high service pumps. The pump currently operates in a start/stop fashion, which causes fluctuations in operation of the treatment processes, which negatively impacts performance of the WTP.

**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:

- 2008 mCPE Corrective Action Plan
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**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
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	
		/			/	

Total estimated energy savings from pump and motor upgrades: \$ \_\_\_\_\_

Total estimated annual financial savings from pump and motor upgrades: \$ \_\_\_\_\_

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

Total pump and motor upgrade cost: \$ \_\_\_\_\_



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
Addition of a VFD to High Service Pump No. 4	100,478 kw-hr/yr	\$10,048	\$50,000
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):

The green project involves the addition of a VFD to one of the existing high service pumps. The pump currently operates in a start/stop fashion, which causes fluctuations in operation of the treatment processes, which negatively impacts performance of the WTP.

The existing High Service Pump No. 4 utilizes a 125 hp motor with a soft starter. Currently, the pump only has start/stop functionality, which means when water levels and pressures in the City's distribution system and elevated storage tanks. In a given day, the pump is needed to operate for roughly 12 hours each day to supply water to the distribution system. However, because the pump is sized for maximum day demands, and does not currently have a VFD (which allows for "turning down" of the pump during lower demands), when the pump operates, it runs at the highest flow and energy usage designed for the pump. At 12 hours a day, the anticipated daily and annual energy usage is approximately 1,110 kw-hr/day and 405,150 kw-hr/yr, respectively. This translates to a cost of \$111 per day and \$40,515 per year, respectively, using \$0.10 per kw-hr.

Installation of a VFD on High Service Pump No. 4 is anticipated to cost (for VFD and associated SCADA controls) approximately \$50,000. Addition of a VFD is projected to allow for a turndown of at least 25%, resulting in a typical power usage during pump operation of roughly 94 hp, resulting in annual energy usage and cost of 304,672 kw-hr/yr and \$30,467 (at \$0.10 per kw-hr). Addition of a VFD should reflect an annual energy and cost savings of 100,478 kw-hr/yr and \$10,048, respectively. Under normal purchasing, this would reflect in a break-even point on investment in roughly 5 years.

In addition to the electrical cost savings, the addition of a VFD to High Service Pump No. 4 should allow for a more streamlined treatment through the day at the WTP, which should also slightly reduce energy and chemical costs in upstream processes. However, those potential cost savings could not easily be quantified and therefore were not included in the anticipated annual cost savings of this project.

Green amount associated with pumping facilities improvements:     \$50,000      
(Attach detailed cost estimate if necessary)



December 30, 2008

Donald L. Tharp, R.S.  
TCEQ, Abilene Region (R3)  
1977 Industrial Blvd.  
Abilene, Texas 79602-7833

**Re: City of Breckenridge Water Treatment Plant; PWS 2150001  
mCPE Corrective Action Plan**

Dear Don:

Pursuant to requirements outlined in the mCPE Corrective Action Plan for the Breckenridge Water Treatment Plant the City of Breckenridge has undertaken steps to modify its current CT study. As the attached memo describes, revisions to the plant's CT study are conditional. If the expanded free chlorine protocol described in the attached memo, and currently being implemented in the plant, demonstrates disinfection byproduct formation below the associated MCLs for TTHMs and HAA5s then the plant CT will be revised to incorporate very slight differences in pipe dimensions as determined via onsite measurements using the existing disinfectants. If the expanded free chlorine protocol as described in the attached memo shows disinfection byproduct formation close to or above associated MCLs then the CT study will be revised to include alternative disinfectants.

If you have any questions contact me at 325.698.5560.

Sincerely,

**Enprotec / Hibbs & Todd, Inc.**

Scott F. Hibbs, P.E.

Enclosures: Memo dated 12/8/08

c: Gary G. Ernest; City of Breckenridge  
George Bishop; City of Breckenridge  
Jack C. Schulze, P.E., TCEQ (MC-155), P.O. Box 13087, Austin TX 78711-3087  
TCEQ Water Supply Division (MC-153), P.O. Box 13087, Austin TX 78711-3087  
Project File 4367

*Environmental, Civil & Geotechnical Engineers*

**Abilene Office**  
402 Cedar  
Abilene, Texas 79601  
P.O. Box 3097  
Abilene, Texas 79604  
325.698.5560 | 325.691.0058 fax

**Lubbock Office**  
6310 Genoa Avenue, Suite E  
Lubbock, Texas 79424  
806.794.1100 | 806.794.0778 fax

**Granbury Office**  
1301 Crawford Ave.  
Granbury, Texas 76048  
817.579.6791 | 817.579.9491 fax

**Plano Office**  
One Preston Park  
2301 Ohio Drive, Suite 105  
Plano, Texas 75093  
972.599.3480 | 972.599.3513 fax

## Technical Memorandum

**To:** George Bishop and Gary Ernest  
**From:** Scott Hibbs, P.E. and Dave Baker  
**CC:** Luci English, P.E.  
**Date:** December 8, 2008  
**Subject:** Free Chlorine Application Point in the Breckenridge WTP Raw Water Piping

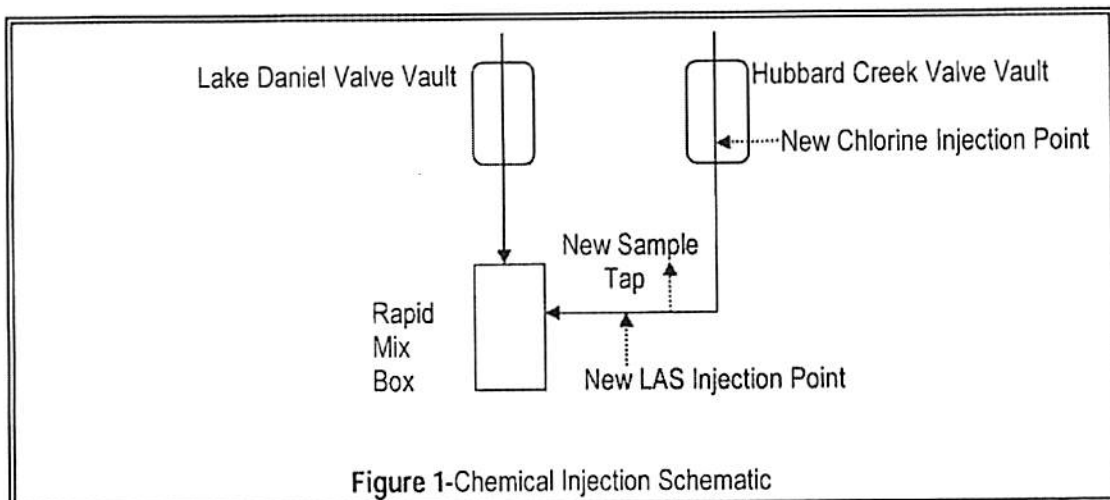
---

### Background

The Breckenridge WTP Corrective Action Plan (CAP) calls for a revision of the plant's disinfection protocol to include a free chlorine contact zone upstream from the ammonia application point (item 6B). The CAP also calls for revision of the plant's CT study by January '09 to account for worst-case operating conditions as well as normal operating conditions.

### Information

To establish worst-case operating conditions a review of the plant's monthly monitoring reports for the past three years was made. Worst-case conditions are those where temperature of the treated water is coldest and flow is highest. Plant records show coldest water temperature of 7.2 degrees C on several days. The highest flow at that temperature occurred on February 28, 2008 with a rate of flow of 1.373 mgd on that day. Based on these conditions the current CT study provides more than adequate inactivation under worst-case conditions. As such no additional inactivation credit need be sought to satisfy minimum inactivation needs. There is the need however for moving the free chlorine and LAS application points upstream from their current location. At present, chlorine at the plant is first applied in the rapid mix box downstream from the ammonia application point. We recommend that the free chlorine application point be moved from the rapid mix box to a point on the Hubbard Creek raw water line just downstream from the flow control valve on the line. See Figure 1.



It is not critical to make the tap for the new chlorine injection point within the existing Hubbard Creek raw water vault. If it is easier to make the tap in the raw water line outside the vault that is acceptable. The new tap however should be located upstream from the 90-degree elbow on the Hubbard Creek line. A new sample tap will also need to be installed on the Hubbard Creek raw water line just downstream (within a few feet) from the 90-degree elbow. It is expected that this sample tap will be used on a daily basis for process control of the chloramine process. We also recommend that the LAS application point should be located immediately downstream from the new raw water sample tap on the Hubbard Creek line. Introducing ammonia at this point in the raw water piping ahead of the rapid mix box ensures ammonia is present in the chlorinated raw water as it enters the rapid mix box to promote formation of chloramines more quickly in the raw water. It is expected that this added measure in the chloramination process will help to promote more efficient chloramine precursor mixing and reduce formation of disinfection byproducts. When making the new chlorine and LAS chemical injection point installations, a corporation stop with injection quill should be used to provide for center of pipe injection of the chemicals.

Prior to making the changes to the chlorine and LAS injection points disinfection byproduct samples should be collected from the treated water at the outlet of the ground storage tank to verify finished water disinfection byproduct levels under the existing protocol. Once the chlorine and LAS injection points have been moved and the system has operated for about a week then disinfection byproduct samples should again be collected from the same finished water sample point to determine the effect of the increased free chlorine zone on formation of disinfection byproducts. We recommend that initially only the changes be made on the Hubbard Creek raw water line. In the event disinfection byproduct sample results from samples collected after the change in chlorine and ammonia application points show acceptable levels of disinfection byproducts then new chemical application points can be made on the Lake Daniel line in a similar fashion as those made on the Hubbard Creek line. At some point in the future, raw water from Lake Daniel would then be treated through the plant to determine DBP formation potential on a full-scale basis under the increased free chlorine contact period.

In the event DBPs remain below the MCL while operating under the limited free chlorine exposure protocol then a slightly revised CT study reflecting the actual field measurements made by Jimmy Loza of eHT would be submitted to TCEQ prior to the January '09 compliance date. In the event DBPs prove problematic under the revised free chlorine protocol then the City would look to either chlorine dioxide or UV treatment to gain required inactivation within DBP MCLs.

END

Texas Water Development Board  
SFY 2012 DWSRF IUP Solicitation Packet

## Source Water Assessment and Protection Program Worksheet

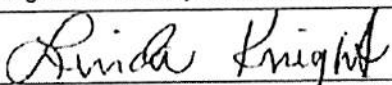
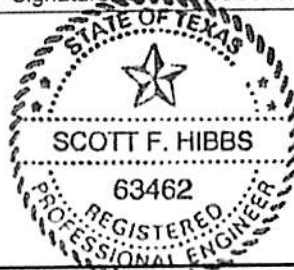
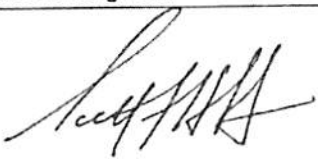
Name of Entity: City of Breckenridge

PWS ID No.: 2150001

### Section 10. ESTIMATED COSTS

Cost Category		(a) Planning	(b) Acquisition	(c) Design	(d) Subtotal (a)+(b)+(c)	(e) Construction	(f) Total (d)+(e)
A.	Treatment					\$1,765,000.00	\$1,765,000.00
B.	Transmission and Distribution						
C.	Source						
D.	Storage						
E.	Purchase of System						
F.	Restructuring						
G.	Land Acquisition						
H.	Source Water Protection						
I.	Engineering	\$56,480.00		\$127,080.00	\$183,560.00	\$98,840.00	\$282,400.00
J.	General, Legal, Financial					\$70,600.00	\$70,600.00
K.	Contingency					\$264,750.00	\$264,750.00
L.	Other (Describe cost.)						
M.	Subtotal (Add Lines A-L.)	\$56,480.00		\$127,080.00	\$183,560.00	\$2,199,190.00	\$2,382,750.00
N.	Financing from Local Funds						
O.	Financing from Other Sources						
P.	Subtotal, SRF-Funded Amount (Subtract Lines N and O from Line M.)						\$2,382,750.00
Q.	TWDB Loan Origination Fee (Calculate 2.25% of Line P.)						\$53,630.00
R.	Grand Total (Add Lines P and Q.)						\$2,436,380.00
S.	Financial Assistance Amount (Round up Line R to the nearest \$5,000.)						\$2,440,000.00
T.	Green Portion [Identify the estimated cost of the green portion (from Question 7.B.) as a percentage of Line S.]						2.8% <sup>8</sup>

### Section 11. AUTHORIZATION AND SIGNATURE

Printed Name and Title of Entity's Authorized Representative	Telephone Number
Linda Knight, Interim City Manager	254-559-8287
Signature of Entity's Authorized Representative	Date (mm/dd/yyyy)
	02/24/2011
If the requested financial assistance amount (Section 10, Line S) is less than or equal to \$100,000, include: • Statement establishing the basis for the project cost. • Signature of system operator.	If the requested financial assistance amount (Section 10, Line S) is greater than \$100,000, include: • Seal of registered professional engineer. • Signature of registered Professional Engineer.
	  2/28/11

# GREEN PROJECT COST SUMMARY

PIF # 9189

Entity: Breckenridge

Project Name: Water Treatment Plant Improvements

**Project Description:** The proposed project is the improvement of the water treatment plant system, including construction of an additional filter cell, a filter-to-waste system, renovate the existing clarifier, upgrade chemical feed, upgrade SCADA system controls and install a VFD to one high service pump.

**Green Description:** The City proposes to install a Variable Frequency Drive to one high service pump

Phases to be Funded: PADC

## PART I

Construction, Engineering and Related Project Costs	Green Elements	Non-Green Elements	Total
1. Construction (list elements below to sufficient detail)			
a) Water Treatment Plant Improvements	\$ 50,000	\$ 1,715,000	\$ 1,765,000
b)	\$ -	\$ -	\$ -
2. Other Project Costs If Applicable (Land, easements, equipment, etc.)			
a)	\$ -	\$ -	\$ -
3. Engineering	\$ -	\$ 282,400	\$ 282,400
<b>Total</b>	<b>\$ 50,000</b>	<b>\$ 1,997,400</b>	<b>\$ 2,047,400</b>

<b>2% Project Elements Considered Green</b>
---

## PART II

Other Project Costs	Item Cost	Attributable to Green Elements
1. Fiscal Services		
a) Financial Advisor	\$ -	\$ -
b) Bond Counsel	\$ -	\$ -
c) Issuance Costs	\$ -	\$ -
d) Bond Insurance / Surety	\$ -	\$ -
e) Bond Reserve Fund	\$ -	\$ -
f) Other (General, Legal, Financial)	\$ 70,600	\$ -
2. Project Legal Expenses	\$ -	\$ -
3. Contingency	\$ 264,750	\$ -
<b>Total Other Project Costs</b>	<b>\$ 335,350</b>	<b>\$ -</b>
<b>Subtotal SRF Funded Amount</b>	<b>\$ 2,382,750</b>	
4. Loan Origination Fee (2.25%)	\$ 53,612	\$ -
<b>Grand Total SRF Funded Amount</b>	<b>\$ 2,436,362</b>	

## PART III

Part I Total Green Element Costs =	\$ 50,000
Part II Costs Attributable to Green Project Elements =	\$ -
<b>Eligible Green Project Reserve Amount =</b>	<b>\$ 50,000</b>

**Green Review Notes:** The green component is only the installation of VFD and associated SCADA controls on Highs Service Pump No. 4. The addition of the VFD is expected to save 304,672 kw-hr and \$10,048 annually, resulting in a payback of approximately 5 years. Energy efficient upgrades, including VFDs, are described as business case eligible for the GPR under the energy efficiency category in EPA green guidance (Part B, 3.5-1).

Reviewed By:                     JM                      
 Checked By:                     JSM                    

Date:                     3/8/12                      
 Date:                     3-8-12