Texas Water Development Board

City of Arlington

CWSRF GREEN PROJECT RESERVE BUSINESS CASE EVALUATION

STATE FISCAL YEAR 2017 INTENDED USE PLAN

PROJECT NUMBER 73752

COMMITMENT DATE: January 12, 2017

DATE OF LOAN CLOSING: May 2, 2017

GREEN ESTIMATE AT CLOSING: $5,512,408

Additional Subsidy: $826,861

TEXAS WATER DEVELOPMENT BOARD
CLEAN WATER STATE REVOLVING FUND (CWSRF)
GREEN PROJECT INFORMATION WORKSHEETS

PART I – GREEN PROJECT INFORMATION

General Project Information

Applicant: City of Arlington Project #: 11908

Project Name: Wastewater Replacements - Various Locations

Contact Name: Walter J. Pishkur, BSBA, MBA, ACHE

Contact Phone and e-mail: 817-459-6603, Buzz.Pishkur@arlingtontx.gov

Brief Overall Project Description:

The City of Arlington project for which funding is requested are prioritized wastewater pipeline replacement segments that consist of 29 gravity segments owned by the City. The total length of pipeline replacement segments is 19,075 linear feet with pipe sizes ranging from 4 to 24 inches. The segments were noted to have high amounts of Inflow and Infiltration (I/I) and the majority of the lines have been in service for at least 30 years. The project has been divided into five areas: Trinity , High Point, Johnson Creek, Davis Pressure Plan Expansion, Circle, and Six Flags.

TEXAS WATER DEVELOPMENT BOARD
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GREEN PROJECT INFORMATION WORKSHEETS

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 $ 5,512,408
- ☐ Environmentally Innovative $ _____

Total Requested Green Amount $ 5,512,408

Total Requested Funding Amount $ 5,512,408

Type of Funding Requested:

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

Completed by:

Name: Wayne Hunter, P.E. Title: Branch Manager, RPS

Signature: _____ Date: March 02, 2016

3.0 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. A few common types of energy efficiency projects that may be considered business case eligible, such as projects for energy efficiency (less than 20% energy efficiency improvement) and projects that eliminate pump stations (lift stations) are listed below. Complete Sections 3.1 and 3.2 if applicable. For any other energy efficiency improvement being considered for business case eligibility, complete Section 3.3.

3.1 – Energy Efficiency Improvements (< 20% improvement)

Provide a detailed description of the proposed project that result in a substantial reduction in energy consumption. Describe operation of the existing system and provide sufficient information establishing the base energy demand. Describe the proposed improvements providing sufficient detail to demonstrate that the proposed efficiencies will be achievable. Quantify all energy and financial savings. Attach supporting calculations.

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:

- [x] TWDB 0161, Part A CWSRF Section 3.5-4
- [ ] _____
- [ ] _____

(Provide Business Case on following page)

Business Case (attach additional pages if necessary):

The six City of Arlington replacement segment project areas within the City's collection system discharge into the Trinity River Authority Central Regional Wastewater System for transporting and treating wastewater flows generated within the City's system. The City pays the Trinity River Authority (TRA) for all flows received. The cost for the transport and treatment of the wastewater flows for which the City pays TRA is as follows:

2016: $2.38/1,000 gallons
2017: $2.74/1,000 gallons
2018: $2.94/1,000 gallons
2019: $3.12/1,000 gallons
2020-2066: $3.36/1,000 gallons

As a result of a hydraulic model and master plan developed for the City's wastewater collection system and flow monitoring data, an evaluation of the system, including the six project areas proposed for replacement, was performed. This evaluation produced a predicted Inflow and Infiltration (I/I) amount totaling 155,227 gallons per day.

The design criteria to be used for the replacement projects will have a design life of 50 years. It is appropriate to then apply the amount of I/I to be removed with the projects and the period of service life of the proposed pipelines to account for the benefit. As shown in Attachment A, this I/I equates to a cost tot he City for transportation and treatment of $9,390,329 over the service life of the improvements. The cost for implementing the Project is $5,512,408. This construction cost is less than the cost of the I/I resulting from no action.

TWDB guidance TWDB-0161, Part A - CWSRF, Section 3.5-4 establishes that the criteria for the required business case is cost effective, which can be demonstrated with a benefit that exceeds the cost. Attached is a detailed breakdown of each project segment, including the opinion of probable construction costs and the predicted I/I to be removed as a result.

Project - Circle															
Location: South of I-30 and West of 360															
Item Description	Quantity	Diameter (inch)		Unit Price		Segment Cost		Surface Replacement Cost				Total Estimated Constr. Cost		Total Estimated Project Cost	
	(ft)	Existing	Upsized	Existing	Upsized	Replacement	Upsized	Surface	Width (ft)	$/SY	Total Cost	Replacement	Upsized	Replacement	Upsized
Section 1															
8" Pipe 0-8', Deep (ft)	665	8	8	$203	$203	$134,995	$134,995	-	0	$0	$0				
Section 2															
4" Pipe 0-8', Deep (ft)	410	4	8	$150	$203	$61,500	$83,230	-	0	$0	$0				
Section 3															
8" Pipe 0-8', Deep (ft)	805	8	8	$203	$203	$163,415	$163,415	Asphalt	28	$200	$161,000				
Totals	1,880					$359,910	$381,640				$161,000	$431,892	$457,968	$483,719	$512,924
Upsizing Cost Increase							$21,730				$161,000		$26,076		$29,205

I/I (gpd) 12,473

Project - Six Flags															
Location: South of I-30 and West of 360															
Item Description	Quantity	Diameter (inch)		Unit Price		Segment Cost		Surface Replacement Cost				Total Estimated Constr. Cost		Total Estimated Project Cost	
	(ft)	Existing	Upsized	Existing	Upsized	Replacement	Upsized	Surface	Width (ft)	$/SY	Total Cost	Replacement	Upsized	Replacement	Upsized
Section 1															
6" Pipe 0-8', Deep (ft)	700	6	8	$168	$203	$117,600	$142,100	Asphalt	28	$200	$140,000				
Section 2															
6" Pipe 0-8', Deep (ft)	540	6	8	$168	$203	$90,720	$109,620	Asphalt	49	$374	$201,960				
Section 3															
6" Pipe 0-8', Deep (ft)	299	6	8	$168	$203	$50,190	$60,646	Asphalt	49	$374	$111,733				
6" Pipe 8-16', Deep (ft)	896	6	8	$190	$225	$170,288	$201,656	Asphalt	49	$374	$335,198				
Totals	2,435					$428,798	$514,023				$788,890	$514,557	$616,827	$576,304	$690,846
Upsizing Cost Increase							$85,225				$788,890		$102,270		$114,542

I/I (gpd) 14,204

Project - High Point															
Location: S Cooper Street & W Arbrook Blvd.															
Item Description	Quantity	Diameter (inch)		Unit Price		Segment Cost		Surface Replacement Cost				Total Estimated Constr. Cost		Total Estimated Project Cost	
	(ft)	Existing	Upsized	Existing	Upsized	Replacement	Upsized	Surface	Width (ft)	$/SY	Total Cost	Replacement	Upsized	Replacement	Upsized
Section 1															
8" Pipe 0-8', Deep (ft)	440	8	8	$203	$203	$89,320	$89,320	Asphalt	41	$323	$142,120				
Section 2															
12" Pipe 0-8', Deep (ft)	280	12	12	$243	$243	$68,040	$68,040	Asphalt	41	$323	$90,440				
Section 3															
8" Pipe 0-8', Deep (ft)	615	8	8	$203	$203	$124,845	$124,845	Asphalt	41	$323	$198,645				
Section 4															
8" Pipe 0-8', Deep (ft)	368	8	8	$203	$203	$74,603	$74,603	Asphalt	41	$323	$118,703				
8" Pipe 8-16', Deep (ft)	1,103	8	8	$225	$225	$248,063	$248,063	Asphalt	41	$323	$356,108				
Section 5															
6" Pipe 0-8', Deep (ft)	324	6	8	$168	$203	$54,390	$65,721	Asphalt	41	$323	$104,571				
6" Pipe 8-16', Deep (ft)	971	6	8	$190	$225	$184,538	$218,531	Asphalt	41	$323	$313,714				
Section 6															
6" Pipe 0-8', Deep (ft)	75	6	8	$168	$203	$12,600	$15,225	Asphalt	41	$323	$24,225				
Totals	4,175					$856,398	$904,348				$1,348,525	$1,027,677	$1,085,217	$1,150,998	$1,215,443
Upsizing Cost Increase							$47,950				$1,348,525		$57,540		$64,445

I/I (gpd) 2,416

Project - Trinity															
Location: NE Green Oaks Blvd. & 360															
Item Description	Quantity	Diameter (inch)		Unit Price		Segment Cost		Surface Replacement Cost				Total Estimated Constr. Cost		Total Estimated Project Cost	
	(ft)	Existing	Upsized	Existing	Upsized	Replacement	Upsized	Surface	Width (ft)	$/SY	Total Cost	Replacement	Upsized	Replacement	Upsized
Section 1															
24" Pipe 0-8', Deep (ft)	551	24	24	$390	$390	$214,988	$214,988	-			$0				
24" Pipe 8-16', Deep (ft)	1,544	24	24	$422	$422	$651,357	$651,357	-			$0				
24" Pipe >16', Deep (ft)	110	24	24	$454	$454	$50,054	$50,054	-			$0				
Section 2															
21" Pipe 0-8', Deep (ft)	275	21	21	$365	$365	$100,375	$100,375	-			$0				
Section 3															
21" Pipe 0-8', Deep (ft)	540	21	24	$365	$390	$197,100	$210,600	-			$0				
Section 4															
21" Pipe 0-8', Deep (ft)	325	21	24	$365	$390	$118,625	$126,750	-			$0				
21" Pipe 8-16', Deep (ft)	975	21	24	$397	$422	$387,075	$411,450	-			$0				
Totals	4,320					$1,719,573	$1,765,573				$0	$2,063,488	$2,118,688	$2,311,106	$2,372,930
Upsizing Cost Increase							$46,000				$0		$55,200		$61,824

I/I (gpd) 85,808

Project - Johnson Creek															
Location: N Center Street & E Randol Mill Road															
Item Description	Quantity	Diameter (inch)		Unit Price		Segment Cost		Surface Replacement Cost				Total Estimated Constr. Cost		Total Estimated Project Cost	
	(ft)	Existing	Upsized	Existing	Upsized	Replacement	Upsized	Surface	Width (ft)	$/SY	Total Cost	Replacement	Upsized	Replacement	Upsized
Section 1															
8" Pipe 0-8', Deep (ft)	370	8	18	$203	$333	$75,110	$123,210	Concrete	12	$115	$42,550				
Section 2															
12" Pipe 0-8', Deep (ft)	700	12	18	$243	$333	$170,100	$233,100	Asphalt	20	$166	$116,200.00				
6" Pipe 0-8', Deep (ft)	400	6	18	$168	$333	$67,200	$133,200	Asphalt	20	$166	$66,400.00				
Section 3															
6" Pipe 0-8', Deep (ft)	340	6	18	$168	$333	$57,120	$113,220	-							
Section 4															
12" Pipe 0-8', Deep (ft)	750	12	18	$243	$333	$182,250	$249,750	-							
Section 5															
8" Pipe 0-8', Deep (ft)	110	8	18	$203	$333	$22,330	$36,630	Asphalt	28	$206	$22,660.00				
Section 2A															
6" Pipe 0-8', Deep (ft)	245	6	8	$168	$203	$41,160	$49,735	Asphalt	28	$206	$50,470.00				
Section 2B															
6" Pipe 0-8', Deep (ft)	250	6	8	$168	$203	$42,000	$50,750	Asphalt	28	$206	$51,500.00				
Totals	3,165					$657,270	$989,595				$349,780	$788,724	$1,187,514	$883,371	$1,330,016
Upsizing Cost Increase							$332,325				$349,780		$398,790		$446,645

I/I (gpd) 27,854

Project - Davis Pressure Plane Expansion															
Location: W Division Street (180) & S Davis Drive															
Item Description	Quantity	Diameter (inch)		Unit Price		Segment Cost		Surface Replacement Cost				Total Estimated Constr. Cost		Total Estimated Project Cost	
	(ft)	Existing	Upsized	Existing	Upsized	Replacement	Upsized	Surface	Width (ft)	$/SY	Total Cost	Replacement	Upsized	Replacement	Upsized
Section 1															
6" Pipe 0-8', Deep (ft)	500	6	8	$168	$203	$84,000	$101,500	Asphalt	38	$304	$152,000				
Section 2															
8" Pipe 0-8', Deep (ft)	125	8	8	$203	$203	$25,375	$25,375	Asphalt	38	$304	$38,000				
Section 3															
6" Pipe 0-8', Deep (ft)	330	6	8	$168	$203	$55,440	$66,990	Asphalt	38	$304	$100,320				
Section 4															

6" Pipe 0-8', Deep (ft)	315	6	8	$168	$203	$52,920	$63,945	Asphalt	38	$304	$95,760				
Section 5															
8" Pipe 0-8', Deep (ft)	340	8	8	$203	$203	$69,020	$69,020	Asphalt	38	$304	$103,360				
Section 6															
8" Pipe 0-8', Deep (ft)	515	8	8	$203	$203	$104,545	$104,545	Asphalt	38	$304	$156,560				
Section 7															
8" Pipe 0-8', Deep (ft)	475	8	8	$203	$203	$96,425	$96,425	Asphalt	38	$304	$144,400				
Section 8															
6" Pipe 0-8', Deep (ft)	500	6	8	$168	$203	$84,000	$101,500	Asphalt	38	$304	$152,000				
Totals	3,100					$571,725	$629,300				$942,400	$686,070	$755,160	$768,398	$845,779
Upsizing Cost Increase							$57,575				$942,400		$69,090		$77,381

I/I (gpd) 12,473

Item Description	Quantity					Segment Cost		Segment Cost				Total Estimated Constr. Cost		Total Estimated Project Cost	
	(ft)					Replacement	Upsized	Replacement			Upsized	Replacement	Upsized	Replacement	Upsized
TOTALS	19,075					4,593,673	5,184,478	0			3,590,595	5,512,408	6,221,374	6,173,897	6,967,938

I/I (gpd) Removed 155,227

Total I/I removed (gpd)	155,227
2016 Treatment Cost ($/1000 gal)	$2.38
2017 Treatment Cost	$2.74
2018 Treatment Cost	$2.94
2019 Treatment Cost	$3.12
2020 - 2066 Treatment Cost	$3.36
Total Treatment Cost (50-year service life)	$9,390,329