Green Business Case
For
Logan County Rural Water District No. 1

Summary:

Logan Co. RWD #1 is proposing a pipeline and pump station project to serve customers East of I-35.

Estimated project cost:	$950,000.00
Estimated loan amount:	$750,000.00

Estimated green portion of project:

Pump Station	$250,000.00

Estimated annual energy savings is 20.6% or up to $654.00 per year.

Back Ground:

The pump station is needed to provide adequate service to the customers East of I-35.

Results:

The base line or standard pumps have a wire to water efficiency ranging between 49.1% to 50.7%.

The specified pumps will have a wire to water efficiency of 71.3%.

Calculated Energy Efficiency:

(see attached comparison table)

Conclusion:

By using the specified pumps in lieu of standard pumps the energy savings will be 6,230 kWh per year or $654.00 per year.

CONSTRUCTION COST ESTIMATE

ITEM DESCRIPTION	UNITS	QTY	UNIT PRICE	TOTAL COST
10" DIRECTIONA BORE INCLUDING PIPE AND FITTINGS (SDR 11 POLYPIPE)	L.F.	850	$140.00	$119,000.00
8" DIRECTIONA BORE INCLUDING PIPE AND FITTINGS (SDR 11 POLYPIPE)	L.F.	200	$80.00	$16,000.00
8" WATERLINE (CLASS 200 PVC)	L.F.	15,200	$15.00	$228,000.00
14" BORE AND CASING	L.F.	375	$80.00	$30,000.00
10"x8" REDUCER	EA.	2	$300.00	$600.00
8" TAPPING VALVE w/ BOX	EA.	1	$1,000.00	$1,000.00
8"x8" TAPPING SLEEVE	EA.	1	$1,000.00	$1,000.00
8"x90° BEND	EA.	5	$300.00	$1,500.00
8"x8" TEE	EA.	1	$500.00	$500.00
8" GATE VALVE w/ BOX	EA.	4	$1,000.00	$4,000.00
8" PLUG w/ 2" BLOW OFF VALE	EA.	1	$1,500.00	$1,500.00
8"x6" TEE	EA.	1	$500.00	$500.00
8"x6" REDUCE	EA.	1	$500.00	$500.00
6" TAPPING VALVE	EA.	1	$750.00	$750.00
6"x6" TAPPING SLEEVE	EA.	1	$750.00	$750.00
6" GATE VALVE w/ BOX	EA.	1	$750.00	$750.00
FILL HYDRANT	EA.	1	$3,500.00	$3,500.00
2" COMBINATION AIR/VACUUM VALVE w/ BOX	EA.	7	$1,500.00	$10,500.00
ANCHORS	EA.	10	$100.00	$1,000.00
ASPHALT DRIVE REPAIR	S.Y.	100	$40.00	$4,000.00
CONCRETE DRIVE REPAIR	S.Y.	100	$50.00	$5,000.00
GRAVEL DRIVE REPAIR	S.Y.	300	$25.00	$7,500.00
SAND BACK FILL	C.Y.	700	$20.00	$14,000.00
PRESSURE AND LEAKAGE TESTING	L.S.	1	$1,000.00	$1,000.00
DISINFECTION	L.S.	1	$1,000.00	$1,000.00
PUMP STATION, GENERATOR, PROPANE TANK, AND APPURTENANCES	L.S.	1	$250,000.00	$250,000.00

TOTAL ESTIMATED CONSTRUCTION COST	**$703,850.00**
CONTINGENCY	$71,150.00
ENGINEERING	$60,000.00
ENVIRONMENTAL	$5,000.00
INSPECTION	$20,000.00
LEGAL & FINANCIAL	$14,000.00
BOND AND CONTRACTS	$14,000.00
DEQ PERMIT	$2,000.00
LAND	$70,000.00
TOTAL PROJECT COST	**$960,000.00**
REQUESTED LOAN AMOUNT	$750,000.00

Table 1

Demonstrating Energy and Cost Savings for Pumps				
Pump Parameter	Comparison Pump	New Pump (Proposed Pump, Spec)	Comparison Pump	Comparison Pump
Maufacturer	Fairbanks 4" 5823	Peerless 4PV10B	Paco 50129VL	Cornell 40129LC
Voltage/ Phase	460/3	460/3	460/3	460/3
		SELECTED PUMP		
Motor Efficiency, %	91	91	87.5	87.5
Pump Efficiency	54	78.4	54.94	57.95
Power usage, Kw-Hr/Yr	18,930	12,700	18920	17940
Power Cost, $/Yr	0.105	0.105	0.105	0.105
Operational Cost, $/Yr	1988	1334	1987	1884
Savings, $/Yr	N/A	654	1	104
Base Standard Efficiency, %	0.491	0.713	0.481	0.507

New Standard Grade Efficiency: Pumps -.54%; Motors-91%

0.54*0.91 0.49

Adding 20% effciency to the standard grade Efficiency:

Base Std. Efficiency, %	69

ITEM NO.	QUANT.	UNIT	DESCRIPTION	UNIT PRICE	TOTAL AMOUNT
23	100	S.Y.	Asphalt Drive Repair		$_____/S.Y.
			_____DOLLARS		$_____
24	100	S.Y.	Concrete Drive Repair		$_____/S.Y.
			_____DOLLARS		$_____
25	300	S.Y.	Gravel Drive Repair		$_____/S.Y.
			_____DOLLARS		$_____
26	700	C.Y.	Sand Backfill		$_____/C.Y.
			_____DOLLARS		$_____
27	1	L.S.	Pressure and Leakage Testing		$_____/L.S.
			_____DOLLARS		$_____
28	1	L.S.	Disinfection		$_____/L.S.
			_____DOLLARS		$_____
29	1	L.S.	Pump Station Complete with all appurtenances As Shown in the Plans and Described in the Specifications. **This is a Lump Sum Item. All Fittings, Valves, Piping, Generator, propane tank, Fencing, building, electrical service connections, And all appurtenances needed for a fully operational complete system and connected to the Proposed and existing Waterlines Are to be included in this pay item. (Refer to sheets 10-13 of the Plans.)**		$_____/L.S.
			_____DOLLARS		$_____

TOTAL BASE BID $_____

SECTION 1400

Pump Specifications

Pump shall be a Peerless PV Inline centrifugal type capable of delivering:
210 gpm at a total head of 100 feet,
355 gpm at a total head of 95 feet with an efficiency of 78%,
460 gpm at a total head of 85 feet with an efficiency of 80%,
600 gpm at a total head of 65 feet at the specified condition. Pumped liquid will be fresh water at a temperature of 85°F with a specific gravity of 1.

Pump casing shall be cast iron with smooth water passages and fitted with a bronze replaceable casing ring. Maximum casing working pressure shall be 175 psig. The pipe connection flanges shall be of identical dimensions, rated at 125 lb. ANSI, and displaced 180 with centerlines concentric on the same horizontal plane.

The impeller supplied for the specific conditions shall be one piece bronze casting of a diameter not greater than 90% of the casing cutwater diameter. The impeller shall be in proper balance for smooth operation at 1750 rpm.
Mechanical Seal Pumps Bronze Fitted.

A face type mechanical seal with Ni-Resist stationary seat, carbon washer, ethylene propylene flexible members, brass metal parts and 18-8 stainless steel spring. Seal shall be mounted over a bronze shaft sleeve.

The motor/impeller shaft shall be equipped with a replaceable bronze sleeve installed between the shaft and the mechanical seal.

Pump shall be closed coupled to a HI/NEMA JM frame ODP electric motor rated at 15 hp, 1750 rpm, 480 volt, 3 ph, 60 Hz. Motor shaft shall be carbon steel and of a size and design to limit shaft deflection at the mechanical seal faces to no more than .002 inches. Motor bearings shall be grease lubricated and sized for maximum of 20,000 hours B10 life which is equivalent to 100,000 hours average bearing life. Pump should be provided with cast iron pedestal mounting support.