October 24, 2011

Mr. Larry Thoma, Chairman
Elgin Public Works Authority
P.O. Box 310
Elgin, Oklahoma 73538

Dear Mr. Thoma,

Under the FY 2011 Appropriations Bill for the Clean Water State Revolving Fund Program (CWSRF), the Oklahoma Water Resources Board has the ability to provide additional subsidization in the form of principal forgiveness to projects that incorporate eligible “green” elements.

In reviewing the documentation provided by the Elgin Public Works Authority in support of the $3,150,000 CWSRF funding request for Wastewater Treatment Plant Improvements (ORF-10-0005-CW), OWRB engineering staff have determined that approximately $300,700.00 is considered “green” according to EPA’s Green Project Reserve Guidelines. Consequently, based on the formula set forth under the Clean Water State Revolving Fund FY 2012 Intended Use Plan, Elgin is eligible for approximately $300,700.00 in CWSRF loan principal forgiveness. The principal forgiveness amount is based on 15% of the total project cost or the cost of the green component(s) whichever is less. The final determination will be made prior to loan closing.

Attached please find the CWSRF Green Project Reserve Eligibility Determination Form completed for your project. Please keep this information for your records. As required by EPA, this information will also be made available on the OWRB website at www.owrb.ok.gov.

Please don’t hesitate to let me know if you have questions or need additional information. We look forward to working with you on this project.

Sincerely,

Joe Freeman, Chief
Financial Assistance Division

Cc: Luena King, City Clerk
    Shane Smith, Consulting Engineer
    Allan Brooks, Bond Counsel
    Joe Gargan, Consulting Engineer
    John Barron, OWRB Engineer
    Sona Mock, OWRB Analyst
    Matt Cogburn, OWRB Environmental Specialist
    Tony Mensah, OWRB Engineering Manager
Green Project Reserve Eligibility Determination

Name of System: Elgin Public Works Authority
CWSRF Project Number/Loan Number: ORF-10-0005-CW

General Project Description:

The Elgin Public Works Authority owns and operates the Elgin Wastewater Treatment plant. The Treatment plant consists of an existing headwork's, two (2) aeration basins, one (1) secondary basin and a slow rate land application system. The project includes construction of an influent lift station, two (2) aerated lagoons, one (1) setting lagoon, installation of a slow rate land application system and other related construction items and appurtenances. The Total project cost is $3,150,000.00

GPR Component Description:

<table>
<thead>
<tr>
<th>Item</th>
<th>Category *</th>
<th>Categorically Green (Yes/No)</th>
<th>Business Case Required? (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The construction of a new influent lift station with two (2) 4 hp pumps</td>
<td>Energy Efficiency</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>The construction of a new irrigation pump station with two (2) 25 hp pumps</td>
<td>Energy Efficiency</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Approved GPR Amount: $300,700.00
Approved Subsidy Amount: (if applicable) $300,700.00

Approved by

[Signature]
Justin Hodge, CWSRF Project Engineer
Date: October 17, 2011

* Categories: Green Infrastructure/Water Efficiency/Energy Efficiency/Environmentally Innovative
To: Elgin Public Works Authority
Attn: Larry Thoma, Mayor
From: Mary Elizabeth Mach, PE
RE: Elgin Wastewater Treatment System Improvements
    CWSRF Green Reserve Program

Date: October 12, 2011

Purpose

The purpose of the Technical Memorandum (TM) is to document the energy savings of selected equipment for proposed improvements for the Elgin Wastewater Treatment System Improvements project. This project has applied for and is slated to receive funding through the Clean Water State Revolving Fund (CWSRF) loan assistance program. A recent initiative of the CWSRF program is the Green Project Reserve (GPR) fund, which grants principle forgiveness on qualifying equipment. This TM has been prepared with the specific intent of qualifying certain elements of the project which may be eligible for GPR funding. Refer to the engineering report approved by ODEQ in March 2011 for information not contained herein.

Summary

- The wastewater system improvements project for the City of Elgin proposes a new influent lift station and a new irrigation pump station. The lift station is necessary as sufficient hydraulic head does not exist on the site and requires three pumps and motors. The City does not have a discharge permit, therefore they must irrigate their effluent; the irrigation pump station requires two pumps and motors.
- Anticipated Total Loan Amount = $3,150,000
  Total influent lift station estimate = $126,800
  Total irrigation pump station estimate = $118,500
  Associated qualifying GPR professional/legal/bond fees = $ 55,400
- Green Project Reserve total = $300,700 (9.5% of requested loan)
- Cost of Comparison Pumps
  - Cost of lift station with comparison pumps = $122,300
  - Cost of irrigation pump station with comparison pumps = $120,800
- Annual average energy savings.
  - Influent lift station = 6,541 Kw-Hr or $ 589
  - Irrigation pump station = 22,180 Kw-Hr or $1,408
- Anticipated total present worth savings over twenty years is 27,515.
  - Influent lift station = $ 4,264
  - Irrigation pump station = $ 23,251
Background

- The upgraded WWTP will have a treatment capacity of 0.293 mgd
- A new influent lift station and a new irrigation pump station are being installed with high efficiency pumps and motors with the following operation points

<table>
<thead>
<tr>
<th>Installation</th>
<th>Required No. of Pumps</th>
<th>Flow (gpm)</th>
<th>Head (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influent Lift Station</td>
<td>3</td>
<td>345</td>
<td>35</td>
</tr>
<tr>
<td>Irrigation Pump Station</td>
<td>2</td>
<td>540</td>
<td>143</td>
</tr>
</tbody>
</table>

- High efficiency pumps and motors will be installed to conserve energy
- Automatic floats and timers have been included to maximize the efficiency of cycle times of pumps, reduce operator hours, and conserve energy

Results

- Influent Lift Station Pumps
  - The proposed new pumps will have a rated efficiency of 69%
  - The proposed new motors will have a rated efficiency of 77.8%
- Irrigation Pump Station
  - The proposed new pumps will have a rated efficiency of 79.6%
  - The proposed new motors will have a rated efficiency of 92.4%

Calculated Energy Efficiency

Influent Lift Station Pumps

- Standard pumps on the market have average efficiency ratings of 44 – 53%
- Standard motors on the market have average efficiency ratings of 74.8 – 91%
- A standard system would consume an average of 24,624 Kw-hr annually
- The wire-to-water efficiency is the pump efficiency times motor efficiency. For standard pumps and motors for this application, the average efficiency is 0.41 or 41%
- The wire-to-water efficiency of the high efficiency pump for this application is 0.69 X 0.78 = 0.54 or 54%
- Comparing the efficiencies of the proposed pumps and motors with standard pumps and motors
  54% / 41% = 1.31
- The increased efficiency of the proposed pump over the standard pumps is 31%, which exceeds the 20% recommended minimum efficiency for pumps and motors
- Example of cost and energy savings a high efficiency pump that meets the criteria
Demonstrating Energy and Cost Savings: Influent Lift Station Pumps

Design condition of 345 gpm and 35 feet, TDH

Usage based on 12 hrs/day, 365 days/year operation

<table>
<thead>
<tr>
<th>Pump Parameter</th>
<th>High Efficiency Pump</th>
<th>Standard Pump #1</th>
<th>Standard Pump #2</th>
<th>Standard Pump #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>Fairbanks-Morse 4&quot; 5432MV, 4.3 BHP</td>
<td>Fairbanks-Morse 4&quot; 5432MVK, 6.68 BHP</td>
<td>Flygt, 3&quot; N-3102 SH 6.5 BHP</td>
<td>Fairbanks-Morse 5&quot; 5436M&amp;W, 5.54 BHP</td>
</tr>
<tr>
<td>Voltage/Phase</td>
<td>460/3</td>
<td>460/3</td>
<td>460/3</td>
<td>460/3</td>
</tr>
<tr>
<td>Motor Efficiency, %</td>
<td>77.8</td>
<td>83.2</td>
<td>91</td>
<td>74.8</td>
</tr>
<tr>
<td>Pump Efficiency</td>
<td>69</td>
<td>44</td>
<td>51.2</td>
<td>53</td>
</tr>
<tr>
<td>Power usage, Kw-Hr/Yr</td>
<td>18,084</td>
<td>26,269</td>
<td>23,370</td>
<td>24,233</td>
</tr>
<tr>
<td>Power Save, Kw-Hr/Yr</td>
<td>-</td>
<td>(8,186)</td>
<td>(5,287)</td>
<td>(6,149)</td>
</tr>
<tr>
<td>Power Cost, $/Kw-Hr</td>
<td>$0.09</td>
<td>$0.09</td>
<td>$0.09</td>
<td>$0.09</td>
</tr>
<tr>
<td>Operational Cost, $/Yr</td>
<td>$1,628</td>
<td>$2,364</td>
<td>$2,103</td>
<td>$2,181</td>
</tr>
<tr>
<td>Savings, $/Yr</td>
<td>-</td>
<td>$737</td>
<td>$476</td>
<td>$553</td>
</tr>
<tr>
<td>Savings, $/20-Yr (3% infl)</td>
<td>$10,962</td>
<td>$7,080</td>
<td>$8,235</td>
<td></td>
</tr>
<tr>
<td>Base Standard Efficiency, %</td>
<td>0.54</td>
<td>0.37</td>
<td>0.47</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Irrigation Pump Station

- Standard pumps on the market have average efficiency ratings of 58.8 - 63.7%
- Standard motors on the market have average efficiency ratings of 92.4 - 93.6%
- A standard system would consume an average of 75,500 Kw-hr annually
- The wire-to-water efficiency is the pump efficiency times motor efficiency. For standard pumps and motors for this application, the average efficiency is 0.57 or 57%
- The wire-to-water efficiency of the high efficiency pump for this application is 0.80 \times 0.924 = 0.74 or 74%
- Comparing the efficiencies of the proposed pumps and motors with standard pumps and motors
  \[74\% / 57\% = 1.30\]
- The increased efficiency of the proposed pump over the standard pumps is 30%, which exceeds the 20% recommended minimum efficiency for pumps and motors
- The table on the next page presents an example of cost and energy savings from a high efficiency pump that meets the criteria
Demonstrating Energy and Cost Savings: Irrigation Pumps

DESIGN CONDITION 540 GPM @ 144' TDH, IRRIGATION WATER

USAGE BASED ON 8 HRS/DAY, 365 DAYS/YR OPERATION

<table>
<thead>
<tr>
<th>Pump Parameter</th>
<th>High Efficiency Pump</th>
<th>Standard Pump #1</th>
<th>Standard Pump #2</th>
<th>Standard Pump #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>Peerless C830A, 25.4 BHP</td>
<td>Peerless 5AE8, 34.4 BHP</td>
<td>Paco 30957VL, 30.83 BHP</td>
<td>Paco 25957LC, 31.39 BHP</td>
</tr>
<tr>
<td>Voltage/Phase</td>
<td>460/3</td>
<td>460/3</td>
<td>460/3</td>
<td>460/3</td>
</tr>
<tr>
<td>Motor Efficiency, %</td>
<td>92.4</td>
<td>93.6</td>
<td>92.5</td>
<td>92.5</td>
</tr>
<tr>
<td>Pump Efficiency</td>
<td>79.6</td>
<td>58.8</td>
<td>63.7</td>
<td>62.6</td>
</tr>
<tr>
<td>Power usage, Kw-Hr/Yr</td>
<td>59,857</td>
<td>80,027</td>
<td>72,575</td>
<td>73,893</td>
</tr>
<tr>
<td>Power savings, Kw-Hr/Yr</td>
<td>-</td>
<td>(20,170)</td>
<td>(12,718)</td>
<td>(14,036)</td>
</tr>
<tr>
<td>Power Cost, $/Kw-Hr</td>
<td>$ 0.09</td>
<td>$ 7.202</td>
<td>$ 6,532</td>
<td>$ 6,651</td>
</tr>
<tr>
<td>Operational Cost, $/Yr</td>
<td>$ 5,387</td>
<td>$ (1,815)</td>
<td>$ (1,145)</td>
<td>$ (1,264)</td>
</tr>
<tr>
<td>Savings, $/Yr</td>
<td>-</td>
<td>$ 27,003</td>
<td>$ 17,035</td>
<td>$ 18,805</td>
</tr>
<tr>
<td>Savings, $/20-Yr (3% infl)</td>
<td>-</td>
<td>$ 17,035</td>
<td>$ 18,805</td>
<td>$ 18,805</td>
</tr>
<tr>
<td>Base Standard Efficiency, %</td>
<td>0.74</td>
<td>0.55</td>
<td>0.59</td>
<td>0.58</td>
</tr>
</tbody>
</table>

Engineering Fees

- GPR qualifying items (before professional fees) = $245,300 or 7.8% of total loan
- Total professional fees for the project = $712,025
  - Engineering fees = $395,500
  - Est. Full-time Construction Inspector fees = $180,000
  - Est. Geotechnical fees = $15,400
  - Bond Counsel fees = $39,375
  - Local Counsel fees = $39,375
  - Financial Advisor fees = $39,375
- GPR qualifying professional fees = 7.8% x $712,025 = $55,400
- Total GPR qualifying funds = $245,000 + $55,400 = $300,700 or 9.5% of total loan

Conclusion

- An energy efficient influent lift station and irrigation pump station will save the City an average of 22,180 Kw-hr a year, which equates 22% less energy consumed
- At 9 centers per kilowatt-hour energy, reductions will result in operations savings $1,997
  - Influent Lift station = $589
  - Irrigation pump station = $1,408
- The total present worth savings due to energy over 20 years, is $29,715
  - Influent Lift station = $8,764
  - Irrigation Pump Station = $20,951
- Total present worth savings including the price of pumps is $27,515
<table>
<thead>
<tr>
<th>Total Present Worth Savings due to High Efficiency Pumps</th>
<th>Influent Liftstation</th>
<th>Irrigation Pump Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Cost – Comparison Pump Station</td>
<td>$ 122,300</td>
<td>$ 120,800</td>
</tr>
<tr>
<td>Capital Cost – High Efficiency Pump Station</td>
<td>$ 126,800</td>
<td>$ 118,500</td>
</tr>
<tr>
<td>Difference</td>
<td>($ 4,500)</td>
<td>$ 2,300</td>
</tr>
<tr>
<td>Present Worth Savings – Energy</td>
<td>$ 8,764</td>
<td>$ 20,951</td>
</tr>
<tr>
<td>Total Present Worth Savings</td>
<td>$ 4,264</td>
<td>$ 23,251</td>
</tr>
</tbody>
</table>
City of Elgin  
Wastewater Treatment Improvement Project  
Green Project Reserve Estimates  

<table>
<thead>
<tr>
<th>Influent Lift Station Pump Station</th>
<th>Irrigation Pump Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>structure = $56,580</td>
<td>structure = $51,000</td>
</tr>
<tr>
<td>equipment = $27,000</td>
<td>equipment = $30,000</td>
</tr>
<tr>
<td>install costs = $11,700</td>
<td>install costs = $9,000</td>
</tr>
<tr>
<td>electrical/controls = $15,000</td>
<td>electrical/controls = $13,000</td>
</tr>
</tbody>
</table>

sub-total = $110,280  
contractor profit (15%) = $16,542  

Lift Station sub-total = $126,800  
Irrigation Station sub-total = $118,500  

Total Pumping Costs = $245,300  
Total Loan Request = $3,150,000  
% of project = 7.8%

| Total Project Engineering Fees = $398,500 |
| Construction Inspection = $180,000 |
| Geotechnical = $15,400 |
| Bond Counsel = $39,375 |
| Financial Advisor = $39,375 |
| Local Counsel = $39,375 |
| Total fees = $712,025 |

Professional fees, prorated = $55,400  
% of project = 7.8%

Total GPR Qualifying Items = $300,700  

Total Loan Request = $3,150,000  
GPR % of Loan = 9.5% (including professional fees)