City of FRESNO REPORT TO THE CITY COUNCIL

AGENDA ITEM NO.	1J
COUNCIL MEETING	12/2/08
APPROVED BY	
DEPARTMENT DIRECTOR	
CITY MANAGER	

December 2, 2008

FROM: RENE A. RAMIREZ, Director
Department of Public Utilities

BY: STEPHEN A. HOGG, Assistant Director
Department of Utilities, Wastewater Management

SUBJECT: APPROVE A PROFESSIONAL SERVICES AGREEMENT WITH CAROLLO ENGINEERS PC, FOR $105,256 FOR CONSULTANT SERVICES FOR THE DIGESTER GAS CONDITIONING DESIGN-BUILD PROJECT AT THE FRESNO/CLOVIS REGIONAL WASTEWATER RECLAMATION FACILITY (COUNCIL DISTRICT NO.3)

Presented to City Council
Date 12/2/08
Disposition Approved

KEY RESULT AREA

One Fresno

RECOMMENDATION

Staff recommends that the City Council approve an Agreement for $105,256 with Carollo Engineers PC, an Arizona Corporation, for consultant services for the digester gas conditioning design-build project at the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF), and authorize the City Manager, or his designee to sign the Agreement on behalf of the City.

EXECUTIVE SUMMARY

The RWRF operates two dual fuel gas turbines that are fueled by a blend of digester gas and natural gas. These turbines provide electrical and heat energy for the RWRF. The digester gas is a byproduct of the wastewater treatment process. Digester gas contains several constituents such as hydrogen sulfide, siloxanes, and carbon dioxide. These compounds reduce the turbines' efficiency, damage engine components and create increased maintenance, and contribute to the generation of air pollutants. These constituents must be removed prior to combustion. There are several available technologies for removal. A design-build project is the best method for project delivery.

Following Fresno Municipal Code Chapter 4 Article 1 and Administrative Order 6-19, the Department of Public Utilities notified 20 consulting firms requesting a statement of qualifications. In addition, the Purchasing Division posted the request on the City's "Bids On-Line" website. The Department received two responses. Staff interviewed of both firms and Carollo Engineers PC, was selected to perform the necessary consultant services. A consultant services agreement has been negotiated in the amount of $95,256 with a contingency amount not to exceed $10,000.

KEY OBJECTIVE BALANCE

The gas conditioning design-build project at the RWRF balances the three focus areas of Customer Satisfaction, Employee Satisfaction and Financial Management. Customer Satisfaction is derived by ensuring uninterrupted wastewater treatment capabilities of the RWRF. Employee Satisfaction is ensured by reducing excessive maintenance. Financial Management is enhanced by reducing purchases of natural gas and maintenance expenses.

BACKGROUND

The RWRF operates two 3.37 kW Allison-Rolls Royce gas turbine generators and a third steam turbine generator. The gas turbines are fueled by a blend of digester gas and natural gas and are capable of producing all the electrical and heat energy needs for the RWRF. This energy can be produced on site, using this renewable energy source, at a cost less than that to purchase power from PG&E. The use of the three generators also allows the RWRF to operate during an electrical utility shutdown or failure.

The RWRF produces up to 1.5 million cubic feet per day of digester gas, as a byproduct of processing regional wastewater flows. The digester gas consists mostly of methane and carbon dioxide. In addition the gas contains undesirable constituents such as hydrogen sulfide (sulfides), siloxanes, and carbon dioxide. These undesirable compounds reduce the turbines' efficiency, damage engine components and create increased maintenance, and contribute to the generation of air pollutants.

As a result of the air emissions created by the combustion of the undesirable gas constituents such as the sulfides, the San Joaquin Valley Air Pollution Control District (SJVAPCD) permit currently limits the amount of digester gas that can be used in the turbines to a 50% of blend digester gas to natural gas. Removal of the harmful components of the digester gas will allow the RWRF to revise the permit to allow burning a higher percentage of digester gas thereby reducing the amount of natural gas that must be purchased.

The digester gas also contains a high concentration of chemical compounds known as siloxanes. Siloxanes are a by product of the wastewater treatment. Siloxanes component compounds can be found in everything from cooking oil to cosmetics. After combustion these siloxanes precipitate onto the turbines parts in the form dusty coating of a ceramic like material. The coating of the turbine parts causes increases in maintenance costs, turbine down time, reduced electrical and thermal efficiencies. Increased maintenance costs that can be directly connected to the presence of these constituents are in excess of $150,000 per year. The installation of a gas conditioning system will dramatically reduce the quantity of contaminates entering the turbine, greatly reducing maintenance and repairs costs. The new system will also increase the available operating time for the turbines thus reducing the amount of electricity purchased from the utility company.

In addition, in 2007, the SJVAPCD implemented a new rule further limiting the nitrogen oxide (NO_2) emissions from combustion gas turbines. This new rule sets extremely low limits on NO_2 emissions and all turbines in the district must begin implementing new emission control measures by 2009 and be in compliance by 2011. The technologies to achieve these new lower emissions requirements are very limited and require much cleaner gas than is currently produced at the RWRF. A gas conditioning system is necessary to meet this new rule.

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consultant services. A consultant services agreement has been negotiated in the amount of $95,256 with a contingency amount not to exceed $10.000. City Attorney's Office has approved it as to form.

FISCAL IMPACT

See attached Fiscal Impact Statement.

Attachments:

Carollo Engineers Consultant Services Agreement
Fiscal Impact Statement
Carollo Liability Insurance Policy

FISCAL IMPACT STATEMENT

PROGRAM: TC00048 Power Generation Facility Digester Gas Conditioning System

RECOMMENDATION	TOTAL OR CURRENT	ANNUALIZED COST
Direct Cost	$105,256.00	
Indirect Cost	$0	
TOTAL COST	$0	
Additional Revenue or Savings Generated	$0	
Net City Cost	$0	
Amount Budgeted (If none budgeted, identify source)	$105,256.00	