



DATE: July 5, 2022

TO: Mayor and City Council

FROM: Director of Public Works

SUBJECT: Adopt a Resolution Authorizing the Single Source Agreement with Western Energy Systems for Services to the Cogeneration Engine System at the Water Pollution Control Facility (WPCF) in an Amount Not-to-Exceed \$507,710 Plus Administrative Change Orders in the Amount of Ten Percent of the Contract Price for a Total of \$558,500

RECOMMENDATION

That Council adopts a resolution (Attachment II) authorizing the City Manager to execute the single source agreement with Western Energy Systems for Services to the Cogeneration Engine system at the Water Pollution Control Facility (WPCF) in an amount not-to-exceed \$507,710 plus administrative change orders in an amount equal to ten percent of the contract amount for a total of \$558,500.

SUMMARY

The WPCF cogeneration system currently utilizes a Jenbacher cogeneration engine to produce energy from biogas to provide power to the WPCF. In November 2014, the City commissioned a Jenbacher Model JGS 416 cogeneration engine as part of the WPCF Cogeneration Upgrade Project. The cogeneration engine surpassed a 60,000-engine operating hour milestone and is due for a complete engine overhaul, long block replacement, and other milestone replacements, as recommended by the engine manufacturer. Western Energy Systems is the exclusive authorized and certified parts and service provider for all Jenbacher products on the west coast. Staff is recommending the City execute a single source agreement with Western Energy Systems to perform the engine overhaul and other recommended milestone replacements in an amount not-to-exceed \$558,500, in order to continue to provide reliable and sustainable power to the WPCF.

BACKGROUND

The WPCF utilizes anaerobic sludge digesters for solids break-down and stabilization. A byproduct of anaerobic digestion is the generation of biogas mostly (methane), which is purified and utilized to generate electricity and reduce the need to purchase energy.. Waste heat from the power generation is captured and is used to heat the digesters. In addition to cost benefits, there are significant environmental advantages to cogeneration in that the

alternative for disposing biogas is to flare (burn) it off as a large open-air flame, which is wasteful of a renewable energy source.

In November 2014, the Jenbacher Model JGS-416 engine was commissioned by Western Energy Systems as part of the WPCF Cogeneration Upgrade Project. The engine is rated to produce 1,132 kW (kilowatts) of power. Currently, the plant demand averages approximately 950 kW on an annual average basis. Because the cogeneration system produces more energy than is required at the WPCF, PG&E savings are generated through the Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) tariff, which allows energy credits to be applied to other City facilities.

In 2014, the City declined to enter into a maintenance agreement with Western Energy Systems for the cogeneration engine due to the high cost of the maintenance contract. The City staff instead has been performing most repairs and routine maintenance on the engine, while assigning only higher level and complex quarterly services to the manufacturer's representative, Western Energy Systems, to perform. Staff anticipates that over the 10-year life of the maintenance contract, the City will have saved approximately \$500,000 by a combination of self-performed and contracted maintenance with Western Energy Systems.

DISCUSSION

As mentioned above, the cogeneration engine surpassed a 60,000-engine operating hour milestone. At this milestone, the manufacturer recommends a complete engine overhaul, including a long block replacement, new wiring, and other critical services, to continue efficient operations of the cogeneration system. A "long block" replacement includes overhaul of the core engine, refurbished crankcase, refurbished crankshaft, new camshaft, new bearings, new pistons, new cylinder heads, new turbocharger, new intercooler, new exhaust manifold, new ignition system and gas mixer, among other parts and is essentially an entire engine re-build.

Staff received a quote from Western Energy Systems in the amount of \$507,710 for the 60,000-hour service. An additional \$50,790 (or 10% of the contract amount) is requested for administrative change orders in the event additional funds are needed for unforeseen conditions and changes during the overhaul, for a total not-to-exceed amount of \$558,500.

Staff is requesting single source approval for Western Energy Systems to perform the engine overhaul and other recommended milestone replacements for the following reasons:

- Western Energy Systems is the only authorized and certified parts and service provider for all Jenbacher products on the West Coast.
- Western Energy Systems provides a warranty on Jenbacher products and services. Work and products supplied by non-authorized and non-certified providers void the manufacturer's warranty.
- Western Energy Systems is familiar with the WPCF as they installed and commissioned the cogeneration engine in 2014 as part of the Cogeneration Upgrade Project. Western Energy Systems also performs quarterly maintenance to the cogeneration engine.

- Western Energy Systems focuses solely on repair and maintenance of Jenbacher engines and are highly qualified for this specialized work.
- The recommended improvements are highly specialized and complex. The engine overhaul requires for the engine to be shipped to Jenbach, Austria, where the engine was manufactured, to be stripped down and fully serviced with specialized machinery. Western Energy Systems would then reinstall the engine at the WPCF, modify the engine controller cabinet and wiring system, perform vibration and performance testing, and commission and start up the engine. Only Jenbacher authorized service providers have the expertise to perform the required complex services.
- The engine overhaul is more cost effective than running the engine to failure and purchasing a new engine. Based on the 2014 cost to purchase the cogeneration engine (\$1,508,434), and assuming a 10-year operational life under continuous operating conditions, it is estimated that a replacement cost of \$2.6 million would be required (in 2024 dollars) for the City to purchase and install a new engine. In addition, the replacement engine may take a year for procurement and installation. An estimated \$750,000 in PG&E energy charges would be incurred while the existing engine is out of service and a new engine is ordered and installed.

ECONOMIC IMPACT

The community will enjoy the benefits of the Project, including maintaining effective treatment that provides environmental protection of the San Francisco Bay. In addition, the energy produced from the cogeneration engine is sufficient to meet the WPCF's energy demands as well as surplus energy that generate PG&E savings through the Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT), which allows energy credits to be applied to other City facilities.

FISCAL IMPACT

The FY22-31 Capital Improvement Program (CIP) includes sufficient funding for the project in the Sewer Improvement Fund (Fund 612), Project 07679 Cogeneration System Maintenance. The Sewer Improvement Fund is an enterprise fund and does not receive any contributions from the General Fund.

STRATEGIC ROADMAP

This agenda item supports the Strategic Roadmap of Invest in Infrastructure and Confront Climate Crisis and Champion Environmental Justice.

SUSTAINABILITY FEATURES

The cogeneration process enables for biogas generated at the WPCF's digesters to be captured as part of the treatment process to be utilized as fuel. Methane is a major component of biogas, and biogas, which is a by-product of wastewater treatment, is considered a renewable energy resource. The WPCF utilizes biogas to fuel the cogeneration

engine to provide renewable energy and reduce the need to purchase energy. The upgrades will help the City maintain its ability to produce green energy off-setting the need to purchase power. The cogeneration process also protects the environment by beneficial reuse rather than flaring (burning) it off as a large open-flare.

PUBLIC CONTACT

All project work will be within the WPCF plant boundary and should have no impact on area businesses or the public at large; therefore, no public contact is necessary for this project.

NEXT STEPS

If Council approves, staff will work with the City Manager to execute the single source agreement with Western Energy Systems.

Prepared by: Mariza Sibal, Associate Civil Engineer

Reviewed by: Suzan England, Senior Utilities Engineer
Dan Magalhaes, WPCF Maintenance Supervisor

Recommended by: Alex Ameri, Director of Public Works

Approved by:



Kelly McAdoo, City Manager