

CITY OF SANTA ROSA
BOARD OF PUBLIC UTILITIES

TO: CHAIR AND BOARD MEMBERS
FROM: PETER MARTIN, DEPUTY DIRECTOR WATER RESOURCES,
SANTA ROSA WATER
SUBJECT: APPROVAL OF PROPOSED AGREEMENT FOR REMOVAL OF
MICROGRID DEMONSTRATION PROJECT BATTERY,
TRANSFORMER, AND INVERTER AT THE LAGUNA
TREATMENT PLANT

AGENDA ACTION: Motion

RECOMMENDATION

It is recommended by Santa Rosa Water staff that the Board of Public Utilities, by motion, approve the Right of Entry and Access Agreement for Removal of Battery, Transformer, and Inverter at the Santa Rosa Laguna Treatment Plant between the City of Santa Rosa and Trane U.S., Inc.

EXECUTIVE SUMMARY

In June 2017, Santa Rosa Water entered into an agreement with Trane U.S., Incorporated (Trane) for the design, install, and operation of a microgrid demonstration project (Project) to be sited at the Laguna Treatment Plant (LTP), which was funded by a \$5 million grant from the California Energy Commission (CEC) to Trane. The Project was intended to demonstrate the use of microgrids paired with renewable energy and test the viability of delivering power to the day ahead energy market as a potential revenue source for Santa Rosa Water. Although the Project components were shown to be functional, Trane discovered that Pacific Gas & Electric Company (PG&E) would not approve the inverter installed by Trane as it did not meet PG&E's interconnection and certification requirements. Therefore, PG&E would not allow the Project to connect to PG&E's system. Also, after additional study, revenue opportunities related to the day ahead energy market were deemed to be very limited.

Santa Rosa Water staff and Trane have agreed the best solution is to terminate the microgrid project. Trane has agreed to perform all work related to removal of the battery, transformer, and inverter installed at the LTP at no cost to Santa Rosa Water.

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The Board of Public Utilities will consider approval of the Agreement between Trane and the City of Santa Rosa for Removal of the Microgrid Demonstration Project Battery, Transformer, and Inverter at the LTP.

BACKGROUND

In response to a 2014 CEC grant solicitation for demonstrating microgrid technologies, Trane, with approval from the City Council, submitted a grant application and listed the LTP as the proposed microgrid demonstration project site. Trane's application was accepted, and in April of 2015, Trane entered into an agreement (EPC14-059) with the CEC for a \$4,999,804 grant with \$2,200,000 in matching funds for implementation of the Project. The objective of the grant was two-fold: (1) fund the development and testing of an advanced microgrid that utilizes renewable electricity and battery energy storage, and (2) demonstrate how advanced microgrids can enable participation in ancillary services "day-ahead" energy markets, such as being able to schedule a demand reduction during critical times, in advance and generate a revenue source for the LTP operations.

In June 2017, the City of Santa Rosa (City) and Trane formally entered into an agreement that allowed for Trane to complete the design and construction of the pilot Project and begin collecting data for the CEC. The Project consisted of (1) the installation of a new 2-Mwh energy storage battery and microgrid controls, (2) the installation of two Selective Catalytic Reducer (SCR) units on two of the existing Cummins Combined Heat and Power (CHP) engines, and (3) the installation of a 125-kw Photovoltaic (PV) parking canopy system.

As part of the agreement, the City agreed to provide Trane with \$750,000 in matching funds to support the design and installation of one of the SCR units. With the matching funds, the City obtained two SCR units while only providing a capital investment equivalent to the installation of one unit. The new SCR units addressed operational capacity constraints in the four CHP engines resulting in improved on-site generation of power. The PV system installed as part of the Project also enhanced opportunities for renewable on-site generation as part of the pilot microgrid system. These three elements of the Project were proposed to work in tandem to evaluate the potential revenue generating opportunities for the LTP through the California Independent System Operator (CAISO) "day-ahead" load nomination market, known as flexible resource adequacy criteria and must offer obligations.

Upon completion of construction, testing startup for the pilot Project was delayed, mostly due to response and recovery from the Tubbs Fire. In 2019, Trane's contractor began on-site testing and simulations that occurred for 30 days. These simulations proved the microgrid could deliver power to the "day-ahead" market consistent with the Project scope of the CEC grant. Trane eventually submitted a full report to the CEC in fulfillment of their grant obligations. The report summarized the Project's operations and identified opportunities and operational constraints for pairing wastewater treatment facilities with microgrid enhancements for demand response and delivery of energy to the grid. The

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report did identify that there were potential limited opportunities for scheduling deliveries to the CAISO “day-ahead” and “spot” markets.

Subsequently, Santa Rosa Water partnered with UC Davis to provide a third-party evaluation of “day-ahead” and “real-time” market opportunities for the Project. The UC Davis evaluation of the Proxy Demand Resource Program offered by CAISO showed that the LTP could shift energy load and generate savings of 1% to 7% in energy costs (2017 dollars) through a combination of demand response programs. However, the UC Davis study also noted that shifting energy loads at LTP while still meeting regulatory and treatment plant operation requirements would reduce the opportunities for “day-ahead” scheduling.

Over the past few years, the LTP has participated in the Base Interruptible Program (BIP) offered by PG&E, which is intended to provide load reduction on PG&E's system on a “day-of” basis when CAISO issues a curtailment notice as grid demands near capacity. LTP Operations staff are notified when CAISO is looking for demand reductions (about 30 minutes notice). Because participation in the program is 100% optional, LTP operations staff can then decide whether to commit to lowering the energy load below a pre-designated level in exchange for incentives. LTP Operations staff has established operational changes that can be instituted for several hours when the BIP event is occurring, and quarterly revenue is received when LTP participates in qualifying events. Over the past year, about \$13,000 per quarter has been received through participation in the BIP. The 100% flexibility for participation in the program is appealing for ensuring continuity of operations at the LTP.

In the intervening time, Trane worked with PG&E to achieve full interconnection with the grid. However, after several discussions between Trane and PG&E, it became clear that PG&E would not accept full interconnection due to the incompatibility of the existing inverter design. Thus, full interconnection is not possible without significant capital investment to achieve PG&E's standards for the inverter. The CEC grant funds distributed to Trane have been fully exhausted and no additional funding is available from Trane or Santa Rosa Water for the Project.

Given what the parties know now, Santa Rosa Water staff and Trane have agreed the best solution is to terminate the Project and pursue decommissioning of certain elements. Trane has agreed to perform all work related to removal of the battery, transformer, and inverter installed at the LTP at no cost to Santa Rosa Water. The attached agreement between Trane and the City of Santa Rosa for Removal of the Microgrid Demonstration Project Battery, Transformer, and Inverter at the LTP will achieve the outcomes necessary to decommission the project and return the facilities to appropriate conditions.

PRIOR BOARD OF PUBLIC UTILITIES REVIEW

On October 21, 2014, the City Council, by motion, authorized the mayor to sign a letter to the California Energy Commission authorizing Trane, through Rockwood Consulting,

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to list the Laguna Treatment Plant as a proposed Microgrid Project Demonstration site.

On December 17, 2015, the Board participated in a study session that gave an overview of how renewable energy sources (namely wind and solar) cause fluctuations in the grid and how the installations of microgrids throughout the system could help stabilize the grid. The presentation also described what a microgrid consists of and how the LTP could function as an advanced microgrid.

On February 23, 2016, the Council, by motion, approved an NDA between Trane and the City for development and implementation of the Project and delegated signature authority to the Director of Santa Rosa Water. The Director of Santa Rosa Water subsequently signed the NDA.

On June 1, 2017, the Board approved the Agreement for the Design, Installation, Operation and Ownership of a Microgrid Demonstration System at the Santa Rosa Laguna Treatment Plant between Trane and the City of Santa Rosa (Agreement) and delegated signature authority to the Director of Santa Rosa Water to approve subsequent agreements related to the Agreement.

ANALYSIS

Project efforts have resulted in several improvements at LTP including installation of two SCRs for the capital cost of one, plus the addition of an operational PV system at the LTP Administration Building parking area. With no additional funding available, and interconnection with PG&E's system requiring significant additional capital investment, Santa Rosa Water staff and Trane are recommending a decommissioning and removal of certain elements of the Project. The ongoing operation and maintenance of the non-operational battery and microgrid controller is estimated to be \$25,000 annually.

Trane has agreed to perform all work related to removal of the battery, transformer, and inverter installed at the LTP at no cost to Santa Rosa Water. Significant industry understanding of microgrid technology and its compatibility with wastewater treatment facilities was gained through this pilot Project.

As noted above, in the time that has elapsed since the components of this Project were first installed, Santa Rosa Water has participated in other demand response programs that were subsequently developed (such as PG&E's BIP), which have offset some LTP operational costs. Santa Rosa Water will continue to evaluate opportunities to pursue green energy projects at LTP, including scaled microgrids, to reduce operational costs and improve reliability in the face of climate change.

FISCAL IMPACT

The work by Trane included in the proposed agreement is at no cost to Santa Rosa Water. Approval of this agreement does not have a fiscal impact on the Regional Wastewater Enterprise Fund.

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ENVIRONMENTAL IMPACT

This project has been reviewed in accordance with the California Environmental Quality Act (CEQA) and is presumed to be categorically exempt pursuant to CEQA Guidelines Section 15301 and 15303 as the Project consists of a minor alteration of an existing public sewerage facility involving no expansion of existing use.

BOARD/COMMISSION/COMMITTEE REVIEW AND RECOMMENDATIONS

On April 24, 2017, the Contract Review Subcommittee reviewed the project background and a proposed agreement for Design, Installation, Operation and Ownership of a Microgrid Demonstration System at the Santa Rosa Laguna Treatment Plant between Trane and the City of Santa Rosa, and recommended that the Board approve the Agreement, and authorize the Director of Santa Rosa Water to execute associated operational agreements.

NOTIFICATION

Not applicable

ATTACHMENTS

- Attachment 1 - Right of Entry and Access Agreement for Removal of Battery, Transformer, and Inverter at the Santa Rosa Laguna Treatment Plant

PRESENTER

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