



**Yamabe & Horn  
Engineering, Inc.**  
CIVIL ENGINEERS • LAND SURVEYORS

ATTACHMENT 3  
2014 WATER-ENERGY GRANT PROGRAM  
2014 ORANGE COVE WATER-ENERGY EFFICIENCY PROJECT  
WORK PLAN

**Summary:**

The City of Orange Cove Water-Energy Efficiency Project will provide both water savings as well as energy savings. This can be accomplished with two proposed projects that City is putting forth in the grant application. The first is a rebate program to replace old toilets, shower heads and bathroom faucets with WaterSense® (Meets EPA Criteria) low flow toilets, shower heads, bathroom faucets and also repair/replace leaking kitchen sink faucets in residential units only.

The second part of the project is to replace old single speed booster pumps, supplying domestic water from the City's Water Treatment Plant, with premium-efficiency motors that are controlled by variable speed drives to significantly reduce electrical energy consumption. Single speed motors/pumps constantly turn off and on during peak water demands using energy inefficiently.

**Toilet/Showerhead/Faucet Rebate Program:**

Task1 – Advertise Program & Conduct In-home Evaluations.

Prepare notice and distribute rebate program to residents of the City of Orange Cove. City to advertise program to residents by including notice in the monthly billing for water and sewer service. The City of Orange Cove will include noticing the program with monthly water bills for 3 to 6 months (depending on public response/applications).

The City will provide home evaluations to check for flow rates and leaks of existing toilets, existing showerheads and existing faucets.

Toilets with flow rates equal to or greater than 1.6 gallons per flush eligible for rebate at full cost of a new low flow (1.28 gallons per flush or less) WaterSense® labeled toilet, including installation costs by a licensed plumbing contractor.

Showerheads with flow rates equal to or greater than 2.5 gallons per minute eligible for rebate at full cost of a new low flow (2.0 gallons per minute) WaterSense® labeled showerhead, including installation costs by a licensed plumbing contractor.

Bathroom faucets with flow rates equal to or greater than 2.2 gallons per minute eligible for rebate at full cost of a new low flow (1.5 gallons per minute) WaterSense® labeled bathroom faucet, including installation costs by a licensed plumbing contractor. Kitchen sink faucets will be evaluated for leaks and if a repair or replacement is appropriate under the rebate program.

The program is limited to residents of the City of Orange Cove that are using water provided by the City of Orange Cove. Work must be performed by a licensed plumber (see Task 2) to be eligible for a rebate.

#### Task 2 - Licensed plumber certification

Rebate program will specify the use of licensed plumbers, licensed by the California Department of Consumer Affairs Contractors License Board in good standing. City will include a list of licensed plumbers, with a current City of Orange Cove business license, when noticing of the program.

#### Task 3 - Verification

Resident will need to provide receipt from the licensed plumbing contractor, from Task 2, that included the cost of the new WaterSense® toilet/showerhead/faucet along with the installation cost. Rebates will have a maximum amount eligible for fixture costs and installation labor costs. The City of Orange Cove will inspect the installed fixtures to insure compliance with the rebate program. Rebate check will be issued after City has determined the fixtures and work is completed to the satisfaction of the program.

## **Water Treatment Plant Booster Pump Motor replacement and Variable Frequency Drive Installation:**

### Task 1: Prepare Plans, Specifications and Engineer's Estimate

Select electrical engineer consultant to prepare plans, specification and engineering's estimate to replace the city's existing single speed electric booster pump motors.

Booster Pump #1....30hp (460 Volt, 3 phase)

Booster Pump #2....50hp (460 Volt, 3 phase)

Booster Pump #3....75hp (460 Volt, 3 phase)

The replacement electric motors will be the same horsepower and will specify premium efficiency electric motors and with variable frequency drives so that the new electric motors can vary the speed based on the water demand. Booster Pump #4 is an existing 75hp electric motor controlled by a variable frequency drive and will not be replaced due to the existing variable speed operation of this pump/motor. The current supervisory control and data acquisition (SCADA) system uses booster pump #4 as the primary pump will start addition booster pumps #1, then #2 and then #3 after each previous pump reaches capacity. If the demand for water exceeds the capacity for booster pump #4 but not with both booster pumps #1 & #4, the system will cycle booster pump #1 off and on. This is the same when the extra demand is needed for pumps #2 & #3. The on and off cycling of the single speed motors requires additions electricity demands than a electric motor that can vary the speed to match the demand while running at or below maximum power (if connected to VFD).

### Task 2: Award Construction Contract

The City of Orange Cove will advertise project for contractors to bid on project using that plans and specifications prepared in Task 1.

The City of Orange Cove will award construction contract to lowest responsible bidding contractor by the City Council. Contracts will be issued and executed before any construction work begins

### Task 3: Construction

Once the construction contract is awarded and contracts are executed by the contractor and the city, the City Engineer will hold a pre-construction meetings outlining what is required in the contract and in the plans and specifications.

The contractor will need to submit the specification of the equipment to be installed to the City Engineer who will insure that the proposed equipment meets the specifications of the contract. Once the equipment submittals are approved, the contractor will be given a reasonable amount of time to order the materials and equipment. The contractor will be given a notice to proceed and will be given a specific number of days to complete the installation of the booster pump electric motors and variable frequency drives for each of the new premium-efficiency electric motors. The VFD's shall be installed in the existing motor controller building.

The City Engineer and Water Treatment Plant chief operator will provide periodic inspection of the contractors work to insure compliance with the contract, the plans and the specification.

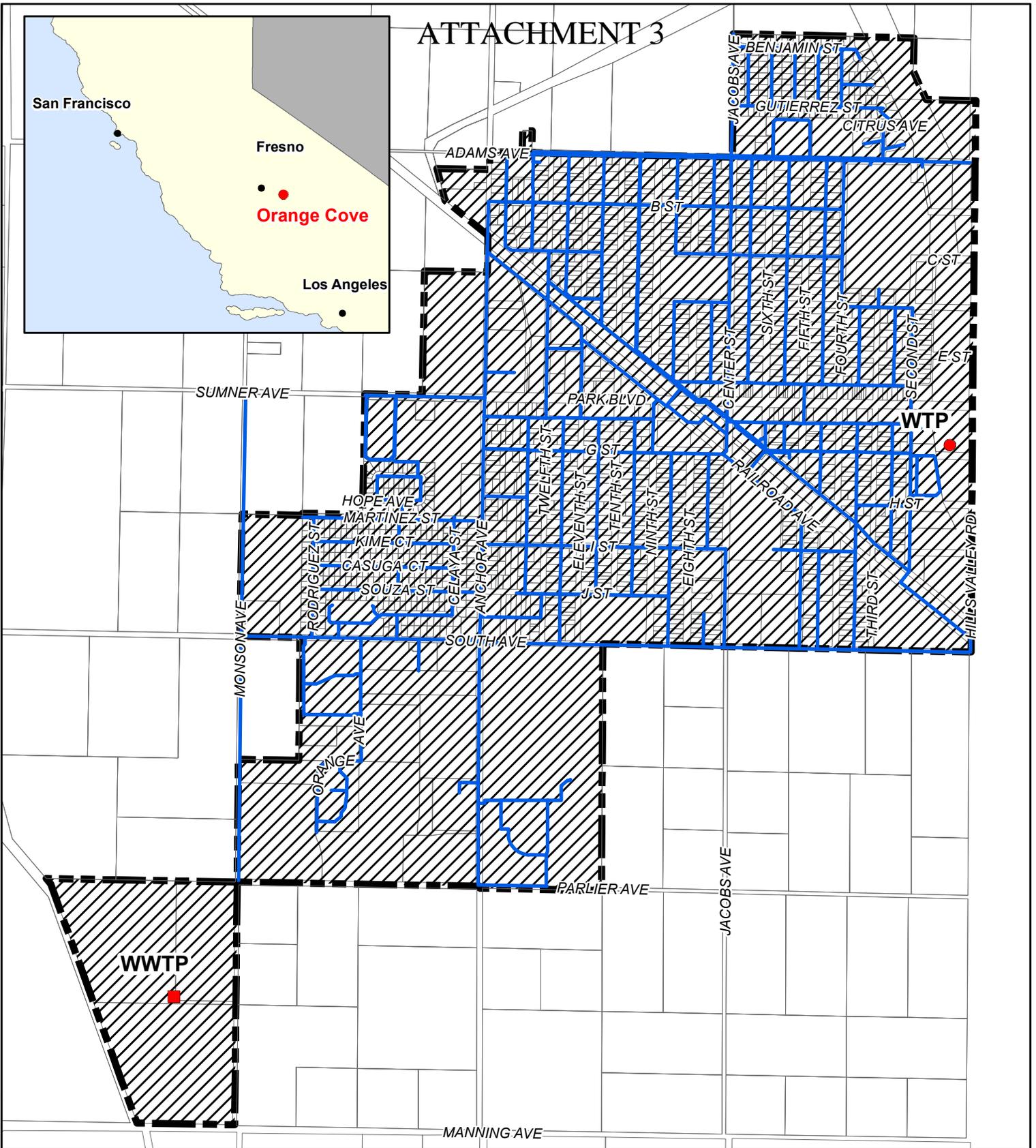
#### Task 4: System Testing & Operations

Part of the contract will be to integrate the three new electric motors and VFD's with the City's Water Treatment Plant SCADA system. The contractor will be required to test each new booster pump and associated VFD to insure each component functions as specified and that all of the components function together within the system.

The contractor will update the WTP operations manual to include the new equipment and also provide as built drawings to the City.

The City Engineer and Water Treatment Plant chief operator will insure that everything is working and in proper order and the City will accept the work, make final payments to the contractor and close out the contract per state laws.

# ATTACHMENT 3



## 2014 Water Energy Grant System Map

- Water\_Mains
- Benefit Area/ City Limits/ Project Area

Total Benefit Area = 50,482,596 sq ft  
DAC Benefit Area = 50,482,596 sq ft (100%)

