

SECTION 1 – PROJECT UNDERSTANDING

EXISTING SYSTEM DESCRIPTION

Chiriaco Summit Water District (the District) is a county water district (Water System No. 3301115), organized in accordance with the State of California County Water District Law (California Water Code Section 30000 *et seq.*). The District serves approximately 50 residents through approximately 22 residential service connections in the unincorporated community of Chiriaco Summit in Riverside County, California. The water system also has four commercial service connections (a coffee shop, a Chevron gas station and food mart, a classic car garage, and the General George S. Patton Memorial Museum) which provide services for local residents and the traveling public along Interstate 10.

In accordance with a water purchase agreement amongst the District, The Metropolitan Water District of Southern California (Metropolitan), and the State of California acting by and through its Department of Transportation (Caltrans), the District withdraws water from the Colorado River Aqueduct using a siphon. The withdrawn water flows by gravity via a 3-inch diameter PVC supply pipeline to a valve which can direct the water either to a 300,000 gallon raw water open reservoir or to a 35,000 gallon bolted steel tank. The valve is usually set to direct water to the 300,000 gallon raw water open reservoir. If District personnel decide to direct the water to the 35,000 gallon bolted steel tank to provide additional storage, the tank can later be emptied into the reservoir if necessary.

From the 300,000 gallon raw water open reservoir, the water flows by gravity through a 3-inch diameter pipeline to a water treatment plant for treatment.

The water treatment plant consists of sand filters followed by a 50 gallon per minute (gpm) prepackaged, hollow-fiber, continuous microfiltration treatment plant followed by disinfection facilities. After treatment and disinfection, the water enters two 5,000 gallon treated water storage tanks. From there, the water is pumped to a 1,000 gallon hydropneumatic tank before entering the domestic water distribution system.

Additionally, a 1,500 gpm, 50 horsepower (hp) diesel engine driven fire pump is located adjacent to and connected to a 12-inch diameter pipeline which is situated within the commercial and residential areas downstream of the 300,000 gallon raw water open reservoir to provide the necessary flow and pressure to serve fire hydrants and a fire service in the commercial area. A schematic diagram of the existing system is presented in **Figure 1** at the end of this section.

NEED FOR ACTION

The District's water system facilities are antiquated, and its single water source (the Colorado River Aqueduct) is subject to lengthy service interruptions. Further, the District's water system facilities are in need of improved security.

➤ Storage Capacity

The District's only water supply source, the Colorado River Aqueduct (CRA), has regularly experienced biennial service interruptions (outages) for routine maintenance, repairs, quagga mussel removal, electrical testing, and upgrades. During the period from 2009 to 2015, outages have typically lasted approximately 3 weeks; however, one outage lasted 30 days.

In addition to typical operational storage, the District's water system does not have adequate storage capacity to meet Riverside County Fire Department fire flow duration standards. The water system has an existing fire pump, hydrants, and fire service connection that were installed previously; however, the system is in need of additional storage to provide adequate fire flow duration.

➤ Deteriorated and Dysfunctional Facilities

Some facilities in the District's existing water supply system are so deteriorated, dysfunctional, and out of code compliance that they are in need of rehabilitation, modification, or replacement.

Chiriaco Summit Water District Water System Improvement Project

The existing 300,000 gallon raw water open reservoir, when originally constructed in the 1930s, was intended to be a temporary facility for use during CRA construction, but it has become a permanent facility in the District's water system.

The existing 2-inch thick gunite lining has cracked and deteriorated over the years, exposing wire mesh and requiring the cracks to be patched. In addition, the reservoir embankment is vulnerable to failure if the overflow outlet becomes clogged or the overflow pipe fails. The overflow pipe has failed in the past, causing significant erosion and costly repair of the reservoir embankment.

Prevailing winds, which can reach velocities as high as 50 to 60 miles per hour, carry silt, sand, and organic matter to the reservoir, and sunlight and high temperatures facilitate the growth of algae and other aquatic organisms in the reservoir. Additionally, the reservoir attracts waterfowl, which can further contaminate the raw water. All three of these factors adversely affect water treatment operations.

The 35,000 gallon water storage tank is very old, in poor condition (it is corroded and it leaks), of inadequate capacity (it does not provide adequate operational storage capacity), and does not meet current seismic design requirements. The interior protective coating and the exterior protective paint have failed, and the steel floor, shell, and roof plates have rusted through. The tank coating and paint undoubtedly contain components, such as volatile petroleum hydrocarbons and lead, which are no longer permitted and constitute potential public health hazards.

The existing booster pumping units and the hydropneumatic pressure tank and associated equipment are not entirely compatible with the water treatment plant and its operation.

The booster pumping units operate individually and without compatible backup or standby units; they do not alternate automatically and can be only operated separately, not in combination.

The 1,000 gallon hydropneumatic pressure tank was a used vessel when it was installed 25 or more

years ago, and it has no identification nameplate indicating manufacturer, date of fabrication, compliance certification, or pressure limits. It appears to be uncertified but is reportedly rated 75 pounds per square inch (psi). Said tank is old, does not meet code, and its interior condition, while unknown, is likely in poor condition.

➤ Water System Security

The District's water supply system is in need of improved security. The water treatment plant, engine driven fire pump, and related facilities are currently situated in a location that was intended to be temporary. The location is unfenced and within the community's commercial and residential area. The facilities are accessible to residents and the general public, including children. The existing 300,000 gallon open reservoir site is also unfenced. Although the existing open reservoir is encircled by a perimeter fence, the fencing is damaged and in need of repair or replacement.

PROJECT UNDERSTANDING

The District is in the process of completing a Safe Drinking Water State Revolving Fund Application for Construction Funding (funding application). The District is currently working with Krieger & Stewart, the State Water Resources Control Board Division of Financial Assistance (SWRCB), and California Rural Water Association to complete the funding application.

The Technical Package portion of the funding application requires an agreement for professional engineering services. This proposal has been prepared as an attachment to said agreement, a copy of which will be provided to the SWRCB to complete the Technical Package.

The funding application, once approved by the SWRCB Division of Financial Assistance, is expected to provide grant funding for construction of the project, which is summarized below and described in additional detail in the project engineering report, dated March 2017.

Chiriaco Summit Water District Water System Improvement Project

The project consists of the following:

- Installation of security fencing (chain link perimeter fence with a double swing vehicle access gate, a single pedestrian gate, and three strands of barbed wire) around the perimeter of the water plant site (5-acre site);
- Installation of a new metal building to house water supply facilities (consisting of relocated treatment system, relocated fire pump, new raw water and treated water pumping units, new electrical equipment, new roughing sand filters, new surge tanks, new air compressor, and new plant piping);
- Relocation of the existing 50 gpm treatment system (consisting of the pre-packaged micro-filtration system, disinfection system, backwash tanks, and electrical equipment) and the existing 1,500 gpm, 50 hp engine driven fire pump (consisting of the fire pump, fuel storage tank, and pressure control systems) to the new metal building within the water plant site;
- Installation of new potable or treated water facilities (consisting of new raw water and treated water pumping units, new electrical equipment, new plant piping, new roughing sand filters, new surge tanks, new hydropneumatic tank, new air compressor, and new plant piping within the water plant site) for domestic water service;
- Rehabilitation of the existing 300,000 gallon raw water open reservoir (consisting of gunite recoating, new inlet facilities, new overflow facilities, and new floating cover);
- Installation of a new 500,000 gallon treated water steel storage tank within the water plant site for potable or treated water storage (operational storage, fire protection storage and emergency [CRA outage or power supply outage] storage); and
- Demolition, removal, and disposal of existing 35,000 gallon bolted steel tank.

A preliminary site plan depicting the proposed facilities is provided in **Figure 1** herein.

Krieger & Stewart proposes to provide engineering services under the construction grant, which will include final project design, preparation of plans and specifications, contract administration (including bidding assistance), construction inspection, and assistance with preparation of a full Technical, Managerial, and Financial (TMF) Assessment, as described in the Scope of Services included in **Section 2**.

