Attachment 1

Brelje & Race
CONSULTING ENGINEERS

# Sunrise Shore Mutual Water Company
# Compliance and Sustainability Project Description
**April 14, 2021**

Sunrise Shore Mutual Water System is a small State-regulated private water system that serves residential properties located along the north end of Sunrise Drive in Lower Lake. The water company has received funding for a planning grant from the Division of Drinking Water for a comprehensive evaluation of the existing water system for the purpose of identifying system deficiencies; summarizing alternatives to correct the deficiencies and estimating associated project costs; a hydrogeology study evaluating the siting of a second water supply well; construction of a second water supply well for reliability purposes; preparation of plans and specifications for the selected improvement project; and obtaining a Use Permit for the improved water supply, treatment and storage facilities.

As a result of the system assessment, that included identification and analysis of project alternatives, the following improvements are being proposed to ensure that the water system complies with current State Drinking Water regulations, to enhance local fire protection, and ensure that the system operations are economically viable.

## Source Improvements

Currently inactive Wells 01 and 02, located at the well site, will be properly abandoned to prevent contamination of the aquifer as directed by the State Water Resources Control Board, Division of Drinking Water. Well destruction permits will be obtained from the County of Lake and the wells must be destroyed in accordance with the California Department of Water Resources Well Standards Bulletins 74-81 and 74-90. The well slab of Well 02 shall be removed.

## Treatment Facility Improvements

The existing treatment equipment at the well site will be replaced with new enhanced treatment. The proposed replacement treatment facilities will include two cone bottomed tanks (one for raw water aeration and the other for backwash water settling and recycling) and a new wood frame building (10' by 14') that will house replacement treatment equipment consisting of an iron and manganese removal package plant and disinfection equipment.

***Aeration System***
The aeration system for pH adjustment will consist of spray aeration within a 3,000-gallon poly cone-bottomed tank. The cone-bottomed tank will allow for easy removal of settled oxidized iron particles. The tank will be installed on a concrete slab behind the building with seismic hold downs. Chlorinated water will enter the tank through an inlet pipe at the top of the tank and be dispersed through a spray nozzle. The spray nozzle will be located to achieve optimal aeration and so that the nozzle is easily accessible for maintenance. A small blower will be installed on the tank to facilitate air circulation. Circulation of the interior tank atmosphere is necessary to continually permit carbon dioxide to be released from the groundwater during aeration. The outlet will be located to provide room for settling of iron and manganese and for additional contact time between the water and chlorine. A booster pump will convey water from the aeration tank through the filtration system and into the finished water storage tanks.

***New Package Plant***
The package plant is anticipated to consist of five (14-inch) powder-coated steel filter vessels, all installed on a skid platform. The final treatment skid vessel configuration will be based on pilot testing to be completed by treatment manufacturer. The filters contain a proprietary oxidizing media developed to oxidize iron and manganese at a high rate. The life of the media depends on the maintenance and loading rates. The control valves are integrated into the filter skid. Due to freezing in the area during winter, pneumatically actuated valves will be used. Use of pneumatic valves will require installation of a small-scale air compressor to actuate the valves.

The treatment system will operate in a downward flow direction. Backwash occurs such that one filter vessel is taken offline at a time for backwashing and the remaining units produce water for the vessel put into backwash mode.

Replacement of the filter media depends on the quality of water filtered and maintenance of the filters. According to the manufacturer, the media typically lasts 15-20 years. As the existing well has high iron and manganese concentrations, the filter media life is expected to be on the shorter end of the range. The proposed filter sizes would require removal and disposal of approximately 15-30 cubic feet of media. Media may be disposed to a general landfill after removal from the filters. Replacement media would be delivered to the site via a small delivery truck.

***Backwash Water Recycle System***
Backwash water from the package plant will be sent to a 6,000-gallon poly cone-bottomed 'decant' tank where the solids liberated from the backwash process will settle before the backwash water is recycled into the treatment system.

Based on a sludge accumulation rate of 0.5 cubic feet per day, the iron and manganese sludge will need to be removed at least every two years. Sludge is anticipated to be removed through the bottom of the cone-bottom tank using a septic hauling truck and disposed of to a wastewater treatment facility.

**Storage Improvements**

The two existing leaking 15,000-gallon redwood storage tanks and concrete pads will be removed from the tank site and properly disposed of. The existing 5,300-gallon poly tanks will be temporarily retained to provide temporary storage during construction of the new storage tanks. The poly tanks will be relocated to a temporary onsite gravel pad and be connected via temporary flexible piping to the existing transmission main from the current treatment plant and to the distribution system. The poly tanks will either be salvaged or disposed of after the proposed tanks are placed in service.

Two bolted-steel tanks are proposed to be erected at the tank site in the area where the existing tanks currently reside. Each tank will have a capacity of approximately 45,000 gallons and be 21.5 feet in diameter with a side shell height of 20.1 feet. Each tank will be anchored to a concrete ring wall foundation in accordance with the current Building Code. Site work will include excavation and removal of approximately 3 feet of soil to expand the tank pad size. A retaining wall will be constructed along the base of the slope and the rear of the existing pad so that the existing slope will remain undisturbed. The tanks will be designed and constructed in accordance with State Standards. Wherever possible, tank appurtenances will be located on the east side (rear or slope side) of the tanks to reduce any visual impacts to the public.

## Miscellaneous Improvements

To reduce operator site visits and help manage the water system more efficiently, a web-based controls/SCADA is proposed to be installed. The system will involve the installation of radio antennas at both the tank and well sites so that tank water level information can be shared with the well site. The radio and instruments that measure tank water level will be powered by a battery system charged by one or more solar panels. The solar system will be relatively small and likely be mounted on one of the tanks.


**TANK SITE – SOUTH VIEW**


**TANK SITE – PLASTIC TANKS**


TANK SITE – ORIGINAL REDWOOD TANKS


**WELL SITE – OVERVIEW**

**WELL SITE ACCESS – SUNRISE COURT**

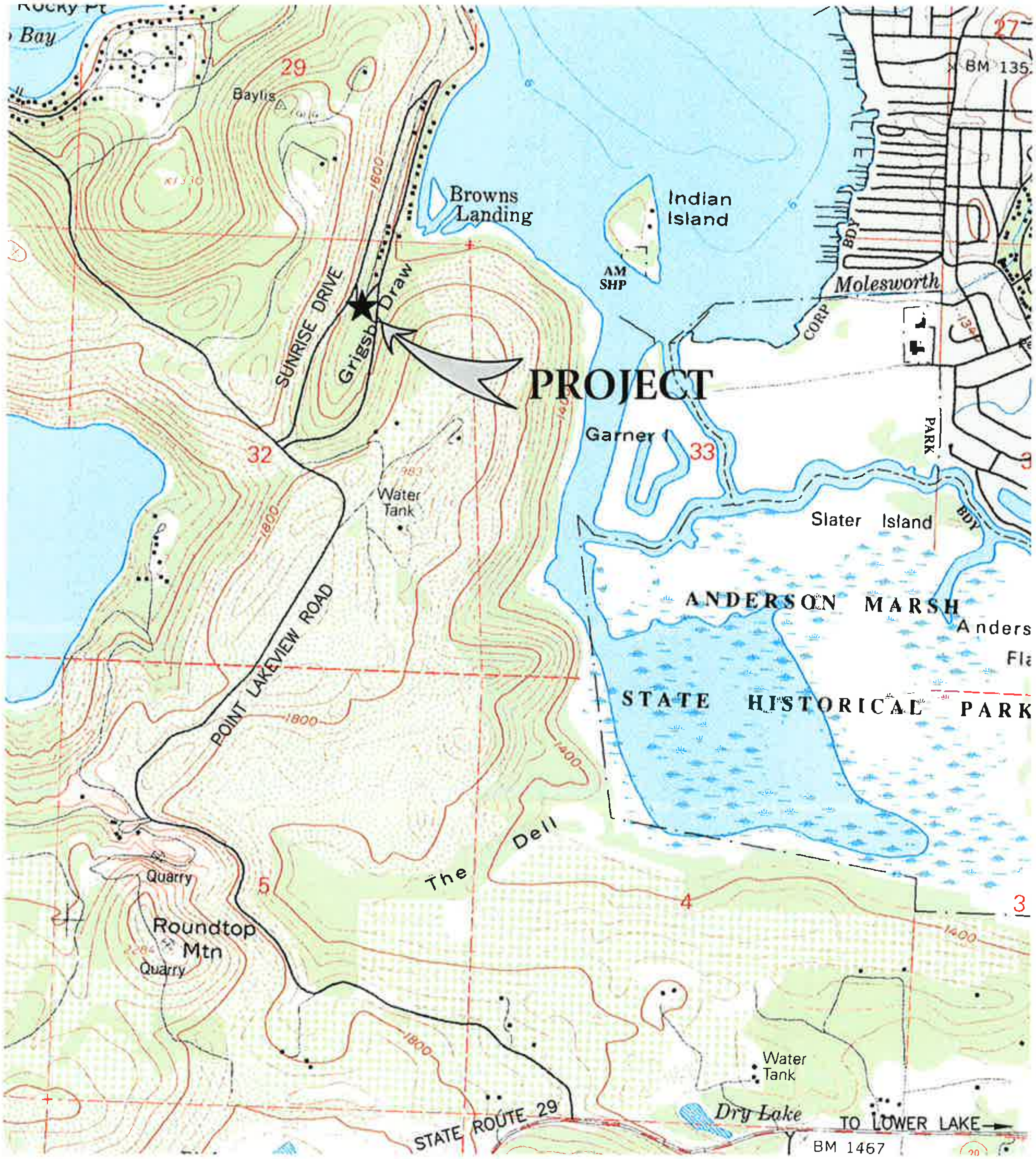
WELL SITE – EXISTING TREATMENT BUILDING

WELL SITE – WELL TO BE ABANDONED

WELL SITE – EXISTING WATER SUPPLY WELL

WELL SITE – BACKWASH STORAGE AND CL2 CONTACT TANKS

WELL SITE – EXISTING TREATMENT BUILDING ENTRY




N

2000 0 2000

SCALE IN FEET

1" = 2000Ft.

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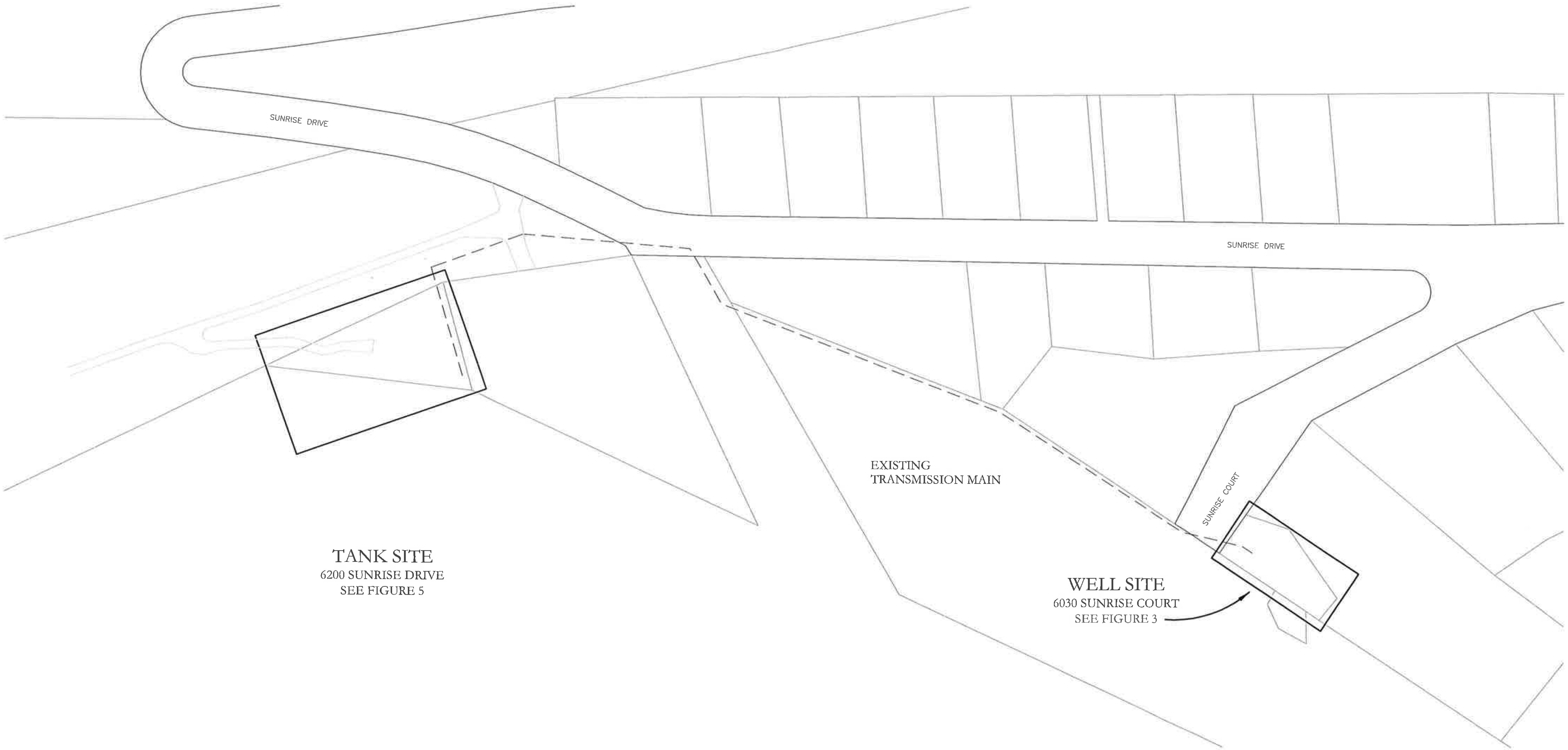
# FIGURE 1

## LOCATION MAP

SUNRISE SHORE MUTUAL WATER COMPANY

APRIL 2021

04-13-21 locey \4268\dwg\4268 00\EXHIBITS\4268.00-EXHIBIT-vicinity map.dwg TAB: VICINITY MAP FOR COUNTY




N

100 0 100

SCALE IN FEET
1" = 100 Ft.

# FIGURE 2

## SITE PLAN FOR WATER SYSTEM IMPROVEMENTS

**SUNRISE SHORE MUTUAL WATER COMPANY**

**APRIL 2021**

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TAB: KEY MAP -FOR COUNTY

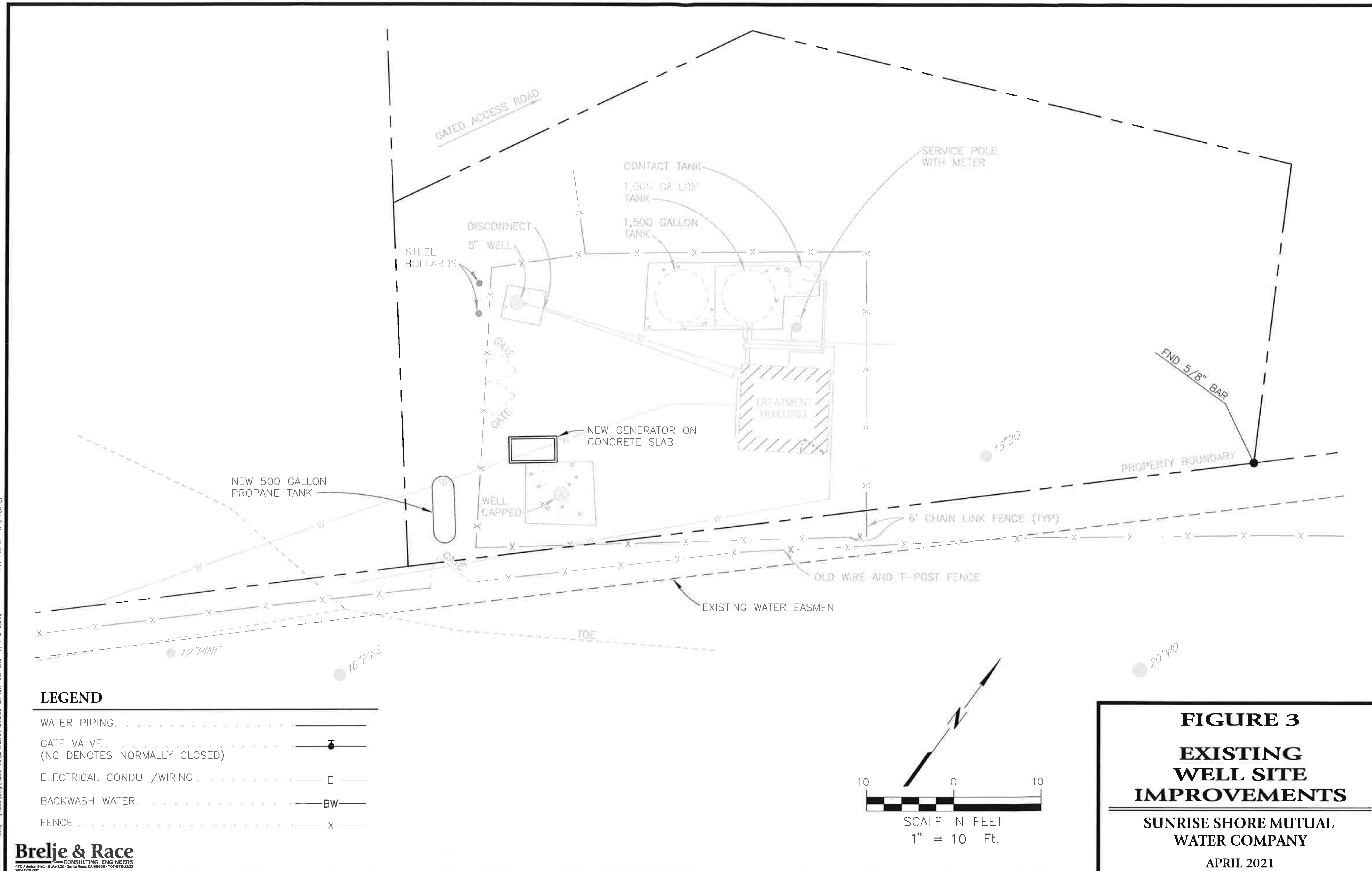



**FIGURE 3**

**EXISTING WELL SITE IMPROVEMENTS**

**SUNRISE SHORE MUTUAL WATER COMPANY**

**APRIL 2021**

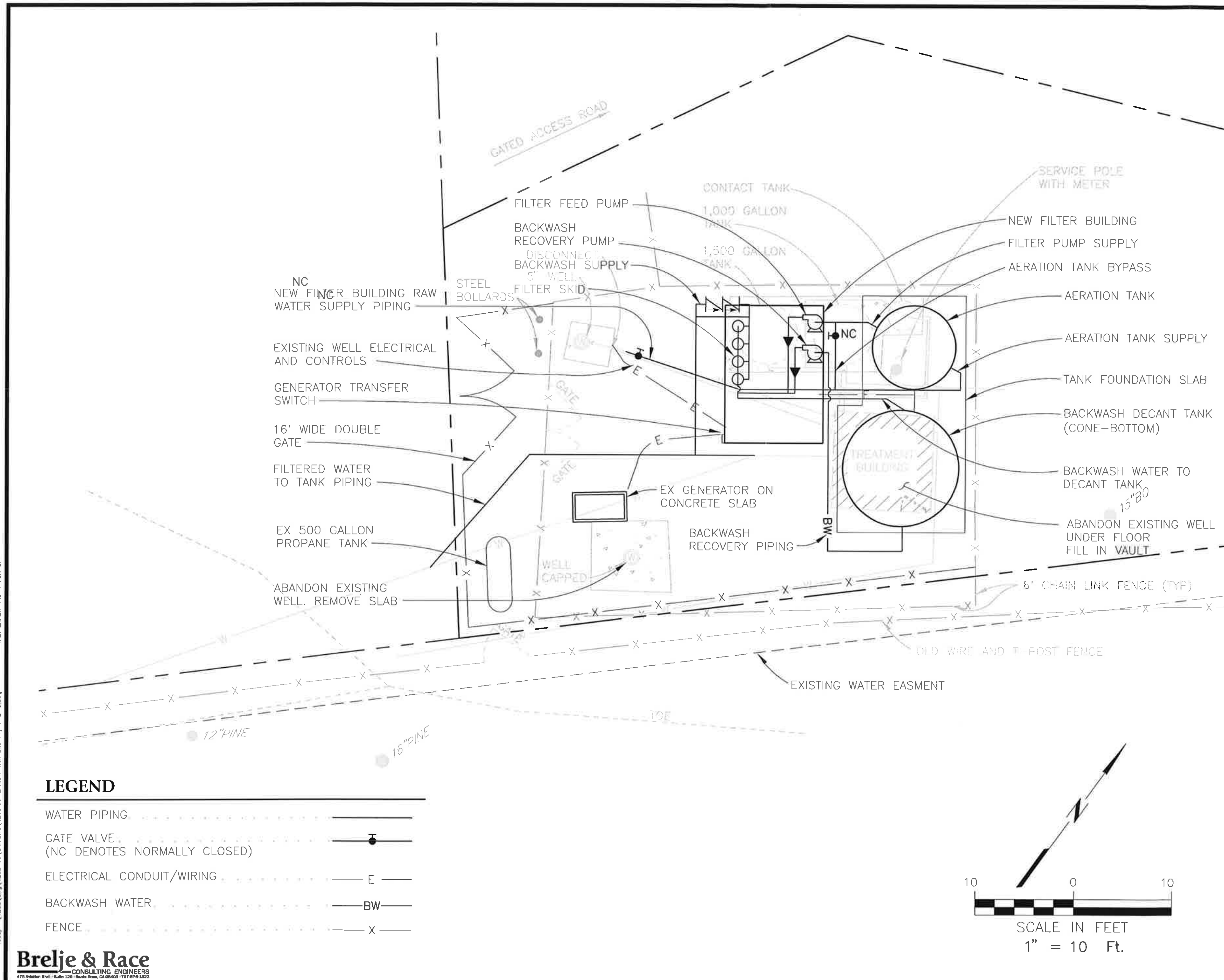
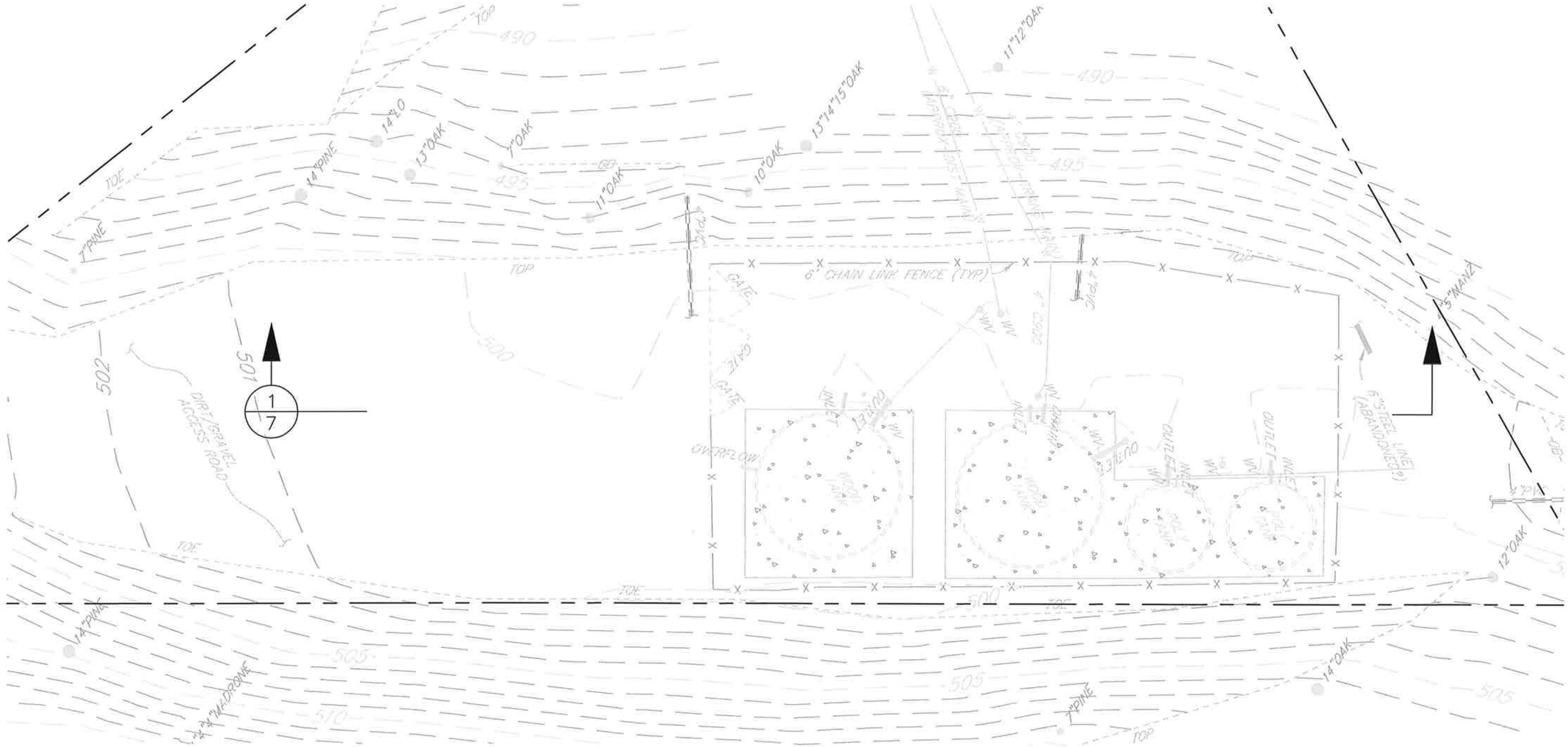



**FIGURE 4**

**PROPOSED WELL SITE IMPROVEMENTS**

**SUNRISE SHORE MUTUAL WATER COMPANY**

**APRIL 2021**




## LEGEND

PIPING — W —

CHAIN LINK FENCE — X —

10 0 10

SCALE IN FEET

1" = 10 Ft.

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04-13-21

# FIGURE 5

# EXISTING TANK SITE FACILITIES

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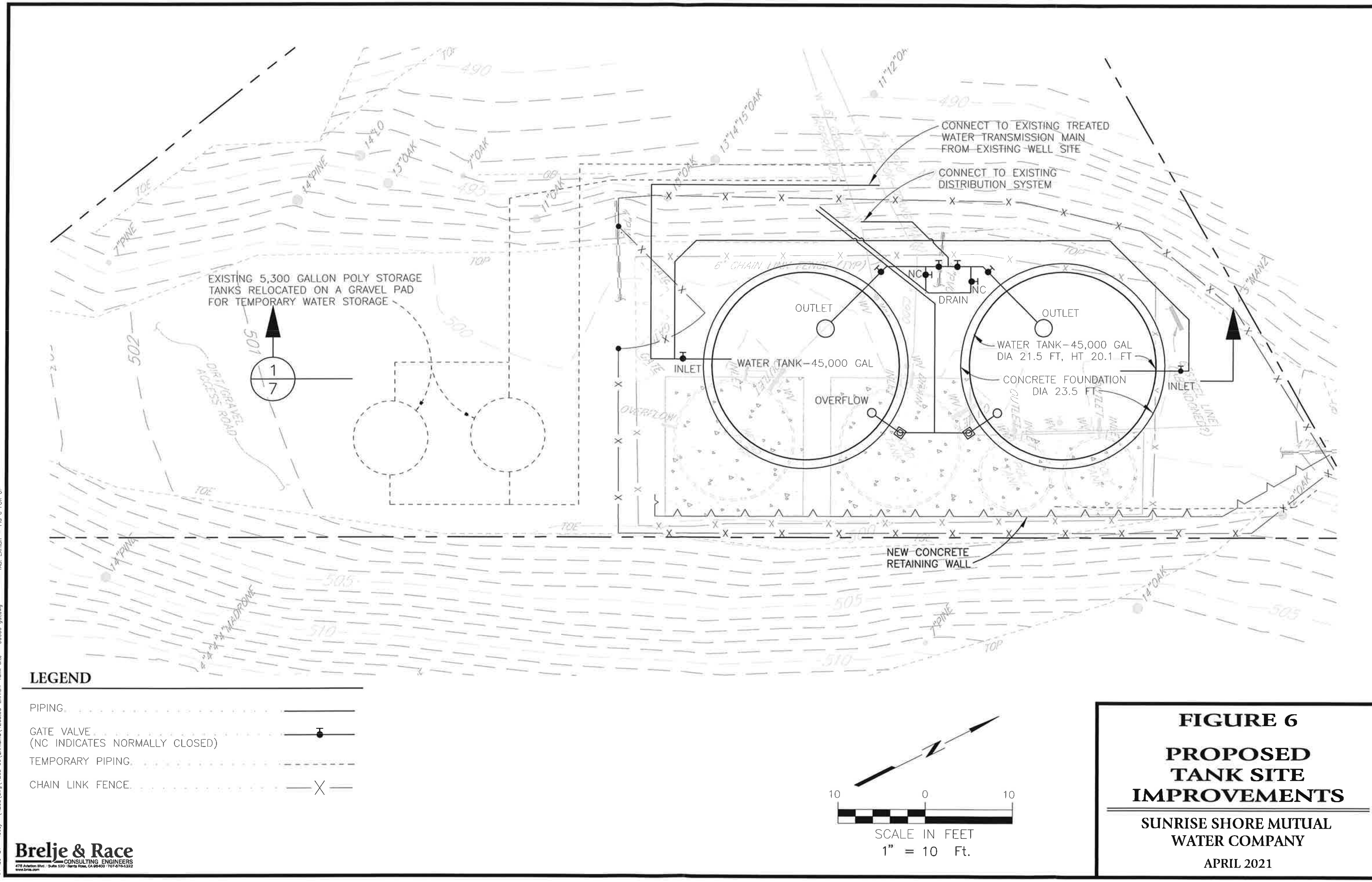
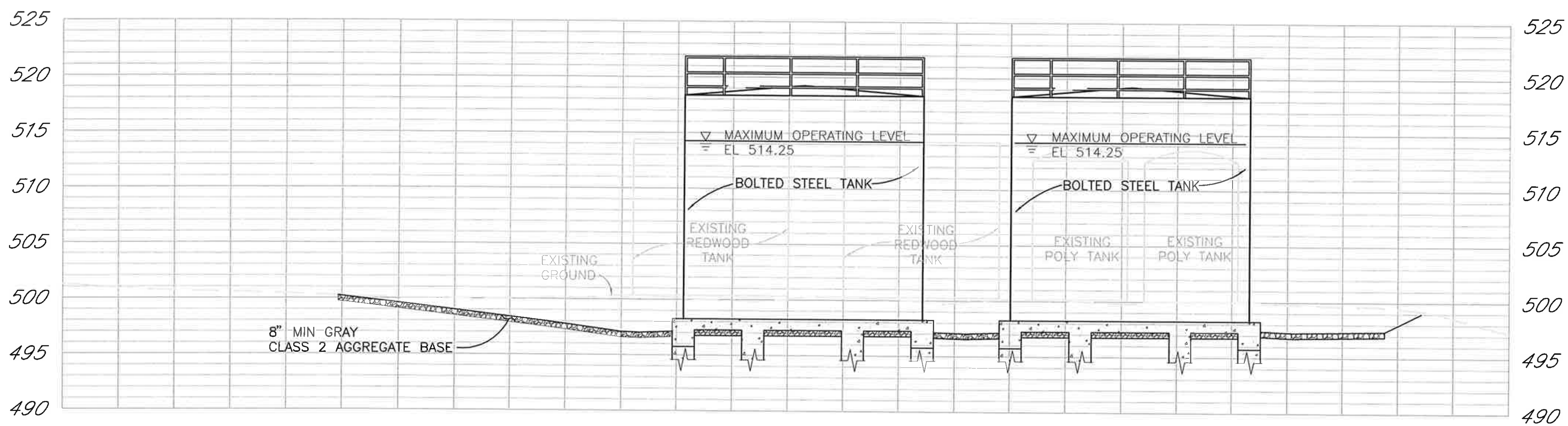



**FIGURE 6**

**PROPOSED TANK SITE IMPROVEMENTS**

**SUNRISE SHORE MUTUAL WATER COMPANY**

**APRIL 2021**




BOLTED STEEL TANKS SECTION

SCALE: HORZ. 1"=10'
VERT. 1"=10'

1
6

TAB: EXHIBIT-SECTIONS

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**FIGURE 7**

**SECTIONS**

**SUNRISE SHORE MUTUAL WATER COMPANY**

**APRIL 2017**