WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT

STATE WATER RESOURCES CONTROL BOARD

PROP 1 PROJECT NO.: C-06-8140-110

AGREEMENT NO.: D15-04009

PROJECT REPORT

FOR

TEHAMA COUNTY SANITATION DISTRICT NO. 1 MINERAL

DECEMBER 2019

JOB NO. 288.36.300

PACE ENGINEERING
REDDING, CALIFORNIA

PACE ENGINEERING

December 16, 2019

288.36.300

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We are pleased to present the Project Report entitled:

TEHAMA COUNTY SANITATION DISTRICT NO. 1 MINERAL
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
PROJECT REPORT

This Project Report format follows requirements of the State Water Resources Control Board (SWRCB) Clean Water State Revolving Fund (CWSRF), Proposition 1 Grant Project No. C-06-8140-110. Funding for this Project Report has been provided in full through Agreement No. D15-04009 with the SWRCB. The contents of this document do not necessarily reflect the views and policies of the SWRCB nor does mention of trade names or commercial products constitute endorsement or recommendation for use (Government Code, § 7550; 40 CFR § 31.20).

PACE Engineering, Inc. would like to thank County staff for their able assistance in its preparation. Please contact us with any questions you may have regarding this Project Report.

Sincerely,

Laurie McCollum, P.E.
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WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT

PROJECT REPORT

FOR

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Gerber, CA 96035

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ABBREVIATIONS

Certain terms and abbreviations have been used in this report for convenience as follows:

ABM	Air Blown Mortar
AC	Asbestos Cement
ACS	American Community Survey
ADWF	Average Dry Weather Flow (The average rate of wastewater flow during summer months.)
AWWF	Average Wet Weather Flow
Basin Plan	Water Quality Control Plan, Fourth Edition, revised June 2015, for the Sacramento and San Joaquin River Basins
BOD	Biochemical Oxygen Demand
CCTV	Closed Circuit Television
CDP	Census Designated Place
CEQA	California Environmental Quality Act
CFM	Cubic Feet per Minute
CFS	Cubic Feet per Second
CIPP	Cured-in-Place Pipe
County	Tehama County
CP	Control Panel
CVRWQCB	California Central Valley Regional Water Quality Control Board
CWSRF	Clean Water State Revolving Fund
DCBM	Dichlorobromomethane
District	Tehama County Sanitation District No. 1 Mineral
DO	Dissolved Oxygen
ENR CCI	Engineering News Record Construction Cost Index
EPA	Environmental Protection Agency
General Plan	Tehama County General Plan
GPAD	Gallons per Acre per Day
GPD	Gallons per Day
GPM	Gallons per Minute
HDD	Horizontal Directional Drilling
HDPE	High Density Polyethylene
HE	Household Equivalent
HP	Horsepower
I&I	Infiltration and Inflow
LAFCO	Local Agency Formation Commission

LCC	Life Cycle Cost
MACP	Manhole Assessment and Certification Program
MCC	Motor Control Center
MG	Million Gallon
MGD	Million Gallons per Day
mg/L	milligram per liter
MHI	Median Household Income
MZDS	Mixing Zone Dilution Study
NASSCO	National Association of Sewer Service Companies
NEMA	National Electrical Manufacturers Association
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPV	Net Present Value
O&M	Operations and Maintenance
PACE	PACE Engineering, Inc.
PACP	Pipeline Assessment and Certification Program
Park Service	Lassen Volcanic National Park Service Headquarters
PER	Preliminary Engineering Report
PLC	Programmable Logic Controller
PVC	Polyvinyl Chloride
PWWF	Peak Wet Weather Flow
Rate Study	District Wastewater Rate Study
RD	Rural Development
SF	Square Feet
SFBC	South Fork Battle Creek
TSS	Total Suspended Solids
ug/L	microgram per liter
UPS	Uninterruptable Power Supply
USGS	United States Geological Survey
WDRs	Waste Discharge Requirements
WWMP	Wastewater Master Plan
WWTP	Wastewater Treatment Plant

TEHAMA COUNTY SANITATION DISTRICT NO. 1 MINERAL WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT PROJECT REPORT DECEMBER 2019

I. PROJECT AREA

A. Vicinity and Service Area

Mineral is a Census Designated Place (CDP) located approximately 40 miles northeast of Red Bluff in Tehama County, California. Tehama County Sanitation District No. 1 (District) is owned and operated by Tehama County Department of Public Works (County) and provides sewer collection and treatment services to Mineral. The Mineral Wastewater Treatment Plant (WWTP) is located on the south side of Highway 36 about one mile west of Mineral as shown in Figure 1. The WWTP operates under Waste Discharge Requirements (WDRs) Order No. R5-2015-0073 (NPDES NO. CA0084069), which was adopted by the California Central Valley Regional Water Quality Control Board (CVRWQCB) on June 5, 2015.

The District's current service area boundary consists of approximately 85 acres (0.13 square miles). However, the District's ultimate service area boundary, mentioned in the 1965 Feasibility Report completed by Clair A. Hill and Associates, is approximately 280 acres (0.4 square miles) and contains areas outside the District's boundary, including Lassen Volcanic National Park Service Headquarters (Park Service) and the Caltrans Maintenance Station. However, the U.S. Forest Service Campground at Battle Creek and adjacent church campground were not included in the ultimate boundary - see Figure 1. It is recommended the District contact the Local Agency Formation Commission (LAFCO) for a review to update the District boundary to include all areas currently served.

B. Land Use

The unincorporated rural community of Mineral is located southwest of Lassen Volcanic National Park in a small valley at about 4,800 feet above sea level. Battle Creek Meadows to the south of the District is relatively flat, but the surrounding areas are all steep. Although Lassen Park is designated as an active volcano, there are no recorded active faults in the Mineral area and seismic risk is classified as low. According to the

Tehama County General Plan, updated March 31, 2009 (General Plan), Mineral falls under the East County Planning Area, which is "typically characterized by large tracts of public land, land under timber preserve contracts, and large holdings utilized primarily for grazing." As such, there is limited availability of services and limited growth opportunities. Battle Creek is the dominant hydrographic feature of the area. Surface drainage from the surrounding mountains is provided by a number of small streams, most of which run year-round.

C. Current System Users

As of April 2017, the Mineral WWTP provides service to 197 active wastewater service connections. The Mineral residential and commercial area consists of approximately 179 residences, the Mineral Lodge complex, the Volcano Country RV Park, and Mineral Elementary School. The District also provides wastewater service to the Park Service, Caltrans, a USFS campground, and a church camp.

The Mineral community is located in somewhat of a recreational area and, due to harsh winters and limited services, many dwellings are only occupied six months out of the year. Both the campground and church camp facilities are closed during winter months. As such, population counts for the community are difficult to estimate. In total, the WWTP serves about 250 household equivalents (HE) during peak summer months. An HE is defined as the average dry weather wastewater flow (ADWF) generated from a single-family residential dwelling. There are no industrial users, and wastewater flowing to the WWTP is primarily domestic. HEs were assigned primarily based on fixture counts for non-residential users per Sewer Ordinance No. 1911 and previous assessment District reports completed by PACE in 1984 and 1996.

No new users are anticipated to result from this project.

D. Population

According to the American Community Survey (ACS) 2013 to 2017 Five-Year Estimate, the current population of Mineral as a CDP is 310. Given the relatively static trend in services over the last ten years, District growth and population is likely to remain

relatively static into the foreseeable future. Therefore, District operations are geared toward meeting regulatory requirements and preventative maintenance rather than system expansion for new development.

According to the District, growth in the last ten years within Mineral has only consisted of the addition of six Park Service RV campsites, which results in an HE-equivalent annual growth rate of about 0.1%. On May 1, 2017, the Department of Finance released Tehama County population growth data that indicated the County had a 0.2% annual growth rate from 2010 to 2017. Additionally, the Department of Finance released County population growth projections prepared by the Demographic Research Unit in January 2018. It was projected therein that the County would see an annual population growth between the 20-year period of 2017 and 2037 of about 0.6%. The General Plan indicates Mineral will have limited growth opportunities due to limited availability of services. As such, an average annual growth rate of 0.3% was utilized herein.

At current flows, if all future connections were single-family residences, the ADWF capacity needed by year 2037 would equate to approximately 0.039 million gallons per day (MGD), and there would be more than enough treatment capacity to accommodate planned estimated growth. Even a 2% annual growth rate would not result in the WWTP ADWF being met until year 2049.

No portion of the project recommended herein is growth-inducing, and no new users will result from this project.

II. WASTEWATER CHARACTERISTICS, EXISTING FACILITIES, CURRENT WATER QUALITY

A. Existing Facilities

Collection System

The original Mineral residential collection system was constructed circa 1920s. Portions of the collection system were replaced between 1952 and 1981. In 1982, the District retained PACE Engineering, Inc. (PACE) to make a field review of the collection system, analyze flow monitoring data collected, and prepare recommendations. The findings of this initial study were documented in the Sewer System Infiltration/Inflow Analysis Report, dated June 1982. As a result of the above-mentioned report, the District authorized PACE to conduct a more comprehensive investigation of the sewer system to locate sources of infiltration and inflow (I&I) and prepare the subsequent Sewer System Evaluation Survey, dated August 1983. In 1986, as part of the Sewer Rehabilitation/Replacement Project, the District replaced approximately 3,000 feet of the remaining vitrified clay sewer pipe installed circa 1920 with approximately 4,200 feet of new 6-inch polyvinyl chloride (PVC) sewer pipe. The project also included rehabilitation of the remaining asbestos cement (AC) and PVC sewer that was installed between 1952 and 1981.

In November 1989, PACE completed the Preliminary Engineering Report (PER) for the Meadowview Area Sewer Project; however, due to lack of funding, the proposed project was never completed. In July 1993, as a result of the District receiving a violation for direct discharge of stabilization pond effluent into South Fork Battle Creek (SFBC), PACE completed an addendum to the November 1989 PER for the Meadowview Area Sewer Project that recommended the District also replace sewer sections that contributed the most I&I. Therefore, as part of the 1996 Meadowview Area Sewer Project, the District not only installed the 6-inch PVC sewer collection system in the Meadowview Area but also replaced portions of sewer in Scenic Avenue, the west end of Mineral Avenue, and Amanda Way with 6-inch PVC sewer pipe.

The Mineral collection system currently consists of approximately 14,600 feet of 6-inch, 5,400 feet of 8-inch, and 100 feet of 10-inch collector sewer mains. Approximately 70% of the collection system consists of PVC pipelines, while the remainder is mostly AC pipe. The entire collection system consists of gravity pipelines with no lift stations required to convey influent wastewater to the WWTP.

Wastewater Treatment Plant and Disposal Facilities

The District's original extended stabilization ponds were constructed in 1967. In 1996, as a result of the District receiving a violation for direct discharge of stabilization pond effluent directly into SFBC and growth within the District, the WWTP was upgraded to include a headworks with bar screen and flow measurement, aerated lagoon, two evaporation/percolation ponds, pressure filter, chlorine disinfection, de-chlorination, and a new outfall into SFBC.

Photo 1 – Mineral WWTP

Current CVRWQCB WDRs Order No. R5-2015-0073 (NPDES No. CA0084069) for the WWTP indicates a maximum permitted ADWF of 0.07 MGD and peak wet weather flow (PWWF) of 0.75 MGD can be discharged seasonally to SFBC between November 15 and April 15 of each year as long as the flow in SFBC is at least 35 cubic feet per second (CFS) (22.6 MGD). This ensures a minimum 30 to 1 dilution of receiving water to effluent flow at all times. During the remainder of the year, effluent is discharged to the evaporation/percolation ponds. In recent years, however, the District has not had to discharge to SFBC as I&I has been decreased due to drought conditions and collection system improvements. Discharge to SFBC has reportedly only had to occur one time since 2002 and that was in December 2005.

Photo 2 – USGS Staff Gage

Prior to 2018, SFBC flow measurements were based on the depth of flow above and below the top of the concrete ford immediately downstream of the point of discharge.

However, as requested by the County, on January 8, 2018, United States Geological Survey (USGS) staff installed a staff gage on the downstream right bank of the creek at the Highway 36 crossing. USGS staff took subsequent measurements between installation and April 12, 2018. Results are shown in Table 1. USGS also provided a provisional rating curve from the seven discharge measurements as shown in Figure 2.

Additionally, the County installed a second staff gage just downstream of the concrete ford on July 17, 2018. This will allow correlation between USGS staff gage readings and flows measured at the WWTP concrete ford, which is more easily accessible from the WWTP. Future verification of SFBC flows prior to effluent discharge will ensure a minimum 35 CFS always occurs as required in current WDRs. This results in a minimum receiving water to effluent flow ratio of 30:1.

Headworks

Raw sewage enters the headworks from the gravity collection system through a 10-inch sewer main. Under normal conditions, influent flows through the 2-foot-wide bar screen, through the Parshall flume, to the aeration basin. The bar screen is cleaned weekly. Approximately two pounds of screened

Photo 3 – WWTP Headworks

material is collected, washed, and deposited in a plastic-lined garbage can monthly for eventual disposal at the Tehama County Landfill in Red Bluff, California. During high flows, or if the bar screen becomes plugged, sewage will automatically overflow and pass through the auxiliary bar screen. When this happens, flow is diverted to Pond 1 following the headworks.

Parshall Flume

WWTP influent flow is measured and recorded via an ultrasonic level transducer, which measures water level in the upstream portion of the Parshall flume. The influent meter was recently replaced in June 2019 after it was discovered to be reading an average of about 40% higher than actual influent flows. A 4-20 mA signal is transmitted to the Operations Building where, prior to August 2019, a seven-day circular chart recorder kept a continuous record and totalized influent flows. Plant flows were historically read once a week and reported as a seven-day average for the daily flow. In August 2019, the chart recorder was replaced with a continuous paperless recorder to identify influent flow trends more accurately.

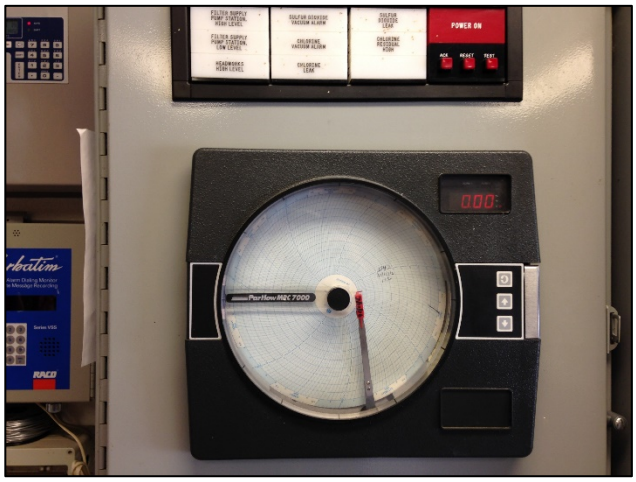


Photo 4 – Recently Replaced Influent Chart Recorder

Aeration Basin

The aeration basin is clay-lined with air blown mortar (ABM) slope protection at the normal water level depth of 11.5 feet. The 1.52 million-gallon (MG) basin is divided into two equally sized cells by a vinyl-coated polyester baffle curtain. The hydraulic detention time in each cell at design ADWF is approximately ten days.

Photo 5 – Aeration Basin

Under normal flow conditions, flow enters at the bottom of Aeration Cell No. 1 from the headworks and is discharged from Aeration Cell No. 2 through the outlet structure. Effluent from Aeration Cell No. 2 can be discharged to either Pond 1 or Pond 2.

Aeration Cell No. 1 is equipped with nine submerged tube aerators. Aeration Cell No. 2 is equipped with three submerged tube aerators. Two, one primary and one backup, 10-horsepower (HP) aeration blowers located in the Operations Building supply air to the submerged tube aerators. Each 10 HP aeration blower is designed to provide about 150 cubic feet per minute (CFM) of air to the 12 submerged tube aerators, which equates to an output of about 12 CFM per aerator. 24-hour cycle timers with 15-minute multiple intervals program aeration blower run times to maintain the desired level of dissolved oxygen (DO) in the aeration cells with the least amount of power consumption.

A constant liquid level is maintained in the basin by the fixed outlet structure. A scum baffle prevents excessive scum carryover into the effluent ponds; however, scum has never been observed in the basin.

Per the WWTP Sludge Disposal Plan completed in 2016, the aeration basin was last sludge judged in 2015 and found to have an average of 1.9 feet of accumulated sludge at an estimated 10% solids. This equates to about 65 dry tons of sludge that will eventually need to be dredged, dewatered, sampled, and hauled to the landfill.

Evaporation/Percolation Ponds

Photo 6 – Evaporation/Percolation Pond 1

Two 2.5-acre evaporation and percolation ponds are provided to receive effluent from the aeration basin. The ponds serve as settling basins for solids from the aeration process, as effluent disposal through evaporation and percolation, and as regulating storage for filtered discharge to SFBC. At least 2 feet of freeboard is maintained in both ponds at all times. Pond 1 will overflow into Pond 2 at the 2-foot freeboard level. In recent years, the operations procedure has been to send effluent from the aeration basin into Pond 2, as it has a faster percolation rate than Pond 1. As Pond 2 begins to get full, effluent is diverted to Pond 1. Both ponds have been dried in the past, but the bottoms have never been cleaned. As indicated in the Sludge Disposal Plan, it is estimated that both ponds have less than six inches of sludge buildup based on the bottom readings of the pond staff gages over the years. The staff gages are scheduled to be surveyed by the County to ensure they are still calibrated accurately.

Per WDRs, treated effluent is disposed of via evaporation and percolation or stored in Ponds 1 and 2 from April 16 to November 14. No discharge to SFBC is allowed during this time. During seasonal discharge to SFBC, withdrawal from each pond is controlled by valves on the suction piping at the Filter Supply Pump Station.

Filter Supply Pump Station

The Filter Supply Pump Station is located on the dike between Ponds 1 and 2. It consists of a 6-foot-diameter wet well containing two 4-inch non-clog submersible pumps. The pump station includes one intake from Pond 1 and two intakes from Pond 2 at different elevations. Each 10 HP Flygt (now Xylem) pump is rated at 400 gallons per minute (GPM) (0.576 MGD) at a total dynamic head of 52 feet. The pumps are reportedly more than 20 years old and have never been pulled for maintenance. Normally, only one pump is required during filtration and both pumps are required during filter backwash. When PWWF is greater than 0.576 MGD, WDRs indicate that as long as the filter is utilized to the maximum extent practicable, additional flow that bypasses the filter will not be considered a violation.

Photo 7 – Filter Supply Pump Station

Pressure Filter

Pond effluent is pumped to the four-cell, horizontal, 8-foot-diameter pressure filter via the Filter Supply Pump Station. These facilities are operated during the allowable discharge period to control the volume of effluent in the effluent ponds and to prevent uncontrolled discharges to SFBC. Operation of the filtration system is activated by pushing the start button on the Filter Control Panel in the Filter Room. The maximum filter rate is controlled by manually throttling the effluent rate control valve.

Photo 8 – Pressure Filter

The filter surface area is 192 square feet (SF), for a maximum loading rate of 2.0 GPM/SF. The filter is comprised of anthracite, filter sand, and multiple gravel sizes. The filter rate decreases from the maximum as the headloss builds up across the filter and as the pond level decreases. If/when discharge is required more frequently, the minimum filter rate will be determined by experience and will be limited by how much throttling is practical across the effluent valve.

The filter is designed for a maximum of 15 feet of headloss across the bed prior to backwashing. The higher the headloss, the more difficult the backwash and the more backwash water required. If/when the filter is utilized more frequently in the future, experience will better determine what the terminal headloss before backwash will be to produce the longest filter run with the least amount of backwash water recycle and backwash difficulty. Based on experience at other filter systems, backwash is typically triggered at a filter headloss of about 12 feet.

Headloss across the filter is shown on the indicator dial at the filter control panel. The filters can be set to automatically backwash at any preset headloss, or the backwash cycle can be initiated manually. It is recommended the filters normally be backwashed while the operator is on duty, so it can be verified the backwash sequence was completed properly. Normally, backwash is accomplished while the operator is on duty to minimize difficulties if a controller or automatic valve should malfunction.

The length of service cycle prior to backwash depends on the quality of pond effluent. The higher the quality of the effluent, the fewer suspended solids to be removed by the filter. Normally, the filter should be backwashed after about 24 hours in service. Chlorine should be added to the filter supply pipeline to limit biological growth in the filter and minimize clogging of the filter media.

Whether the backwash cycle is initiated automatically by differential headloss or initiated manually, the sequence is the same. Each of the four cells within the filter is sequentially backwashed with effluent from the remaining three filter cells for a pre-set time period, typically around eight minutes per cell.

The surface wash valve and inlet backwash valves for the remaining three cells automatically open and close until all four filter cells are backwashed in sequence. The surface wash pump remains on and the filter effluent valve remains closed until all four cells have been backwashed. When the backwash cycle is completed, the surface wash pump turns off and the filter effluent valve opens. Backwash water is discharged to Pond 1.

The filter backwash rate is shown on the flow rate indicator mounted on the backwash header. A maximum filter backwash rate of 15 GPM/SF/cell equates to a 720 GPM maximum backwash rate. A desirable backwash rate is the minimum rate to adequately clean the bed in a reasonable time period. A backwash rate of 12 GPM/SF is typical, which would equate to a flow rate of 580 GPM. The proper backwash rate should be worked up to gradually so as not to wash the media out of the bed.

Only one 80 GPM surface wash pump is installed and has never been replaced, although it is rarely used. If the surface wash pump should fail, it is better to backwash the filter without the surface wash rather than not at all. Although surface wash is desired, the filter can operate for a period of days without surface wash. A 6-inch Water Specialties propeller meter is provided in the filter effluent piping to measure the quantity of water pumped through the filter and into SFBC. Filter media was last inspected in April 2013 and was found to be in good condition.

Chlorination

Chlorination equipment is installed in the Operations Building. All gas chlorine and sulfur dioxide equipment were removed in June 2013 in favor of liquid sodium hypochlorite and sodium bisulfite for safety reasons.

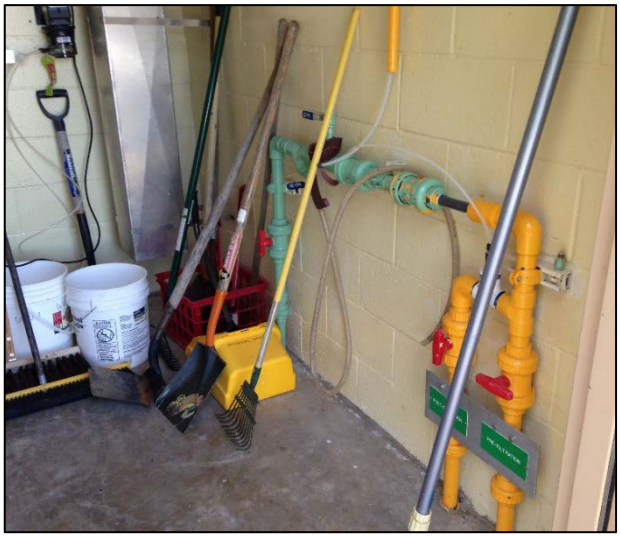


Photo 9 – Chlorination Piping

Chlorine injection points are located on filter influent piping for disinfection and to reduce excessive biological growth buildup inside the filter, as well as on the filter effluent standpipe in front of the chlorine contact pipeline for disinfection. The filter effluent is normally chlorinated at the filter standpipe just prior to being discharged to the 420-foot-long, 27-inch chlorine contact pipeline. Approximately 30 minutes of contact time is provided at 400 GPM to disinfect the effluent prior to dechlorination and discharge to SFBC. A chlorine dose of between 10 milligrams per liter (mg/L) and 15 mg/L is typically sufficient to result in a residual of 2 mg/L to 3 mg/L.

Dechlorination

Filtered effluent is dechlorinated after the chlorine contact pipe prior to effluent entering SFBC. Originally, the system was equipped with one 150-pound sulfur dioxide cylinder and sulfonator located in the sulfur dioxide room. A residual analyzer can still provide continuous chlorine residual monitoring and is located in the office.

Photo 10 – Dechlorination Box

A Myers 1½ HP submersible feed water centrifugal pump and dechlorinated water sample pump are both located in the dechlorination box at the end of the chlorine contact pipeline. The feed water pump must be running for at least five minutes prior to initiating the filtration system to avoid a high chlorine residual alarm.

Photo 11 – Hydropneumatic Tank

"Potable" Water System

Water is supplied from a 247-foot-deep on-site well with a 6-inch-diameter casing in the top 140 feet. Static water level is about ten feet below grade. The 1 HP Fairbanks Morse well pump is rated at about 10 GPM at 60 PSI when pumping from a water level of about 100 feet below grade. Pressure within the water system is controlled by a pressure switch in conjunction with a 158-gallon Well-X-Trol hydropneumatic bladder tank. The water system was originally intended to supply the WWTP with drinking water. However, the groundwater contains such a high amount of iron that it is not suitable for drinking at the WWTP and is instead only used for hand washing and flushing the WWTP restroom toilet. Both the well pump and hydropneumatic bladder tank are more than 20 years old and have never been serviced.

Control Systems

Photo 12 – Control Panel CP-1

The WWTP motor control center (MCC) is located in the Operations Building and is equipped with a service meter, main disconnect, circuit breakers, and controls for the associated equipment. The MCC indicates the status of the aeration blowers, chlorinator feed water pump, filter supply pumps, surface wash pumps, sulfur dioxide feedwater pump, and well pump. An annunciator mounted in Control Panel CP-1 indicates the status of plant alarms that are currently connected to an auto dialer. Originally, the following alarms were connected to the auto dialer: loss of power to auto dialer; headworks high level; pond high level; chlorine leak; sulfur dioxide leak; and filter system shutdown caused by chlorinator high/low vacuum, sulfonator high/low vacuum, chlorine residual

effluent high, and filter pumps low level shutdown. However, the change to sodium hypochlorite and sodium bisulfite, together with the lack of use of the chemicals, has resulted in the chlorine gas and sulfur dioxide-related alarms routinely being bypassed.

Water Quality

The WWTP is located at Section 26, Township 38N, Range 3E Mount Diablo Base and Meridian. The WWTP discharges to SFBC, a water of the United States and tributary to Battle Creek. The discharge location is latitude 40°20'54" north and longitude 121°37'25" west.

The CVRWQCB adopted Water Quality Control Plan, Fourth Edition, revised June 2015, for the Sacramento and San Joaquin River Basins (Basin Plan), which defines the following beneficial uses for SFBC and underlying groundwater as follows:

SFBC:

- Municipal and domestic supply
- Agricultural supply
- Hydropower generation
- Water contact recreation
- Non-contact water recreation
- Warm and cold freshwater habitat
- Migration of aquatic organisms
- Warm and cold spawning, reproduction, and/or early development
- Wildlife habitat

Groundwater:

- Municipal and domestic supply
- Agricultural supply
- Industrial process supply
- Industrial service supply

The District collects receiving water samples as required by WDR Table E-5 upstream and downstream of the discharge point but only during discharge to SFBC as required per the WDRs. Five simulated discharge events took place between 2008 and 2013, but these were determined by the CVRWQCB to not be representative of conditions during actual discharge. As such, only two discharge events representative of discharge conditions were done on February 14, 2017, and April 9, 2019, in an attempt to gather more data. The February 2017 discharge was done as part of a Mixing Zone and Dilution Study (MZDS) completed by PACE and the District, with the CVRWQCB present. The effluent flow rate measured during the study was 0.41 CFS as measured at the rectangular weir in the dechlorination box. The flow in SFBC at the time of the study was approximately 39.1 CFS as measured with a Model F584 Water Current Meter. This equated to a creek to effluent ratio of about 95 to 1. Two transects were set up at 28 feet and 75 feet downstream of the discharge, and the effluent rhodamine dye was measured with a fluorometer. Resulting dilution ratios were 32 and 97 at the 28-foot and 75-foot transects, respectively. Another discharge event was done on April 9, 2019, to gather additional data during conditions representative of when future discharges may occur (i.e., full ponds and high flows in SFBC).

Upstream receiving water samples taken from SFBC since 2008 indicate SFBC has assimilative capacity for all constituents with reasonable potential, with the exception of copper. One sample taken June 28, 2011, resulted in an upstream total copper concentration of 4.5 micrograms per liter (ug/L). However, on this date, Mineral received 0.65 inches of precipitation, which is a significant amount. It is likely that a large portion of the copper concentration adhered to particulates due to the rain event rather than dissolved in the groundwater. Also, as previously noted, the CVRWQCB did not consider this data as representative of what might actually occur during discharge. Receiving water total and dissolved copper concentrations sampled during recent representative discharge events indicate there is available assimilative capacity in the SFBC should future dilution credits be required for copper. Refer to Table 2 for recent representative upstream and downstream receiving water sample results.

The District collects quarterly groundwater samples as required by WDR Table E-6 from three groundwater wells located near the evaporation/percolation ponds. Groundwater quality results taken from monitoring wells RGW-001, RGW-002, and RGW-003 from September 2015 through June 2019 are shown in Table 3.

Refer to Appendix B for a CD of all water quality data from September 2015 through June 2019.

B. Responsible Entities

The County is responsible for all aspects of sewer services within the District service area boundary.

C. Sources of Wastewater

There are no lift stations in the collection system, as all raw wastewater flows by gravity to the headworks at the WWTP.

Wastewater flowing to the WWTP is primarily domestic. Other contributors are small commercial users including a lodge with a restaurant, RV park, and campgrounds. It is estimated small commercial top users account for approximately 72 HEs, or an ADWF of about 0.01 MGD. There are no major industrial users in the District. The current ADWF is estimated to be 0.037 MGD, and the estimated PWWF is 0.57 MGD. The WWTP original design was for an ADWF of 0.07 MGD and a PWWF of 0.75 MGD.

D. Sources of Industrial Waste

No major source of industrial waste exists within the District service area boundary.

E. Discharge Violations

The District has not received any discharge violations. The intent of the recommended project is to improve overall effluent quality, replace aging and inefficient infrastructure, and correct existing system deficiencies such that future discharge violations do not occur.

F. Wastewater Influent Characteristics and Variations

Influent is measured at the WWTP headworks prior to entering the treatment process. The only influent constituents required to be regularly monitored are weekly pH and monthly biochemical oxygen demand (BOD) and total suspended solids (TSS). Influent BOD, TSS, and pH samples taken between August 2015 and August 2019 are shown in Figure 3. As shown therein, no unanticipated specific variations in influent constituents, other than seasonal variations, are apparent. The average influent BOD is 112 mg/L, while the average influent TSS and pH are 87 mg/L and 6.8, respectively.

G. Wastewater Effluent Characteristics and Variations

WWTP effluent is sampled at the aeration basin outlet structure prior to being discharged through the outfall to SFBC. However, effluent is only required to be regularly monitored during discharge to SFBC. Samples taken at the WWTP from 2008 through 2013 indicate effluent could have reasonable potential to exceed water quality objectives for copper, dichlorobromomethane (DCBM), chloroform, and zinc. However, current WDRs reflect that the CVRWQCB did not consider sample results during this time to be representative of water quality since they were taken during simulated discharge events without a large amount of I&I-induced water in the ponds.

Effluent sampling results taken during the two most recent representative discharge events are shown in Table 4. As shown therein, all constituents that have shown possible reasonable potential in the past were well below water quality objectives with the exception of copper. Utilizing a minimum downstream hardness of 15 mg/L, the water quality objective of 2.34 ug/L for total copper was exceeded during the February 14, 2017 discharge event with a total copper concentration of 2.6 ug/L. However, dissolved copper at this time was lower than water quality objectives.

The February 14, 2017 effluent aluminum concentration of 388 ug/L also exceeded the secondary MCL of 200 ug/L. Upstream receiving water concentrations were also above this concentration. As such, additional receiving water data will need to be taken to verify if assimilative capacity is available for aluminum.

It is also recommended additional receiving water data be taken for both total and dissolved copper and total and dissolved zinc at times when SFBC is flowing high enough such that samples are representative of when discharge might occur. This will verify if assimilative capacity is also available for copper and zinc as well.

H. Past Efforts to Address Problems

As mentioned previously herein, improvement projects to address I&I and collection and treatment system deficiencies have been completed in the past. However, the last significant project was completed more than 20 years ago; therefore, additional improvements are now needed. As such, the planned improvement project includes collection system improvements to replace deficient sections of pipeline and WWTP improvements primarily to improve monitoring and safety. Analysis of these alternatives is included in the subsequent alternatives analysis herein.

I. Current Asset, Operation, and Maintenance Management Systems

Operations and maintenance (O&M) procedures at the WWTP are described in the 1997 O&M Manual, which was completed after the most recent significant WWTP upgrade. Aside from the disinfection section, all operations described therein are still accurate. Costs are included in the project recommended herein to update the O&M Manual upon completion of the suggested improvements.

A District Wastewater Master Plan (WWMP) was completed in September 2019. This effort included an engineering analysis of the District wastewater collection system and WWTP and the effects current and potential future wastewater flow conditions have on each of these components. The wastewater collection system was analyzed using the Innovyze® H_2OMAP Sewer computer modeling program for wastewater flow determination and pipeline sizing. Analysis of the sewer collection system and WWTP was accomplished with the assistance and review of District staff.

The WWMP included preliminary plans and cost estimates for major capital improvements recommended over the next 20 years. Emphasis was placed on planning and staging of improvements necessary to correct existing deficiencies and improve safety of operations.

A Wastewater Rate Study (Rate Study) is being completed subsequent to this report. The Rate Study is anticipated to recommend a rate increase that will provide the revenues needed to allow the District to recover costs of system O&M from existing and future customers within a five-year period. Costs reviewed will include O&M, debt service, updated capital replacement needs, administration, and depreciation. The proposed rate structure will be developed under the premise that service charges would be equitable such that, as nearly as practical, each customer would pay their fair share of the costs of providing the services received. To ensure the current asset, operation, and maintenance management systems are adequate and up to date, it is recommended a Rate Study be reviewed and updated every five years.

J. Evaluation of Excessive I&I to the System

Based on review of the 2015 to 2017 WWTP flow records, the three-year ADWF is approximately 0.037 MGD. A current population of 310 results in an average daily flow of just under 120 gallons per capita per day. As such, a Sewer System Evaluation Survey is not required. However, further investigation was completed as part of the 2019 WWMP further described below.

A review of historical wet weather flows at the WWTP indicated an instantaneous PWWF of 0.713 MGD was recorded on March 22, 2018. This day also resulted in a four-hour sustained peak of 0.70 MGD and average daily PWWF of 0.57 MGD. Thus, during wet weather conditions, the current peaking factor is about 15. This is much higher than is typically acceptable and is a significant component of the system flow. Given the current population of 310, this equates to a wet weather flow of just over 1,838 gallons per capita per day. Average wet weather flow (AWWF) in recent years is 0.12 MGD, or about 380 gallons per capita per day. It is important to note, inaccuracy of the influent flow measurements was recently discovered in the summer of 2019. Therefore, the

peak flows utilized herein should be re-evaluated when the next significant winter occurs to verify accuracy of historic peak measurements.

A review of WWTP records (ADWF of 0.037 MGD and PWWF of 0.57 MGD) suggests that, at PWWF, an extremely large portion (94%) of the wastewater flows are due to I&I, and it is believed most of this may be from infiltration. This is based on the observation that it takes a prolonged period of rain to significantly increase I&I flows at the WWTP. Furthermore, plant flows appear to drop off relatively slowly following a period of intense rainfall.

Since 1982, numerous I&I studies have been performed in the District as well as a few projects to fix deficiencies identified during those I&I monitoring efforts. It has been known for many years the Park Service has been a large contributor of system I&I. Instantaneous flow measurements completed in April and May of 1982 indicated the Park Service contributed an average of 47% of the total WWTP flow in three monitoring events. One additional measurement completed on January 24, 1983, indicated the Park Service contributed about 24% of the total WWTP flow. Six additional instantaneous flow measurements were taken between January 8, 1986, and March 10, 1989, all following wet weather events. The average flow contribution from the Park Service to the WWTP during these measurements was 42%.

Photo 13 – I&I Flow Monitor

As part of the 2019 WWMP, an I&I flow monitoring unit was installed in the Park Service manhole from January 18 through March 5, 2018. A summary of the I&I data gathered during this time indicated the Park Service manhole contributed approximately 18.5% of the total I&I to the WWTP. However, from the I&I monitoring effort, the ADWF measured from the Park Service was 10,728 gallons per day (GPD), or about 73 HEs. This is more than twice of what the Park Service is currently billed for, which is 4,810 GPD, or about 33 HEs. As such, the difference of 40 HEs in

ADWF was attributed to I&I, increasing the Park Service I&I contribution to 21% of the total I&I flow entering the WWTP. While this contribution is far less than it has been in past measurements, it is still a significant portion that should be reduced.

Numerous other measurements of the Park Service flow contribution were taken in 2018 and 2019, the result of which are shown in Table 5. As shown therein, only one additional monitoring event was completed when flow monitors were installed in both the 6-inch Park Service pipeline and the 8-inch upstream pipeline. From May 10 through May 27, 2019, the flow monitors indicated the Park Service was still contributing 46% of the total influent flow compared to 54% from the rest of the system. The remaining measurements and flows included in Table 5 were calculated from depths measured by the District in each of the respective pipelines.

It should be noted that construction at the Park Service was ongoing during most of this data collection. Complete water and sewer system replacement was finished by late summer 2019, which should significantly reduce the contribution historically observed there. Additionally, it was also discovered early in the summer of 2019 that the aging inefficient flow meter was reading on average about 40% too high of what actual influent flows were. As such, a new influent flow meter was installed in June 2019 and recalibrated on August 13, 2019, which now accurately reflects true influent flows. The circular chart recorder was also updated at this time with a new continuous paperless recorder. It has been initially set up to record influent flows every ten minutes, which will allow for much greater accuracy in determining peaks, averages, and totals compared to a 7-day chart recorder. Smaller flow recording increments should be particularly helpful in better identifying the intermittent peak flow contribution from the USFS Campground and Church Camp.

To locate problem areas and obvious sources of I&I in collection system mains, the District most recently completed closed-circuit television (CCTV) inspection of the entire collection system from August to October 2017. Inspection was performed in accordance with the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) and Manhole Assessment and Certification Program (MACP) standards and procedures. Per NASSCO standards, each pipeline inspected received a condition grade ranging from 1 to 5, with 5 being the most significant defect and 1 being a minor defect. Grades were assigned based on the significance of the defect, extent of damage, percentage of restriction to flow capacity, or amount of wall loss due to deterioration. Each pipe segment received a separate segment grade score for both structural and O&M defects depending on the condition grade number and the number of occurrences in the segment.

Photo 14 – I&I from Park Service during ADWF

Photo 15 – CCTV Showing Root Intrusion

Of the nearly 19,800 feet of pipeline inspected, CCTV results showed only the pipelines included in Table 6 to have defects of some kind that require attention. Results of the CCTV inspection identified ten locations in which there were mechanical deficiencies in the existing pipelines including holes, significant root intrusion, offset joints, broken lateral connections, pipe deformities, etc. There were also several pipelines identified with multiple significant defects including many offset joints, root intrusion, and infiltration resulting in recommendation of replacing the entire pipeline segment. The rating score should be viewed with caution since a high overall score may indicate a high number of low-severity defects, a low

number of high-severity defects, or a balance of high- and low-severity defect grades. Of the 87 manholes inspected, only the five manholes included in Table 7 were determined to have defects that require attention.

CCTV inspection of the mains revealed a relatively tight system with just over 1,100 feet of pipeline recommended for replacement. As such, it was suspected the source of I&I could be from laterals and private house connections. The District Board of Directors passed Ordinance No. 15 on May 22, 2001. Refer to Appendix C. Per this ordinance, the District owns and maintains the lateral from the main line to the property line, and the property owner must maintain the building sewer from the property line into the building. The 1989 PER for the Meadowview Area Sewer Project indicated that smoke testing and subsequent leak testing of sewer laterals were completed in the early to mid-1980s. At that time, letters were mailed to property owners with problems identified on private property, and all noted problems were reportedly corrected. However, this effort was completed more than 30 years ago. Additional smoke testing completed in September 2010 only identified a handful of deficiencies that were all reportedly remedied. It is suspected that elevated groundwater in the area may minimize the efficiency of smoke testing by preventing detection of defects.

In another attempt to determine if laterals are contributing to system infiltration, CCTV of as many laterals as possible was completed from July through September 2019. Lateral CCTV revealed more than 71% of the initial 89 laterals inspected have deficiencies that require additional attention, whether that be complete replacement, repair, or cleaning and subsequent CCTV. This ranged from large collapses and significant roots to cleanouts below grade or sags. Most deficiencies identified were minor roots, offset joints, or sags rather than large holes or significant roots at every joint. However, this was the case in some laterals, and even minor deficiencies contribute to system I&I. Many cleanouts were found to be deficient and in some cases below grade. It is recommended these be raised above grade or placed in an enclosed utility box and adequately capped as applicable. Refer to Table 8 for lateral CCTV results and associated recommendations.

Note that only 45% of service connections were inspected. Remaining laterals either could not be located, do not have a cleanout to allow for CCTV of the lateral, or had not yet been investigated at the time of this report. It is recommended cleanouts be installed at all houses and property lines, if they are not already, and either leakage testing be completed to verify flows are within maximum allowances or CCTV be completed after cleanout installation to determine if the lateral has deficiencies. Letters should be sent to property owners requiring repair or replacement of those building sewers with noted deficiencies. The District has already started this process.

Improvements recommended herein do not currently include replacement of identified deficient private laterals or installation of cleanouts and subsequent CCTV inspection, as it is expected these will be paid for by individual homeowners. The District will need to be diligent in following up with letters sent and implementing fines as needed to ensure improvements are made.

III. TREATMENT OBJECTIVES FOR DISCHARGE OR REUSE

A. Project Need, Objectives, and Expected Benefits

Collection System: The capital improvement plan developed in the 2019 WWMP identified numerous improvements needed to correct existing system deficiencies, as well as recommended aging sewer main replacements. The entire wastewater collection system was inspected via CCTV from August to October 2017. Results of the CCTV inspection identified ten locations in which there were mechanical deficiencies in the existing pipelines including holes, significant root intrusion, offset joints, broken lateral connections, pipe deformities, etc. There were also several pipelines identified with multiple significant defects including many offset joints, root intrusion, and infiltration resulting in recommendation of replacing the entire pipeline segment.

Of the nearly 19,800 feet of pipeline inspected via CCTV, the pipelines included in Table 6 were determined to have defects of some kind that require attention. The rating score should be viewed with caution since a high overall score may indicate a high number of low-severity defects, a low number of high-severity defects, or a balance of high- and low-severity defect grades.

Proposed pipeline improvements to be included in the capital improvement project were prioritized based on further analysis of the overall pipe rating. Pipelines with significant mechanical deficiencies and those believed to likely result in the largest I&I were included for replacement and/or repair and are highlighted in yellow in Table 6. All of the ten identified mechanical deficiencies are included for repair.

Of the 87 manholes inspected, only five manholes were identified as having defects as shown in Table 7. Of these, four manholes are recommended for replacement as part of the improvement project to minimize system I&I.

Wastewater Treatment Plant: As described in the 2019 WWMP, several immediate improvements are also needed at the WWTP to correct existing deficiencies.

Headworks: The District has historically had problems with power outages affecting measurements and, on occasion, other various issues with accurate influent reporting. The District recently replaced the influent flow meter and upgraded to continuous paperless flow monitoring; however, installation of an uninterruptible power supply (UPS) is also recommended to provide battery backup during power outages. It is also preferred and would be more efficient if the Mineral WWTP influent data could be viewed remotely rather than the part-time operator having to download it at the WWTP on a regular basis.

Aeration Basin: The District currently samples WWTP effluent from the aeration basin outlet structure. During months when snow is on the ground, accessing the concrete pad can be dangerous for the lone operator as ice forms on top of the concrete. As such, a fall prevention system was recommended to be installed in the 2019 WWMP. However, the District has since installed hand railing on the structure in-house. Therefore, this improvement is already complete and no longer needed as part of the project recommended herein.

Percolation and Evaporation Ponds: The slopes down to the ponds get slippery, icy, and very wet in the winter months and make sampling a precarious task. As such, it is recommended that steps with railing be installed into Ponds 1 and 2 sooner rather than later for safety and sampling.

Filter Supply Pump Station: It is recommended both 10 HP pumps in the Filter Supply Pump Station be pulled, serviced, and inspected. Costs have been included herein in anticipation that the pumps will need to be replaced as they are more than 20 years old, have never been serviced, and have met their useful service life. If inspection indicates otherwise, costs will need to be adjusted accordingly.

Potable Water System: The existing WWTP potable water hydropneumatic bladder tank is now more than 20 years old and, therefore, is recommended to be replaced. Costs have been included herein accordingly. Consideration was also given to inspecting and possibly replacing the aging well pump. However, the well pump is down about 130 feet, so inspection will be costly requiring a crane and other specialized equipment. Given that there have been no problems with the well pump and it is only utilized briefly a couple of times a week at most, replacement is not recommended at this time.

Control System: It is recommended the auto dialer be replaced, as it reportedly only alerts the operator on-call when power has been restored but not when a power outage first occurs. Additionally, the operator on-call often gets false alarm notifications from the prior gas chlorination system. As such, the chlorine gas and sulfur dioxide-related alarms have since been bypassed. It is recommended this problem be remedied and alarms correctly wired to reflect current chlorination system operations.

It is also recommended a manual transfer switch and j-box be installed such that a 105-kilowatt portable generator can be rented and temporarily connected to run all major WWTP components in the event of a power outage. If/when discharge to SFBC occurs on a more frequent basis, it is recommended a dedicated emergency generator be installed with an automatic transfer switch for standby power, although this is not included in the project proposed herein.

The WWTP MCC located in the Operations Building provides a central location for control of most plant equipment and annunciation of abnormal conditions. The MCC was originally installed in 1996 and is therefore now more than 20 years old. The U.S. Environmental Protection Agency (EPA) estimates electrical equipment to have a useful service life of 7 to 10 years. As such, it is recommended the MCC be replaced if/when significant work is done to the electrical control system. In the meantime, the District intends to have an electrician service the MCC (i.e., dust cabinets, tighten connections, etc.) and provide inspection results to plan for associated future improvements. Depending on the results of the inspection, costs may need to be updated herein to complete improvements to the MCC sooner rather than later.

Project objectives of the above-recommended improvements are to treat current wastewater flows adequately and more efficiently. It is anticipated all WWTP final effluent limits and WDRs will more likely be attained with increased operator flexibility and safety. Upon completion of the improvement project, it is expected that a number of the major components of the WWTP will have updated infrastructure that meets current codes and standards. All of the major mechanical deficiencies identified during CCTV inspection of the collection system will be corrected, and approximately 1,100 feet of deficient pipelines will be replaced. This will improve integrity of the wastewater collection system, improve surrounding groundwater quality, and minimize infiltration, inflow, and exfiltration due to deficient pipelines.

B. Performance Characteristics Required for Efficient Treatment

The WWTP is operated in accordance with WDR Order No. R5-2015-0073 as adopted by the CVRWQCB on June 5, 2015. Final effluent limits required to be met are included in Appendix A, along with monitoring requirements.

C. Required Health-Related Water Characteristics

To protect the beneficial uses of the water resources affected by the facility described in Section II.A. herein, the District must meet effluent limitations as described in WDR Order No. R5-2015-0073 when discharging to the ponds and SFBC.

D. Wastewater Discharge or Reuse Requirements

Wastewater is discharged in accordance with WDR Order No. R5-2015-0073. Refer to Appendix A for final effluent limits of the current permit.

The District does not currently recycle any wastewater and does not intend to do so anytime soon. As such, the District does not have any reuse requirements.

E. Relevant Operation and On-Site Requirements

As described on Page 4 of WDR Order No. R5-2015-0073, the following operation and on-site requirements apply:

1. Discharge of wastewater from the Facility at a location or in a manner different from that described in the Order is prohibited.
2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard Provisions I.G. and I.H.
3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the Water Code.
4. The Discharger shall not allow pollutant-free wastewater to be discharged into the treatment or disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.
5. The Discharge of effluent to surface waters from April 16 to November 14 and during periods when flow in South Fork Battle Creek, adjacent to the facility, is less than 35 CFS, is prohibited, unless approved by the Executive Officer.
6. The discharge of waste classified as hazardous as defined in Section 2521(a) of Title 23, CCR, Section 2510, et seq. (hereafter Chapter 15) or designated as defined in Section 13173 of the California Water Code, is prohibited.

F. Project Future Flow Rates or Other Changes to Influent Water Characteristics

According to the District, growth in the last ten years within Mineral has only consisted of the addition of six Park Service RV campsites, which results in an HE-equivalent annual growth rate of about 0.1%. On May 1, 2017, the Department of Finance released the County's population growth data, which indicated the County had a 0.2% annual growth rate from 2010 to 2017. Additionally, the Department of Finance released County population growth projections prepared by the Demographic Research Unit in January 2018. It was projected therein that the County would see an annual population growth between the 20-year period of 2017 and 2037 of about 0.6%. The General Plan indicates Mineral will have limited growth opportunities due to limited availability of services. As such, an average annual growth rate of 0.3% was utilized herein.

At current flows, if all future connections were single-family residences, the ADWF capacity needed by year 2037 would equate to approximately 0.039 MGD, and there would be more than enough treatment capacity to accommodate planned future development.

Given the relatively static trend in services in Mineral over the last ten years, the District is more in a preventive repair and/or replace O&M mode rather than one of system expansion to accommodate new development.

Influent wastewater characteristics are anticipated to remain similar to current flow characteristics with flows being primarily domestic with light commercial users. Large industrial users are not anticipated in the near future.
No components of the recommended projects are growth inducing, and no new users will result from the project.

G. Additional Facilities or Actions Needed to Comply with WDRs

No additional facilities or actions are needed to meet current WDRs. However, to correct current WWTP and collection system operational deficiencies, several improvements are immediately recommended including the following:

- Repair of ten pipeline mechanical deficiencies identified via CCTV to repair broken pipe, eliminate roots, offset joints, etc.
- Replacement of four manholes identified via CCTV.
- Replacement of approximately 1,100 feet of existing deficient 6-inch pipe to be replaced with new 6-inch PVC pipe, 955 feet of which consists of existing AC pipe and 150 feet of existing deficient PVC pipe.
- Installation of a UPS and remote monitoring capabilities at the WWTP.
- Installation of steps with railing at Percolation and Evaporation Ponds 1 and 2.
- Replacement of Filter Supply Pumps.
- Replacement of the auto dialer, bladder tank, and alarm system.
- Installation of manual transfer switch and j-box.

IV. PROJECT ALTERNATIVES ANALYSIS

A. Design Parameters and Assumptions

Design criteria used for evaluation of alternatives are shown in Table 10 and was generated from current design limitations described in the O&M Manual based on available historical data, discharge limits established by the CVRWQCB, and industry recognized design standards. It outlines process units and loading under the 1996 design and 2017 flow conditions. Future 2037 design criteria were determined to keep pace with projected population but primarily to correct existing system deficiencies.

Life-cycle cost (LCC), or net present worth, analysis parameters include:

1) Construction costs will be based upon similar prevailing wage rate public works projects constructed in the north state incremented by the Engineering News Record Construction Cost Index (ENR CCI), which stands at 11,380 for November 2019.

2) Discount or interest rate is based upon the Real Discount Rate, which is a forecast of real interest rates from which the inflation premium has been removed and based on the economic assumptions for the Federal 2020 Budget. Real rates are used for discounting constant-dollar flows, as is often required in cost-effectiveness analysis. The 20-year Real Interest Rate is 1.5% according to the Office of Management and Budget Circular No. A-94, revised December 2018.

3) Useful service lives of the facilities as determined by the USEPA are summarized in Table 9. While USEPA developed these for water equipment, service lives of assets in wastewater systems that do not come into direct contact with wastewater have been found to be similar and are applicable.

B. Alternatives Analysis

Alternatives considered were developed to meet California Governmental Code Section 65041.1. These state planning priorities are intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety in the state including in urban, suburban, and rural communities. All alternatives considered meet state planning priorities in that no new land will be impacted. All improvements will be confined to previously disturbed areas. Infill development is promoted, as many of the improvements will maintain and improve existing infrastructure already in place. Pipeline improvements will minimize environmental impacts as much as possible while still remedying problems. A California Environmental Quality Act (CEQA) categorical exemption and National Environmental Policy Act (NEPA) categorical exclusion are likely applicable since the recommended project involves replacement of existing facilities. Environmental documentation is being developed separate from this report. No growth inducing impacts are added because of the proposed improvements.

Regionalization Alternative: Connecting to or constructing improvements at a centrally located facility was an alternative considered as part of a regional solution. This regionalization alternative would allow other proposed developments to utilize a centrally located facility, as opposed to facilities unique to each development. However, the communities of Paynes Creek and Mill Creek are the closest that have substantial wastewater systems, and they are more than ten miles away and separated by significant geologic formations. As such, this alternative is considered infeasible to implement and a cost estimate is not given.

No Project Alternative: This alternative would result in continued inefficient operations utilizing outdated, unsafe, and obsolete equipment and continued excessive I&I that the District cannot afford. Given that other feasible alternatives exist for which current funding allows, this alternative is not justifiable.

Alternatives Considered

Various collection and treatment alternatives have been considered as further described below. Provided construction funding opportunities are made available to the District, the wastewater collection and treatment systems considered and selected in this Project Report should meet the regulatory, environmental, and economic objectives of all stakeholders.

Collection System Improvements:

This project has documented that the wastewater collection system is subject to some mechanical deficiencies as indicated by CCTV of the entire system. Pipeline and manhole improvements will improve the integrity of the system and reduce potential for sanitary sewer overflows and continual O&M problems; however, lateral repairs and replacements by individual homeowners will be key in reducing system I&I.

Collection system replacement alternatives were considered including 1) open cut; 2) pipe bursting; 3) horizontal directional drilling (HDD); and 4) cured-in-place pipe (CIPP).

Open cut trench excavation is the traditional and most popular method for sewer construction, repair, or replacement. Open cut trench excavation consists of excavating a trench for the manual installation of each piece of pipe. This method is usually the least expensive method if the pipe is not located under pavement. The open cut trench method involves excavating down to and exposing the existing pipe so that it can be repaired or replaced and then backfilled. If the open cut trench excavation is located in an unpaved area, the excavation can be backfilled with select native soil and surface vegetation restored by seed or sod. When the open cut trench excavation is located under pavement, the existing pavement must be saw cut and removed, the excavation filled with granular backfill to prevent settlement, and the pavement replaced.

Advantages:

- Can be less expensive than trenchless methods in unpaved areas
- Applicable for collapsed pipe, severely broken pipe, and heavy root blockages

- Does not require roots or debris to be removed from the pipe
- Many more contractors available to bid project
- Sewer grade is adjusted as installed and not subject to existing problems

Disadvantages:

- More excavation is required compared to trenchless methods
- May require removal of pavement, which increases expense
- Compaction control during installation is essential

Environmental impacts of open cut trench excavation is greater than trenchless methods as it requires more earth disturbance, which increases the potential for erosion. It will also include removal and replacement of pavement in some areas, which increases temporary air quality impacts during construction due to additional earth disturbance and emissions from material used for repaving (ENPLAN Alternatives Analysis for CSA 17 Wastewater Collection and Treatment Improvement Project, May 2017).

Pipe bursting is a trenchless method of replacing buried pipelines without the need for a traditional construction trench. Launching and receiving pits replace the trench needed by conventional, open cut pipe laying. Pipe bursting, which can be either pneumatic, hydraulic expansion, or static pull, fractures the existing pipe and displaces the fragments outward while a new pipe is drawn in to replace it. Typically, PVC or high density polyethylene (HDPE) pipe is utilized for the new pipe in the pipe bursting process.

Advantages:

- Reduces the amount of excavation required
- May reduce pavement removal and replacement costs
- Jointless pipe reduces root and water infiltration
- Can increase the diameter of existing pipe
- Can avoid environmentally sensitive areas

Disadvantages:

- More expensive than open cut trench excavation in unpaved areas
- Roots and debris must be removed from pipe before installation
- Pipe not exposed during installation, so grade could be compromised resulting in bellies or high points particularly if pipe bursting is to replace existing sags or offset joints as is the case in some locations in the District

Environmental impacts of pipe bursting is less than open cut in that the amount of excavation and pavement removal and replacement is reduced. This reduces the potential for erosion and air quality impacts. Pipe bursting also allows for avoidance of environmentally sensitive areas (ENPLAN, May 2017). However, pipe bursting is not appropriate for collapsed, severely broken, or sagging pipelines as is the case in some locations where collection system pipeline improvements are proposed.

HDD is a trenchless technology similar to pipe bursting and CIPP and is typically used when attempting to minimize surface disturbance. Directional drilling relies upon entry and exit pits and requires substantial laydown area for the pipe to be pulled into place. A horizontal hole is drilled and reamed, and the new pipe, which is typically HDPE or fused PVC, is pulled into place. Open cut trenching is required for each connection and at the manholes.

Advantages:

- Reduces amount of excavation
- May eliminate pavement removal and replacement costs
- Jointless pipe reduces root and water infiltration
- Can be used for deep excavations
- Can avoid environmentally sensitive areas

Disadvantages:

- More expensive than open cut trench excavation in unpaved areas
- Pipe not exposed during installation, so grade could be compromised resulting in bellies or high points particularly if pipe bursting is to replace existing sags or offset joints as is the case in some locations in the District

Environmental impacts of HDD is the same as that of pipe bursting. HDD reduces the amount of excavation and pavement removal and replacement, which reduces the potential for erosion and air quality impacts. It also allows for avoidance of environmentally sensitive areas (ENPLAN, May 2017). However, the pipe is not exposed during HDD installation. As such, the grade of the resulting pipeline could be compromised, particularly when HDD is used to replace existing sags or significant offset joints. This is the case in some locations where improvements are proposed in the District.

CIPP is a trenchless rehabilitation method used mainly to repair existing pipelines. CIPP is a jointless, seamless pipe within the existing pipe. A resin-saturated felt tube made of various materials is inverted or pulled into a damaged pipe. It is typically done from the upstream access point, usually an access pit or manhole. The liner can be inverted using water or air pressure. Hot water, UV light, ambient cured, or steam is used to cure the resin and form a tight fitting, jointless, and corrosion-resistant replacement pipe.

Advantages:

- Reduces amount of excavation required
- May eliminate pavement removal and replacement costs
- Jointless pipe reduces root and water infiltration
- Can avoid environmentally sensitive areas

Disadvantages:

- More expensive than open cut trench excavation in unpaved areas
- Roots and debris must be removed from pipe before installation
- Not applicable for collapsed, severely broken pipe, or heavy root blockages
- Pipe not exposed during installation, so grade could be compromised resulting in bellies or high points particularly if pipe bursting is to replace existing sags or offset joints as is the case in some locations in the District

Environmental impacts of CIPP are similar to HDD and pipe bursting in that they are less than open cut. CIPP reduces the amount of excavation required and may eliminate pavement removal and replacement costs. CIPP also avoids environmentally sensitive

areas (ENPLAN, May 2017). However, similar to other trenchless technologies, CIPP is not appropriate for collapsed, severely broken, or sagging pipelines with significant offset joints.

PACE bid a public works project for the City of Yreka in 2015 that included three of the aforementioned pipe installation methods. The average cost per foot is itemized in Table 11. Although these costs have increased since 2015, the equivalent difference in price is still applicable.

Most of the recommended pipeline improvements are due to multiple offset joints, severely broken pipe, or sags in the collection system. Pipe bursting and other trenchless technologies are not recommended in most locations due to the presence of these deficiencies. Additionally, most of the recommended collection system improvements are located in areas not subject to high traffic or environmentally sensitive areas that would warrant the increased cost of more expensive technologies. As such, it is recommended replacement sewers be installed in or immediately adjacent to existing sewers using open cut trench technology.

Wastewater Treatment Plant Improvements:

WWTP discharge is regulated per WDR Order No. R5-2015-0073. While numerous treatment technologies exist that could meet discharge requirements, existing infrastructure and facilities are already currently meeting requirements. As such, minimal alternatives exist to repair or replace existing deficiencies, and only those that utilize as much existing infrastructure and processes as possible while still gaining desired effluent quality and process efficiency improvements were considered.

Alternatives considered for providing remote monitoring capabilities included radio telemetry and internet-based telemetry. Both alternatives would require a computer workstation at the County Office in Gerber. Radio telemetry would include installation of a radio antenna and programmable logic controller (PLC) at the WWTP and County Office at an approximate cost of $20,000 including programming and integration. This alternative would only allow for remote monitoring between the two locations.

Telemetry alternatives considered included the more conventional internet-based telemetry, as well as a cloud-based system such as XiO. The conventional option would require an internet connection, protocol converter with firewall connectivity, and PLC at the WWTP at a cost of about $18,000 including programming and integration. While this is a more cost-effective alternative compared to radio telemetry, an additional ongoing internet service fee of about $45 per month would be required for internet-based telemetry. However, this option would allow for remote monitoring from anywhere internet is available.

A cloud-based system would also allow for remote monitoring from anywhere internet is available and would likely have a similar monthly fee of about $45 as that of the internet-based telemetry. However, the up-front capital cost to install a cloud-based system is much less costly than that of a conventional telemetry system. There are a few negatives though, which include complete reliance solely on the cloud-based company to maintain and manage the system. A local engineer and/or programmer would not be able to troubleshoot any issues that may arise, and if the cloud-based company goes out of business, a new system would have to be installed.

A radio path survey between the WWTP in Mineral and the Tehama County Office in Gerber was completed by Schneider Electric on October 3, 2019. Results of the survey indicated that installation of radio telemetry is not a viable alternative due to geological obstructions between the WWTP and County Office. As such, internet availability was verified at the WWTP, and it is recommended the District install either an internet connection or cloud-based system for remote monitoring. The District intends to look further into the XiO option. The subsequent Rate Study will anticipate the associated ongoing increased cost of about $45 per month for either of these options.

Consideration was given to installing safety measures constructed of wood rather than aluminum at Percolation and Evaporation Ponds 1 and 2. Wood has a more cost-effective, up-front capital cost, likely about one-third of that of aluminum, but it would not withstand the freezing harsh winters in Mineral. The wooden structures would have

to be replaced often. As such, it is recommended aluminum railings and steps be constructed for a better long-term solution with associated O&M savings.

Consideration was also given to just inspecting and repairing the existing Filter Supply Pumps as needed. Flygt Pumps (now Xylem) provided a quote to service the pumps at a July 2018 cost of approximately $2,300. If any repairs were needed, additional costs would be required. The approximate cost for a new pump is about $10,000. Given that the pumps have never been pulled for service, are more than 20 years old, and have met their useful service life, it is recommended the pumps be replaced rather than repaired. Even if services and repair did result in the pumps still working, it would be questionable how long they would last. New pumps would be much more efficient and reliable from an O&M standpoint. However, the District is inspecting the pumps, and inspection results may require the costs anticipated herein to be updated.

Installation of a UPS and manual transfer switch and replacement of the alarm system do not have any less costly alternatives aside from the No Project Alternative. As previously considered herein, given that other feasible alternatives exist for which current funding allows, this alternative is not feasible.

O&M Cost Estimate

While collection system replacement alternatives were previously considered herein, it was determined that only open cut was feasible in most locations to ensure resulting sewers would eliminate sags and significant offset joints and be at proper grades. As such, pipe bursting and other trenchless technology alternatives were not carried through for a more detailed alternatives analysis. Ongoing maintenance costs associated with pipeline blockages and surcharging will actually be reduced from what they have historically been following replacement of deficient wastewater collection mains and mechanical deficiencies. Additionally, replacement of deficient alarms and pumps should also decrease O&M costs at the WWTP. As such, the only increase in O&M anticipated will be to service the new remote monitoring equipment on an as-needed basis, which is estimated to cost less than $500 per year.

Short-Lived Asset Reserve

Short-lived assets, which require significant maintenance or full replacement within 5 to 15 years, are itemized for considered alternatives in Table 12. As shown therein, only proposed electrical and controls equipment and Filter Supply Pumps are applicable for short-lived asset reserve costs.

LCC

LCC estimate is a tool to determine the most cost-effective option among different competing alternatives to purchase, own, operate, maintain, and finally dispose of an object or process. Each alternative should be equally appropriate to be implemented on technical grounds. All the costs are totaled to a present-day value known as net present value (NPV) or present worth. LCC estimates are based on time of construction and include costs for construction, indirect costs, O&M, short-lived asset replacement, and salvage value.

LCC was not carried through for all pipeline collection system alternatives. Aside from open-cut trenching, all other alternatives considered are trenchless technologies that are not feasible to implement in most all cases due to the presence of multiple sags, significant offset joints, severely broken pipes, or heavy root blockages. Pipe bursting, HDD, and CIPP all have the possibility of resulting in inadequate final grades when these existing conditions are present, and therefore, these alternatives may result in additional problems and are not recommended. LCC for open-cut trenching is included in Table 13. As shown therein, no additional O&M or short-lived assets are expected as a result of the pipeline improvements. Less O&M will be spent than currently occurs in regard to staff time tending to broken pipes and wastewater backups in the areas in which improvements will take place, and no short-lived assets will be added to the system as all improvements have anticipated service lives of greater than 15 years.

All project alternatives considered have the same opportunities for water and energy efficiency and integrate climate change considerations as follows:

1. Improvements to the wastewater collection system will minimize I&I thereby reducing the amount of waste that must be treated, which leads to an increase in both water and energy efficiency.

2. Proposed alternatives further seek to integrate energy efficiency goals and minimize ongoing costs to taxpayers by requiring the use of National Electrical Manufacturers Association (NEMA) Premium motors and generators. NEMA Premium motors and optimized systems reduce electrical consumption thereby reducing pollution associated with electrical power generation. These measures will reduce the net capital and operations cost of the project and are consistent with State Revolving Fund climate change goals.

V. SELECTED PROJECT

A. Description

While collection system replacement alternatives were previously considered herein, it was determined that only open cut was feasible in most locations to ensure resulting sewers would effectively eliminate significant mechanical deficiencies, be at proper grades, and remedy multiple offset joints. As such, pipe bursting and other trenchless technology alternatives were not carried through for more detailed alternative analysis.

All project alternatives will improve the integrity of the system and minimize occurrences of sanitary sewer overflows and O&M problems as well as upgrade motors and electrical to those of premium efficiencies. As such, the recommended collection and treatment system improvements were primarily selected due to existing infrastructure, site, and funding limitations and ease of O&M.

The recommended Wastewater Treatment and Collection System Improvement Project will include the following components:

- Repair of ten pipeline mechanical deficiencies identified via CCTV to repair broken pipe, eliminate roots, offset joints, etc.
- Replacement of four manholes identified via CCTV.
- Replacement of approximately 1,100 feet of existing deficient 6-inch pipe to be replaced with new 6-inch PVC pipe, 955 feet of which consists of existing AC pipe and 150 feet of existing deficient PVC pipe.
- Installation of a UPS and remote monitoring capabilities.
- Installation of steps with railing at Percolation and Evaporation Ponds 1 and 2.
- Replacement of Filter Supply Pumps.
- Replacement of the auto dialer, bladder tank, and alarm system.
- Installation of manual transfer switch and j-box.

The above project components are anticipated to result in the following:

- Assuming approximately ten feet of pipe will be replaced at each mechanical deficiency, the total length of pipe being replaced will be 1,205 feet.
- No private lateral pipelines will be replaced aside from some lateral connections to main lines of pipelines being replaced.
- Piping at all existing deficiencies will be replaced rather than simply rehabilitated or repaired.
- The approximate reduction in I&I is difficult to predict but is expected to be minor given that the majority is believed to be coming from private laterals, which will be replaced by homeowners.

Refer to Figure 4 for the existing collection system and proposed improvements. Refer to Figures 5 and 6 for the existing WWTP site plan and process flow diagram with proposed improvements, respectively.

California Governmental Code § 65041.1 addresses state planning priorities and sustainable water resources management priorities. These policies are intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety in the state including in urban, suburban, and rural communities.

The recommended project complies with these priorities as follows:

a) Promote infill development and equity by rehabilitating, maintaining, and improving existing infrastructure that supports infill development and appropriate reuse and redevelopment of previously developed, underutilized land that is presently served by transit, streets, water, sewer, and other essential services, particularly in underserved areas, and to preserving cultural and historic resources.

The recommended project efficiently utilizes land already occupied by existing facilities. Proposed facilities will serve only those areas within the existing Sewer Service Area already receiving service.

b) Protect environmental and agricultural resources by protecting, preserving, and enhancing the state's most valuable natural resources, including working landscapes such as farm, range, and forest lands, natural lands such as wetlands, watersheds, wildlife habitats, and other wildlands, recreation lands such as parks, trails, greenbelts, and other open space, and landscapes with locally unique features and areas identified by the state as deserving special protection.

The recommended project protects environmental resources including wildlife habitat and recreational activities by minimizing I&I and removing contaminants from the wastewater prior to discharge. Collection system improvements will minimize the potential for sanitary sewer overflows and contamination to groundwater. All environmental impacts will be analyzed and mitigated in the construction contract documents.

The recommended project incorporates energy and water conservation measures by installing premium efficiency pumps and motors and minimizing I&I, which in turn reduces the amount of waste that must be treated and reduces the pump horsepower necessary to treat future PWWFs.

c) Encourage efficient development patterns by ensuring that any infrastructure associated with development, other than infill development, supports new development that does all of the following:

(1) Uses land efficiently.
(2) Is built adjacent to existing developed areas to the extent consistent with the priorities specified pursuant to subdivision b).
(3) Is located in an area appropriately planned for growth.
(4) Is served by adequate transportation and other essential utilities and services.
(5) Minimizes ongoing costs to taxpayers.

As noted above, the recommended project will efficiently utilize land already occupied by existing facilities. Proposed facilities will serve only those areas within the proposed Sewer Service Area already receiving service. No components of this project are growth inducing, and no new users will result from this project.

B. Design Criteria and Useful Life of the Project

Design criteria of the recommended project to meet regulatory requirements and useful life of project components are presented in the following locations:

Table 10:	WWTP Design Criteria
Table 9:	Equipment Useful Service Lives
Appendix A:	Effluent limits and monitoring requirements

C. Life Cycle Cost Estimate

The recommended project cost breakdown is included in Table 14. As shown therein, construction costs are approximately $687,000, with indirect costs of $269,000, for a total project cost requested for financing of $1,025,000. The estimated annual O&M of the recommended project components will be nearly identical to those currently in place. With the exception of additional remote monitoring equipment, which slightly increases annual O&M by about $500, and an annual short-lived asset reserve of $6,900 as shown in Table 12, most all of the improvements are to repair existing infrastructure. As such, the LCC estimate for the recommended project is itemized in Table 15 with a project NPV of $1,081,000. This includes a replacement salvage value of $153,000 as shown in Table 16.

D. Schedule

A preliminary project schedule is presented in Table 17. The schedule is dependent upon successful completion of key steps to fund the recommended project.

E. Permits

A Caltrans Encroachment Permit will be required for collection system improvements along Highway 299, as well as a Streambed Alteration Agreement from California Fish

and Wildlife and a Regional Board Water Quality Certification. The project is anticipated to proceed under an Army Corps of Engineers Non-Notifying Nationwide Permit 12. No permits are anticipated to be needed for the WWTP improvements. CEQA and NEPA documentation is being prepared by ENPLAN separate from this report.

F. Key Issues to be Resolved

Best management practices described in Table 18 will be required of the contractor for the project, which will reduce construction-related issues. Elevated groundwater levels may be encountered during construction; however, costs have been included to account for bypass pumping and dewatering. Contractors will be notified of this issue during a pre-bid meeting.

Key to the success of the recommended project is successfully obtaining construction grant funding. In 2015, the District qualified for Clean Water State Revolving Fund (CWSRF) Proposition 1 Small Community Grant funding for completion of this Project Report. However, since that time, it has become questionable if Mineral meets the CWSRF requirement that at least 50% of the dwellings must be the primary dwelling of permanent residents who reside in the community at least six months of the year to be eligible for construction grant or loan funds. Per CWSRF, it is anticipated the District may be eligible for construction funding; however, there will soon be a new way to determine eligibility of seasonal communities. It is envisioned that CWSRF will be the primary source for construction funding as well; however, the subsequent Rate Study will consider multiple funding options since CWSRF funding is not guaranteed.

The District currently qualifies as a disadvantaged community with a median household income (MHI) of $49,766, or just 74% of that of the state according to the ACS 2013 to 2017 5-Year Estimate. As such, if they are found to be eligible, the District would qualify for up to 75% construction grant funding if wastewater rates were at least 1.5% of the MHI (an annual single-family residential rate of $746.49).

If CWSRF determines the District does not meet the future permanent residency requirement, alternative funding will need to be pursued. USDA Rural Development (RD) currently utilizes the ACS 2006 to 2010 5-Year Estimate to determine eligibility for grant funding. The corresponding District MHI for this time period is $64,583, or even more than that of the state. Furthermore, USDA RD typically requires wastewater rates to be upwards of 2% of the MHI to be considered for grant funding. As such, USDA RD would not currently have any grant funding available for District construction projects. Instead, low-interest loan funding would be available at a market rate currently at 3.0% for a maximum 40-year loan term. USDA RD does not have a permanent residency requirement to be eligible for loan funding like CWSRF does.

The Rate Study will include further details on recommended wastewater rates over the next five years to not only fund improvements recommended herein but also to consider system O&M, including adequate wastewater system staffing and other considered budgetary components.

TABLES

TABLE 1

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project

SOUTH FORK BATTLE CREEK USGS GAGING STATION MEASUREMENTS[1]

Measurement No.	Date	Staff Gage Reading (FT)	SFBC Flow (CFS)
1	1/8/2018	14.02	46.6
2	1/19/2018	14.24	88.0
3	2/6/2018	14.05	55.7
4	3/7/2018	13.85	26.0
5	3/14/2018	14.48	128.1
6	4/2/2018	14.38	122.4
7	4/12/2018	14.49	157.6

1. Refer to Figure 2 herein for the provisional rating curve USGS developed from these measurements.

TABLE 2

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
RECEIVING WATER QUALITY DATA

Constituent	Units	Results						MCL[1]	Qualifier	MDL	RL
		February 14, 2017			April 9, 2019						
		RSW-001	RSW-001[2]	RSW-002	RSW-001	RSW-001[2]	RSW-002				
Alkalinity as CaCO3	mg/l	18		21	17		17	-		1	5
Aluminum	ug/l		288			364		200		1.6	5.0
Ammonia as N	mg/l	0.02		ND	ND		ND	-	J, -	0.01	0.05
Antimony	ug/l		ND			ND				0.17	0.50
Arsenic	ug/l		ND			ND				0.19	0.50
Barium	ug/l		5.8							0.1	0.5
Beryllium	ug/l		ND			ND				0.08	0.50
Bicarbonate	mg/l	22		26	20		20	-		1	5
Boron	ug/l	2.2		2.4	2.9		3.0	-	J, J	2	10
Bromodichloromethane	ug/l		ND			ND				0.09	0.50
Cadmium	ug/l		ND			ND				0.08	0.20
Calcium	mg/l	4.0		4.0	4.2		4.1	-		0.2	1
Carbonate	mg/l	ND		ND	ND		ND	-		1	5
Chloride	mg/l	0.69		0.70	0.44		0.44	250		0.1	0.5
Chloroform	ug/l		ND			ND				0.12	0.50
Chromium	ug/l		0.6			0.71				0.13	0.50
Chromium, Hexavalent (CrVI)	ug/l		0.138			0.096			J	0.010	0.100
Chromium, Trivalent	ug/l		0.444			0.609				0.130	0.500
Copper, Total	ug/l		0.5			0.50		1,000	J, J	0.17	0.50
Copper, Dissolved	ug/l	0.30		0.30	0.28		0.24	1,000	J, J	0.1	0.5
Cyanide, Total	ug/l		ND			ND				1.0	3.0
Di-n-butyl phthalate	ug/l		3.2						J	1.4	5.0
Electrical Conductivity	umhos/cm	40		40	42		43				
Fluoride	mg/l		0.04						J	0.02	0.10
Hardness	mg/l	15	17	15	18	18	17	-		3	5
Hydroxide	mg/l	ND		ND	ND		ND	-		1	5
Iron	ug/l	149		183	242		200	300		7	15
Lead	ug/l		ND			0.18			J	0.07	0.50
Magnesium	mg/l	1.6		1.6	1.7		1.8	-		0.2	1
Manganese	ug/l	3.8		4.3	8.02		7.78	50		0.1	0.5
Mercury	ug/l		ND			ND				0.07	0.20
Nickel	ug/l		0.6			0.67				0.16	0.50
pH	pH units	7.31	7.32	7.25	7.23	7.27	7.30	6.5-8.4			
Potassium	mg/l	0.8		0.8	1.6		ND	-	J, J	0.2	1
Selenium	ug/l		ND			ND				0.3	2.0
Silver	ug/l		ND			ND				0.04	0.20
Sodium	mg/l	2.2		2.2	2.8		2.5	-		0.2	1
Specific Conductance	umhos/cm	40		40	42		43	900		2	10
Sulfide	mg/l		ND							0.010	0.020
Sulfur	ug/l		474							20	100
Thallium	ug/l		ND			ND				0.06	0.50
Total Coliforms	MPN/100 ml	-		-	300		240				
Total Dissolved Solids	mg/l	32		50	37		42	500		3	6
Total Phosphorus as P	mg/l	ND		ND	ND		ND	-		0.02	0.05
Turbidity	NTU	2.8		3.0	4.2		3.6	5		0.1	0.5
Zinc, Total	ug/l		0.6			0.9		7.8	J	0.5	2.0
Zinc, Dissolved	ug/l	ND		ND	ND		ND	7.8		0.6	2

Notes:

1. Most stringent applicable MCL

2. Regional Water Quality Control Board Sample Results

J = Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). The J-flag is equivalent to the DNQ Estimated Concentration flag.

ND = Non-detect

Result is above the most stringent water quality objective.

TABLE 3

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
GROUNDWATER QUALITY DATA

Constituent	Units	RGW-001		RGW-002		RGW-003		Most Stringent Water Quality Objective
		Min	Max	Min	Max	Min	Max	
Alkalinity, Total (as CaCO3)	mg/L	76	91	58	112	63	90	NA
Ammonia, Total (as N)	mg/L	<0.01	0.02	0.01	0.214	<0.01	0.208	NA
Boron, Total	ug/L	2.5	11.2	8.0	55.1	5.1	34.3	NA
Calcium, Total	mg/L	13.3	17.5	15.6	31.0	13.8	25.9	NA
Chloride	mg/L	1.24	5.43	5.44	71.8	3.78	28.6	250
Electrical Conductivity @ 25 Deg. C	umhos/cm	142	187	135	484	153	263	900
Hardness, Total (as CaCO3)	mg/L	60	73	59	110	55	85	NA
Iron, Dissolved	ug/L	<7.5	<7.5	1730	1730	1160	1160	300
Iron, Total	ug/L	27	2200	2600	53700	283	26600	300
Magnesium, Total	mg/L	6.7	9.6	5.1	14.2	5.4	11.9	NA
Manganese, Dissolved	ug/L	1.38	1.38	4260	4260	1840	1840	50
Manganese, Total	ug/L	2.52	56.9	934	5930	408	2930	50
Nitrate, Total (as N)	mg/L	0.06	0.15	<0.02	0.52	<0.02	0.09	10
Nitrogen, Total (as N)	mg/L	<0.09	0.42	0.273	2.3	0.17	0.7	NA
pH	mg/L	5.89	7.09	6.17	7.59	6.09	7.56	6.5-8.4
Phosphorus, Total (as P)	mg/L	<0.02	0.11	0.031	2.45	<0.02	0.73	NA
Potassium, Total Recoverable	mg/L	0.9	1.2	1.2	6.0	2.1	4.2	NA
Sodium, Total	mg/L	5.0	10.3	7.0	36.4	8.9	23.2	NA
Total Coliform	MPN/100 mL	<2	110	<2	350	<2	430	<2.2
Fecal Coliform	MPN/100 mL	<2	<2	<2	<2	<2	<2	<2.2
Total Dissolved Solids (TDS)	mg/L	105	186	116	318	105	176	500
Total Kjeldahl Nitrogen (TKN) (as N)	mg/L	<0.09	0.4	0.3	2.3	0.1	0.5	NA

Notes:

Indicates result above most stringent water quality objective

NA No applicable water quality objective

Data from samples taken September 2015 through June 2019

TABLE 4

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
EFFLUENT WATER QUALITY DATA

Analyte	Units	Results[1,4]				Water Quality Objective				
		02/14/17 (1)	02/14/17 (2)[5]	04/09/19 (3)	04/09/19 (4)[5]	Basin Plan	WDR MCL	Primary MCL	Secondary MCL	CTR
Alkalinity as CaCO3	mg/l	22	-	17	-	-	-	-	-	-
Aluminum	ug/l	-	388	-	126	-	-	1,000	200	-
Antimony	ug/l	-	ND	-	ND	-	-	-	-	-
Arsenic	ug/l	-	ND	-	ND	-	-	-	-	-
Barium	ug/l	-	3.4	-	-	-	-	1,000	-	-
Beryllium	ug/l	-	ND	-	ND	-	-	-	-	-
Bicarbonate	mg/l	27	-	21	-	-	-	-	-	-
Boron	ug/l	5.2	-	4.1	-	-	-	-	-	-
Bromodichloromethane	ug/l	-	0.23	-	0.39	-	80	80	-	0.56
Cadmium	ug/l	-	ND		ND	-	-	-	-	-
Calcium	mg/l	4.1	-	4.3	-	-	-	-	-	-
Chloride	mg/l	0.72	-	4.54	-	-	-	-	250	-
Chloroform	ug/l	-	11.0	-	7.45	-	-	80	-	-
Chromium	ug/l	-	0.5	-	0.23	-	-	50	-	-
Chromium, Hexavalent (CrVI)	ug/l	-	0.053	-	0.033	-	-	10	-	10.54[2]
Chromium, Trivalent	ug/l	-	0.483	-	0.197	-	-	-	-	37.6[2]
Copper, Dissolved	ug/l	1.9	-	1.5	-	2.31[2]	-	-	-	2.25[2]
Copper, Total	ug/l	-	2.6	-	1.97	-	1,000	1,300	1,000	2.34[2]
Cyanide, Total	ug/l	-	ND	-	ND	-	-	-	-	-
Di-n-butyl phthalate	ug/l	-	2.5	-	-	-	-	-	-	-
Fecal Coliforms	MPN/100 ml	-	-	<2	-	-	-	-	-	-
Fluoride	mg/l	-	0.03	-	-	-	-	-	2	-
Hardness	mg/l	13	13	17	17	-	-	-	-	-
Iron	ug/l	217	-	99.3	-	-	-	-	300	-
Lead	ug/l	-	0.3	-	0.13	-	15	15	-	0.4[2]
Magnesium	mg/l	1.1	-	1.3	-	-	-	-	-	-
Manganese	ug/l	3.8	-	3.47	-	-	-	-	50	-
Mercury	ug/l	-	ND	-	ND	-	-	-	-	-
Nickel	ug/l	-	0.5	-	0.29	-	100	100	-	10.48[2]
Nitrate as N	mg/l	0.12	-	-	-	-	10	-	-	-
Nitrite as N	mg/l	0.004	-	-	-	-	-	1	-	-
pH	pH units	7.01	7.06	8.75	8.48	-	6.5-8.4	-	6.5-8.4	-
Potassium	mg/l	0.8	-	0.7	-	-	-	-	-	-
Selenium	ug/l	-	ND	-	ND	-	-	-	-	-
Silver	ug/l	-	ND	-	ND	-	-	-	-	-
Sodium	mg/l	9.6	-	5.3	-	-	-	-	-	-
Specific Conductance	umhos/cm	71	-	58	-	-	-	-	900	-
Sulfate as SO4	mg/l	1.5	-	-	-	-	-	-	250	-
Sulfide	mg/l	-	0.018	-	-	-	-	-	-	-
Sulfur	ug/l	-	506	-	-	-	-	-	-	-
Thallium	ug/l	-	ND	-	ND	-	-	-	-	-
Total Coliforms	MPN/100 ml	<2	-	<2	-	-	23[3]	-	-	-
Total Dissolved Solids	mg/l	45	-	43	-	-	-	-	500	-
Total Phosphorus as P	mg/l	0.17	-	0.124	-	-	-	-	-	-
Zinc, Total	ug/l	-	5.1	-	5.9	7.09[2]	5000	-	5000	24[2]
Zinc, Dissolved	ug/l	3.7	-	1.9	-	-	-	-	-	-

Notes:

1. More than one test was done for some of the analytes.
2. Based on a minimum downstream ambient hardness of 15 mg/L.
3. As a 7-day median.
4. Refer to Appendix B for all sampling results.
5. Regional Water Quality Control Board Sampling Results.

Result is above the most stringent water quality objective.

TABLE 5

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project

PARK SERVICE FLOW MEASUREMENTS[3]

Date	Park Service 6" Pipe Depth (FT)	Park Service Flow (GPM)	Park Service Flow % of Total	Upstream 8" Pipe Depth (FT)	Upstream Flow (GPM)	Remainder of System Flow % of Total	Total (GPM)
9/3/19[1]	0.05	5	34	-	9	66	14
8/6/2019[1]	0.11	24	75	0.07	8	25	32
Flow monitor avg from 5/10/19-5/27/19	-	97	46	-	114	54	211
4/18/2019[1]	0.46	233	71	0.27	93	29	326
1/31/2019[1]	0.33	152	75	0.20	51	25	203
1/8/2019[1]	0.16	48	81	0.08	11	19	59
Flow monitor avg from 1/18/18-3/5/18[2]	-	22	19	-	97	81	119
1/29/2018[1]	0.33	152	76	0.17	47	24	199

Notes:

1. Flows calculated from depth of flow measurements.
2. The 97 GPM upstream flow is suspect as it was based on average WWTP flows taken from circular charts. Only the Park Service had a monitor on it at this time.
3. Construction of wastewater and water improvements at the Park Service was ongoing during January through May 2019 measurements taken above.

TABLE 6

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project

PIPELINE CCTV RESULTS

Street	Upstream MH	Downstream MH	Pipe Material	CCTV Length (FT)	Diameter (IN)	Pipe Slope (FT/FT)	Overall Rate Index (ORI)	Laterals	Spot Repair	Notes
MORGAN AVE	4A	4	PVC	112	6	0.004	5	2		Survey abandoned due to tap factory near cleanout, no improvements necessary
HUSKY WAY	50	49	AC	148	6	0.042	4	1		Multiple offset joints, infiltration at 114'
AMANDA WAY	55	54	PVC	130	6	0.033	4	0		5% deformed pipe at joint 3:00 to 6:00 - survey abandoned; no repair needed
EASEMENT	75	76	AC	394	8	0.007	4	0	1	Hole with soil visible at 300', spot repair
EASEMENT	73B	74	AC	396	8	0.007	3	1	1	Fine roots and fracture at 249' - debris attached to roots in top of pipe
MINERAL AVE	36	35	AC	343	8	0.014	2	1		No issues - lateral has been capped
SCENIC AVE	42	41	PVC	100	6	0.010	2	1		Minor attached deposits, no improvements necessary
SCENIC AVE	43	42	PVC	396	6	0.023	2	13	1	Gasket obstruction at joint 10'
BATTLE CREEK AVE	63A	63	PVC	109	6	0.043	2	2	1	Root and holes in pipe at 104'
EASEMENT	71	72	AC	62	8	0.007	2	1		No issues - lateral has been capped
EASEMENT	74	75	AC	396	8	0.007	2	0	1	Spiral fracture with minor roots at 353', spot repair
EASEMENT	76A	77	AC	333	8	0.007	2	0	1	Root ball at joint 86', spot repair
EASEMENT	15	14	PVC	100	6	0.187	1	0		Alignment down, no repairs necessary
EASEMENT	27	26	PVC	282	6	0.083	1	4	1	Fine roots at 112'
MT LASSEN AVE	46	45	PVC	91	6	0.018	1	0		Minor attached deposits, no improvements necessary
EASEMENT	49	48	PVC	125	6	0.050	1	2		Alignment left, no improvements necessary
EASEMENT	50A	50	AC	150	6	0.009	1	1		Minor attached deposits, no improvements necessary
EASEMENT	50B	50A	PVC	96	6	0.006	1	1		Multiple offset joints last 25'
BERESFORD WAY	51	50	AC	300	6	0.090	1	3		Cracked pipe at 26', multiple joint offsets
BERESFORD WAY	52	51	AC	482	6	0.007	1	8		Multiple offset joints with infiltration
AMANDA WAY	53A	53	PVC	132	6	0.043	1	2	1	Fine roots in 8" at cleanout end
AMANDA WAY	54	53	PVC	140	6	0.031	1	4		Multiple offset joints and minor root intrusion
BATTLE CREEK AVE	65	64	PVC	315	6	0.016	1	11	1	Fine roots at joint 110'
EASEMENT	76	76A	AC	396	8	0.007	1	0	1	Roots at 3'
AMANDA WAY	101	54A	PVC	199	6	0.006	0	0		Sag 40% 170' to 178'
BERESFORDWAY	52	51	PVC	5	6	0.007	0	8		Pipe changes from PVC to AC four different times
BEREFORD WAY	52A	52	PVC	139	6	0.043	0	5		No repair needed - pipe in good shape
AMANDA WAY	53	50	PVC	245	6	0.015	0	2		Multiple sags 10%-30% full, PVC to AC 237'
AMANDA WAY	54A	54	PVC	154	6	0.056	0	1		Pipe in good condition
EASEMENT	56A	56	PVC	80	6	0.043	0	1		Soil exposed in cleanout - clean out and replace cap
EASEMENT	66	67	AC	397	8	0.007	0	0		Multiple sags 30% full
EASEMENT	68	69	AC	392	8	0.007	0	0		Offset joint leaving Manhole 68; sags, 30% full, debris at 330'
EASEMENT	72	73	AC	396	8	0.007	0	0		Multiple sags 30% full

Note: Highlighted pipelines to be included in improvement project recommended herein.

TABLE 7

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
MANHOLE CCTV RESULTS

MH Number	MH Component	MACP Code	Depth (FT)	Observation	Replace?	Notes
48	WI	RFJ	7.3	Roots fine joint from 7 o'clock to 3 o'clock, within 8 inch		County provide root killer and seal joint
50A	WE	ID	4.9	Infiltration dripper from 2 o'clock to 8 o'clock, within 8 inch	x	Multiple infiltration stains
57	WI	RFJ	3.2	Roots fine joint from 10 o'clock to 4 o'clock, within 8 inch and intruding seal	x	Multiple infiltration stains and fine roots
62	WI	IS	1.4	Infiltration stain from 12 o'clock to 12 o'clock, within 8 inch	x	Multiple infiltration stains
64	COI	RMJ	2.0	Roots medium joint at 3 o'clock, 5% lost, within 8 inch	x	Fine roots, hole, infiltration stains
				Replace Manhole Total :	4	

WI = Wall Interior
WE = Wall Exterior
COI = Cone Interior
RFJ = Roots Fine Joint
ID = Infiltration Dripper
IS = Infiltration Stain
RMJ = Roots Medium Joint

TABLE 8

Tehama County Sanitation District No. 1 Mineral

Wastewater Collection and Treatment Improvement Project

LATERAL CCTV RESULTS

Inspection Date	Street	Address	Contractor Comments	PACE Comments	PACE Recommendations
8/13/2019	Mineral Avenue	38193	right side by tree, low spot at 106'	significant buildup (grease?), sag at 106', roots at 42', needs a grease trap, raise cleanout above grade and cap	snake and redo CCTV
8/13/2019	Mineral Avenue	38207	added clean out in front, ran from toilet	roots at 35' and 42', broken pipe at 42'	repair or replace
8/17/2019	Mineral Avenue	38213	front, line looks low, a lot of standing water	sag from 6' to 38', only went to 39' and stopped, not all the way to connection and most all underwater	snake and redo CCTV
7/13/2019	Mineral Avenue	38219	right front of garage	roots at 35' joint camera cannot pass, repair and redo CCTV	repair
8/13/2019	Mineral Avenue	38223	left front-reflector, collapse at 71'	collapse at 71', repair and redo CCTV	repair
8/13/2019	Mineral Avenue	38224	left front-reflector		ok
8/13/2019	Mineral Avenue	38231	front buried	cleanout below grade, raise	repair
8/13/2019	Mineral Avenue	38232	roots found at 14' and 24'	roots at every joint, raise new cleanout above grade and cap	replace
8/13/2019	Mineral Avenue	38236	front	crack at first joint at 7', offset joint at transition to PVC at 36' with multiple elbows, offset joint at 38' to different PVC, raise new cleanout above grade and cap	replace
8/13/2019	Mineral Avenue	38237	in house, brown house under porch	sag at 20', difficult to see from debris and water at transition at 28' (looks like roots)	snake and redo CCTV
	Mineral Avenue	38293	potentially too small, can't find cleanout		cannot CCTV - install new cleanout
8/13/2019	Mineral Avenue	38241	front of house-left of steps		ok
8/13/2019	Mineral Avenue	38242	right side		ok
8/17/2019	Mineral Avenue	38261	right side, line has some low spots	standing water first 15', small offset joints, couple of sags	snake and redo CCTV
	Mineral Avenue	38275	back right side into house, brass clean out needs drilled out to access.		cannot CCTV - install new cleanout
8/17/2019	Mineral Avenue	38279	right side, line looks good		ok
8/20/2019	Mineral Avenue	38283	under porch, roots at 3', 8', and 16'	roots at every joint, raise new cleanout above grade and cap	replace
	Mineral Avenue	38284	left side-2" into house, too small for camera head		cannot CCTV - install new cleanout
	Mineral Avenue	38287	left rear-2" vent, too small for camera head		cannot CCTV - install new cleanout
8/20/2019	Mineral Avenue	38288	connects to old city sewer	tee 7' in, raise new cleanout above grade and cap	replace
9/5/2019	Mineral Avenue	38301			ok
8/20/2019	Mineral Avenue	38311	front of porch-2nd post from right, roots at 13'	pipe deformity at 10', broken pipe and roots at 13'	repair or replace
8/20/2019	Mineral Avenue	38324	rear - ran 83', line looks good. Connection at 43'.	sag at 30' to 40', stopped at 83' due to bend	snake and redo CCTV
8/20/2019	Mineral Avenue	38329	in house, roots in line, obstruction at 40'	camera submerged and roots at 24', obstruction cannot pass at 40'	replace
8/17/2019	Mineral Avenue	38330	front buried	verify if cleanout buried per Contractor notes, raise if so	repair
8/30/2019	Mineral Avenue	38350	Goes right to the county sewer	cleanout cap looks broken or taped over, replace cap	repair
8/20/2019	Battle Creek	38262	rear, bad spot at 86', runs uphill	32' another connection or?, adverse slope	replace
8/20/2019	Battle Creek	38293	west side of house-white arrow	roots at all joints, raise new cleanout above grade and cap	replace
8/20/2019	Battle Creek	38305	west side of house-stake with flag (7/2/19)		ok
9/5/2019	Battle Creek	38310			ok
8/20/2019	Battle Creek	38311			ok
8/30/2019	brown house, red door east of 38331		right side	sag 20' to 38'	repair or replace
8/20/2019	Battle Creek	38314	rear left	multiple connections first 10', tee at 18', stuck at elb at 38', did not TV to County connection	snake and redo CCTV
9/5/2019	Battle Creek	38321	left side	Roots at joint 17', 32', 53', 60'	replace
8/30/2019	Battle Creek	38321	green shack west of 38325, right side		ok
7/25/2019	Battle Creek	38334			ok
9/5/2019	Battle Creek	38335	beneath green paver	raise cleanout above grade and cap	repair
8/30/2019	Battle Creek	38338	rear left	large sag at 74' to 91', did not TV to County connection, or is sag in County line??	repair
8/30/2019	Battle Creek	38353	rear	significant buildup (grease?), needs grease trap	snake and redo CCTV
8/30/2019	Battle Creek	38357	right side	buildup (grease?), needs grease trap	snake and redo CCTV
	Scenic Ave	38207	right front-in garage, can't get past T in line		cannot CCTV - install new cleanout
8/13/2019	Scenic Ave	38215	in garage under house-photo 7/16/19, line is flat at 16', 26', and 36'. Ran camera out 60'	multiple sags, roots at joint, raise new cleanout above grade and cap	replace
8/20/2019	Scenic Ave	38221	under front deck-accessible-2"		ok
8/17/2019	Scenic Ave	38227	rear of house-vented	replace broken cap	repair
8/20/2019	Scenic Ave	38228	rear-under crawl space(west side), clear line, lip catches at county joint.		ok
8/17/2019	Scenic Ave	38234	front of house-white arrow		ok
8/20/2019	Scenic Ave	38235	front of house-left of porch-flag on pipe	offset joint at 37' at county connection (soil visible?)	repair
	Scenic Ave	38240	under house-front, could not locate, no one home		cannot CCTV - install new cleanout
8/17/2019	Scenic Ave	38248	front		ok
8/17/2019	Scenic Ave	38254	left side of house		ok
	Scenic Ave	38255	left side behind porch-2" line into house, too small for camera head		cannot CCTV - install new cleanout
8/17/2019	Scenic Ave	38269	front-north side, line is off-center at 26', could not pass.	offset joint with roots at 26', repair and redo CCTV	repair or replace
8/17/2019	Scenic Ave	38270	west side of house	possible offset joint at 42' debris on camera entire time	snake and redo CCTV
8/17/2019	Scenic Ave	38281	front of house, could not get past 106'	roots at 95'	repair
8/17/2019	Scenic Ave	38289	left side of house-south side, line very greasy, could not pass obstruction at 64'	needs grease trap	snake and redo CCTV
8/17/2019	Scenic Ave	38296	behind house	rocks in line at entrance, hole at 4' (another cleanout?), significant offset joint at 25', deformed pipe at 48'?, roots or collapse at joint at 54', raise new cleanout above grade and cap	replace
8/20/2019	Scenic Ave	38300	west side of house	camera until 71', not all the way to County connection	snake and redo CCTV
8/17/2019	Scenic Ave	38305	behind house-south side, too much wastewater in line, could not see anything past 60'	18' infiltration from hole (lateral?) above, hole at 20'	replace
8/17/2019	Scenic Ave	38308	front		ok
9/5/2019	Scenic Ave	38313	SW corner-by crawl space vent in box(7/30/19)	significant buildup (grease?), possible roots at 6', sag 10' to 40', needs grease trap	snake and redo CCTV
	Scenic Ave	38318	inside garage, line has T that camera can't pass		cannot CCTV - install new cleanout
8/20/2019	Scenic Ave	38319	behind house-south side	multiple turns, sag at 60' to 70', stopped at 70', not all the way to County connection	snake and redo CCTV
9/5/2019	Scenic Ave	38328	line is blocked, marked bad spots, no District cleanout	camera under water first 32' then large drop in pipe and full of roots, offset joints, raise new cleanout above grade and cap	replace
8/20/2019	Scenic Ave	38334	front-carport		ok
8/17/2019	Scenic Ave	38348	front of house, small roots at 13', 17', and 22'	roots at all joints	replace
8/20/2019	Mt Lassen Ave	18775	rear(west), a lot of roots every 3' due to clay pipe joints	roots at all joints	replace
	Kirk Michaels		rear left, cleanout installed backwards		cannot CCTV - install new cleanout
8/20/2019	Mt Turner Ave	18729	rear of house, a lot of gravel in line	cleanout on ground, soil visit at offset joint at 5', another lateral connection at 16'?, rocks and gravel at another connection at 22', deformed pipe at 54', broken pipe at 37'	replace
8/20/2019	Mt Turner Ave	18757	left side of house(south side)	sag from 15' to 35', lateral connection at 37'?	repair
8/30/2019	Hampton Ave	38222	east side-front		ok
9/7/2019	Hampton Ave	38226	southwest corner-front	adverse slope 9-10', possible roots at joint 23'	repair
8/30/2019	Hampton Ave	38234	east side		ok
8/30/2019	Hampton Ave	38242	east side		ok
8/30/2019	Hampton Ave	38248	east side		ok
9/7/2019	Hampton Ave	38256	northwest corner		ok
8/30/2019	Hampton Ave	38270	(most easterly house)front of house	sag 32' to District line	ok
8/30/2019	Morgan Ave	38212	front		ok
8/30/2019	Beresford Way	38385	left side	roots at all joints, deformed pipe	replace
	Beresford Way	3841	2" horizontal vent-right side too small for camera head		cannot CCTV - install new cleanout
9/7/2019	Beresford Way	38412	west side		ok
9/7/2019	Beresford Way	38424	2" back vent	roots and deformed pipe with possible hole in top at 14', deformed at 23' and offset joint, deformed at 43', significant roots at multiple joints	replace
8/30/2019	Beresford Way	38430	Ran from pulled toilet	offset joints and broken pipe at 8' to 10', offset joint and roots at 27'	repair or replace
9/7/2019	Beresford Way	38431	southwest of patio in hole	cleanout below grade, two sags	repair or replace
8/30/2019	Beresford Way	38444	front	offset joint at 33', 41', cracked joint at 37'	repair or replace
9/7/2019	motel		right rear	not adequately above grade, cap?, multiple sags under water most of video, roots 2' joint	repair or replace
	laundry		right side, 2" clean out		cannot CCTV - install new cleanout
8/30/2019	campground office		west side		ok
	Amanda Way	38384	2" white-back left side too small for camera head		cannot CCTV - install new cleanout
9/7/2019	Amanda way	38398	left side	full of silt/dirt, possible roots at 17' joint, old pipe to 50' questionable at joints, raise cleanout above grade	snake and redo CCTV

TABLE 9

Tehama County Sanitation District No. 1 Mineral Wastewater Collection and Treatment Improvement Project

EQUIPMENT USEFUL SERVICE LIVES

Component	Useful Life (years)[1]
Chlorination Equipment	10-15
Other Treatment Equipment	10-15
Pumps	10-15
Buildings	30-60
Electrical Systems	7-10
Transmission Mains	35-40
Distribution Pipes	35-40
Lab/Monitoring Equipment	5-7
Tools and Shop Equipment	10-15
Landscaping/Grading	40-60
Office Furniture/Supplies	10
Computers	5
Transportation Equipment	10

1. Typical Life Expectancies taken from US Environmental Protection Agency Asset Management: A Handbook for Small Drinking Water Systems. EPA 816-R-03-016. September 2003. These numbers are ranges of expected useful lives drawn from a variety of sources. The ranges assume that assets have been properly maintained.

TABLE 10

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
WWTP DESIGN CRITERIA

	Description	1996 Design[1]	Current 2017 Flows	2037 Design
1	**Population**		310	329
2	**Household Equivalents**	350 @ 175 GPD/HE	250 @ 148 GPD/HE	266 @ 148 GPD/HE
3	**Flows**			
4	Average Dry Weather Flow, ADWF (MGD)	0.07	0.037	0.039
5	Peak Wet Weather Flow, PWWF (MGD)	0.75	0.57	0.60
6	PWWF : ADWF	10.7	15.4	15.3
7	**Sewage Loadings**			
8	Biochemical Oxygen Demand (BOD_5)			
9	ADWF BOD_5 (Mg/L)[2]	250	197	209
10	ADWF BOD_5 (Lbs/Day)	146	61	69
11	Total Suspended Solids (TSS)			
12	ADWF TSS (Mg/L)[2]	250	162	172
13	ADWF TSS (Lbs/Day)	146	50	56
14	**Headworks**			
15	Bar Screen			
16	Number of Units	1	1	1
17	Width (Ft)	2	2	2
18	Number of Bars	18	18	18
19	Method of Cleaning	Manual	Manual	Manual
20	**Aeration Basin**			
21	Number of Cells	2	2	2
22	Cell Surface Area (SF)	12,197	12,197	12,197
23	Cell Water Depth (Ft)	11.5	11.5	11.5
24	Cell Side Slope (H:V)	2:1	2:1	2:1
25	Cell Volume (CF)	94,251	94,251	94,251
26	Cell Volume (MG)	0.71	0.71	0.71
27	Freeboard (Ft)	2	2	2
28	Organic Loading Overall (Lbs BOD_5/1000 CF/Day)	1.5	0.6	0.7
29	Detention Time @ ADWF per Cell (Day)	10	19	18
30	Number Submerged Tube Aerators			
31	Cell No. 1	9	9	9
32	Cell No. 2	3	3	3
33	Aerator Oxygen Transfer Efficiency (Lbs O^2/Aerator-Hr)	1.15	1.15	1.15
34	Standard Oxygenation Rate (Lbs O^2/Hr)[3]			
35	Cell No. 1	11.0	11.0	11.0
36	Cell No. 2	3.63	3.63	3.63
37	Aeration Capacity Required (Lbs O^2/Lbs BOD_5 applied)	1.8	4.3	3.9
38	Air Supply per Aerator (CFM)	12	12	12
39	Blower Horsepower (Hp)	10	10	10
40	**Evaporation/Percolation Ponds**			
41	Number	2	2	2
42	Side Water Depth (Ft)	5	5	5
43	Average Surface Area (SF)	217,800	217,800	217,800
44	Average Surface Area (AC)	5.0	5.0	5.0
45	Total Capacity (Ac-Ft)	25	25	25
46	Total Capacity (MG)	8.1	8.1	8.1
47	Freeboard (Ft)	2	2	2
48	**Filter Supply Pump Station**			
49	Wet Well Diameter (Ft)	6	6	6
50	Wet Well Water Depth (Ft)	8.5	8.5	8.5
51	Number of Pumps	2	2	2
52	Pump Capacity (GPM)	400	400	400
53	Total Dynamic Head (Ft)	52	52	52
54	Pump Horsepower (Hp)	10	10	10
55	**Pressure Filter**			
56	Number of Filters	1	1	1
57	Filter Diameter (Ft)	8	8	8
58	Surface Area (SF)	192	192	192
59	Maximum Capacity (MGD)	0.55	0.55	0.55
60	Maximum Loading Rate (GPM/SF)	2	2	2
61	Maximum Backwash Rate (GPM/SF/Cell)	15	15	15
62	Maximum Headloss to Backwash (Ft)	20	20	20
63	Net Positive Suction Head (Ft)	7	7	7
64	**Filter Surface Wash Pump**			
65	Number of Pumps	1	1	1
66	Pump Capacity (GPM)	80	80	80
67	**Chlorination**			
68	Contact Pipeline Diameter (In)	27	27	27
69	Contact Pipeline Length (Ft)	410	410	410
70	Contact Pipeline Volume (Gal)	11,746	11,746	11,746
71	Contact Time @ Maximum Filter Loading Rate (Min)	29	29	29
72	Number of Gas Chlorinators	2	0	0
73	Maximum Dosage per Chlorinator (Lbs/Day)	100	-	-
74	Chlorination Supply Pump			
75	Number	2*	2*	2*
76	Capacity (GPM)	12	12	12
77	**Dechlorination**			
78	Number of Gas Sulfonators	2	0	0
79	Maximum Dosage per Sulfonator (Lbs/Day)	100	-	-
80	Sulfonation Supply Pump			
81	Number	2*	2*	2*
82	Capacity (GPM)	10	10	10
83	**Potable Water System**			
84	Well Depth (Ft)	247	247	247
85	Well Diameter (In)	6	6	6
86	Static Water Level Below Grade (Ft)	10	10	10
87	Potable Water System Pump			
88	Number	1	1	1
89	Capacity (GPM)	10	10	10
90	Discharge Pressure (PSI)	60	60	60

Notes:
1. Design criteria as indicated in the Operations and Maintenance Manual completed by PACE Engineering, Inc., dated January 1997.
2. BOD and TSS data from influent samples taken July through September for years 2015 through 2017.
3. Assumptions: T=20°C; Elev = 4815 FT; Alpha = 0.85; Beta = 0.95.
* One spare.

TABLE 11

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project

ALTERNATIVE PIPELINE REPLACEMENT COSTS

Pipe Installation Method	Cost Per Ft
8-inch Sewer Main Open Cut with Class A1 Backfill, complete	$102
8-inch Sewer Main Pipe Burst, complete	$159
8-inch Sewer Main Directional Drill, complete	$235

Note: Costs from Yreka 2015 WWTP & Collection System Improvement Project, Schedule A.

TABLE 12

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project

SHORT-LIVED ASSETS RESERVE ESTIMATE

Equipment	Period	Estimated Cost[1]	Annual Reserve
Replace Filter Supply Pumps	15	$30,000	$2,000
Replace Hydropneumatic Bladder Tank	15	$10,000	$667
Replace UPS and Remote Monitoring Equipment	10	$20,000	$2,000
Replace Alarm Auto Dialer	10	$10,000	$1,000
Replace Transfer Switch	10	$12,000	$1,200
		Total Annual Cost	$6,900

1. Costs in November 2019 dollars.

TABLE 13

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
OPEN-CUT PIPELINE TRENCHING - LIFE CYCLE COST ESTIMATE

Year	Design & Construction $ /a/	O&M Costs, $		Salvage Value $ /c/	Present Worth Factor = 1.5%	Present Worth of Costs, $				
		Fixed O&M /b/	Variable Short-Lived Assets /b/			Design & Construction	O & M		Salvage Value	Total
							Fixed	Variable		
2020										
2021					1.03023					
2022	62,000				1.01500	62,930				62,930
2023	583,000				1.00000	583,000				583,000
2024		0	0		0.98522		0	0		0
2025		0	0		0.97066		0	0		0
2026		0	0		0.95632		0	0		0
2027		0	0		0.94218		0	0		0
2028		0	0		0.92826		0	0		0
2029		0	0		0.91454		0	0		0
2030		0	0		0.90103		0	0		0
2031		0	0		0.88771		0	0		0
2032		0	0		0.87459		0	0		0
2033		0	0		0.86167		0	0		0
2034		0	0		0.84893		0	0		0
2035		0	0		0.83639		0	0		0
2036		0	0		0.82403		0	0		0
2037		0	0		0.81185		0	0		0
2038		0	0		0.79985		0	0		0
2039		0	0		0.78803		0	0		0
2040		0	0		0.77639		0	0		0
2041		0	0		0.76491		0	0		0
2042		0	0		0.75361		0	0		0
2043		0	0	110,500	0.74247		0	0	82,043	(82,043)
Total	645,000					645,930	0	0		563,887

Recommended Project Present Worth Cost $563,900

a) All costs are November 2019 dollars.

b) Fixed costs equal O&M costs and variable costs equal short-lived assets reserve.

c) No salvage value for engineering, legal, and administrative costs.

TABLE 14

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
PRELIMINARY PROJECT COST ESTIMATE

No.	Item	Quantity	Unit	Unit Cost	Total Cost[1]
Construction Costs					
1	Replace manholes	4	EA	$10,000	$40,000
2	Replace pipeline mechanical deficiency (roots, offset joint, etc.)	10	EA	$3,000	$30,000
3	6-inch PVC sewer main, Class A1 backfill <8' deep, complete	1,105	LF	$200	$221,000
4	Replace hydropneumatic bladder tank	1	LS	$10,000	$10,000
5	Install UPS and remote monitoring	1	LS	$20,000	$20,000
6	Alarm auto dialer upgrades	1	LS	$10,000	$10,000
7	Replace filter supply pumps	1	LS	$30,000	$30,000
8	Install manual transfer switch	1	LS	$12,000	$12,000
9	Install percolation pond steps and railing	1	LS	$20,000	$20,000
10	Trench, sheeting, shoring	1	LS	$20,000	$20,000
11	Mobilization/Demobilization	1	LS	$60,000	$60,000
12	Bypass pumping	1	LS	$10,000	$10,000
13	Dewatering	1	LS	$10,000	$10,000
14	Submittals	1	LS	$10,000	$10,000
15	Bonds	1	LS	$10,000	$10,000
16	Insurance	1	LS	$10,000	$10,000
17				***Subtotal Construction Cost***	$523,000
18				Inflation adder for construction in 2023 @ 5% per year	$113,000
19				Contractor Overhead and Profit @ 8%	$51,000
20				***TOTAL CONSTRUCTION COSTS***	***$687,000***
21	***Indirect Costs***				
22	***Engineering Services***				
23	Bidding/Contract Award Services				$20,000
24	Engineering Design @ 10% of construction costs				$69,000
25	Engineering Construction Administration @ 8% of construction costs				$55,000
26	Inflation Adder for Engineering & Construction Administration in 2022/2023 @ 3% per year				$11,000
27	Construction Observation				$29,000
28	Construction Phase Surveying				$5,000
29	Standard Operating Procedures				$10,000
30	O&M Manual Update				$10,000
31	Record Drawings				$5,000
32				***Total Engineering Services***	***$214,000***
33	***Other Indirect Services***				
34	Environmental Construction Administration				$5,000
35	Easements/Right-of-Way/Permits				$10,000
36	Funding Administration				$20,000
37	Labor Code Compliance				$15,000
38	Administration and Legal				$5,000
39				***Total Other Indirect Services***	***$55,000***
40				***TOTAL INDIRECT COSTS***	***$269,000***
41				***Project Contingencies @ 10% of Construction Costs***	$69,000
				TOTAL PROJECT COST	***$1,025,000***

1. Costs in November 2019 dollars.

TABLE 15

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
RECOMMENDED PROJECT - LIFE CYCLE COST ESTIMATE

Year	Design & Construction $ /a/	O&M Costs, $		Salvage Value $ /c/	Present Worth Factor = 1.5%	Present Worth of Costs, $				
		Fixed O&M /b/	Variable Short-Lived Assets /b/			Design & Construction	O & M		Salvage Value	Total
							Fixed	Variable		
2020										
2021					1.03023					
2022	89,000				1.01500	90,335				90,335
2023	936,000				1.00000	936,000				936,000
2024		500	6,900		0.98522		493	6,798		7,291
2025		515	7,107		0.97066		500	6,898		7,398
2026		530	7,320		0.95632		507	7,000		7,508
2027		546	7,540		0.94218		515	7,104		7,619
2028		563	7,766		0.92826		522	7,209		7,731
2029		580	7,999		0.91454		530	7,315		7,846
2030		597	8,239		0.90103		538	7,424		7,961
2031		615	8,486		0.88771		546	7,533		8,079
2032		633	8,741		0.87459		554	7,645		8,199
2033		652	9,003		0.86167		562	7,758		8,320
2034		672	9,273		0.84893		570	7,872		8,443
2035		692	9,551		0.83639		579	7,989		8,567
2036		713	9,838		0.82403		587	8,107		8,694
2037		734	10,133		0.81185		596	8,226		8,822
2038		756	10,437		0.79985		605	8,348		8,953
2039		779	10,750		0.78803		614	8,471		9,085
2040		802	11,072		0.77639		623	8,597		9,219
2041		826	11,405		0.76491		632	8,724		9,356
2042		851	11,747		0.75361		641	8,852		9,494
2043		877	12,099	153,000	0.74247		651	8,983	113,598	(103,964)
Total	1,025,000					1,026,335	11,366			1,080,956

Recommended Project Present Worth Cost = $1,081,000

a) All costs are November 2019 dollars.

b) Fixed costs equal O&M costs and variable costs equal short-lived assets reserve.

c) No salvage value for engineering, legal, and administrative costs.

TABLE 16

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
RECOMMENDED PROJECT SALVAGE VALUE

Item		Cost[1]	Useful Life[2]	Salvage Value[3]
1	Replace manholes	$40,000	40	$20,000
2	Replace pipeline mechanical deficiency (roots, offset joint, etc.)	$30,000	40	$15,000
3	6-inch PVC sewer main, Class A1 backfill <8' deep, complete	$221,000	40	$110,500
4	Replace hydropneumatic bladder tank	$10,000	15	$0
5	Install UPS and remote monitoring	$20,000	10	$0
6	Alarm auto dialer upgrades	$10,000	10	$0
7	Replace filter supply pumps	$30,000	15	$0
8	Install manual transfer switch	$12,000	10	$0
9	Install percolation pond steps and railing	$20,000	30	$6,667
			Total Replacement Cost	$153,000

1. All costs are in November 2019 dollars.
2. Service lives are as presented in Table 9.
3. No salvage value for engineering, legal & administration costs.

TABLE 17

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project

PRELIMINARY PROJECT SCHEDULE

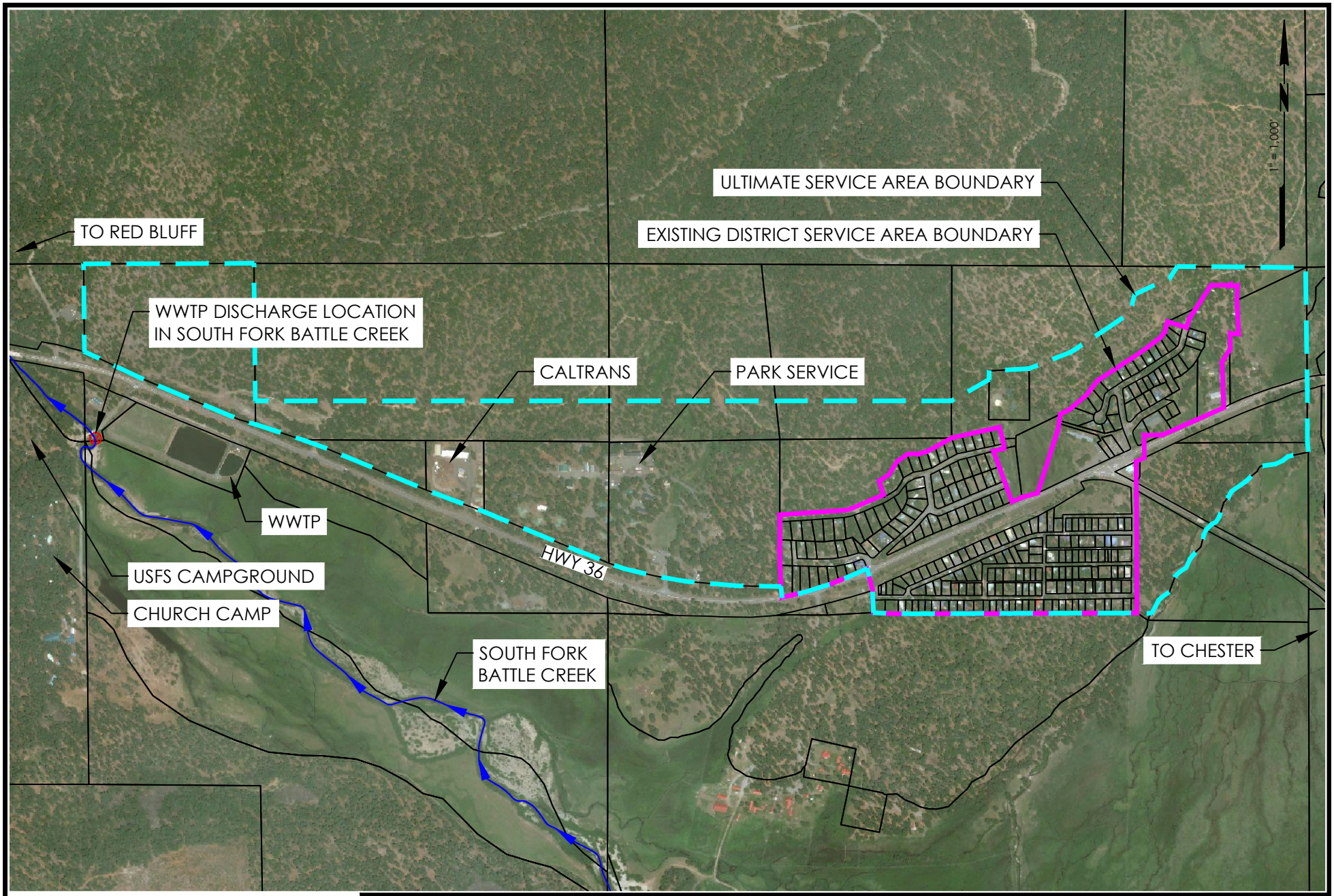
Item No.	Action	Target Date	Completion Date
1	PACE submits application for construction funding to CWSRF	Dec-19	
2	CWSRF Construction Funding Agreement executed	Jul-21	
3	District directs PACE to proceed with design	Aug-21	
4	Draft Drawings submitted to District and CWSRF	Dec-21	
5	Comments on draft Drawings received	Feb-22	
6	Final Drawings and Specifications submitted to District, CWSRF, & CVRWQCB	May-22	
7	Final design and specifications approved	Jul-22	
8	District approves advertising for bids	Aug-22	
9	District invites construction bids	Sep-22	
10	Construction bids received	Dec-22	
11	Construction contracts awarded	Feb-23	
12	Begin construction	Apr-23	
13	Construction complete	Sep-23	

TABLE 18

Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
CONSTRUCTION BEST MANAGEMENT PRACTICES

Best Management Practice	Monitoring Action
Work Area	
Minimize Work Area	Define limits of work area in contract documents and delineate any sensitive areas that are to be left undisturbed.
Erosion Control	Establish erosion control procedures in contract documents including sensitive areas to be left undisturbed. Standard practices required by the District will be strictly adhered to by the construction Contractor and enforced by the Engineer.
Revegetation of Disturbed Areas	All areas disturbed shall be seeded and mulched. Revegetation shall consist of native species, grasses, and forbs. Revegetation efforts shall be in place prior to the return of the wet season and in no case later than October 15th of each season.
Construction Activities	
Dust Control	Roads and work areas likely to generate dust shall be watered during construction activities and swept clean where possible.
Noise Control	Work hours will be limited typically to 7 a.m. to 5 p.m. in residential areas unless special activities, i.e. tie-ins, are required at night during periods of low water demand.
Sensitive Resources	
Subsurface Cultural Resources	Where subsurface cultural materials are encountered during construction activities, all activities shall be halted within a 50-foot radius and an archaeologist called in to examine the artifacts and determine if additional mitigation measures are required.

FIGURES



PACE ENGINEERING
REDDING, CALIFORNIA

TEHAMA COUNTY SANITATION DISTRICT NO. 1 MINERAL
WASTEWATER COLLECTION AND TREATMENT
IMPROVEMENT PROJECT

SERVICE AREA BOUNDARY

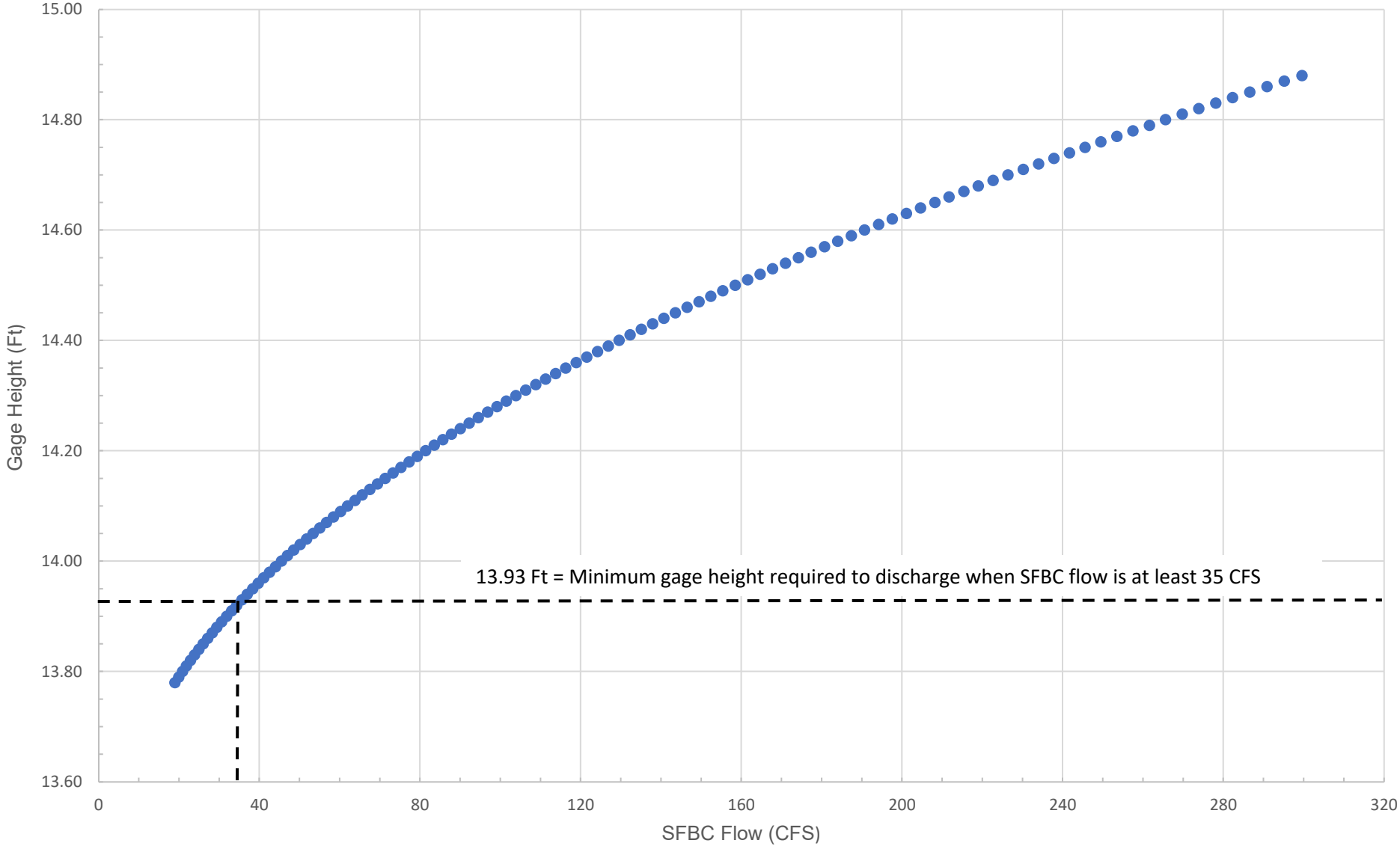
FIGURE 1
DATE: 10/19
JOB # 288.36

Plot Date: October 03, 2019 – 7:52 am Login Name: pcibart
File Name: M:\Land Projects\0288.36 Mineral WW Collection & Treatment System Improvement Project\DWG\Service Area Boundary.dwg, Layout: BDRY

FIGURE 2

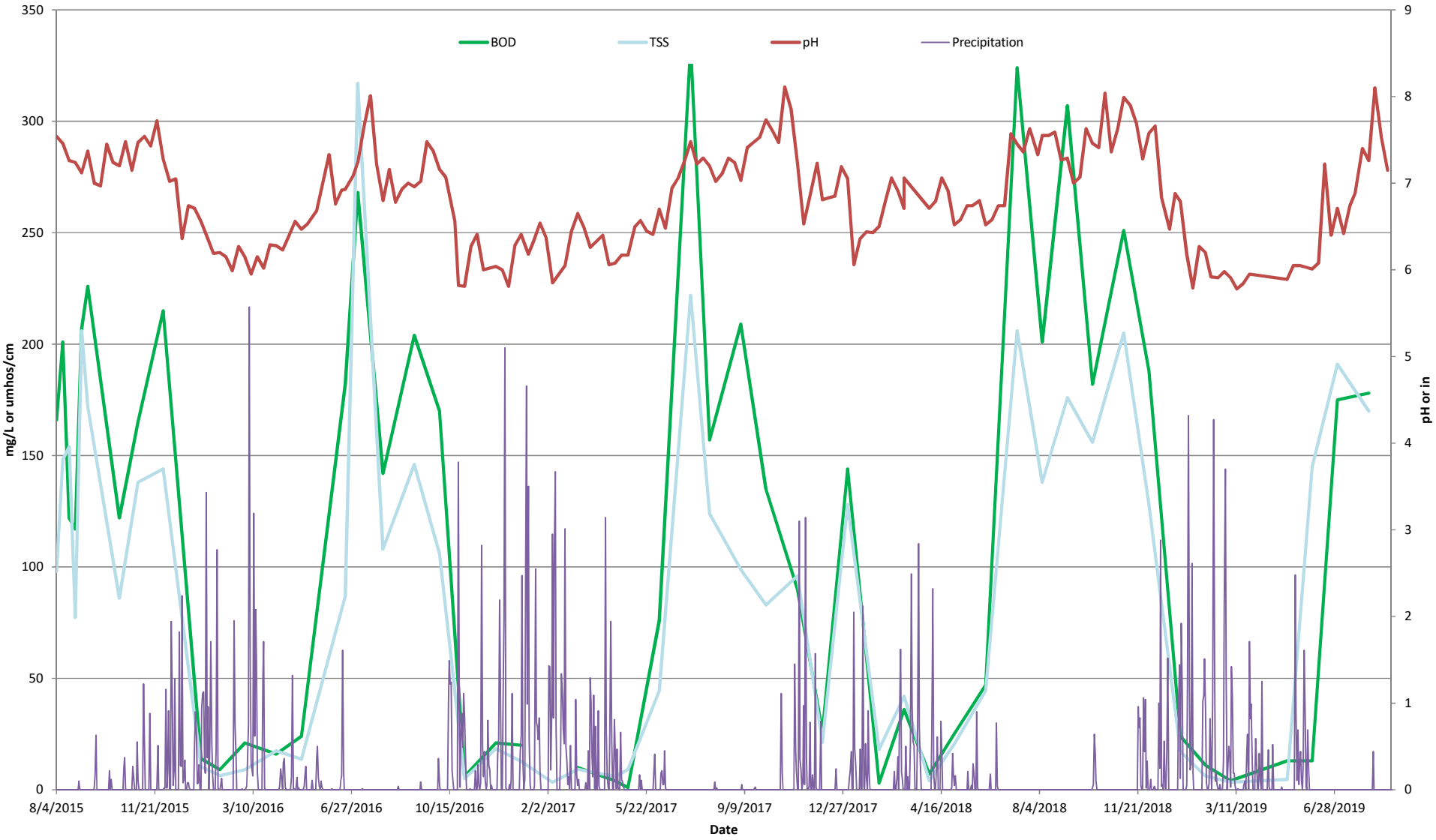
Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project

South Fork Battle Creek USGS Gaging Station
Provisional Rating Curve



M:\Jobs\0288\0288.36 Mineral Wastewater Collection and Treatment Improvement Project\Phase 300 Project Report\Spreadsheets\USGS Measurements.xlsx

FIGURE 3
Tehama County Sanitation District No. 1 Mineral
Wastewater Collection and Treatment Improvement Project
Influent Wastewater Characteristics



M:\Jobs\0288\0288.36 Mineral Wastewater Collection and Treatment Improvement Project\Phase 300 Project Report\Spreadsheets\PC Influent Data .xlsx

LEGEND:
- 8" GRAVITY FLOW SEWER AND SIZE
- 77 MANHOLE AND NUMBER
- OUTFALL TO WWTP
- PARCEL
- 8" PROPOSED PIPE REPLACEMENT
- 57 PROPOSED MANHOLE REPLACEMENT
- SPOT REPAIR

1"=300'

TO RED BLUFF

USFS CAMPGROUND

CHURCH CAMP

WWTP

OUTFALL

CALTRANS

PARK SERVICE

HWY 36

TO CHESTER

EXISTING DISTRICT SERVICE AREA BOUNDARY

ULTIMATE SERVICE AREA BOUNDARY

REPLACE 485' OF (E) 6" AC W/ (N) 6" PVC

REPLACE 450' OF (E) 6" AC W/ (N) 6" PVC

REPLACE 20' OF (E) 6" AC W/ (N) 6" PVC

REPLACE 150' (E) 6" PVC W/ (N) 6" PVC

BERESFORD WAY

HUSKY WAY

HAMPTON AVE

MORGAN AVE

ALPINE AVE

SCENIC AVE

BATTLE CREEK AVE

MINERAL AVE

BAR IS ONE INCH ON ORIGINAL DRAWING

0" 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

HALF SCALE

PACE ENGINEERING
REDDING, CALIFORNIA

DES PC	CKD LM	JOB NO.
DRN PC	DATE 11/06/19	288.36.300

SIGNED

TEHAMA COUNTY SANITATION DISTRICT NO.1 MINERAL
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT

EXISTING COLLECTION SYSTEM AND RECOMMENDED IMPROVEMENTS

FIGURE 4

Plot Date: November 06, 2019 – 12:12 pm Login Name: lmccallum
File Name: M:\Land Projects\0288.36 Mineral WW Collection & Treatment System Improvement Project\DWG\Recommended Improvements.dwg, Layout: FIG4

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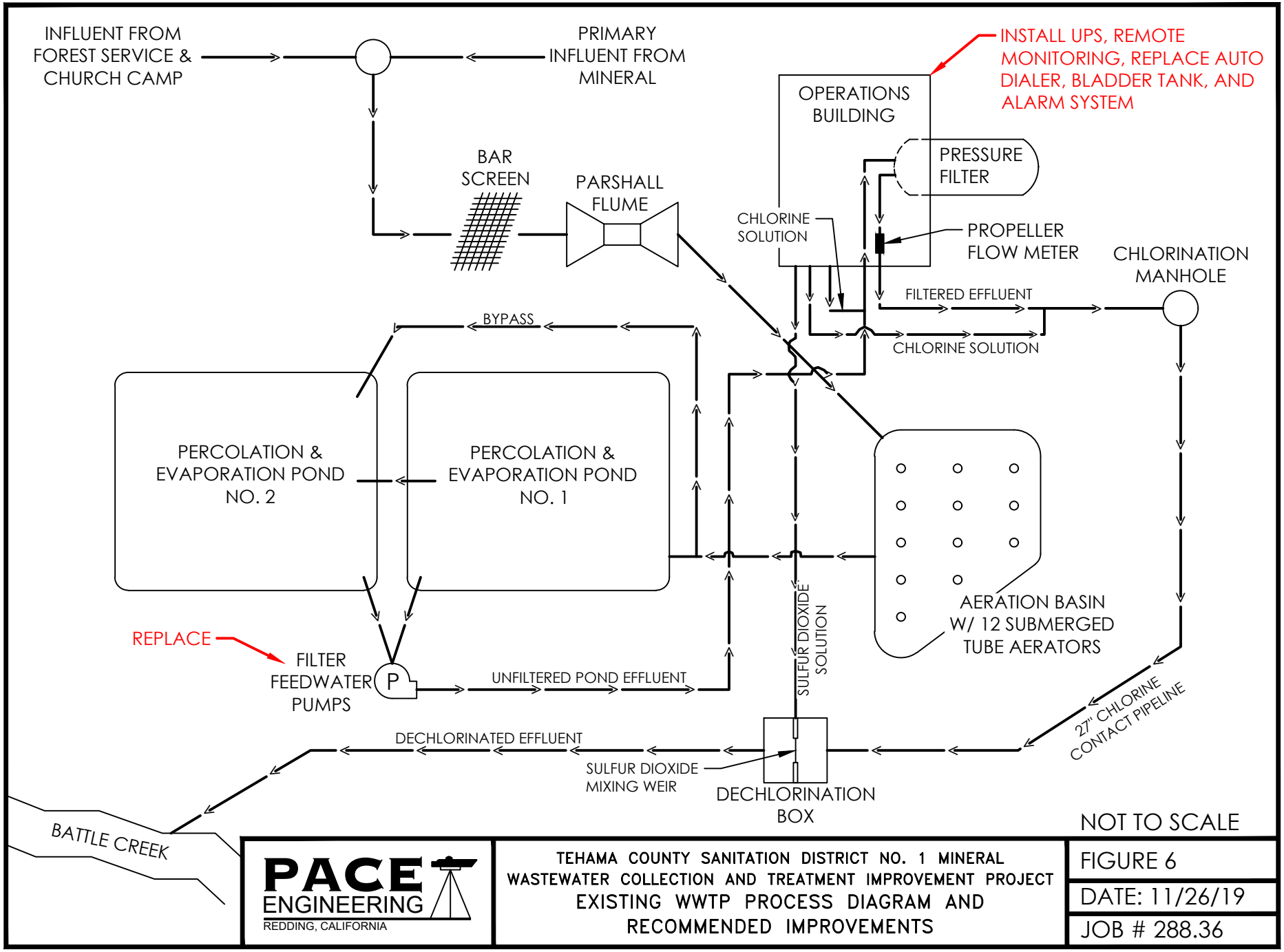
TEHAMA COUNTY SANITATION DISTRICT NO. 1 MINERAL
WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
EXISTING WWTP SITE PLAN AND RECOMMENDED IMPROVEMENTS

FIGURE 5

DATE: 11/26

JOB # 288.36

Plot Date: November 26, 2019 – 9:00 am Login Name: lmccollum
File Name: M:\Land Projects\0288.36 Mineral WW Collection & Treatment System Improvement Project\WWTP Site Plan.dwg, Layout: FIG 5



PACE ENGINEERING
REDDING, CALIFORNIA

TEHAMA COUNTY SANITATION DISTRICT NO. 1 MINERAL WASTEWATER COLLECTION AND TREATMENT IMPROVEMENT PROJECT
EXISTING WWTP PROCESS DIAGRAM AND RECOMMENDED IMPROVEMENTS

FIGURE 6
DATE: 11/26/19
JOB # 288.36

Plot Date: November 26, 2019 – 1:26 pm Login Name: lmccollum
File Name: M:\Land Projects\0288.36 Mineral WW Collection & Treatment System Improvement Project\DWG\WWTP Schematic – Figure 6.dwg, Layout: Fig 6

APPENDICES

APPENDIX A

WASTE DISCHARGE REQUIREMENTS
EFFLUENT LIMITS AND MONITORING REQUIREMENTS

E. Notification of Interested Parties. The Central Valley Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe WDR's for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of the notification are provided in the Fact Sheet.

F. Consideration of Public Comment. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet.

THEREFORE, IT IS HEREBY ORDERED that this Order supersedes Order R5-2007-0098 except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order. This action in no way prevents the Central Valley Water Board from taking enforcement action for past violations of the previous Order.

III. DISCHARGE PROHIBITIONS

A. Discharge of wastewater from the Facility, as the Facility is specifically described in the Fact Sheet in section II.B, at a location or in a manner different from that described in this Order is prohibited.

B. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard Provisions I.G. and I.H. (Attachment D).

C. Neither the discharge nor its treatment shall create a nuisance as defined in section 13050 of the Water Code.

D. The Discharger shall not allow pollutant-free wastewater to be discharged into the treatment or disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

E. The Discharge of effluent to surface waters from April 16 to November 14 and during periods when flow in South Fork Battle Creek, adjacent to the facility, is less than 35 cfs, is prohibited, unless approved by the Executive Officer in accordance with Standard Provisions VI.C.6.b.

F. The discharge of waste classified as hazardous as defined in Section 2521(a) of Title 23, CCR, Section 2510, et seq. (hereafter Chapter 15) or designated as defined in Section 13173 of the California Water Code, is prohibited.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point No. D-001

1. Final Effluent Limitations – Discharge Point No. D-001

The Discharger shall maintain compliance with the following effluent limitations at Discharge Point D-001, with compliance measured at Monitoring Location EFF-001 as described in the Monitoring and Reporting Program, Attachment E:

a. The Discharger shall maintain compliance with the effluent limitations specified in Table 4:

Table 4. Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Average Dry Weather Effluent Flow	mgd	.070				
Daily Peak Wet Weather Effluent Flow	mgd			0.75		
Conventional Pollutants						
pH	standard units				6.0	9.0
Biochemical Oxygen Demand 5-day @ 20°C	mg/L	10	15	30		
	lbs/day[1]	63	94	188		
Total Suspended Solids	mg/L	30	45	90		
	lbs/day[1]	188	281	563		

[1] Based on the daily peak wet weather flow of 0.75 mgd

b. **Percent Removal:** The average monthly percent removal of BOD 5-day 20°C (BOD_5) and total suspended solids (TSS) shall not be less than 85 percent.

c. **Acute Whole Effluent Toxicity.** Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

i. 70%, minimum for any one bioassay; and
ii. 90%, median for any three consecutive bioassays.

d. **Total Residual Chlorine.** Effluent total residual chlorine shall not exceed:

i. 0.011 mg/L, as a 4-day average; and
ii. 0.019 mg/L, as a 1-hour average.

e. **Total Coliform Organisms.** Effluent total coliform organisms shall not exceed:

i. 23 most probably number (MPN) per 100 mL, as a 7-day median; and
ii. 240 MPN/10 mL, more than once in any 30-day period.

f. **Chlorpyrifos and Diazinon.** Effluent chlorpyrifos and diazinon concentrations shall not exceed the sum of one (1.0) as defined below:

i. Average Monthly Effluent Limitation

$$S_{AMEL} = \frac{C_{D-avg}}{0.079} + \frac{C_{C-avg}}{0.012} \leq 1.0$$

CD-avg = average monthly diazinon effluent concentration in µg/L
CC-avg = average monthly chlorpyrifos effluent concentration in µg/L

ii. Maximum Daily Effluent Limitation

$$S_{MDEL} = \frac{C_{D-max}}{0.16} + \frac{C_{C-max}}{0.025} \leq 1.0$$

CD-max = maximum daily diazinon effluent concentration in µg/L
CC-max = maximum daily chlorpyrifos effluent concentration in µg/L

2. Interim Effluent Limitations – Not Applicable

B. Land Discharge Specifications

a. No waste constituent shall be released, discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations of this Order.

b. Wastewater treatment, storage, and disposal shall not cause pollution or a nuisance as defined by Water Code section 13050.

c. The discharge shall remain within the permitted waste treatment/containment structures at all times.

C. Recycling Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

The discharge shall not cause the following in South Fork Battle Creek:

1. **Bacteria.** The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, to exceed a geometric mean of 200 MPN/100 mL, nor more than 10 percent of the total number of fecal coliform samples taken during any 30-day period to exceed 400 MPN/100 mL.
2. **Biostimulatory Substances.** Water to contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.
3. **Chemical Constituents.** Chemical constituents to be present in concentrations that adversely affect beneficial uses.
4. **Color.** Discoloration that causes nuisance or adversely affects beneficial uses.
5. **Dissolved Oxygen:**
   a. The monthly median of the mean daily dissolved oxygen concentration to fall below 85 percent of saturation in the main water mass;
   b. The 95 percentile dissolved oxygen concentration to fall below 75 percent of saturation; nor
   c. The dissolved oxygen concentration to be reduced below 7.0 mg/L at any time.
6. **Floating Material.** Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.
7. **Oil and Grease.** Oils, greases, waxes, or other materials to be present in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
8. **pH.** The pH to be depressed below 6.5 nor raised above 8.5**.**
9. **Pesticides:**
   a. Pesticides to be present, individually or in combination, in concentrations that adversely affect beneficial uses;
   b. Pesticides to be present in bottom sediments or aquatic life in concentrations that adversely affect beneficial uses;

c. Total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by USEPA or the Executive Officer;

d. Pesticide concentrations to exceed those allowable by applicable antidegradation policies (see State Water Board Resolution No. 68-16 and 40 CFR 131.12.);

e. Pesticide concentrations to exceed the lowest levels technically and economically achievable;

f. Pesticides to be present in concentration in excess of the maximum contaminant levels set forth in CCR, Title 22, division 4, chapter 15; nor

g. Thiobencarb to be present in excess of 1.0 µg/L.

10. **Radioactivity:**

    a. Radionuclides to be present in concentrations that are harmful to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

    b. Radionuclides to be present in excess of the maximum contaminant levels (MCLs) specified in Table 64442 of section 64442 and Table 64443 of section 64443 of Title 22 of the California Code of Regulations.

11. **Suspended Sediments.** The suspended sediment load and suspended sediment discharge rate of surface waters to be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

12. **Settleable Substances.** Substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

13. **Suspended Material.** Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.

14. **Taste and Odors.** Taste- or odor-producing substances to be present in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.

15. **Temperature.** The natural temperature to be increased by more than 5°F. Compliance to be determined based on the difference in temperature at RSW-001 and RSW-002.

16. **Toxicity.** Toxic substances to be present, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

17. **Turbidity.**

    a. Shall not exceed 2 Nephelometric Turbidity Units (NTU) where natural turbidity is less than 1 NTU;

    b. Shall not increase more than 1 NTU where natural turbidity is between 1 and 5 NTUs;

    c. Shall not increase more than 20 percent where natural turbidity is between 5 and 50 NTUs;

    d. Shall not increase more than 10 NTU where natural turbidity is between 50 and 100 NTUs; nor

    e. Shall not increase more than 10 percent where natural turbidity is greater than 100 NTUs.

B. Groundwater Limitations

Release of waste constituents from any portion of the Facility shall not cause groundwater to:

1. Contain any of the following constituents in concentrations greater than listed or greater than natural background quality, whichever is greater.

Table 5. Groundwater Limitations

Constituent	Units	Limitation
Total Coliform Organisms	MPN/100 mL	<2.2[1]

[1] Over any seven-day period

2. Except as specified in 1 above, contains constituents in concentrations that exceed either the Primary or Secondary MCL established in Title 22 of the California Code of Regulations. For TDS, the upper level Secondary MCL of 1,000 mg/L is applicable.

3. Exhibit a pH of less than 6.5 or greater than 8.4 pH units.

4. Impart taste, odor, chemical constituents, toxicity, or color that creates nuisance or impairs any beneficial use.

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (40 C.F.R. § 122.48) requires that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Central Valley Water Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements that implement federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of the Central Valley Water Board.

B. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to mixing with the receiving waters. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

C. Chemical, bacteriological, and bioassay analyses of any material required by this Order shall be conducted by a laboratory certified for such analyses by the Department of Public Health (DPH). Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Central Valley Water Board. In the event a certified laboratory is not available to the Discharger for any onsite field measurements such as pH, DO, turbidity, temperature, and residual chlorine, such analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program for any onsite field measurements such as pH, DO, turbidity, temperature, and residual chlorine must be kept onsite in the treatment facility laboratory and shall be available for inspection by Central Valley Water Board staff. The Discharger must demonstrate sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform these field measurements. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Central Valley Water Board.

D. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

E. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this Monitoring and Reporting Program.

F. Laboratories analyzing monitoring samples shall be certified by the Department of Public Health (DPH), in accordance with the provision of Water Code section 13176, and must include quality assurance/quality control data with their reports.

G. The Discharger shall ensure that the results of the Discharge Monitoring Report-Quality Assurance (DMR-QA) Study or the most recent Water Pollution Performance Evaluation Study are submitted annually to the State Water Resources Control Board at the following address:

State Water Resources Control Board Quality Assurance Program Officer

Office of Information Management and Analysis
State Water Resources Control Board
1001 I Street, Sacramento, CA 95814

H. The Discharger shall file with the Central Valley Water Board technical reports on self-monitoring performed according to the detailed specifications contained in this Monitoring and Reporting Program.

I. The results of all monitoring required by this Order shall be reported to the Central Valley Water Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order. Unless otherwise specified, discharge flows shall be reported in terms of the monthly average and the daily maximum discharge flows.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
--	INF-001	Influent to Facility Latitude: 40.34791° Longitude: -121.62079°
D-001	EFF-001	Effluent discharged through outfall to South Battle Creek Latitude: 40.3482° Longitude: -121.6245°
--	RSW-001	South Fork Battle Creek, approximately 50 feet upstream of Discharge Point D-001 Latitude: 40.3478° Longitude: -121.6249°
--	RSW-002	South Fork Battle Creek, Highway 36 bridge downstream of Discharge Point D-001 Latitude: 40.3483° Longitude: -121.6247°
--	PND-001	Evaporation/percolation Pond 1 (Eastern Pond) Latitude: 40.3480° Longitude: -121.6217°
--	PND-002	Evaporation/percolation Pond 2 (Western Pond) Latitude: 40.3484° Longitude: -121.6231°
--	BIO-001	Biosolids removed from the Facility
--	RGW-001	Up-gradient Monitoring Well
--	RGW-002	Monitoring Well between Evaporation Ponds 1 and 2
--	RGW-003	Down-gradient Monitoring Well
--	SPL-001	Municipal water supply

The North latitude and West longitude information in Table 1 are approximate for administrative purposes.

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

1. The Discharger shall monitor influent to the Facility at Monitoring Location INF-001 as follows:

Table E-2. Influent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	MGD	Meter	Continuous	[1]
pH	Standard Units	Grab [2]	1/Week	[1]
BOD 5-day @ 20°C	mg/L	8-hr Composite [3]	[4]	[1]
Total Suspended Solids	mg/L	8-hr Composite [3]	[4]	[1]

[1] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136; or by methods approved by the Central Valley Water Board or the State Water Board.

[2] Grab samples shall not be collected at the same time each day to get a complete representation of variations in the influent.

[3] 8-hour flow proportional or time weighted composite.

[4] Samples shall be collected weekly concurrent with effluent samples during periods of discharge to South Fork Battle Creek or annual filter test. During periods of discharge to the evaporation/percolation ponds samples shall be collected once per month.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

1. The Discharger shall monitor treated wastewater discharged to South Fork Battle Creek at Monitoring Location EFF-001 as follows. If more than one analytical test method is listed for a given parameter, the Discharger must select from the listed methods and corresponding Minimum Level:

Table E-3. Effluent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency[1]	Required Analytical Test Method
Flow	mgd	Meter	Continuous	[2]
Chlorine, Total Residual	mg/L	Grab	4/day or Continuous	[2, 3]
Biochemical Oxygen Demand (BOD) (5-day @ 20 Deg. C)	mg/L	8-hr Composite [4]	1/Week	[2]
	lbs/day	Calculate	1/Week	[2]
Total Suspended Solids	mg/L	8-hr Composite [4]	1/Week	[2]
	lbs/day	Calculate	1/Week	[2]
pH	Standard Units	Grab	1/Week [5, 6]	[2]
Temperature	˚C	Grab	1/Week [5, 6]	[2]
Total Coliform Organisms	MPN/100 mL	Grab	1/Week	[2]
Electrical Conductivity @ 25˚C	µmhos/cm	Grab	1/Month	[2]
Chloride	mg/L	Grab	1/Month	[2]
Sulfate	mg/L	Grab	1/Month	[2]
Total Dissolved Solids	mg/L	Grab	1/Month	[2]
Hardness (as $CaCO_{3)}$	mg/L	Grab	1/Month [7]	[2]
Ammonia Nitrogen, Total (as N)		Grab	1/Month [5, 6, 8]	[2]
Nitrate Nitrogen, Total (as N)	mg/L	Grab	1/Month [9]	[2]
Nitrite Nitrogen, Total (as N)	mg/L	Grab	1/Month [9]	[2]
Chlorpyrifos	µg/L	Grab	1/Year	[14]
Diazinon	µg/L	Grab	1/Year	[14]
Priority Pollutant Metals	µg/L	Grab	1/Year	[2]

Standard Minerals [11]	mg/L	Grab	1/Year	[2]
Priority Pollutants and Other Constituents of Concern (see Attachment E)[15]	µg/L	8-hr Composite [4]	[12]	2, 10, 13
Acute Toxicity (see Section V. below)	% Survival	Grab	1/Discharge Season	--
Whole Effluent Toxicity (see Section V. below)	TU_c	Grab	1/Permit Term	--

[1] **Monitoring frequencies shall only apply during discharge to South Fork Battle Creek.**

[2] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.

[3] Total chlorine residual must be monitored with a method sensitive to and accurate at the permitted level of 0.01 mg/L.

[4] 8-hour flow or time proportional composite.

[5] pH and temperature shall be recorded at the time of ammonia sample collection.

[6] A hand-held field meter may be used, provided the meter utilizes a USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. A calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program shall be maintained at the Facility.

[7] Hardness samples shall be collected concurrently with metals samples.

[8] Concurrent with whole effluent toxicity monitoring.

[9] Monitoring for nitrite and nitrate shall be conducted concurrently.

[10] For priority pollutant constituents with effluent limitations, detection limits shall be below the effluent limitations. If the lowest minimum level (ML) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan or SIP) is not below the effluent limitation, the detection limit shall be the lowest ML. For priority pollutant constituents without effluent limitations, the detection limits shall be equal to or less than the lowest ML published in Appendix 4 of the SIP.

[11] Standard minerals shall include the following: boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and hardness, and include verification that the analysis is complete (i.e., cation/anion balance).

[12] Priority pollutants shall be sampled three times during the permit term and shall be conducted concurrently with upstream receiving water monitoring for hardness (as $CaCO_3$) and pH. See *Effluent and Receiving Water Characterization Study,* Attachment E, Section IX.D for more detailed requirements related to performing the priority pollutant monitoring

[13] Volatile constituents shall be sampled in accordance with 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.

[14] USEPA Method 625M, Method 8141, or equivalent. Minimum reporting limits: <100 ng/L diazinon; <15 ng/L chlorpyrifos.

[15] The maximum required Reporting Level is specified in Attachment E, Table E-11, Priority Pollutants and Other Constituents of Concern

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Acute Toxicity Testing. The Discharger shall conduct acute toxicity testing to determine whether the effluent is contributing acute toxicity to the receiving water. The Discharger shall meet the following acute toxicity testing requirements:

1. *Monitoring Frequency* – If there has been a discharge to the receiving water, the Discharger shall perform acute toxicity testing once during the discharge season concurrent with effluent ammonia sampling.

2. *Sample Types* – The Discharger may use flow-through or static renewal testing. For static renewal testing, the samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location Monitoring Location EFF-001.

3. *Test Species* – Test species shall be rainbow trout (Oncorhynchus mykiss)

4. *Methods* – The acute toxicity testing samples shall be analyzed using EPA-821-R-02-012, Fifth Edition. Temperature, total residual chlorine, and pH shall be recorded at the time of sample collection. No pH adjustment may be made unless approved by the Executive Officer.

5. *Test Failure* – If an acute toxicity test does not meet all test acceptability criteria, as specified in the test method, the Discharger must re-sample and re-test as soon as possible, not to exceed 7 days following notification of test failure.

B. Chronic Toxicity Testing. The Discharger shall conduct three species chronic toxicity testing to determine whether the effluent is contributing chronic toxicity to the receiving water. The Discharger shall meet the following chronic toxicity testing requirements:

1. *Monitoring Frequency –* If there has been a discharge to the receiving water, the Discharger shall perform three species chronic toxicity testing; once during the term of this Order and no later than 6 months prior to permit expiration.

2. *Sample Types* – Effluent samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location EFF-001. The receiving water control shall be a grab sample obtained Monitoring Location RSW-001, as identified in this Monitoring and Reporting Program.

3. *Sample Volumes* – Adequate sample volumes shall be collected to provide renewal water to complete the test in the event that the discharge is intermittent.

4. *Test Species* – Chronic toxicity testing measures sublethal (e.g., reduced growth, reproduction) and/or lethal effects to test organisms exposed to an effluent compared to that of the control organisms. The Discharger shall conduct chronic toxicity tests with:

   a. The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);

   b. The fathead minnow, *Pimephales promelas* (larval survival and growth test); and

   c. The green alga, *Selenastrum capricornutum* (growth test).

5. Methods – The presence of chronic toxicity shall be estimated as specified in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002.

6. Reference Toxicant – As required by the SIP, all chronic toxicity tests shall be conducted with concurrent testing with a reference toxicant and shall be reported with the chronic toxicity test results.

7. *Dilutions* – For routine and accelerated chronic toxicity monitoring, it is not necessary to perform the test using a dilution series. The test may be performed using 100% effluent and one control. For TRE monitoring, the chronic toxicity testing shall be performed using the dilution series identified in Table E-4, below, unless an alternative dilution series is detailed in the submitted TRE Action Plan. A receiving water control or laboratory water control may be used as the diluent.

Table E-4. Chronic Toxicity Testing Dilution Series

Sample	Dilutions (%)					Control	
	100	75	50	25	12.5	Receiving Water	Laboratory Water
% Effluent	100	75	50	25	12.5	0	0
% Receiving Water	0	25	50	75	87.5	100	0
% Laboratory Water	0	0	0	0	0	0	100

8. *Test Failure* – The Discharger must re-sample and re-test as soon as possible, but no later than fourteen (14) days after receiving notification of a test failure. A test failure is defined as follows:

   a. The reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October 2002 (Method Manual), and its subsequent amendments or revisions; or

   b. The percent minimum significant difference (PMSD) measured for the test exceeds the upper PMSD bound variability criterion in Table 6 on page 52 of the Method Manual. (A retest is only required in this case if the test results do not exceed the monitoring trigger specified in the Special Provision at section VI. 2.a.iii. of the Order.)

C. WET Testing Notification Requirements. The Discharger shall notify the Central Valley Water Board within 24-hours after the receipt of test results exceeding the monitoring trigger during regular or accelerated monitoring, or an exceedance of the acute toxicity effluent limitation.

D. WET Testing Reporting Requirements. All toxicity test reports shall include the contracting laboratory's complete report provided to the Discharger and shall be in accordance with the appropriate "Report Preparation and Test Review" sections of the method manuals. At a minimum, whole effluent toxicity monitoring shall be reported as follows:

1. **Chronic WET Reporting.** Regular chronic toxicity monitoring results shall be reported to the Central Valley Water Board within 30 days following completion of the test, and shall contain, at minimum:

   a. The results expressed in TUc, measured as 100/NOEC, and also measured as 100/LC50, 100/EC25, 100/IC25, and 100/IC50, as appropriate.

   b. The statistical methods used to calculate endpoints;

   c. The statistical output page, which includes the calculation of the percent minimum significant difference (PMSD);

   d. The dates of sample collection and initiation of each toxicity test; and

e. The results compared to the numeric toxicity monitoring trigger.

Additionally, the monthly discharger self-monitoring reports shall contain an updated chronology of chronic toxicity test results expressed in TUc, and organized by test species, type of test (survival, growth or reproduction), and monitoring frequency, i.e., either quarterly, monthly, accelerated, or Toxicity Reduction Evaluation (TRE).

2. **Acute WET Reporting.** Acute toxicity test results shall be submitted with the monthly discharger self-monitoring reports and reported as percent survival.

3. **TRE Reporting.** Reports for TREs shall be submitted in accordance with the schedule contained in the Discharger's approved TRE Workplan, or as amended by the Discharger's TRE Action Plan.

4. **Quality Assurance (QA).** The Discharger must provide the following information for QA purposes:

   a. Results of the applicable reference toxicant data with the statistical output page giving the species, NOEC, LOEC, type of toxicant, dilution water used, concentrations used, PMSD, and dates tested.

   b. The reference toxicant control charts for each endpoint, which include summaries of reference toxicant tests performed by the contracting laboratory.

   c. Any information on deviations or problems encountered and how they were dealt with.

VI. LAND DISCHARGE MONITORING REQUIREMENTS – NOT APPLICABLE

VII. RECYCLING MONITORING REQUIREMENTS – NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

A. Monitoring Locations RSW-001 and RSW-002

1. The Discharger shall monitor South Fork Battle Creek at Monitoring Locations RSW-001 and RSW-002 as follows:

Table E-5. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency[1]	Required Analytical Test Method
South Fork Battle Creek Flow[2]	cfs	Staff Gauge	1/Day	
Dissolved Oxygen	mg/L	Grab	1/Week	[3]
pH	Standard Units	Grab	1/Week [4, 5]	[3]
Temperature	˚C	Grab	1/Week [4, 5]	[3]
Turbidity	NTU	Grab	1/Week	[3]
Electrical Conductivity @ 25˚C	µmhos/cm	Grab	1/Month	[3]
Total Dissolved Solids	mg/L	Grab	1/Month	[3]
Hardness (as $CaCO_{3)}$	mg/L	Grab	1/Month	[3]
Ammonia Nitrogen, Total (as N)		Grab	1/Month [6]	[3]
Standard Minerals [7]	mg/L	Grab	1/Year	[3]
Priority Pollutants and Other Constituents of Concern (see Attachment E, Table E-9) [2]	µg/L	Grab	[8]	[3, 9, 10]

[1] **Monitoring frequencies shall apply during discharge to South Fork Battle Creek.**

[2] Monitoring required at RSW-001 only.

[3] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.

[4] pH and temperature shall be recorded at the time of ammonia sample collection.

[5] A hand-held field meter may be used, provided the meter utilizes a USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. A calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program shall be maintained at the Facility.

[6] Concurrent with whole effluent toxicity monitoring.

[7] Standard minerals shall include the following: boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and hardness, and include verification that the analysis is complete (i.e., cation/anion balance).

[8] Priority pollutants shall be sampled three times during the permit term and shall be conducted concurrently with upstream receiving water monitoring for hardness (as $CaCO_3$) and pH. See the *Effluent and Receiving Water Characterization Study,* Attachment E, Section IX.D, Table E-9 for more detailed requirements related to performing the priority pollutant monitoring.

[9] Volatile constituents shall be sampled in accordance with 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.

[10] The maximum required Reporting Level is specified in Attachment E, Table E-9, Effluent and Receiving Water Characterization Study.

2. In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Monitoring Locations RSW-001 and RSW-002. Attention shall be given to the presence or absence of:

   a. Floating or suspended matter;
   b. Discoloration;
   c. Bottom deposits, if visible;
   d. Aquatic life;
   e. Visible films, sheens, or coatings;
   f. Fungi, slimes, or objectionable growths; and
   g. Potential nuisance conditions.

   Notes on receiving water conditions shall be summarized in the monitoring report.

B. Monitoring Locations RGW-001, RGW-002, RGW-003

1. Prior to construction and/or beginning a sampling program of any new groundwater monitoring wells, the Discharger shall submit plans and specifications to the Central Valley Water Board for approval. Once installed, all new wells shall be added to the monitoring network (which currently consists of Monitoring Well Nos. RGW-001, RGW-002, and RGW-003) and shall be sampled and analyzed according to the schedule below. All samples shall be collected using approved EPA methods. Water table elevations shall be calculated to determine groundwater gradient and direction of flow.

2. Prior to sampling, the groundwater elevations shall be measured and the wells shall be purged of at least three well volumes until temperature, pH, and electrical conductivity have stabilized. Depth to groundwater shall be measured to the nearest 0.01 feet. Groundwater monitoring at RGW-001, RGW-002, RGW-003, and any new groundwater monitoring wells shall include, at a minimum, the following:

Table E-6. Groundwater Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Depth to Groundwater	±0.01 feet	Measurement	1/Quarter[4]	--
Groundwater Elevation[1]	±0.01 feet	Calculated	1/Quarter[4]	--

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Gradient	feet/feet	Calculated	1/Quarter	--
Gradient Direction	degrees	Calculated	1/Quarter	--
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Quarter	2
Total Dissolved Solids	mg/L	Grab	1/Quarter	2
pH	standard units	Grab	1/Quarter	2
Total Coliform Organisms	MPN/100 mL	Grab	1/Quarter	2
Ammonia (as NH_4)	mg/L	Grab	1/Quarter	
Total Nitrogen	mg/L	Grab	1/Quarter	2
Nitrate Nitrogen, Total (as N)	mg/L	Grab	1/Quarter	
Total Kjeldahl Nitrogen	mg/L	Grab	1/Quarter	2
Standard Minerals [3]	µg/L	Grab	1/Quarter	2

1 Groundwater elevation shall be determined based on depth-to-water measurements from a surveyed measuring point elevation on the well. The groundwater elevation shall be used to calculate the direction and gradient of groundwater flow, which must be reported.

2 Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.

3 Standard minerals shall include the following: boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and hardness, and include verification that the analysis is complete (i.e., cation/anion balance).

IX. OTHER MONITORING REQUIREMENTS

A. Monitoring Location PND-001 and PND-002

1. The Discharger shall monitor the evaporation/percolation ponds at Monitoring Locations PND-001 and PND-002 as follows:

Table E-7. Pond Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency
Freeboard and Liquid Depth	Feet[1]	Visual	1/Month
Dissolved Oxygen	mg/L	Grab	1/Week
pH	Standard Units	Grab	1/Week
Observations[2]	--	--	1/Month
Biochemical Oxygen Demand (5-day @ 20°C)[3]	mg/L	Grab	1/Month[4]
Total Suspended Solids[3]	mg/L	Grab	1/Month[4]
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Month[4]
Nitrate (as N)	mg/L	Grab	1/Month[4]
Iron	mg/L	Grab	1/Year
Manganese	mg/L	Grab	1/Year

1 Freeboard shall be monitored to the nearest tenth of a foot.

2 Observations include: a) seepage through the dikes; b) excessive odors or other nuisances; and c) excessive weed growth in ponds.

[3] Sample shall be collected at the discharge to PND-001 only.
[4] During the first year of the permit term only.

B. Biosolids

1. Monitoring Location BIO-001

   a. A composite sample of sludge shall be collected at Monitoring Location BIO-001 prior to sludge removal from the ponds in accordance with EPA's *POTW Sludge Sampling and Analysis Guidance Document*, August 1989, and tested for priority pollutants listed in 40 CFR Part 122, Appendix D, Tables II and III (excluding total phenols).

   b. Biosolids monitoring shall be conducted using the methods in Test Methods for Evaluating Solid Waste, Physical/Chemical methods (EPA publication SW-846), as required in 40 CFR 503.8(b)(4). All results must be reported on a 100% dry weight basis. Records of all analyses must state on each page of the laboratory report whether the results are expressed in "100% dry weight" or "as is."

   c. Sampling records shall be retained for a minimum of **5 years**. A log shall be maintained of sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log must be complete enough to serve as a basis for part of the annual report.

C. Municipal Water Supply

1. Monitoring Location SPL-001

   a. The Discharger shall monitor the municipal water supply at SPL-001 as follows. A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Municipal water supply samples shall be collected at approximately the same time as effluent samples.

Table E-8. Municipal Water Supply Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency
Total Dissolved Solids[1]	mg/L	Grab	1/year
Electrical Conductivity @ 25°C[1]	µmhos/cm	Grab	1/year
Standard Minerals[2]	mg/L	Grab	1/year

[1] If the water supply is from more than one source, the total dissolved solids and electrical conductivity shall be reported as a weighted average and include copies of supporting calculations.
[2] Standard minerals shall include all major cations and anions and include verification that the analysis is complete (i.e., cation/anion balance).

D. Effluent and Receiving Water Characterization

1. **Monitoring.** Priority pollutant samples shall be collected from the effluent and upstream receiving water (EFF-001 and RSW-001) during periods of discharge and analyzed for the constituents listed in Table E-9, below. Monitoring shall be conducted **three times during the permit term**, including at least one monitoring event during the first discharge of the permit term. The results of such monitoring shall be submitted to the Central Valley Water Board with the self-monitoring reports. The monitoring event shall provide representative sample results for the effluent and upstream receiving water. (Note: Duplicative monitoring for priority pollutants is not required. If monitoring and

reporting for a priority pollutant listed in Table E-3 or Table E-5 is already required in this Order, the Discharger is not required to perform additional, duplicative monitoring and reporting as specified in this section.)

2. **Concurrent Sampling.** Effluent and receiving water sampling shall be performed at approximately the same time, on the same date.

3. **Sample type.** All receiving water samples shall be taken as grab samples. Effluent samples shall be taken as described in **Table E-9**, below.

Table E-9. Effluent and Receiving Water Characterization Monitoring

Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
2- Chloroethyl vinyl ether	µg/L	Grab	1
Acrolein	µg/L	Grab	2
Acrylonitrile	µg/L	Grab	2
Benzene	µg/L	Grab	0.5
Bromoform	µg/L	Grab	0.5
Carbon Tetrachloride	µg/L	Grab	0.5
Chlorobenzene	µg/L	Grab	0.5
Chloroethane	µg/L	Grab	0.5
Chloroform	µg/L	Grab	2
Chloromethane	µg/L	Grab	2
Dibromochloromethane	µg/L	Grab	0.5
Dichlorobromomethane	µg/L	Grab	0.5
Dichloromethane	µg/L	Grab	2
Ethylbenzene	µg/L	Grab	2
Hexachlorobenzene	µg/L	Grab	1
Hexachlorobutadiene	µg/L	Grab	1
Hexachloroethane	µg/L	Grab	1
Methyl bromide (Bromomethane)	µg/L	Grab	1
Naphthalene	µg/L	Grab	10
Parachlorometa cresol	µg/L	Grab	
Tetrachloroethene	µg/L	Grab	0.5
Toluene	µg/L	Grab	2
trans-1,2-Dichloroethylene	µg/L	Grab	1
Trichloroethene	µg/L	Grab	2
Vinyl chloride	µg/L	Grab	0.5
Methyl-tert-butyl ether (MTBE)	µg/L	Grab	
Trichlorofluoromethane	µg/L	Grab	
1,1,1-Trichloroethane	µg/L	Grab	0.5
1,1-dichloroethane	µg/L	Grab	0.5
1,1-dichloroethylene	µg/L	Grab	0.5
1,2-dichloropropane	µg/L	Grab	0.5
1,3-dichloropropylene	µg/L	Grab	0.5
1,1,2,2-tetrachloroethane	µg/L	Grab	0.5
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	Grab	0.5
1,2,4-trichlorobenzene	µg/L	Grab	1
1,2-dichoroethane	µg/L	Grab	0.5
1,2-dichlorobenzene	µg/L	Grab	0.5
1,3-dichlorobenzene	µg/L	Grab	0.5
1,4-dichlorobenzene	µg/L	Grab	0.5
Styrene	µg/L	Grab	
Xylenes	µg/L	Grab	
1,2-Benzanthracene	µg/L	Grab	5

Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
1,2-Diphenylhydrazine	µg/L	Grab	1
2-Chlorophenol	µg/L	Grab	5
2,4-Dichlorophenol	µg/L	Grab	5
2,4-Dimethylphenol	µg/L	Grab	2
2,4-Dinitrophenol	µg/L	Grab	5
2,4-Dinitrotoluene	µg/L	Grab	5
2,4,6-Trichlorophenol	µg/L	Grab	10
2,6-Dinitrotoluene	µg/L	Grab	5
2-Nitrophenol	µg/L	Grab	10
2-Chloronaphthalene	µg/L	Grab	10
3,3'-Dichlorobenzidine	µg/L	Grab	5
3,4-Benzofluoranthene	µg/L	Grab	10
4-Chloro-3-methylphenol	µg/L	Grab	5
4,6-Dinitro-2-methylphenol	µg/L	Grab	10
4-Nitrophenol	µg/L	Grab	10
4-Bromophenyl phenyl ether	µg/L	Grab	10
4-Chlorophenyl phenyl ether	µg/L	Grab	5
Acenaphthene	µg/L	Grab	1
Acenaphthylene	µg/L	Grab	10
Anthracene	µg/L	Grab	10
Benzidine	µg/L	Grab	5
Benzo(a)pyrene (3,4-Benzopyrene)	µg/L	Grab	2
Benzo(g,h,i)perylene	µg/L	Grab	5
Benzo(k)fluoranthene	µg/L	Grab	2
Bis(2-chloroethoxy) methane	µg/L	Grab	5
Bis(2-chloroethyl) ether	µg/L	Grab	1
Bis(2-chloroisopropyl) ether	µg/L	Grab	10
Bis(2-ethylhexyl) phthalate	µg/L	Grab	5
Butyl benzyl phthalate	µg/L	Grab	10
Chrysene	µg/L	Grab	5
Di-n-butylphthalate	µg/L	Grab	10
Di-n-octylphthalate	µg/L	Grab	10
Dibenzo(a,h)-anthracene	µg/L	Grab	0.1
Diethyl phthalate	µg/L	Grab	10
Dimethyl phthalate	µg/L	Grab	10
Fluoranthene	µg/L	Grab	10
Fluorene	µg/L	Grab	10
Hexachlorocyclopentadiene	µg/L	Grab	5
Indeno(1,2,3-c,d)pyrene	µg/L	Grab	0.05
Isophorone	µg/L	Grab	1
N-Nitrosodiphenylamine	µg/L	Grab	1
N-Nitrosodimethylamine	µg/L	Grab	5
N-Nitrosodi-n-propylamine	µg/L	Grab	5
Nitrobenzene	µg/L	Grab	10
Pentachlorophenol	µg/L	Grab	1
Phenanthrene	µg/L	Grab	5
Phenol	µg/L	Grab	1
Pyrene	µg/L	Grab	10
Aluminum	µg/L	Grab	
Antimony	µg/L	Grab	5
Arsenic	µg/L	Grab	10
Asbestos	µg/L	Grab	

Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
Barium	µg/L	Grab	
Beryllium	µg/L	Grab	2
Cadmium	µg/L	Grab	0.5
Chromium (III)	µg/L	Grab	50
Chromium (VI)	µg/L	Grab	10
Copper	µg/L	Grab	0.5
Cyanide	µg/L	Grab	5
Fluoride	µg/L	Grab	
Iron	µg/L	Grab	
Lead	µg/L	Grab	0.5
Mercury	µg/L	Grab	0.5
Manganese	µg/L	Grab	
Molybdenum	µg/L	Grab	
Nickel	µg/L	Grab	20
Selenium	µg/L	Grab	5
Silver	µg/L	Grab	0.25
Thallium	µg/L	Grab	1
Tributyltin	µg/L	Grab	
Zinc	µg/L	Grab	20
4,4'-DDD	µg/L	Grab	0.05
4,4'-DDE	µg/L	Grab	0.05
4,4'-DDT	µg/L	Grab	0.01
alpha-Endosulfan	µg/L	Grab	0.02
alpha-Hexachlorocyclohexane (BHC)	µg/L	Grab	0.01
Alachlor	µg/L	Grab	
Aldrin	µg/L	Grab	0.005
beta-Endosulfan	µg/L	Grab	0.01
beta-Hexachlorocyclohexane	µg/L	Grab	0.005
Chlordane	µg/L	Grab	0.1
delta-Hexachlorocyclohexane	µg/L	Grab	0.005
Dieldrin	µg/L	Grab	0.01
Endosulfan sulfate	µg/L	Grab	0.01
Endrin	µg/L	Grab	0.01
Endrin Aldehyde	µg/L	Grab	0.01
Heptachlor	µg/L	Grab	0.01
Heptachlor Epoxide	µg/L	Grab	0.02
Lindane (gamma-Hexachlorocyclohexane)	µg/L	Grab	0.5
PCB-1016	µg/L	Grab	0.5
PCB-1221	µg/L	Grab	0.5
PCB-1232	µg/L	Grab	0.5
PCB-1242	µg/L	Grab	0.5
PCB-1248	µg/L	Grab	0.5
PCB-1254	µg/L	Grab	0.5
PCB-1260	µg/L	Grab	0.5
Toxaphene	µg/L	Grab	
Atrazine	µg/L	Grab	
Bentazon	µg/L	Grab	
Carbofuran	µg/L	Grab	
2,4-D	µg/L	Grab	
Dalapon	µg/L	Grab	

Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	Grab	
Di(2-ethylhexyl)adipate	µg/L	Grab	
Dinoseb	µg/L	Grab	
Diquat	µg/L	Grab	
Endothal	µg/L	Grab	
Ethylene Dibromide	µg/L	Grab	
Methoxychlor	µg/L	Grab	
Molinate (Ordram)	µg/L	Grab	
Oxamyl	µg/L	Grab	
Picloram	µg/L	Grab	
Simazine (Princep)	µg/L	Grab	
Thiobencarb	µg/L	Grab	
2,3,7,8-TCDD (Dioxin)	µg/L	Grab	
2,4,5-TP (Silvex)	µg/L	Grab	
Diazinon	µg/L	Grab	
Chlorpyrifos	µg/L	Grab	
Ammonia (as N)	mg/L	Grab	
Boron	µg/L	Grab	
Chloride	mg/L	Grab	
Flow	MGD	Meter	
Hardness (as $CaCO_3$)	mg/L	Grab	
Foaming Agents (MBAS)	µg/L	Grab	
Mercury, Methyl	ng/L	Grab	
Nitrate (as N)	mg/L	Grab	
Nitrite (as N)	mg/L	Grab	
pH	Std Units	Grab	
Phosphorus, Total (as P)	mg/L	Grab	
Specific conductance (EC)	µmhos/cm	Grab	
Sulfate	mg/L	Grab	
Sulfide (as S)	mg/L	Grab	
Sulfite (as SO_3)	mg/L	Grab	
Temperature	^oC	Grab	
Total Dissolved Solids (TDS)	mg/L	Grab	

[1] The reporting levels required in this table for priority pollutant constituents are established based on Section 2.4.2 and Appendix 4 of the SIP.

APPENDIX B

WATER QUALITY DATA

WATER QUALITY DATA CD INCLUDED IN HARDCOPIES OF FINAL PROJECT REPORT

APPENDIX C

DISTRICT ORDINANCE NO. 15

TEHAMA COUNTY SANITATION DISTRICT #1
ORDINANCE #15

AN ORDINANCE SUPERSEDING ALL PREVIOUS ORDINANCES AND PRESCRIBING REGULATIONS, USER FEES, AND INSTALLATION FEES

The Board of Directors of the Tehama County Sanitation District #1 ordains as follows:

ARTICLE 1: Tehama County Sanitation District #1 Ordinances #1 through #14 are hereby superseded and repealed.

ARTICLE 2: An ordinance prescribing regulations, user fees, and installation fees for Tehama County Sanitation District #1 is hereby enacted and shall read as follows:

CHAPTER 1
GENERAL RULES AND REGULATIONS

Section 1.1: DEFINITIONS. Unless the context specifically indicates otherwise, the meaning of terms used in this ordinance shall be as follows:

"District Board of Directors" - shall mean the Tehama County Board of Supervisors acting on behalf of the District.

"Building sewer" - shall mean the extension from the building to the clean-out at the property line and is maintained by the property owner.

"Easement" - shall mean an acquired legal right for the specific use of land owned by others.

"Floatable oil" - is oil, fat, or grease in a physical state such that it will separate by gravity from wastewater by treatment in an approved pretreatment facility. A wastewater shall be considered free of floatable fat if it is properly pretreated and the wastewater does not interfere with the collection system.

"Garbage" - shall mean the animal and vegetable waste resulting from the handling, preparation, cooking and serving of foods.

"Household Equivalent (H.E.)" - Term of measurement used to quantify water discharged to the system by each user. One H.E. equals 200 gallons per day, the amount of water discharged by the design household (single-family residential dwelling).

"Industrial wastes" - shall mean the wastewater from industrial processes, trade, or business as distinct from domestic or sanitary wastes.

"Lateral" - that segment of the sewer service pipe from the main line to the clean out at the property line.

"May" - is permissive (see "Shall").

"Natural outlet" - shall mean any outlet, including storm sewers and combined sewer overflows, into a watercourse, pond, ditch, lake or other body of surface or groundwater.

"May" - is permissive (see "Shall").

"Person" - shall mean any individual, firm, company, association, society, corporation, or group.

"PH" - shall mean the logarithm (base 10) of the reciprocal of the hydrogen-ion activity. The concentration is the weight of hydrogen-ions, in grams, per liter of solution. Neutral water, for example, has a pH value of 7 and a hydrogen-ion concentration of 10 (to the -7 power).

"Properly shredded garbage" - shall mean the wastes from the preparation, cooking, and dispensing of food that have been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than ½ inch (1.27 centimeters) in any dimension.

"Public sewer" - shall mean a common sewer controlled by a governmental agency or public utility.

"Sanitary sewer" - shall mean a sewer that carried liquid and water-carried wastes from residences, commercial buildings, industrial plants, and institutions together with minor quantities of ground, storm and surface waters that are not admitted intentionally.

"Sewage" - is the spent water of a community. The preferred term is "wastewater".

"Sewer" - shall mean a pipe or conduit that carries wastewater.

"Shall" - is mandatory (see "May").

"Slug" - shall mean any discharge of water or wastewater which in concentration of any given constituent or in quantity of flow exceeds for any period of duration longer than fifteen (15) minutes more than five (5) times the average twenty-four (24) hour concentration or flows during normal operation and shall adversely affect the collection system and/or performance of the wastewater treatment works.

"Storm drain" - shall mean a drain or pipeline for conveying water, groundwater, subsurface water, or unpolluted water from any source.

"Suspended solids" - shall mean total suspended matter that either floats on the surface of, or is in suspension in, water, wastewater, or other liquids, and that is removable by laboratory filtering as prescribed in "Standard Methods for the Examination of Water and Wastewater" and referred to as nonfilterable residue.

"Unpolluted water" - is water of quality equal to or better than the effluent criteria in effect or water that would not cause violation of receiving water quality standards and would not be benefitted by discharge to the sanitary sewers and wastewater treatment facilities provided.

"Wastewater" - shall mean the spent water of a community. From the standpoint of source, it may be a combination of the liquid and water-carried wastes from residences,

commercial buildings, industrial plants, and institutions, together with any ground-water, surface water, and storm water that may be present.

"Wastewater facilities" - shall mean the structures, equipment, and processes required to collect, carry away, and treat domestic and industrial wastes and dispose of the effluent.

"Wastewater treatment works" - shall mean an arrangement of devices and structures for treating wastewater, industrial wastes, and sludge. Sometimes used as synonymous with "waste treatment plant' or "wastewater treatment plant" or "water pollution control plant".

"Watercourse" - shall mean a natural or artificial channel for the passage of water, either continuously or intermittently.

Section 1.2: GENERAL. Unless otherwise determined by the Board of Directors, all wastewater disposal services provided by Tehama County Sanitation District #1 shall be made in accordance with these rules and regulations. Fees and charges noted herein shall be fixed and collected by the District to recover, in whole or in part, the cost of rendering a wastewater disposal service. The revenue obtained thereby is in addition to revenue obtained by the levy of taxes assessed for debt incurred to improve the wastewater facilities. Failure to comply with any provision of this ordinance may result in penalties or liens, as provided herein.

Section 1.3: BOUNDARIES. The boundaries of the Tehama County Sanitation District are as follows:

All that real property situate in the County of Tehama, State of California, being a portion of Section 25, Township 29 North, Range 3 East, M.D.M., and more particularly shown on that certain map entitled "Proposed Boundaries of Tehama County Sanitation District No. 1, Assessment District No. 1995-1, Tehama County, California". Said Map was filed August 8, 1995 in Book 1 of Maps of Assessment Districts at Page 46 in the office of the County Recorder of the County of Tehama, State of California.

Section 1.4: APPLICATION FOR SERVICE. Application for a building sewer connection permit and wastewater disposal service shall be made in writing on a form available at the District Office. The application shall include required application fees. No applicant will be denied service on the grounds of race, color, national origin or sex.

Section 1.6: TENANTS. Upon the written request of the property owner, bills may be addressed to tenants for payment. The property owner remains responsible for payment of the bill.

Section 1.7: DAMAGE TO DISTRICT - OWNED EQUIPMENT. The cost to repair any damage occurring to pipes or other District equipment or property caused by a tenant or property owner, shall be charged to the property owner and is due and payable upon presentation by the District to the property owner or tenant of a bill therefor.

Section 1.8: EXTENSION OF SERVICE. Extensions of service to individuals, subdivisions, groups, or a community of users, shall be constructed at the sole expense of the person or entity applying for the extension, and shall meet or exceed minimum standards of design and construction of facilities, as outlined in the Tehama County Land Division Standards,

and as required by the District Board of Directors. Plans and specifications shall be submitted to and approved by the District before any construction commences. Construction shall be done by a licensed contractor and construction shall be inspected and approved by the District. Upon completion of the installation, appropriate easements or rights of way shall be conveyed to the District. An agreement shall be executed by the applicant, guaranteeing to the District all the construction for a period of one (1) year after the construction is accepted by the District, against defective design, defective material and faulty workmanship. The agreement shall require a bond in the amount of one-hundred percent (100%) of the estimated construction cost of the work done. The bond requirement may be waived by the District for minor extensions as defined by the District.

CHAPTER 2
USER FEES AND CHARGES

Section 2.1: FEE SCHEDULE. Pursuant to Health and Safety Code Section 5471, annual fees and charges shall be collected from users inside and outside of the District for services and facilities furnished by it. Service charges shall be as shown on the Service Charge Schedule below.

ANNUAL SERVICE CHARGE SCHEDULE

TYPE OF USE	HOUSEHOLD EQUIVALENT	ANNUAL SERVICE CHARGE
Single Family Dwelling (including Trailers)	1	$260.00
Motels, Lodging, each Room:		
*Toilet with sink	0.3	$78.00
*Bath/Shower	0.1	$26.00
Service Stations, Garages:		
*Each public toilet with sink	0.4	$104.00
*Each wash rack	0.2	$52.00
*Each additional sink	0.3	$78.00
RV-Trailer Parks:		
*Each site with sewer hookup	0.4	$104.00
*Bathhouse:		
-each toilet with sink	0.3	$78.00
-each bath/shower	0.2	$52.00
*Laundry	1	$260.00
*Sanitary Dump Station	1.3	$338.00
Tavern, Restaurant:		
*Each toilet with sink	0.4	$104.00
*Kitchen sink	1	$260.00
*Each additional sink	0.3	$78.00
Stores and Shops:		
*Each public toilet with sink	0.4	$104.00
*Each private toilet with sink	0.3	$78.00
*Each additional sink	0.3	$78.00
Schools, each toilet (includes sink)	1	$260.00
Out of District Users:		
*Battle Creek Campground (USFS)	4.5	$1,170.00
*CalTrans Maintenance Station	4	$1,040.00
*Church Camp (Assemblies of God)	10.2	$2,652.00
*Lassen Volcanic National Park	32.5	$8,450.00

Section 2:2: BILLING. All service charges for wastewater disposal services shall be based upon Household Equivalents (H.E.) and shall be collected in advance, per Government Code Section 54347, not less than twice a year, by the District or its authorized representative on the bills provided therefore, along with any other applicable fees or penalties.

Bills are due and payable within thirty (30) days after the billing date. An initial penalty of ten percent (10%) plus twelve percent (12%) per annum may be charged if the bill is not paid within the due date. Unpaid fees for wastewater disposal service will be collected in accordance with the provisions of Government Code Section 25210.77f except that where reference is made to the Board of Supervisors it shall mean the Board of Directors of Tehama County Sanitation District #1.

Section 2.2.1: WAIVER OF USER FEES. Any request by users to waive the annual fee or portion thereof will be considered by the Board on a case-by-case basis.

Section 2.3: CONNECTION FEE. Pursuant to Health and Safety Code Section 5474, the original building sewer connection permit and inspection fee for any type of facility shall have a fee of Two Hundred Dollars ($200.00) and includes one inspection. Such fee shall be collected prior to establishing a hookup with the District System. The fee is used to cover the inspection of the connection and other administrative expenses in setting up the new account. Additional inspections will be at actual cost. The term of the installation and the permit will be void two years after issuance. The connection fee will be returned less a Twenty-five Dollar ($25.00) fee for handling and processing should the permit be voided. Installation permits will be issued to only One (1) party for One (1) property on which a building permit or mobile home permit has been applied for with the Tehama County Building Department.

Section 2.4: EXCESS FLOW FEES. Any User who causes or allows discharges in excess of normal flows, as determined by the District, typical for the type of use served shall bear the costs for such excess flows. The costs for such excess flow shall be based on the number of H.E. and the User shall pay the current established H.E. rate per year per H.E. in addition to the user fee described in the Service Charge Schedule.

Lateral cleanouts provide the District the opportunity to check for excessive flow into the collection system. Infiltration leakage of 500 gallons per day, per inch in building sewer diameter, per mile of building sewer will be allowed. Infiltration leakage above these limits is considered excessive and users shall be penalized with a higher user fee. Therefore, based on leakage tests performed in conformance with District Standards, the user fee shall be increased at the rate of one H.E. For up to 200 g.p.d., two H.E. for up to 400 g.p.d., and so on, of building sewer infiltration leakage in excess of the allowed limits, with a maximum user fee of five times the normal rate based on the number of H.E. connected. The excess flow fees shall apply for a full year. At the end of one year, and upon correction of the excessive flow, the District will, if appropriate, adjust the rate back to the regular fee. If no corrections are made the higher user fee will continue for an additional year.

Section 2.5: ASSESSMENT # 1984-1. Upon application for connection, multiple lots that received one assessment from the Central Mineral Project Assessment District # 1984-1 shall pay, in cash, an amount equal to the additional assessment which was not previously imposed as a special connection charge for each additional lateral connection.

Section 2.6: ASSESSMENT # 1995-1. Upon application for connection, multiple lots that received one assessment from the Mineral Sewer Improvement Project Assessment District # 1995-1 shall pay, in cash, an amount equal to the additional assessment which was not previously imposed, as a special connection charge for each additional lateral connection.

Section 2.7: OUT OF DISTRICT FEES. New connections or increased H.E. made by out of district users will be considered by the Board on a case-by-case basis and all out of district usage will be reviewed periodically. The annual service charge will be based on H.E. in the same manner as District residents. If the District experiences capacity problems, new out of district users or increased H.E. of current out or district users may be prohibited. Additional capacity charges may be assessed to these users.

CHAPTER 3

DISTRICT SEWAGE DISPOSAL SYSTEMS

Section 3.1: INDIVIDUAL SEWAGE DISPOSAL SYSTEMS. The District collection System and Treatment Works are the only approved sewage disposal systems. Septic Tanks and Leach Fields are not allowed to exist within the District Boundaries. It shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool, or other facility intended or used for the disposal of wastewater within the District boundaries. All land uses that generate sewage shall connect to the Tehama County Sanitation District #1 Sewerage System, and all septic tank and leach field systems shall be properly abandoned.

CHAPTER 4

WASTEWATER SEWAGE DISPOSAL SERVICE

Section 4.1: MANDATORY USE OF PUBLIC SEWERS.

a. It shall be unlawful for any person to place, deposit, or permit to be deposited in any insanitary manner on public or private property within the District or in any area under the jurisdiction of the District, any human or animal excrement, garbage or objectionable waste.

b. It shall be unlawful to discharge to any natural outlet within the District which provides sewage disposal services or in any area under the jurisdiction of said District, any wastewater or other polluted waters.

c. The owner(s) of all houses, buildings, or properties used for human occupancy, employment, recreation, or other purposes situated within the District which provides sewage disposal services and abutting on any street, alley or right of way in which there is now located or may in the future be located a public sanitary sewer of the District, is hereby required at the owner's expense to connect such buildings directly to the proper public sewer in accordance with the provisions of this Ordinance, within ninety (90) days after the date of official notice to do so. The District may authorize an extension of this deadline where justified.

d. No statement contained in this article shall be construed to interfere with any additional requirements that may be imposed by the health officer.

Section 4.2: BUILDING SEWERS AND CONNECTIONS.

a. No unauthorized person(s) shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance thereof in the District without first obtaining a written permit from the District.

b. To obtain a building sewer connection permit, the owner(s) or owner's agent shall make application on a special form furnished by the District. The permit application shall be supplemented by any plans, specifications, or other information considered pertinent in the judgment of the District. A connection fee, as set by Section 2.3, for building sewer connection permit shall be paid to the District at the time the application is filed.

c. All costs and expenses incidental to the installation and connection of the building sewer shall be borne by the owner(s). The owner(s) shall indemnify the District from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer.

d. A separate and independent building sewer shall be provided for every facility to be served; except where otherwise permitted by the District.

e. Old building sewers may be used in connection with new buildings only when they are found, on examination and test by the District, to meet all requirements of this Ordinance.

f. The size, slope, alignment, materials of construction of a building sewer, and the methods to be used in excavating, placing of the pipe, jointing, testing, and backfilling the trench, shall all conform to the requirements of the Building and Plumbing Code or other

applicable rules and regulations of the District and the County. In the absence of code provisions or in amplification thereof, the materials and procedures set forth in appropriate specifications of the ASTM and WPCF Manual of Practice #9, shall apply.

g. Whenever possible, the building sewer shall be brought to the building at an elevation below the basement floor. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by an approved means and discharged to the building sewer.

h. No person(s) shall make connection of roof downspouts, foundation drains, areaway drains, or other sources of surface runoff or groundwater to a building sewer which in turn is connected directly or indirectly to a public sanitary sewer unless such connection is approved by the District for purposes of disposal of polluted surface drainage.

i. The connection of the building sewer into the public sewer shall conform to the requirements of the Building and Plumbing Code or other applicable rules and regulations of the District and the County. All such connections shall be made gastight and watertight and verified by proper testing. Any deviation from the prescribed procedures and materials must be approved by the District before installation.

j. The applicant for the building sewer connection permit shall notify the District when the building sewer is ready for inspection and connection to the public sewer. The connection and testing shall be made under the supervision of the District or their representative. The building sewer shall be inspected prior to backfilling.

k. All excavations for building sewer installation shall be adequately guarded with reflective barricades so as to protect the public from hazard. Streets, sidewalks, parkways, and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the District.

Section 4.3: LIMITATION ON USE OF THE PUBLIC SEWERS.

a. No person(s) shall discharge or cause to be discharged any of the following described waters or wastes to any sewers provided by the District:

(1) Any gasoline, benzene, naptha, fuel oil or other flammable or explosive liquid, solid or gas.

(2) Any waters containing toxic or poisonous solids, liquids, or gasses in sufficient quantity, either single or by interaction with other wastes, to injure or interfere with any waste treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters of the wastewater treatment plant.

(3) Any waters or wastes having a pH lower than (5.5), or having any other corrosive property capable of causing damage or hazard to structures, equipment, and personnel of the wastewater works.

(4) Solid or viscous substances in quantities or of such size capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the

wastewater facilities such as, but not limited to, ashes, bones, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, unground garbage, whole blood, paunch manure, hair, fleshings, entrails, paper dishes, cups, milk containers, etc., either whole or ground by garbage grinders.

(b) The following described substances, materials, waters, or waste shall be limited in discharges to sanitary sewer systems to concentrations or quantities which will not harm either the sewers, wastewater treatment process or equipment, will not have an adverse effect on the receiving stream, or will not otherwise endanger lives, limb, public property, or constitute a nuisance. The District may set limitations lower than the limitations established in the regulations below if in their opinion such more severe limitations are necessary to meet the above objectives. In forming their opinion as to the acceptability, the District will give consideration to such factors as the quantity of subject waste in relation to flows and velocities in the sewers, materials of construction of the sewers, the wastewater treatment process employed, capacity of the wastewater treatment plant, degree of treatability of the waste in the wastewater treatment plant, and other pertinent factors. The limitations or restrictions on materials or characteristics of waste or wastewaters discharged to the sanitary sewer which shall not be violated without approval of the District are as follows:

(1) Wastewater having a temperature higher than 150 degrees Fahrenheit (65 degrees Celsius).

(2) Wastewater containing more than 25 milligrams per liter of petroleum oil, non-biodegradable cutting oils, or product of mineral oil origin.

(3) Any garbage that has not been properly shredded. Garbage grinders may be connected to sanitary sewers from homes, motels, restaurants, catering establishments, or similar places where garbage originates from the preparation of food in kitchens for the purpose of consumption on the premises or when served by caterers.

(4) Any waters or wastes containing iron, chromium, copper, zinc, and similar objectionable or toxic substances to such degree that any such material received in the composite wastewater at the wastewater treatment works exceeds the limits established by the District for such materials.

(5) Any waters or wastes containing odor-producing substances exceeding limits which may be established by the District.

(6) Any radioactive wastes or isotopes of such half-life or concentration as may exceed limits established by the District in compliance with applicable state or federal regulations.

(7) Quantities of flow, concentrations, or both which constitute a "slug" as defined herein.

(8) Waters or wastes containing substances which are not amenable to treatment or reduction by the wastewater treatment processes employed, or are amenable to treatment only to such degree that the wastewater treatment plan effluent cannot meet the requirements of other agencies having jurisdiction over such discharge.

(9) Any water or wastes which, by interaction with other waters or wastes in the public sewer system, releases toxic gases, form suspended solids which interfere with the collection system, or create a condition deleterious to structures and treatment processes.

c. If any waters or wastes are discharged or are proposed to be discharged to the public sewers in the District, which waters contain the substances or possess the characteristics enumerated in Section 4.3, and which in the judgment of the District, may have a deleterious effect upon the wastewater facilities, processes, equipment, or receiving waters, or which otherwise create a hazard to life or constitute a public nuisance, the District may:

(1) Reject the wastes,

(2) Require pretreatment to an acceptable condition for discharge to the public sewers,

(3) Require control over the quantities and rates of discharge, and/or

(4) Require payment to cover added costs of handling and treating the wastes not covered by existing sewer charges.

When considering the above alternatives, the District shall give consideration to the economic impact of each alternative on the discharger. If the District permits the pretreatment or equalization of waste flows, the design and installation of the plants and equipment shall be subject to the review and approval of the District.

d. Grease, oil, and sand interceptors shall be provided when, in the opinion of the District, they are necessary for the proper handling of liquid wastes containing floatable grease in excessive amounts, or any flammable wastes, sand, or other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the District, and shall be located so as to be readily and easily accessible for cleaning and inspection. In the maintaining of these interceptors the owner(s) shall be responsible for the proper removal and disposal by appropriate means of the captured material and shall maintain records of the dates and means of disposal for review by the District. Any removal and hauling of the collected materials not performed by owner(s) personnel, must be performed by currently licensed waste disposal firms.

e. Where pretreatment or flow-equalizing facilities are provided or required for any waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the owner(s) at his expense.

f. The District may require a user of sewer services to provide information needed to determine compliance with this Ordinance. These requirements may include:

(1) Wastewaters discharge peak rate and volume over a specified time period.

(2) Chemical analyses of wastewaters.

(3) Information on raw materials, processes, and products affecting wastewater volume and quality.

(4) Quantity and disposition of specific liquid, sludge, oil, solvent, or other materials important to sewer use control.

(5) A plot plan of sewers on the user's property showing sewer and pretreatment facility location.

(6) Details of wastewater pretreatment facilities.

(7) Details of systems to prevent and control the losses of materials through spills to the District's sewer.

g. All measurements, tests and analyses of the characteristics of waters and wastes to which reference is made in this Ordinance shall be determined in accordance with the latest edition of "Standard Methods of the Examination of Water and Wastewater", published by the American Public Health Association. Sampling methods, location, times, durations, and frequencies are to be determined on an individual basis subject to approval by the District.

Section 4.4: DAMAGE TO WASTEWATER FACILITIES. No person(s) shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is a part of the wastewater facilities. Any person(s) violating this provision shall be subject to immediate arrest under charge of disorderly conduct.

Section 4.5: POWERS AND AUTHORITY OF INSPECTORS.

a. Upon prior notification to the occupant the District's duly authorized representatives shall be permitted to enter all properties for the purposes of inspection, observation, measurement, sampling and testing pertinent to discharge to the District sewer system in accordance with the provisions of this Ordinance.

b. While performing the necessary work on private properties referred to in Subsection a, above, the District's duly authorized representatives shall observe all safety rules applicable to the premises established by the owner, and the owner shall be held harmless for injury or death to the District's employees or County employees, and the District shall indemnify the owner against loss or damage to its property by District's employees or County employees and against liability claims and demands for personal injury or property damage asserted against the owner and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the owner to maintain safe conditions.

c. The District's duly authorized representatives shall be permitted to enter all private properties through which the District holds a duly negotiated easement for the purpose of, but not limited to, inspection, observation, measurement, sampling, repair, and maintenance of any portion of the wastewater facilities lying within said easement. All entry and subsequent work, if any, on said easement, shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved.

Section 4.6: PENALTIES.

a. Any person found to be violating any provision of this Ordinance shall be served by the District with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations.

b. Any person who shall continue any violation beyond the time limit provided for in this Ordinance, shall be guilty of a misdemeanor, and on conviction thereof shall be fined in the amount not exceeding Five Hundred ($500.00) Dollars for each violation. Each day in which any such violation shall continue shall be deemed a separate offense.

c. Any person violating any of the provisions of this Ordinance shall become liable to the District for any expense, loss, or damage incurred by the District by reason of such violation.

Section 4.7: VALIDITY.

a. The invalidity of any section, clause, sentence, or provision of this Ordinance shall not affect the validity of any other part of this Ordinance which can be given effect without such invalid part or parts.

ARTICLE 3: This ordinance shall become operative on and after July 1, 2001.

ARTICLE 4 This Ordinance shall take effect at the expiration of Thirty (30) days from and after its passing and, before taking effect, shall be published one (1) time in a newspaper of general circulation printed and published in said County of Tehama.

Passed and approved by the Board of Directors of the Tehama County Sanitation District #1, State of California, at their meeting of May 22, 2001, by the following vote:

AYES: Directors Willard, Borror, Russell, Turner and McIver

NOES: None

ABSENT OR NOT VOTING: None

Chairman of the Board of Directors
Tehama County Sanitation District No. 1

ATTEST: May 22, 2001

MARY ALICE GEORGE, County Clerk and
ex-officio Clerk of the Board of Directors of
the County of Tehama, State of California.

By: Jennifer E. Burnett
Deputy