

Water

Water from the Nacimiento Reservoir is treated, stored, and delivered to residential units, businesses, and greenbelts. This is made possible with six pumping stations, a treatment plant with a capacity of two million gallons per day, five storage tanks, and approximately 16 miles of pipeline. Water is pumped uphill almost 700 total feet in elevation then gravity fed downhill through seven pressure zones to homes that are spread over a range of 350 feet in elevation.

Our only source of water is from the Nacimiento Reservoir. We have four contracts with the County of San Luis Obispo totaling 889 Acre Feet (290 million gallons) per year from the Lake.

The location and means to take delivery of this water is actually from the Nacimiento River via a pump station on the southerly bank of the Nacimiento River, some 3,000 feet downstream from the reservoir. PS-1 (Pump Station One) is a triplex pump station fed by three sixty foot long, 16-inch stainless steel well screen pipes located under the riverbed. Only two pumps were installed when PS-1 was constructed in 1994. Installation of a third pump is planned in the future. PS-1 “lifts” water up 120 feet in elevation to a storage tank at our nearby treatment plant.

Use of “surface water” (lakes, rivers, streams) or a water supply “under the influence of surface water” (shallow wells such as our PS-1) requires treatment for removal of contaminants potentially harmful to human health. Accordingly, the Jim McWilliams Water Treatment Plant went online in March, 1994. With a design capacity of 2 MGD, there is enough capacity for full build-out of 2,900 residential units under the County approved master plan for Heritage Ranch.

The cost of the Treatment Plant was three million dollars. The District and the American Universal Insurance Company (successor property owner to the Six Corporation) split the cost. To fund our half, and to fund replacement of PS-1 and PS-4, a two million dollar loan was taken out with the State of California. The developers of the new Tract 1910 and 1990 paid \$284,000 to the District as part of the requirement to repay Plant improvement costs and to fund new well and booster pump facilities.

The Treatment Plant is a direct filtration treatment plant. The treatment process includes clarification and filtration using aluminum sulfate (Alum) and cationic polymer (contains a positive electrical charge which attracts negatively charged particles) contaminants in the water, after which it is disinfected with hypochlorite (12% chlorine solution). A corrosion inhibitor, orthophosphate, is added into the water system to protect piping against corrosion.

The District Board approved a scope of work for an engineering study in 2010 to address several water quality issues at the water treatment plant. The main issue was Disinfection Byproducts (DBP) compliance. The District has exceeded the Maximum Contaminate Level (MCL) of this primary drinking water standard. DBP is a treatment byproduct of chlorination and organics in raw water. The EPA has concluded that long term exposure

to DBP can lead to higher cancer rates. The second issue was iron and manganese compliance. The District has battled with high iron and manganese concentration in our water and has exceeded the MCL of these secondary drinking water standards. The presence of either iron or manganese in large quantities has caused major “dirty water” complaints from our customers. A related but critical treatment issue is the removal of constituents in the water in the event that we begin to intake water directly out of the reservoir, the river, or the Nacimiento Water Project (pipeline). The engineering study recommended new treatment processes at the plant to modify the system closer to conventional treatment with a sedimentation process before the filters. The addition of a Plate Settler was recommended with new filtration systems to provide a higher level of water treatment capability.

The Board elected to phase in the improvement process at the WTP due primarily to cost. The project was broken up into two phases. Phase I included installation of a potassium permanganate, powdered activated carbon, and tank mixing system at the plant. Potassium permanganate and powdered activated carbon are added to raw water before it enters the filters. These are added to reduce the formation of disinfection byproducts that are created when chlorine combines with organics in the treatment process. Phase I is completed and online. Phase I was funded from capital reserves at a cost of \$650,000.

Installation of a plate settler was postponed until a funding source could be identified. The plate settler is a major piece of equipment that provides further water treatment ability and act as a sedimentation basin at the WTP. This plate settler has many benefits to the WTP and provides protection from high turbidity events. It will also be needed if we ever elect to connect to a direct pipeline to the Nacimiento Lake or River for water deliveries during a drought period. The plate settler improvements are necessary to manage the disinfection byproducts (DBP), iron/manganese, and turbidity removal at the WTP.

A funding request was submitted to the State Department of Public Health Drinking Water for financial assistance with the improvements at the WTP on August 31, 2010. This funding is processed through the Safe Drinking Water State Revolving Fund (SDWSRF) program. The SDWSRF provides millions of dollars to water agencies annually to improve their drinking water systems. Our project for the improvements at our WTP to alleviate disinfection byproducts and iron and manganese problems was approved in June 2013 for funding by the State in the amount of \$988,000. The loan terms are 20 years at an interest rate of 1.78%. After a competitive bid process the new WesTech Inclined Plate Settler was constructed and operating in October 2014.

In view of the many years before full build-out, the plant was designed and built to be operated with maximum efficiency both now and in the future. Incremental filtration, multiple stage pumping and a SCADA system (Supervisor Control and Data Acquisition) all combine to make this possible.

We normally operate the plant from early morning until the two million gallon tank is full. In the winter, this means three or four days a week, six to eight hours a day. In the summer, it usually means seven days a week, up to 24 hours a day. We have four operators whose primary assignment is the operation of the Treatment Plant. Work schedules flex to accommodate seasonal demands, on-call status is rotated, and SCADA allows for remote

monitoring or quick alarm response. In addition to our treatment operators, Jason Molinari who is our Operations Supervisor, functions as a back-up operator from time to time and works as needed at the Plant.

The treated water is pumped from the plant “up the hill” to PS-4, an in-line booster, then to the distribution system and storage. Our distribution system consists of asbestos-concrete and plastic mains, from four inch up to twelve inch in diameter. Services are of polyethylene plastic, a not-so-good material that keeps us busy from time to time replacing. Besides valves, fire hydrants, meters and air/vacuum releases, we also maintain eight pressure reducing stations, vault enclosed devices that create pressure zones due to the range of elevation in our service area (the aforementioned 350 foot range, absent any control, would be 152 psi).

PS-5 is a small booster station inside a brown shack alongside G-14 on your right a quarter mile outside the gate (the one with a red light on the outside wall). PS-5 maintains water to a 40,000 gallon tank up the hill from the shack on lot eight of the 20-acre parcels. This small system serves lots one through eight of the 20-acre parcels and is required to maintain adequate pressure at the higher building site elevations of these parcels. Finally, PS-6 is located in Tract 1990 along Lakeside Village Drive North. This pump station maintains adequate pressure for 66 lots in the upper elevations of this tract.

Our water system operates under the authority of a permit issued by the State of California, Department of Water Resources, Public Health, Sanitary Engineering Branch. Many tests are taken to monitor and check the quality of water. Some tests are done daily, some weekly, and others on a periodic basis. Staff does most of the testing. Outside testing is performed weekly by an independent lab, and the State also visits to inspect, sample, and complete their own separate testing. A Water Quality report is published annually to all our customers around May/June. Our number one priority in our total operation is the supply of drinking water that is free of contamination.

Future Water Improvements

The District is pursuing an emergency connection to the Nacimiento Water Project (NWP). The NWP is the pipeline leading from the reservoir to the City of San Luis Obispo. The flow of water to the river is controlled by Monterey County Water Resources Agency (MCWRA) until the reservoir reaches the upper minimum pool boundary of 687.8 feet at which time all reservoir releases may stop. Any release of water at the minimum pool requires the authorization of San Luis Obispo County. This situation has never occurred and water has always flowed in the river. However, the community has come very close in the past with discussions in 2009 between MCWRA and San Luis Obispo County regarding reduced/no flow in the river.

During dead pool conditions, reservoir elevation below 670 feet, water can no longer be gravity fed to the lower outlet works of the dam. At this reservoir elevation the Nacimiento River is not physically capable of receiving gravity fed water from the outlet works of the dam and the only water supply for Heritage Ranch (gallery wells downstream of the dam) will be without a water supply. Dead pool conditions have never existed since the reservoir

was constructed in 1958. However, it has come close during several multi-year drought periods. These include 1960 (671'), 1977 (674'), and in 1989/90 (672'). The NWP extends into the reservoir 10 feet below dead pool providing an emergency supply of water for all connections to the system.

The District proposed project includes a pipe between the NWP and our water intake pump station 1 along the Nacimiento River. The HRCSD's water pump station 1 is almost directly across the Nacimiento River from the proposed connection point at an existing air vacuum valve on the NWP. This water pipe would only be placed in service in the event there is no water in the Nacimiento River. The estimated cost of this project is \$150,000.

The project is only for short term emergency use, only when there is no water flowing in the Nacimiento River. This condition would likely be caused by a reservoir elevation below dead pool elevation of 670 feet, a malfunction of the lower outlet works that did not permit MCWRA to release water into the river. This event would be short term to allow other water pumping systems to be established in the reservoir, repair of any broken structures on the dam, or until the eventual rising of reservoir water levels from rainfall. The use of the NWP water would be temporary and only needed to supply water for fire protection and the health and safety of the community.

The District submitted a drought grant application through the San Luis Obispo County Integrated Water Management Plan. Responding to California's drought, the State Department of Water Resources made limited Proposition 84 funds available on a competitive basis to agencies for emergency water projects. Project funding award will be made by the State sometime before the end of 2014. The District will proceed with its emergency water project regardless if grant funds are awarded.