

## APPENDIX E: MODESTO RESERVOIR MANAGEMENT PLAN



# **MANAGEMENT PLAN MODESTO RESERVOIR**

## **1. INTRODUCTION**

Modesto Reservoir is a multi-purpose structure serving the needs of Modesto and the surrounding communities. The reservoir is owned and operated by the Modesto Irrigation District. The land surrounding the reservoir consists of private property and MID land leased to the Stanislaus County Parks and Recreation Department for campgrounds and day use, and land owned by Stanislaus County. Cattle grazing occurs on both private and county owned lands around the reservoir. Historically, the water has been used for irrigation and recreational activities such as boating, swimming, and fishing. A new era for Modesto Reservoir has begun with the completion of the Modesto Regional Water Treatment Plant. The facility treats water from Modesto Reservoir and conveys the treated water to the City of Modesto for distribution to the residents of Modesto. The remainder of this document is dedicated to addressing factors that could have a negative impact on the source water for the water treatment facility and the steps that will be taken to eliminate or minimize them.

## **2. INFLUENCES ON WATER QUALITY**

The three main categories of factors that influence water quality in the Modesto Reservoir are recreation, runoff, and animals. These areas will be explored in further detail in the sections to follow.

### **2.1 RECREATION**

Recreation has, historically, been a major use of the reservoir. It is not practical to eliminate this use, since large amounts of public funds have already been expended in developing campground, day use, and support facilities. Recreation occurs in many forms on the reservoir with varying degrees of impact. We are currently in process of obtaining a legislative exemption, to allow whole body contact recreation.

#### **2.1.1 BOATING**

Boating is allowed during day light hours only. Boats equipped with sanitary facilities are not allowed on the reservoir. Under no circumstances are boats allowed to anchor overnight, except in conjunction with the owner using campground facilities. Use of bilge pumps is prohibited except in areas equipped with facilities to dispose of the waste, or in emergency circumstances.

### **2.1.2 SWIMMING**

Whole body contact is allowed with the water through swimming and water skiing. Swimming is likely to occur only in the campground and day use areas. Bodily contact with the water is likely to occur through water skiing throughout the lake. The exception to this would be areas restricted to boats or areas with low speed limits.

### **2.1.3 PETS**

Visitors to the Modesto Reservoir are not allowed to bring dogs or horses onto the grounds.

### **2.1.4 SANITATION FACILITIES**

Sanitation facilities are provided through flush toilets, portable chemical toilets, vault toilets, full hookups at developed campgrounds, and shower areas. Flush toilets, camper hookups, and showers are connected to a sewerage collection system that transports the waste water to a treatment facility via two lift stations. Chemical toilets are provided on an as needed basis, and are placed strategically around the lake to provide adequate service. Vault and chemical toilets are serviced at intervals depending on the volume of people visiting the reservoir (appendix 1).

Trash receptacles are provided around the lake, with a higher concentration in the areas of more frequent use. Trash cleanup and removal are provided at regular intervals (appendix 1).

### **2.1.5 CAMPGROUNDS**

Developed and undeveloped campgrounds exist at various locations around the reservoir. There are 186 developed campsites with 150 of these providing full hookups. Camping is allowed in undeveloped areas, provided it is at least fifty feet from the high water mark.

### **2.1.6 FUEL SPILLS**

A fueling station is located adjacent to the boat ramp on the east side of the reservoir. Fuel is stored in a Convault tank on the shore above the lake. Gas pumps are located on the end of a floating dock. Connection is made between the pumps and the tank with galvanized pipe; rubber hose is used at all flex points in the pipeline. Bilge pumps may be used only in emergency circumstances. This should preclude oil and gas from entering the water from boats.

### **2.1.7 FISH CLEANING**

Fish cleaning is not allowed in areas in which the waste from this activity would enter the reservoir.

### **2.1.8 ACCESS TO REST ROOMS FOR SPORTSMEN**

Fishing and hunting is allowed on the reservoir. Sanitary facilities are provided by portable toilets.

### **2.1.9 SEWER TREATMENT FACILITIES**

Sewage lift stations are protected by impoundment berms, visual alarms, automatic lift station failure notification, and redundant pumps. The sewage is treated by an aeration facilities at a site 300 feet from the reservoir to prevent flow back into the reservoir in the event of a spill.

## **2.2 RUNOFF**

Runoff into the reservoir should be limited to rainy periods. Normal amounts should have minimal effect on the reservoir, since there are few waterways that drain into the reservoir. In the event of large runoff, there are several factors that could affect water quality.

### **2.2.1 SILT**

Most lands surrounding the reservoir are open areas populated by native grasses. Silt migration from these areas should be negligible.

### **2.2.2 VEGETATION**

Very few trees and shrubs surround the reservoir. Vegetation entering the reservoir should be limited, and should not impact water quality.

### **2.2.3 ASH**

Based on the vegetation populations mentioned above, the amount of ash produced from a rangeland fire should be minimal.

#### **2.2.4 ALGAE BLOOMS**

The aforementioned items all have an impact on algae blooms. Since none are expected to have a significant effect on water quality, the possibility of algae blooms is small.

### **2.3 CATTLE**

Cattle currently graze up to the shoreline and enter the reservoir to drink water. This poses several problems.

#### **2.3.1 CATTLE DROPPINGS**

With moderate amounts of rainfall, cattle droppings could be washed into the reservoir.

#### **2.3.2 CATTLE IN THE WATER**

Cattle are not fenced off from the shoreline and can, therefore, enter the water.

#### **2.3.3 CATTLE DYING IN WATER**

Since cattle are allowed to enter the waters of the reservoir, the possibility exists for cattle to become disabled in the water and die.

### **3. CONTROL PROCEDURES**

Responsibility for the quality of the water in Modesto Reservoir rests with two agencies, the Stanislaus County Parks and Recreation Department (County), and the Modesto Irrigation District. Each has unique responsibilities and resources. The two agencies will work together in order to accomplish the goal of maintaining Modesto Reservoir as a multi use facility with high quality water. Now that the reservoir has become a source for domestic drinking water, the following steps will be taken by the two agencies to protect the raw water source in order to provide safe drinking water.

#### **3.1 COUNTY**

The County is primarily responsible for the lands that surround the reservoir. These lands can be categorized as developed recreational, undeveloped recreational, and open areas. The following steps will be taken by the County to minimize the impact of the previously mentioned factors influencing water quality.

##### **3.1.1 REGULAR PATROLS**

During periods of high use the reservoir will be patrolled by the Sheriffs Department and park personnel 24 hours a day. During periods of lighter use, the reservoir will be patrolled during daylight hours only.

### **3.1.2 MANNED RANGER STATION**

The ranger station at the entrance to the reservoir is manned from 6:00 a.m. to midnight during the summer. The Rangers will inspect all boats entering the reservoir to ensure compliance with the restrictions on the type of boats allowed.

### **3.1.3 RESTRICTED ACCESS**

The area near the intakes to the water plant is restricted from public access. This area is protected in the water with a buoy system five hundred feet from the intakes, marking the area as restricted. The dam is restricted to prevent both vehicular and foot traffic.

### **3.1.4 CAMPING AND BOATING RESTRICTIONS**

All camping and boating restrictions will be strictly enforced by the County. Of special importance is the enforcement of the fifty-foot set back from the high water mark in undeveloped areas.

### **3.1.5 ANIMAL ORDINANCES**

Dogs and horses are not allowed on the premises of the reservoir.

### **3.1.6 SEWAGE CONTROLS**

The wastewater treatment plant is staffed by a California Grade 1 operator. Alarms give visual warning of lift station failures. An automated dialing system is installed to notify parks personnel in the event of a lift station failure. Currently the auto-dialer is tested monthly to verify the integrity of the phone link. The testing procedure is in the process of being changed, such that the float can be lifted to activate the alarm, and auto-dialer. It is anticipated that this will be checked on a weekly basis.

### **3.1.7 EDUCATION**

Pamphlets are handed out at the entrance station to explain what activities are and are not allowed at the reservoir. Also explained is the necessity of the regulations to protect the source of drinking water for the citizens of Modesto.

### **3.1.8 GRAZING LEASES**

The County administers the grazing leases for their parcels of land that are not used for recreational purposes. Currently the rancher's animal husbandry practices precludes having calves younger than three months old grazing on the reservoir. This is significant because calves younger than three months of age tend to be infected with *Cryptosporidium* more often, and shed larger numbers of oocysts than calves older than three months. Future leases could be written such that the cattle allowed to graze around the reservoir would be restricted to those older than three months of age.

## **3.2 MODESTO IRRIGATION DISTRICT**

Modesto Irrigation District will operate the water treatment plant to optimize finished water quality based on source water conditions. The following items will be employed to protect and treat the source water.

### **3.2.1 PATROLS**

Modesto Irrigation District will pay the cost of staffing an extra part time Sheriff, to enable 24 hour patrols during the summer months.

### **3.2.2 CAMPGROUNDS**

To offset the loss of undeveloped camping areas caused by the fifty-foot restriction from the high water mark, 98 full hookup campsites have been added.

### **3.2.3 MULTIPLE BARRIER TREATMENT**

Depending on source water quality, the plant will be run in either a direct filtration or a conventional treatment mode. It is anticipated that the plant will run in the conventional treatment mode the majority of the time.

### **3.2.4 DISINFECTION**

Disinfection is provided in two stages. Ozone is applied to the raw water as it enters the plant. Chlorine is applied continuously just prior to the filters. A chlorine injection point is also located at the flash mixer for pre-chlorination should this need arise. Filter effluent is chlorinated prior to pH stabilization. Adequate free chlorine residuals are maintained to ensure the bacteriological quality of the water throughout the City of Modesto's distribution system.

### **3.2.5 MONITORING**

A comprehensive monitoring program has been enacted. The program will assess the chemical and bacteriological quality of the water from the time it enters the reservoir to the time it leaves the Terminal Reservoir and Pump Station.

Recreation on Modesto Reservoir is expected to have two major impacts, those being microbiological and MTBE contamination. Routine monitoring is performed on weekly basis to assess the microbiological impact of recreation on the reservoir. Samples are collected weekly for total and fecal *coliform* from the campground area at Shady Point and also from the reservoir inlet. On summer holiday weekends, sampling is increased to include the West Boat Ramp, Lake View, and Narrows. Samples are collected on the two days previous to the weekend and two days following. In addition the raw water coming into the plant is routinely sampled daily. Monthly samples are collected for MTBE at the raw water vault, mid-reservoir, fueling station, and the LaGrange diversion dam. In addition samples are collected the day before and after summer holiday weekends.

### **3.2.6 SB 2201**

Senate Bill 2201 (appendix 2) was signed into law by Governor Wilson on June 19, 1998 granting a waiver, which allows full body contact recreation at Modesto Reservoir. Contained within the law was a requirement to report to the legislature on multiple water quality issues on or before January 1, 2002. MID is required by the department to submit an annual report on activity at Modesto Reservoir. Any pertinent information collected for SB 2201 will be included in our annual report to the State.

## **4.0 CONCLUSION**

There are certain risk factors associated with a multiple use reservoir being used as a source for drinking water. It is believed that with proper operation of the reservoir and the implementation of modern water treatment procedures, these risk factors will have little or no impact on the finished water. With the cooperation of the County, Modesto Irrigation District, and the public, Modesto Reservoir has and can continue to serve as a source of enjoyment and drinking water for the citizens of Modesto.

## Appendix 1

### Stanislaus County Park Inspection Procedures For Modesto Reservoir

## Appendix 2

SB 2201

