APPENDIX I

North Fork Water and Wastewater Feasibility Study

North Fork
Water and Wastewater Feasibility Study

November 2006

Prepared for:

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1.0 Introduction

HydroScience Engineers, Inc., (HSe) was retained by Analytical Environmental Services (AES), Inc. to prepare a water and wastewater feasibility study for the proposed North Fork hotel, casino, or retail alternatives at the North Fork Rancheria owned by the Mono Indians (Tribe) in Madera County, California. This includes a review of background site conditions, an evaluation of the facility requirements, and a preliminary design of key water and wastewater facilities. This report summarizes HSe's investigation and is organized into the following sections:

- Introduction
- Projected Flows
- Regulatory Requirements
- Water Supply Assessment
- Wastewater Assessment
- Conclusions and Recommendations
- Abbreviations
- References

1.1 Background

Two separate locations are being considered, one of which is near Madera (Madera site), and the other one is near North Fork (North Fork site). These locations are shown in **Figure 1-1**. The proposed site near the City of Madera is approximately 305-acres in size and is located along Highway 99 as shown in **Figure 1-2.** It is currently utilized for growing agricultural crops, and has a residence and associated outbuildings on the property's southeastern corner. An aerial photograph of the site is shown in **Figure 1-3.** The other proposed project site is located near the City of North Fork, in the Sierra Nevada foothills approximately 20 miles south of Yosemite National Park, as shown in **Figure 1-4**. The total project site is approximately 31-acres in size and is currently utilized as a rural residential area.

1.2 Project Description

Five alternatives are being considered for this project. Three of the alternatives are located near the City of Madera, and a fourth alternative is located near the City of North Fork. The fifth alternative is to take no action. The five alternatives are as follows:

- Alternative A – An approximately 250,000 square foot (ft^2) casino with a 200-room hotel at the Madera site as shown in **Figure 1-5**.
- Alternative B – An approximately 190,000 ft^2 casino at the Madera site as shown in **Figure 1-6**.
- Alternative C – A regional shopping center at the Madera site as shown in **Figure 1-7**.
- Alternative D – An approximately 26,000 ft^2 casino located near the City of North Fork as shown in **Figure 1-8**.
- Alternative E – No action alternative. Alternative E is not discussed further in this water and wastewater feasibility study because it is assumed that no additional water demands or wastewater flows will be generated from the proposed project sites under this alternative.

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Figure 1-1
North Fork
Water and Wastewater Feasibility Study
Vicinity Map

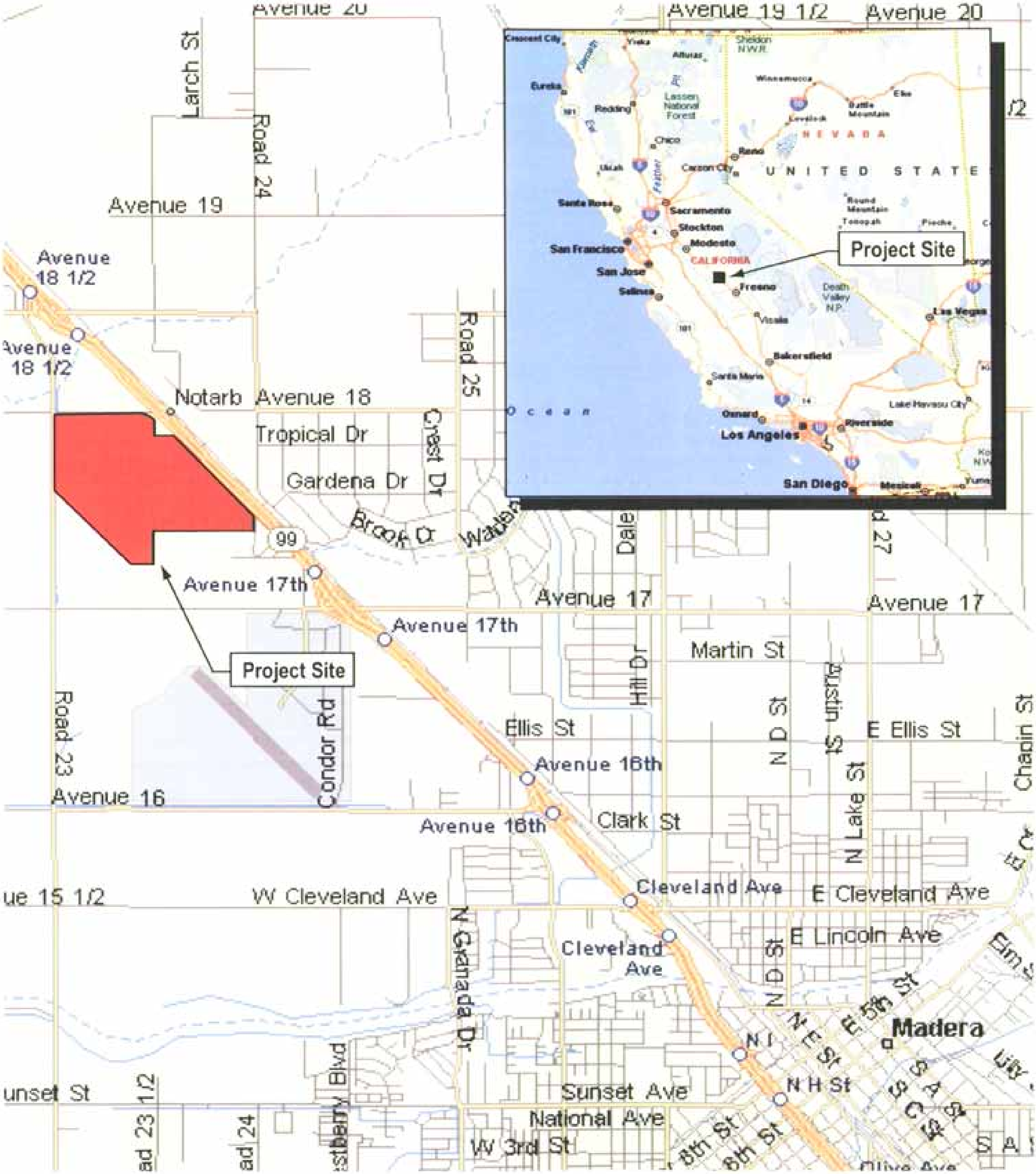

Figure 1-2
North Fork
Water and Wastewater Feasibility Study
Vicinity and Location Map for Alternatives A, B, and C

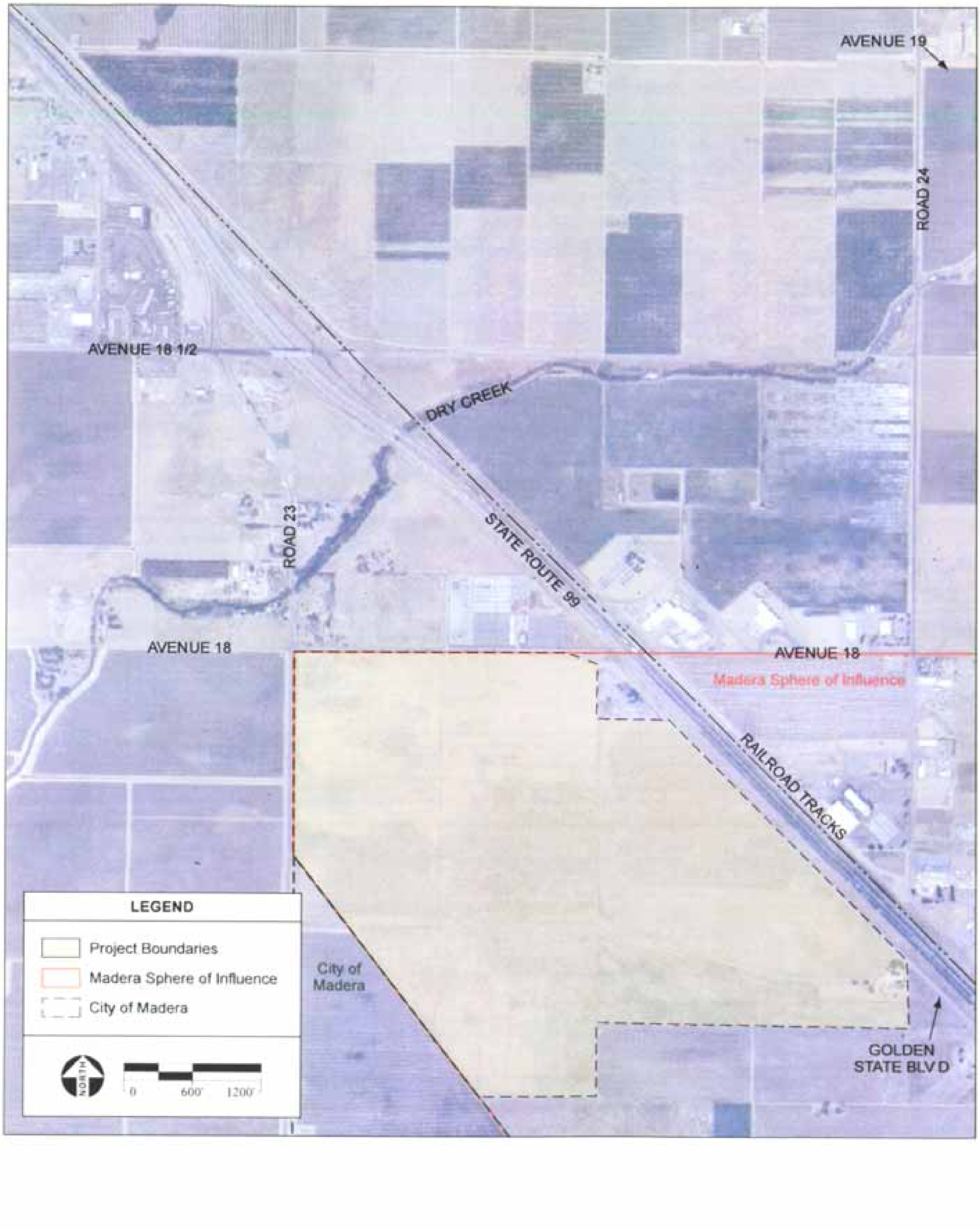

Figure 1-3
North Fork
Water and Wastewater Feasibility Study
Aerial Site Map for Alternatives A, B, and C

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Figure 1-4
North Fork
Water and Wastewater Feasibility Study
Vicinity and Location Map for Alternative D

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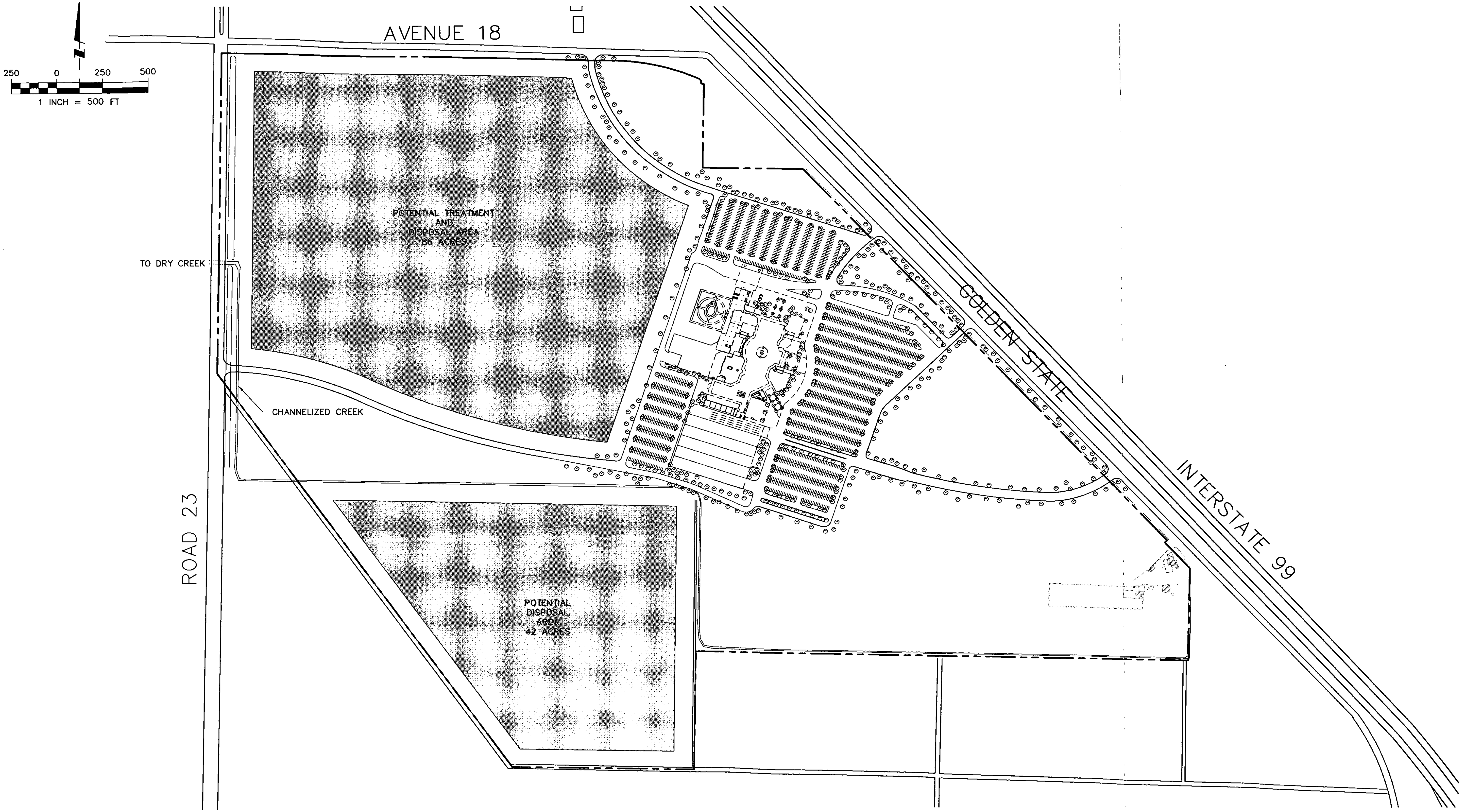

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Figure 1-5
North Fork
Water and Wastewater Feasibility Study
Alternative A Site Plan

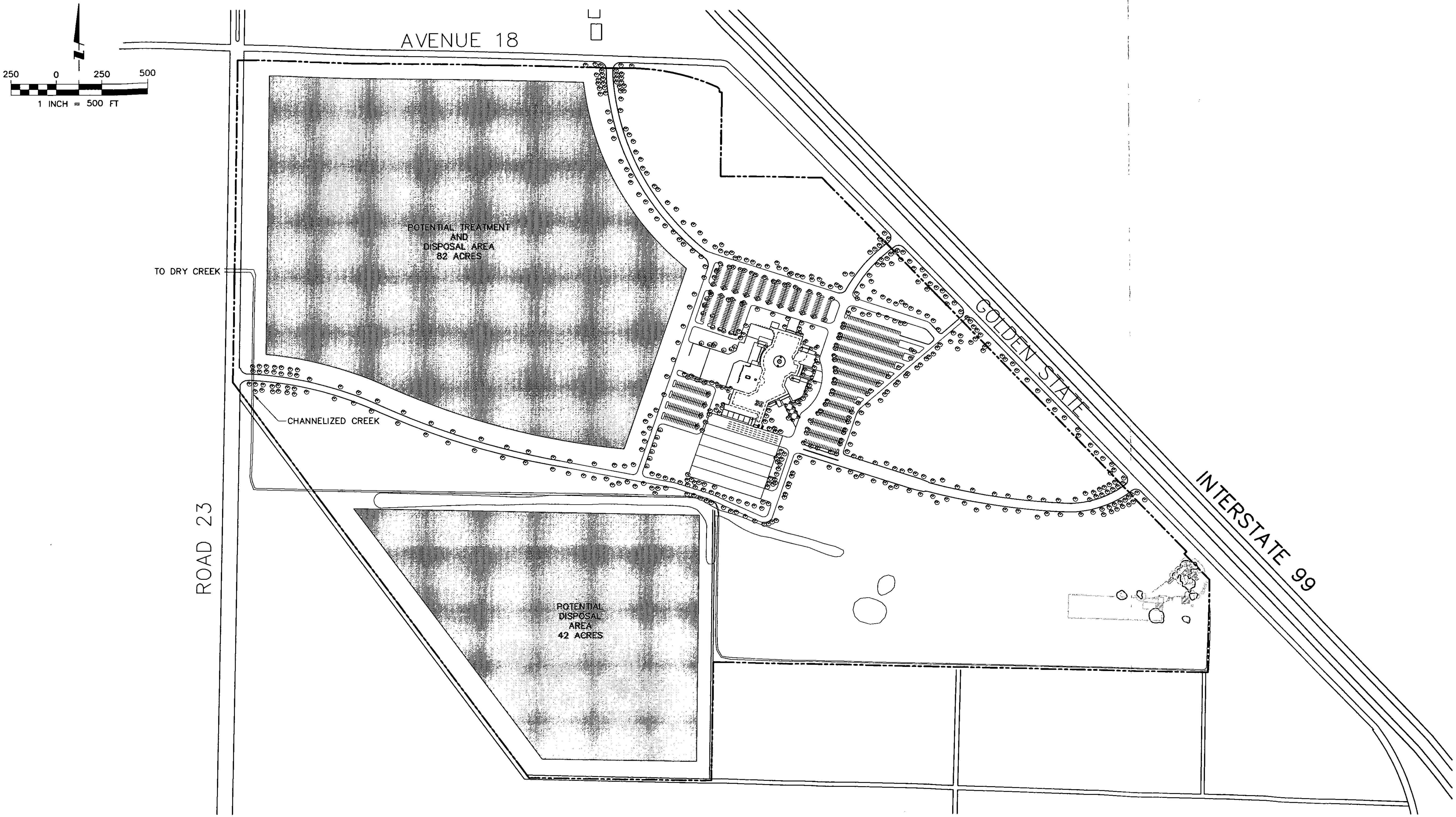

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Figure 1-6
North Fork
Water and Wastewater Feasibility Study
Alternative B Site Plan

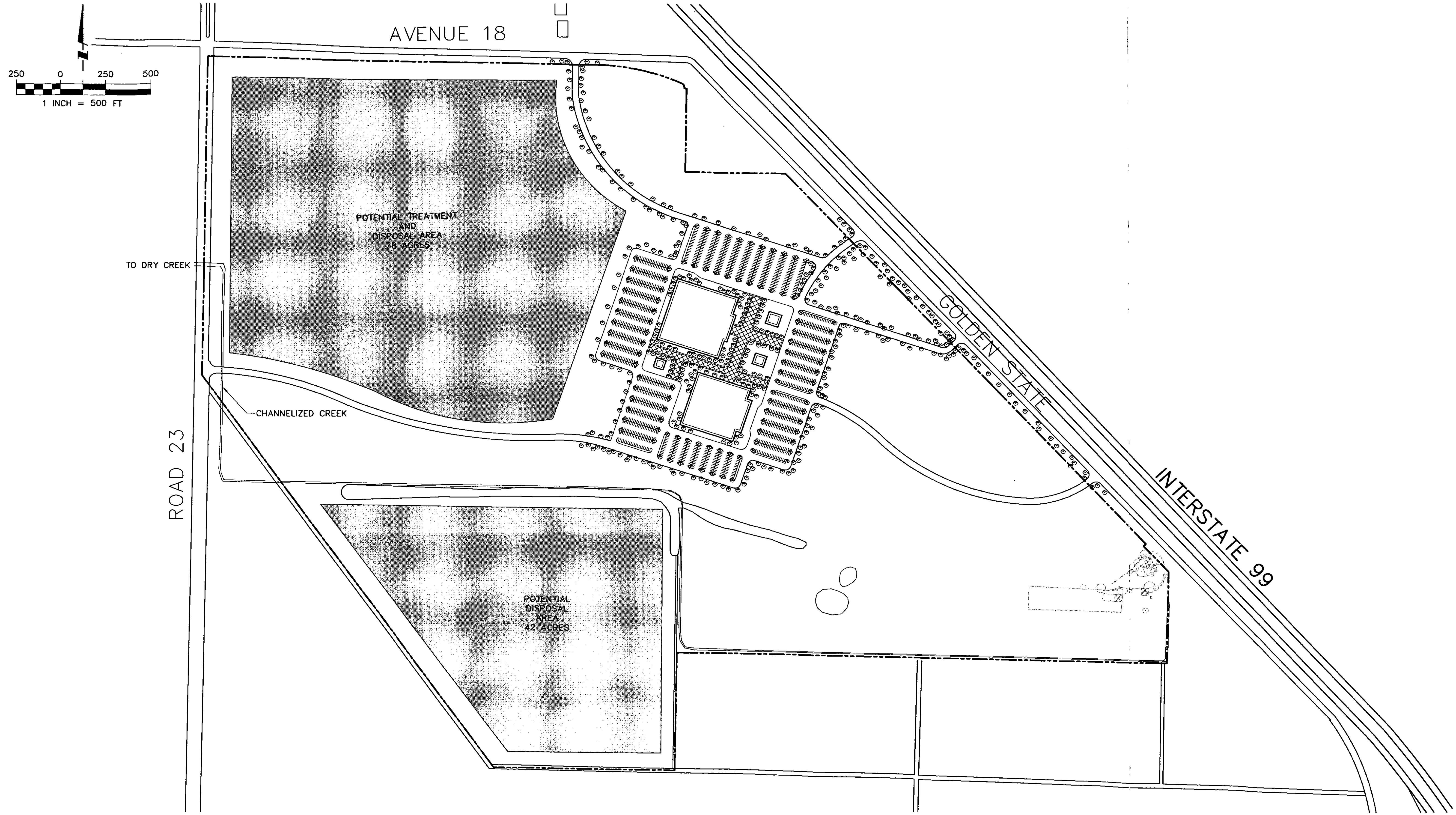

Figure 1-7
North Fork
Water and Wastewater Feasibility Study
Alternative C Site Plan

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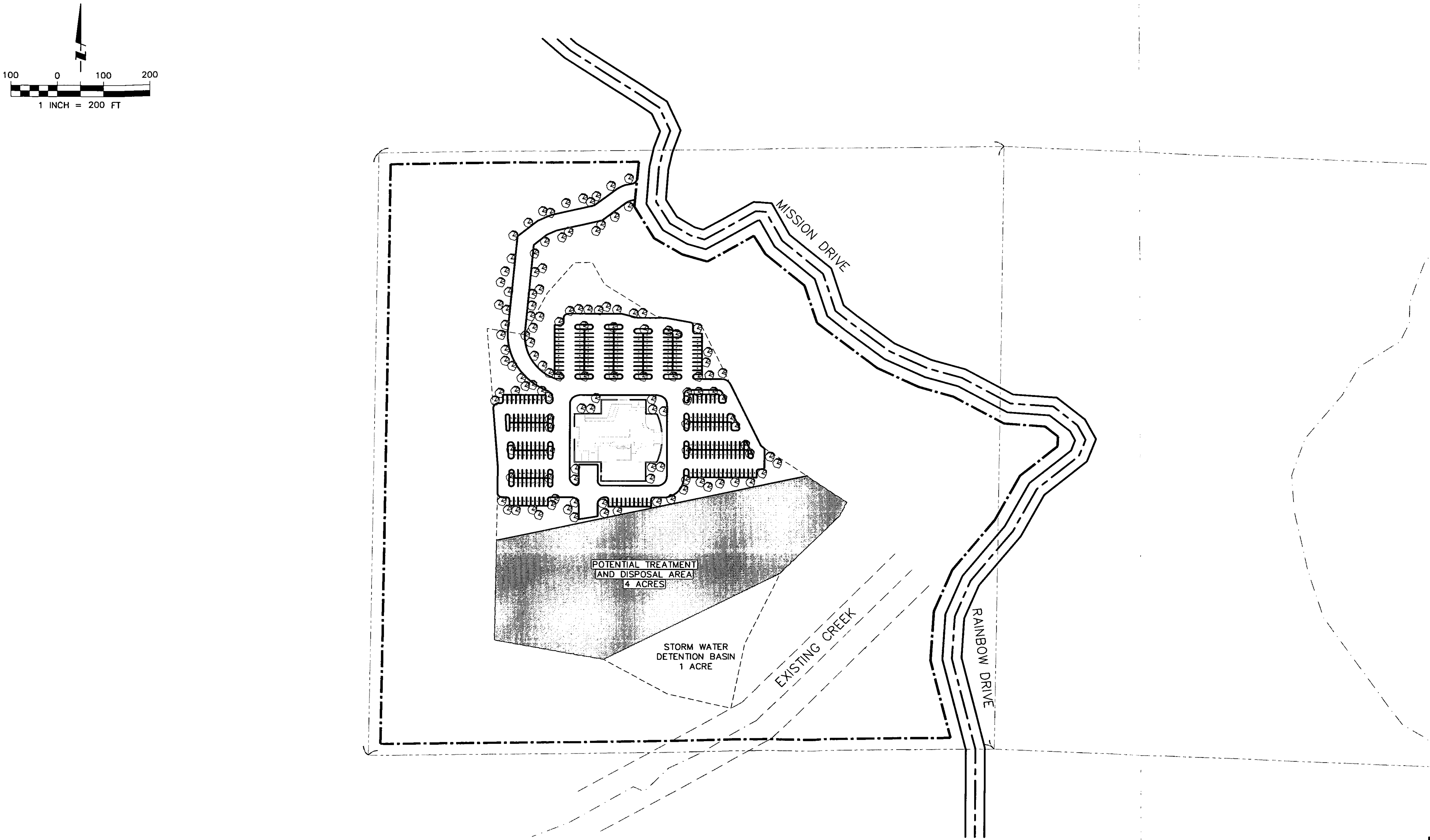

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Figure 1-8
North Fork
Water and Wastewater Feasibility Study
Alternative D Site Plan

Related facility area (square footage) estimates for each alternative are further summarized in **Table 1-1**.

Table 1-1: Facility Area Estimates

Facility	Alternative			
	A (ft^2)	B (ft^2)	C (ft^2)	D (ft^2)
Casino				
Casino Gaming	83,100	57,000	--	8,900
Support Areas	28,500	23,800	--	4,600
Food and Beverage	67,400	53,700	12,000	4,500
Public and Misc. Areas	10,000	9,500	--	2,000
Back of House	50,000	37,800	--	6,000
Retail	1,200	--	225,000	--
Entertainment/Lounge	7,000	7,000	--	--
Hotel	207,700	--	--	--
Pool and Spa	16,800	--	--	--
Central Plant/Cooling Towers	21,300	9,000	--	--
Project Total[a]	**493,000**	**198,000**	**237,000**	**26,000**

[a] Does not include parking.

1.3 Objectives

This water and wastewater feasibility study for the proposed North Fork Hotel, casino, or retail alternatives in Madera County, California will be a preliminary planning document and is not intended for purposes of design and construction. The objectives of this feasibility study are listed below.

- Estimate domestic water demands and any on-site storage requirements
- Evaluate wastewater flows based on the proposed facilities and comparable gaming facilities
- Develop preliminary sizing of key wastewater collection and treatment facilities
- Evaluate the potential for reducing water demands with reclaimed water
- Develop a water supply strategy
- Develop a wastewater treatment and disposal strategy

2.0 Projected Flows

This section outlines the design criteria and general assumptions for estimating the wastewater production and water demands anticipated for Alternatives A through D. The analysis begins with estimates of wastewater production, since unit wastewater flow for the various services and customers is more readily available than water usage information. This data is subsequently used to back-calculate the corresponding water demand.

In addition to the water and wastewater flows, recycled water demand and its influence on the water demand and wastewater disposal requirements were also evaluated. Reclamation has the dual advantage of reducing the net potable water demand and the wastewater disposal requirements, since potable water demand traditionally needed for landscape irrigation and toilet flushing, for instance, can be satisfied with recycled water. At the same time, treated wastewater that would normally require disposal can instead be applied for beneficial reuse. The extent to which the reclamation program affects the potable water demand and wastewater disposal requirements is also summarized in this section.

2.1 Wastewater Flows

Facility programs are used to calculate the wastewater flows for the proposed site layout alternatives. The facility program provided for each site alternative describes what type of restaurants are proposed and the respective number of seats, the number of hotel rooms, square footage of facility areas, retail areas, and the like. From these descriptions and quantities, unit wastewater flows (gallons per day per unit) can be estimated. **Tables 2-1 through 2-4** provide estimated wastewater flows for the four proposed site layout alternatives. Due to the size and complexity of the information used to generate the condensed results presented in **Tables 2-1 through 2-4**, refer to **Appendix A** for the complete versions of **Tables 2-1 through 2-4**.

Casinos differ from other business establishments in the hours that they are open, the type of services they provide and occupancy. The peak times of the day vary slightly depending on the surrounding community but there is a fairly typical pattern to the rate of occupancy for casinos in general. The occupancy or use of the casino typically varies depending on whether it is a weekday or a weekend. Occupancy and flows are usually the lowest during the weekdays of Monday through Friday. Normal two-day weekends (Saturday and Sunday) usually have the highest flows on a weekly basis.

A casino is open 24 hours a day and the number of guests varies throughout the day. Based on observed flows at other similar casinos there are times of the day when the casino has a lower or higher occupancy rate and these times are different, depending on whether it is during a weekday or a weekend. For example, during a typical weekday in the morning and early afternoon the casino has an occupancy rate of roughly 30 to 40 percent but starting in the late afternoon, and extending into the night, the casino may have a 60 to 70 percent occupancy rate.

Retail centers, however, are more typical business establishments in the hours that they are open, the type of services they provide and occupancy. Similar to casinos, the peak times of the day vary slightly depending on the surrounding community but there is a fairly typical pattern to the rate of occupancy for retail centers in general. The occupancy or use of the retail center typically varies depending on whether it is a weekday or a weekend. Occupancy and flows are usually the lowest during the weekdays of Monday through Friday. Normal two-day weekends (Saturday and Sunday) usually have the highest flows on a weekly basis.

A retail center is typically open 12-hours a day and the number of guests varies throughout the day. Based on flows at other retail centers there are times of the day when the shops have a lower or higher occupancy rate and these times are different, depending on whether it is during a weekday or a weekend. For example, during a typical weekday in the morning and early afternoon the retail center has an occupancy rate of roughly 30 to 40 percent but starting the late afternoon, and extending into the evening, the retail center may have a 60 to 70 percent occupancy rate.

For **Tables 2-1, 2-2, and 2-4**, the estimated flows are based on a summation of flows for two 12-hour cycles, a 12-hour morning (a.m.) cycle and a 12-hour evening (p.m.) cycle. The rates of occupancy for daily 12-hour cycles changes dramatically depending on whether it is during the weekday or a weekend day. For **Table 2-3,** the estimated flows are based on a summation of flows for a typical 12-hour business day for retail centers. The rates of occupancy for daily 12-hour cycles changes dramatically depending on whether it is during the weekday or a weekend day.

For all alternatives, an average estimated wastewater flow is calculated using the weekday and weekend flows. The average is weighted based on five days of weekday plus two days of weekend flows. The average wastewater flow is useful in determining the design average day water demand and design wastewater disposal flow.

Table 2-1: Estimated Wastewater Flows for Alternative A

	Area (ft^2)	Unit (gpd/ft^2)	Base Flow (gpd)	Typical WEEKDAY Flows [a] (gpd)	Typical WEEKEND Flows [a] (gpd)	AVERAGE Day Flows [b] (gpd)
Casino	121,630	1.25	151,700	87,200	128,900	99,100
Back of House	50,000	1.37	68,500	27,400	41,400	31,400
Retail	1,185	0.01	12	5	9	8
Food and Beverage	67,365	1.56	105,200	50,700	89,500	61,800
Entertainment/Lounge	7,000	0.54	3,780	1,500	2,400	1,800
Hotel	207,680	0.16	32,700	16,100	31,600	20,500
Pool and Spa	16,850	0.35	4,320	1,800	3,700	2,400
Central Plant/Cooling Towers	21,300	3.10	66,000	49,500	49,500	49,500
TOTAL [c]	**493,000**		**432,000**	**230,000**	**350,000**	**270,000**

[a] Used for calculation purposes only.

[b] Average Day Flow = 5/7 Weekday + 2/7 Weekend

[c] Total wastewater flows rounded to nearest 10,000 gpd.

Table 2-2: Estimated Wastewater Flows for Alternative B

	Area (ft^2)	Unit (gpd/ft^2)	Base Flow (gpd)	Typical WEEKDAY Flows [a] (gpd)	Typical WEEKEND Flows [a] (gpd)	AVERAGE Day Flows [b] (gpd)
Casino	90,255	1.02	91,820	52,800	78,100	60,000
Back of House	37,825	1.39	52,420	21,000	31,600	24,000
Retail	--	--	--	--	--	--
Food and Beverage	53,725	1.46	78,640	37,900	66,800	46,100
Entertainment/Lounge	7,000	0.54	3,780	1,500	2,400	1,800
Hotel	--	--	--	--	--	--
Pool and Spa	--	--	--	--	--	--
Central Plant/Cooling Towers	9,000	4.44	40,000	30,000	30,000	30,000
TOTAL [c]	**198,000**		**270,000**	**140,000**	**210,000**	**160,000**

[a] Used for calculation purposes only.

[b] Average Day Flow = 5/7 Weekday + 2/7 Weekend

[c] Total wastewater flows rounded to nearest 10,000 gpd.

Table 2-3: Estimated Wastewater Flows for Alternative C

	Area (ft^2)	Unit (gpd/ft^2)	Base Flow (gpd)	Typical WEEKDAY Flows [a] (gpd)	Typical WEEKEND Flows [a] (gpd)	AVERAGE Day Flows [b] (gpd)
Retail	225,000	0.12	27,700	11,100	17,300	12,900
Food and Beverage	12,000	0.63	7,500	3,600	6,400	4,400
TOTAL [c]	**237,000**		**35,000**	**15,000**	**24,000**	**17,000**

[a] Used for calculation purposes only.

[b] Average Day Flow = 5/7 Weekday + 2/7 Weekend

[c] Total wastewater flows rounded to nearest 1,000 gpd.

Table 2-4: Estimated Wastewater Flows for Alternative D

	Area (ft^2)	Unit (gpd/ft^2)	Base Flow (gpd)	Typical WEEKDAY Flows [a] (gpd)	Typical WEEKEND Flows [a] (gpd)	AVERAGE Day Flows [b] (gpd)
Casino	15,451	1.00	15,500	8,900	13,180	10,130
Back of House	6,000	1.18	7,050	2,820	4,260	3,230
Retail	--		--	--	--	--
Food and Beverage	4,550	2.87	13,050	6,280	11,090	7,660
Entertainment/Lounge	--		--	--	--	--
Hotel	--		--	--	--	--
Pool and Spa	--		--	--	--	--
Central Plant/Cooling Towers	--		--	--	--	--
TOTAL [c]	**26,000**		**36,000**	**18,000**	**29,000**	**21,000**

[a] Used for calculation purposes only.

[b] Average Day Flow = 5/7 Weekday + 2/7 Weekend

[c] Wastewater flows rounded to nearest 1,000 gpd.

It is assumed that the casino heating and air conditioning system will include cooling towers. Cooling towers extract waste heat to the atmosphere through the cooling of a water stream to a lower temperature. A cooling tower allows a small portion of the water being cooled to evaporate into a moving air stream to provide significant cooling to the rest of that water stream. Cooled water is returned from the cooling tower to be reused and some water must be added to it to replace the portion of the flow that evaporates. Some water is also lost by droplets being carried out with the exhaust air (drift).

The heat from the water stream transferred to the air stream raises the air's temperature and its relative humidity to 100%, and this air is discharged to the atmosphere. Because only pure water evaporates, the concentration of dissolved minerals and other solids in the recirculating water increases. To counteract this increasing concentration of dissolved minerals and other solids, water is periodically flushed from the system in a process called blow-down and replaced with fresh water.

The make-up amount must equal the total of the evaporation, blow-down, drift, and other water losses such as wind blowout and leakage, to maintain a steady water level. In total, the makeup water supply required to maintain a steady water level equals the water lost to evaporation, blow-down waste, and drift loss. It is assumed that drift loss equals 5% of the water supplied to the cooling tower. The drift loss is the loss that is not accounted for by evaporation and waste (or blow-down water).

Inflow and infiltration (I&I) is typical in older gravity sewer collection systems or in areas of poor surface drainage and high groundwater. I&I is calculated as a percentage of the influent flow. However, because this project will be new construction, it is assumed that no I&I will occur.

2.2 Potable Water Demand

There are many uses for domestic water in the proposed alternatives. The water supplied or purveyed from the site will have uses that include:

- Cooking
- Bath Tubs
- Cleaning
- Restrooms
- Laundry
- Pools and Hot Tubs
- Dishwashing
- Sinks
- Landscaping
- Heating Units
- Consumption
- Janitorial
- Cooling Towers
- Showers
- Air Conditioning Units

The domestic water demands are calculated from the estimated wastewater flows. It is assumed that there is a 5 percent loss in the domestic water flow, as it becomes wastewater due to consumption, evaporation, and leakage. For the cooling towers, it is assumed that the total evaporation and drift loss is twice the assumed wasting rate (or blow down) of the cooling towers. No sizing of the cooling towers or water demands have been provided; therefore, it is assumed that Alternatives A and B will operate like similarly sized casinos based on the square footage provided.

No areas were provided for cooling towers for Alternatives C and D, therefore, no flows were assumed for cooling towers for those alternatives.

Table 2-5 shows estimated water demands as a function of estimated wastewater flows. Weekday, weekend, and average day flows are provided. It is assumed that 5 percent of water used is lost to consumption and other factors, and does not become part of the wastewater flow. These numbers are preliminary and are for planning purposes only.

Fire flow requirements (or guidelines) are set by the local fire authorities, based on the building's use and classification. Storage requirements for casinos are generally controlled by fire protection requirements plus domestic requirements. The fire protection requirements are not identified in this document so an assumed storage requirement based on similar facilities was made.

Table 2-5: Estimated Water Demands if Water is Not Recycled (gpd)

	Alternative			
	A	B	C	D
Weekday Day [a]	346,000	211,000	15,000	19,000
Weekend Day [b]	464,000	280,000	25,000	30,000
Average Day [c]	380,000	231,000	18,000	22,000
Landscape Irrigation [d]	20,000	20,000	5,000	5,000
Recommended Water Supply [e]	**400,000**	**251,000**	**23,000**	**27,000**

[a] Weekday Day Demand = (Weekday Wastewater Flow/0.95 + Cooling Tower Evaporation and Drift).

[b] Weekend Day Demand = (Weekend Wastewater Flow/0.95 + Cooling Tower Evaporation and Drift).

[c] Average Day Demand = (Average Wastewater Flow/0.95 + Cooling Tower Evaporation and Drift).

[d] Estimated at average daily demand of 5,000 gpd/acre landscaping. Type and acreage of landscaping assumed.

[e] Recommended supply = average day plus landscape irrigation.

Assumes water demand for evaporation and drift losses are equal to twice the blow down waste.

Water demands rounded to the nearest 1,000 gpd.

2.3 Recycled Water

Recycled water in this report means wastewater that has been treated sufficiently to meet the California Department of Health Services' (DHS) comprehensive recycled water regulations that define treatment processes, water quality criteria, and treatment reliability requirements for public use of recycled water. These regulations are contained in Title 22, Division 4, Chapter 3 of the California Administrative Code, more commonly referred to as Title 22.

Approved by the State in December 2000, Title 22 prescribes recycled water criteria and divides them into several categories based upon the extent of public access or risk of exposure. In general, Title 22 regulations are more stringent for uses with high potential for public contact and less stringent for uses with low potential for public contact. Depending on the use, Title 22 establishes four levels of treatment required for recycled water: undisinfected secondary, undisinfected secondary–23, undisinfected secondary–2.2, and disinfected tertiary. For more information on uses for these categories, see **Appendix B.**

Disinfected Tertiary Recycled Water. If on-site treatment is selected, this level of treatment is recommended because it provides greater flexibility in reuse and disposal options. This category of recycled water includes secondary effluent that has undergone tertiary treatment and has been disinfected to a level such that the median coliform bacteria in the water does not exceed 2.2 most probable number (MPN) per 100 milliliter (mL). Title 22 defines the tertiary treatment process as wastewater that has been oxidized, coagulated, clarified, and filtered. The recycled water turbidity should not exceed 2 nephelometric turbidity units (NTU) on average, should not exceed 5 NTU more than five percent of the time during any 24-hour period, and should never exceed 10 NTU.

2.3.1 Design Criteria

To estimate the extent of the potable water applications that could be substituted with recycled water, average water usage for each facility was broken down according to the possible applications. These applications and their typical usage breakdowns are summarized in **Table 2-6.** All toilet flushing and landscaping can be dual-plumbed for use with disinfected tertiary recycled water. It is assumed that approximately 50 percent of the water demand for the cooling towers can be converted to recycled water use. The percent reduction in potable water demand use is then estimated on a basis of percent replacement by recycled water.

Table 2-6: Breakdown in Typical Domestic Water Uses at Varying Facilities

Facility	Toilet Flushing [a]	Bathing	Cooking, drinking	Laundry, dishes	Cooling Towers [a]	Landscape Irrigation [a]	Water Demand Reduction Using Recycled Water
Casino	72% [b]	-	28%	-	-	-	72%
Events center	72% [b]	-	28%	-	-	-	72%
Restaurant	27%	-	53%	20%	-	-	27%
Retail	72% [b]	-	28%	-	-	-	72%
Cooling Towers	-	-	-	-	100%	-	50%
Landscape Irrigation						100%	100%

[a] Can be converted to recycled water service.
[b] Source: Irvine Ranch Water District
RW = Recycled Water

2.3.2 Recycled Water Demands

The use of recycled water at the proposed facilities for the use of flushing toilets, urinals, and the cooling towers would reduce the potable water demand. In similarly sized facilities the recycling of disinfected tertiary reclaimed wastewater equals approximately 40 percent of the wastewater flow. For the purpose of this estimate, it is assumed that 40 percent of the wastewater flow is recycled and used for such purposes. **Table 2-7** shows the calculated recycled water demands as a factor of the estimated wastewater flows. Note that due to the fact landscape irrigation does not contribute to the wastewater flow, it has not been included as part of the recycled water demand in **Table 2-7**.

Table 2-7: Estimated Recycled Water Demands Without Landscape Irrigation (gpd) [a]

	Alternative			
	A	B	C	D
Weekday Day	94,000	57,000	6,000	7,000
Weekend Day	139,000	84,000	9,000	11,000
Average Day	107,000	65,000	7,000	8,000

[a] Recycled water demand = 0.40 * wastewater flow.
Recycled water demands rounded to the nearest 1,000 gpd.

2.4 Water Demands with Recycled Water

Water is also used for landscaping irrigation. A total of 4.0-acres of landscaping with an average water demand of 5,000-gpd/acre for a total of 20,000-gpd is assumed for Alternatives A and B. A total of 1.0-acre of landscaping with an average water demand of 5,000-gpd/acre for a total of 5,000-gpd is assumed for Alternatives C and D. **Table 2-8** shows estimated average day recycled water demands as a function of estimated wastewater flows. Landscaping water demands will be supplied by recycled water as an alternative means of wastewater effluent disposal, thereby reducing the summer and dry weather disposal required.

Table 2-8: Estimated Water Demands if Water is Recycled

	Alternative			
	A	B	C	D
Weekday				
Water Demand [a]	366,000	231,000	20,000	24,000
Recycled Water Demand (with landscape irrigation demand)	114,000	77,000	11,000	12,000
Water demand if water is recycled [b]	252,000	154,000	9,000	12,000
Weekend				
Water Demand [a]	484,000	300,000	30,000	35,000
Recycled Water Demand (with landscape irrigation demand)	159,000	104,000	14,000	16,000
Water demand if water is recycled [b]	325,000	196,000	16,000	19,000
Average Day [c]				
Water Demand [a]	400,000	251,000	23,000	27,000
Recycled Water Demand (with landscape irrigation demand)	127,000	85,000	12,000	13,000
Water demand if water is recycled [b]	273,000	166,000	11,000	14,000

[a] Includes landscape irrigation. See Table 2-5.
[b] Recommended supply = average day domestic water less recycled water.
[c] 5/7 * week day + 2/7 * weekend day
Water demands rounded to the nearest 1,000 gpd.

3.0 Regulatory Requirements

This section identifies the typical regulatory requirements applicable for the North Fork alternatives with respect to the proposed wastewater treatment and disposal methods or reuse identified in this report. Regulatory requirements differ depending on the method of treatment and disposal. Because the proposed system is on Tribal lands, the primary regulatory agency would be the United States Environmental Protection Agency (EPA).

3.1 Land Disposal

Land disposal via spray fields on land held in trust for the Tribe ("trust land") is regulated by the United States Environmental Protection Agency (EPA) and is not subject to regulation by the Regional Water Quality Control Board (RWQCB). However, the Water Code enables the RWQCB to prepare Waste Discharge Requirements (WDRs) for any discharge that may impair beneficial uses of waters of the State. Under California Water Code Section 13260, a Report of Waste Discharge (ROWD) must be submitted to the RWQCB. North Fork is located in the Central Valley Region (Region 5), and therefore, would submit a ROWD for the proposed land disposal of treated wastewater to the Central Valley Region RWQCB office, which is located in Sacramento. Land disposal would require a WDRs permit and may require concurrence from the California DHS for any recycled water (Title 22) facilities. Typical requirements include tailwater and runoff control, possible installation of monitoring wells, and consideration of antidegradation provisions.

Typical discharge prohibitions include:

- The direct, point-source discharge of pollutants or wastes to surface waters or surface water drainage courses or to waters of the U.S.;
- Bypass around, or overflow from, the treatment plant and spray disposal area of untreated or partially treated waste; and
- Resurfacing of wastewater percolating from the spray disposal field.

Typical discharge specifications include:

- Wastewater spray drift from the wastewater treatment plant (WWTP) or spray disposal field shall not migrate out of the plant's property boundaries.
- All tailwater and/or stormwater shall be collected and returned to the holding ponds at all times when wastewater is being applied to the spray disposal field.
- The discharger shall not irrigate with effluent 24 hours before precipitation, during periods of precipitation, and for 24 hours after wastewater application has ceased.
- The tailwater recapture system must be operated to capture all wastewater runoff, as well as any stormwater runoff that occurs within 24 hours of the last application of wastewater.
- The discharger shall cease spray irrigation of wastewater when winds exceed 30 mph.
- Public contact with wastewater shall be precluded through such means as fences, placards, and/or irrigation management practices (or other acceptable methods).
- Objectionable odors originating at this facility shall not be perceivable beyond the boundary of the WWTP and disposal areas.
- A controlled 100-foot buffer shall be maintained around the spray disposal field's wetted area created during wastewater application.

3.2 Subsurface Disposal

Subsurface disposal is regulated under the Federal Underground Injection Control (UIC) Program, which works to prevent contamination of drinking water resources from underground injection of waste. The UIC Program is administered by the EPA, not only because the project is on trust land, but because California is a Direct Implementation State (40 CFR Part 144.83). The UIC program is a crucial component of the source water assessment and protection program (Section 3.6), because it identifies, permits, and regulates the design, siting, operation, and maintenance of subsurface disposal systems that are designed to dispose of waste underground. Subsurface disposal is classified as a Class V injection well under the UIC Program. All Class V injection well owners in California and on tribal land are required to submit inventory information to EPA Region 9. According to 40 CFR Part 144.82, a Class V well cannot allow the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of that contaminant may cause a violation of the primary drinking water standards under 40 CFR part 141, other health based standards, or may otherwise adversely affect the health of persons.

Historically, the EPA considers groundwater quality degradation criteria based upon the State's local regional water quality control plan, referred to as Basin Plan. The preparation and adoption of Basin Plans is required by the California Water Code (Section 13240) and supported by the Federal Clean Water Act. Section 303 of the Clean Water Act requires states to adopt water quality standards that consider "the designated uses of the navigable water involved and the water quality criteria for such waters based upon such uses." Since beneficial uses, together with their corresponding water quality objectives, can be defined per Federal regulations as water quality standards, the Basin Plans are regulatory references for meeting the State and Federal requirements for water quality control (40 CFR 131.20). One significant difference between the State and Federal programs is that California's basin plans establish standards for groundwaters in addition to surface waters.

Although California does not have delegation for the UIC program (like the NPDES program), the Water Code enables the RWQCB to prepare WDRs for any discharge that may impair beneficial uses of waters of the State. Under California Water Code Section 13260, a ROWD must be submitted to the RWQCB for proposed subsurface disposal of treated wastewater. The RWQCB then determines if a permit to discharge containing WDRs will be issued. Because this project is on Indian land, the ROWD is submitted to the EPA instead of the RWQCB. Among other things, the ROWD would typically provide a subsurface hydrologic characterization to assess the potential for constituents in the discharge to impact groundwater quality.

Typical discharge prohibitions include:

- Discharge of wastes to surface waters or surface water drainage courses,
- Discharge of wastes to areas other than the designated treatment and disposal areas, and
- Bypass or overflow of untreated or partially treated waste.

Typical discharge specifications include:

- Objectionable odors originating from the WWTP shall not be perceivable beyond the boundary of the WWTP and disposal areas.
- Wastewater discharged to leachlines shall remain underground at all times.
- The distance between any unlined pond or leaching trench bottoms and the anticipated highest groundwater shall be greater than 36 inches, or such distance as necessary to provide compliance with local groundwater limitations.

- Operation of the WWTP shall be performed by wastewater treatment operators licensed by the State of California.
- Public contact with the wastewater shall be precluded through such means as fences and signs or acceptable alternatives.

3.3 Surface Water Disposal

Discharge to surface water would be subject to approval by the EPA in the form of a National Pollutant Discharge Elimination System (NPDES) permit. Additionally, the NPDES permit would likely be subject to the requirements of the California Toxics Rule (CTR) and the National Toxics Rule (NTR). California has promulgated the CTR to bring the State in compliance with the Clean Water Act for priority toxic pollutants. The EPA has indicated that any new Federally issued NPDES permits for tribal wastewater facilities will require compliance with the NTR. The discharge to surface water would also have to be in accordance with the State Implementation Plan (SIP) and the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (generally referred to as the Basin Plan).

The permit process would involve performing an analysis to assess the downstream environmental impacts. The permit would likely contain mass-based discharge limitations. In addition to pollutant limitations, toxicity standards may also be established and monitored by bioassay. Since there would be no industrial discharges to the casino wastewater system, levels of metals and other toxic components are expected to be minimal; however, it can still be assumed that any new surface water discharge in the area would have to be treated to very high standards, such as tertiary levels, and disinfected before discharging to local surface waters.

3.4 Recycled Water

One option is for the WWTP to produce recycled water for on-site reuse, which will add to the water quality requirements of the effluent from the WWTP. Recycled water use on tribal land is regulated by the EPA. The EPA has typically mirrored their recycled water standards to California's Title 22 standards for similar projects in California. For the range of uses considered for this project, the WWTP could produce disinfected tertiary recycled water (DTRW) in accordance with full Title 22 requirements. DTRW meets the following water quality requirements, which are specific to a membrane bioreactor (MBR) treatment process expected for this project's wastewater treatment facility:

- Has been passed through a microfiltration, ultrafiltration (UF), nanofiltration (NF), or reverse osmosis (RO) membrane so that the turbidity of the filtered wastewater does not exceed any of the following:
  - 0.2 NTU more than 95 percent of the time within a 24-hour period; and
  - 0.5 NTU at any time.
- The filtered wastewater has been disinfected by either:
  - A chlorine disinfection process following filtration that provides a contact time ([CT] the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or
  - A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.

> The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 mL utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 mL in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 mL.

In addition to the aforementioned recycled water quality requirements, there are a number of operational, uses, and reporting restrictions identified in Title 22. However, it is not expected that any of these requirements will limit the viability of recycled water reuse on-site, and these requirements are typical for any recycled water use application. All uses of recycled water would have to be approved by EPA. As long as DTRW is produced, there would appear to be no issues associated with this intended use.

3.5 Public Water System

Options that involve the development of a drinking water system using on-site wells would be classified as a public water system under the Safe Drinking Water Act (SDWA). A public water system is defined as any entity serving water for the purposes of human consumption to 15 or more active service connections or 25 or more people at least 60 days out of the year. More specifically, the drinking water system for the casino would be classified as a Non-Transient/Non-Community (NTNC) public water system under the SDWA because it is not a community water system and it will regularly serve at least the same 25 persons over 6 months per year.

Discussions have been initiated with the EPA regarding the proposed NTNC public water system for the casino. During the design phase, the EPA will require schematics of the system showing the well location, storage, any treatment (including disinfection), well construction details and drilling logs, anticipated visitor and employee population numbers, flow rate, and storage capacities. Planning for the sample points and dedicated sampling stations will be coordinated with the EPA. Typically the EPA will visit the site at least once and perform a walk-through of the entire facility.

Baseline monitoring will be submitted to the EPA before the well goes online and the public uses the water. Similar facilities have requirements for monthly coliform testing, quarterly lead and copper testing and other testing that must be conducted annually. Monitoring requirements for the proposed casino will likely be similar, but will be determined by the EPA based on the size of the facility, the anticipated population, and other factors specific to the project. The EPA will assign a Public Water System Identification Number to the drinking water system. A monitoring plan would be submitted to the EPA.

3.6 Source Water Protection Program

Source water is untreated water from streams, rivers, lakes, or underground aquifers, which is used to supply private wells and public drinking water. The EPA's Office of Ground Water and Drinking Water administers the Source Water Protection Program to prevent contamination of drinking water supplies. The Source Water Protection Program, authorized by the 1996 amendments to the SDWA, outlines a comprehensive plan to achieve maximum public health protection. According to the plan, it is essential that every community take these six steps:

1. Delineate their drinking water source protection area
2. Inventory known and potential sources of contamination within these areas
3. Determine the susceptibility of their water supply system to these contaminants

4. Notify and involve the public about threats identified in the contaminant source inventory and what they mean to their public water system
5. Implement management measures to prevent, reduce, or eliminate threat,
6. Develop contingency planning strategies to deal with water supply contamination or service interruption emergencies

The UIC program (Section 3.2) is a crucial component of the source water assessment and protection program, because it identifies, permits, and regulates the design, siting, operation, and maintenance of injection wells that are designed to dispose of waste underground.

4.0 Water Supply Assessment

This section describes components necessary to provide water supply service to the various project alternatives. It discusses on-site groundwater and off-site City sources of supply and water quality for the proposed project site in the vicinity of the City of Madera, as well as, the proposed project site in the vicinity of the City of North Fork. The final aspect is a preliminary evaluation of the water system requirements to deliver water to each of the project alternatives.

4.1 Water Supply Requirements

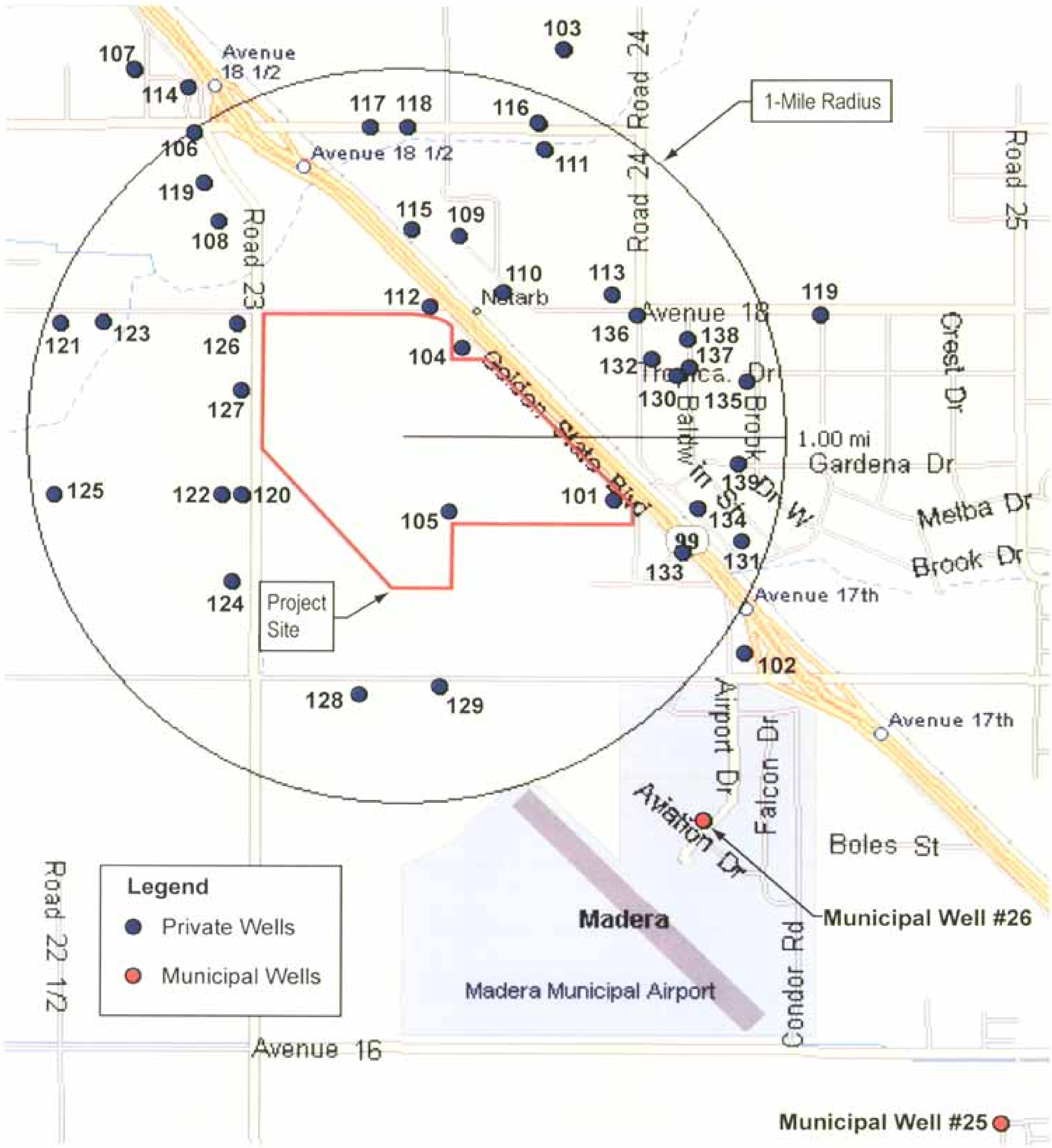
This section identifies preliminary water supply, water treatment, water storage, and pumping requirements to supply the project alternatives with potable water. The facilities identified in this section are based on HSe's experience with similar projects. One option is to maximize the reuse of recycled water in order to minimize the water supply requirements. The following water supply strategies were assessed for the four alternatives:

- On-site groundwater
- Off-site water supply from the City of Madera
- Off-site water supply from the City of North Fork

4.1.1 On-site Groundwater for Alternatives A, B, and C

Options that involve the development of a drinking water system using on-site wells would be classified as a public water system under the SDWA (Section 3.5). Siting and installing on-site wells will be done under the guidelines of the UIC program (Section 3.2), which is a crucial component of the Source Water Protection Program (Section 3.6). Wells within a one-mile radius of the proposed project alternatives near the City of Madera are shown in **Figure 4-1**, along with the nearest City of Madera municipal wells. There is one active agricultural well on the property, Well No. 105. It is not known which of the private wells surrounding the property are currently in operation. A summary of well data is included in **Table 4-1**.

Municipal Well No. 26 is located about a mile south of the Project site at the intersection of Airport Drive and Aviation Drive. This well is approximately 600 feet deep and has a capacity of approximately 1,300 gallons per minute (gpm). Municipal Well No. 25 is located about 1.5 miles southeast of the Project site. This well is approximately 500 feet deep and has a capacity of approximately 2,200 gpm. The groundwater level has been dropping in the region so a new on-site well with adequate capacity for the hotel, casino, or retail alternatives would probably need to be at least 600 feet deep. Groundwater quality is generally good but manganese levels tend to increase with depth north of the City and may require treatment.



Well Source: Department of Water Resources

HydroScience Engineers, Inc.

Figure 4-1
North Fork
Water and Wastewater Feasibility Study
Groundwater Wells in the Vicinity of the Madera Site

Table 4-1: Existing Groundwater Wells at the Madera Site

Well Number	Screen Depth* From (ft)	Screen Depth* To (ft)	Diameter (inches)	Total Depth (ft)	Depth to Groundwater (ft)	Discharge Rate (gpm)	Year of Well Installation
101	240	252	8	272	112	-	1982
102	205	145	6	205	110	50	1979
103	182	220	3	345	96	-	1965
104	197	273	8	280	97	250	1979
105	199	291	12	295	95	-	1973
106	-	-	-	308	112	-	1982
107	240	340	16	600	-	-	1993
108	172	188	8	202	90	-	1973
109	295	420	14	450	108	-	1980
110	-	-	-	400	143	300	1990
111	210	408	14	416	110	-	1981
112	-	-	-	120	-	-	1977
113	372	384	12	415	134	300	1985
114	200	300	12	356	104	-	1978
115	216	224	10	228	88	-	1975
116	180	220	6	220	-	40	-
117	240	280	5	280	130	180	1988
118	273	333	11	-	168	-	1995
119	-	-	-	-	165	-	1998
120	228	236	10	290	90	-	1966
121	232	240	10	285	92	-	1966
122	220	570	10	591	97	-	1978
123	214	524	14	549	98	-	1978
124	265	696	16	700	-	-	1998
125	273	292	14	500	90	-	1971
126	264	708	16	716	155	-	1998
127	200	400	6	400	-	-	2001
128	90	152	-	225	66	1390	1956
129	270	300	16	510	-	-	1995
130	180	220	6	247	125	80	1987
131	280	360	6 5/8	360	245	70	1992
132	268 [a]	-	8	292	141	150	1988
133	220	260	5	260	-	80	1988
134	160	180	6 5/8	275	90	-	1991
135	275	335	11	335	155	-	1993
136	268	328	11	333	165	-	1997
137	291	351	11	356	168	-	1997
138	300	360	6 5/8	360	168	100	2001
139	240	300	6	300	172	50	2001

*Some wells had multiple screens; screen nearest ground surface listed here.

Source: Department of Water Resources

[a] Open bottom, no screen.

4.1.2 Off-site Water from the City of Madera

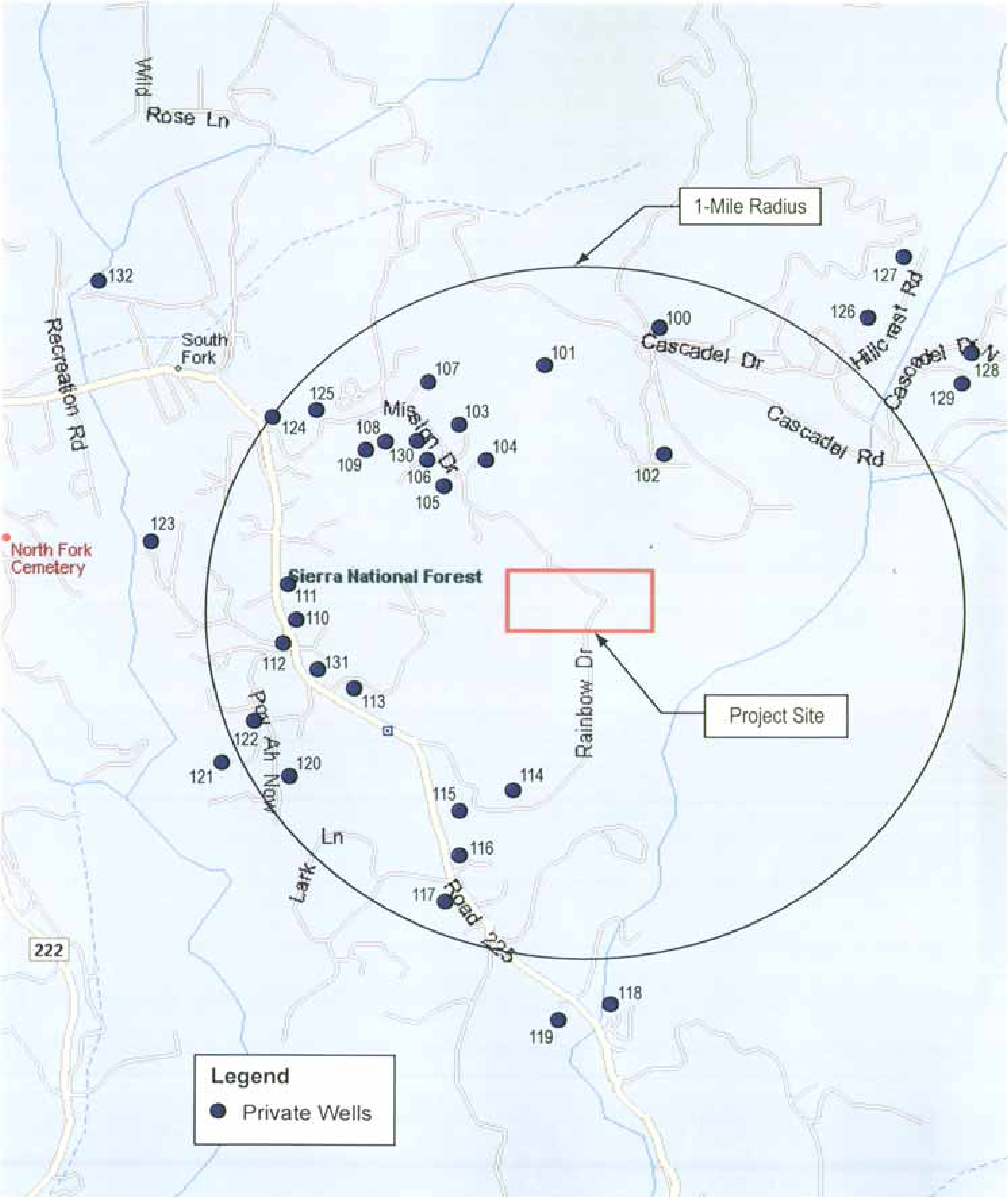
The City's nearest water well is Well No. 26 at Airport Drive, as shown in **Figure 4-1.** The well is approximately 600 feet deep and has a capacity of approximately 1,300 gpm. The City uses this well for standby and fire flow demands. The airport's water is supplied by Municipal Well No. 25, approximately a half-mile southeast of the airport. If the casino were to hook up to the City's water system, it is expected, based on discussions with City staff, that the City would require a looped system to the well as shown in **Figure 4-2.** The City would require the Tribe to fund the drilling and development of an on-site well that would be added to the casino loop to provide primary water supply. The City's existing Well No. 26 would be used solely for redundancy and fire flow capacity (it's current use in the City's water system). If fire flow capacity is not met, then either a second well or an on-site water storage tank will be required.

4.1.3 On-site Groundwater for Alternative D

Options that involve the development of a drinking water system using on-site wells would be classified as a public water system under the SDWA (Section 3.5). Siting and installing on-site wells will be done under the guidelines of the UIC program (Section 3.2), which is a crucial component of the Source Water Protection Program (Section 3.6). Wells located within a one-mile radius of the proposed project alternative near the City of North Fork are shown in **Figure 4-3**. A number of well logs did not provide adequate information to locate the wells on a map. However, they are within the one-mile radius based on the section number listed on the logs. A summary of well data is included in **Table 4-2**. The table indicates which wells are not included in the figure.

The County of Madera assessed the groundwater conditions in eastern Madera County (County of Madera, 2002). The following information is based on that study. Overall water balance and current water demands in the foothill region suggest that a sufficient quantity of water is available on a regional basis to meet current demands and support some future development. Planning for future development needs to examine the hydrologic conditions on a localized watershed and subwatershed basis in order to ensure an adequate water supply for local and downstream uses. The County's study included a detailed review of 1,492 well log records in the foothill region. The median well yield is 8.5 gpm and average well yield is 22 gpm. These well yields are based on drillers' airlift tests, so actual production may be lower. In terms of future development, caution should be used in assigning well yields to determine the amount of water available from a given well. In particular, bedrock well yields in excess of 10 to 20 gpm (and especially greater than 50 gpm) should be evaluated in more detail by means of 72-hour pumping tests with a consistent and constant pumping rate.

Figure 4-2
North Fork
Water and Wastewater Feasibility Study
Public Water Facilities Option for Alternatives A, B, and C



Well Source: Department of Water Resources

Figure 4-3
North Fork
Water and Wastewater Feasibility Study
Groundwater Wells in the Vicinity of the North Fork Site

HydroScience Engineers, Inc.

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Table 4-2: Existing Groundwater Wells at the North Fork Site

Well Number	Screen Depth From (ft)	Screen Depth To (ft)	Diameter (inches)	Total Depth (ft)	Depth to Groundwater (ft)	Discharge Rate (gpm)	Year of Well Installation
100	-	-	6 1/4	700	355	4	1993
101	-	-	6	100	38	25	1979
102	-	-	-	1075	440	5	1991
103	-	-	6 1/8	450	365	100	1995
104	-	-	6 5/8	275	220	15	1995
105	-	-	6	525	100	25	1995
106	-	-	6 1/8	375	300	15	1995
107	-	-	6	525	495	18	1996
108	-	-	6 1/2	275	85	5	1985
109	-	-	6 1/2	300	145	3	1985
110	-	-	6 5/8	120	-	30	1976
111	-	-	6 1/4	300	90	9	2002
112	-	-	6	460	107	2.5	1994
113	-	-	6 5/8	300	46	2	1972
114	-	-	6	450	-	1	1980
115	-	-	6 1/2	280	185	20	1987
116	-	-	6 5/8	675	-	15	1976
117	-	-	7	150	39	20	1980
118	-	-	6 1/2	475	120	6	1991
119	-	-	6 1/4	500	390	12	1994
120	-	-	-	350	-	1.5	1978
121	-	-	6 1/4	100	64	15	1994
122	-	-	6 1/4	150	90	30	2002
123	-	-	6 5/8	280	-	4	1976
124	-	-	6 5/8	550	81	25	1991
125	-	-	6 1/4	660	-	5	1991
126	-	-	-	600	-	40	1991
127	-	-	6 1/4	1000	-	4	1991
128	-	-	-	800	575	3	2002[a]
129	-	-	6 5/8	105	8	100	1988
130	-	-	6	400	65	10	1995
131	-	-	7	325	111	2	1981
132	-	-	8 5/8	891	66	171	1987
200[b]	-	-	6	155	-	-	1980
201[b]	-	-	6	355	65	3.5	1981
202[b]	-	-	6	300	31	1.5	1983
203[b]	-	-	-	74	33	5	1959
204[b]	-	-	7	220	21	1.5	1971
205[b]	-	-	7	170	27	6	1973[c]
206[b]	-	-	7	230	160	2	1973[c]
207[b]	-	-	7	200	18	1.5	1973[c]
208[b]	-	-	6 5/8	60	-	30	1972
209[b]	-	-	6	300	172	4	1983[d]

Source: Department of Water Resources

[a] Well was deepened.

[b] Not included on figure because location information on well log was incomplete.

[c] Well log indicated well was located within South Fork Indian Reservation.

[d] Well log indicated well was located within Indian Mission off Coscodel Road.

Note: Well locations shown in Figure 4-3 are approximate.

Groundwater quality is generally good in eastern Madera County. Concentrations of total dissolved solids (TDS) are in the 100 to 300 ppm range, but several wells in the Hillview Water Company sytems had TDS concentrations that exceeded 10,000 ppm. Although these levels do not present a health concern, a more mineralized taste may result. Some water quality problems do occur in the county systems, including elevated concentrations of total coliform bacteria, gross alpha/uranium, arsenic, iron, and manganese. Elevated iron and manganese concentrations may be due to elevated turbidity in the sample and may not reflect actual groundwater concentrations. Although naturally occurring and typically related to the granitic rocks of the Sierra Nevada, elevated concentrations of gross alpha uranium and arsenic have rendered some sources of supply nonpotable. Elevated concentrations of iron and manganese seem to correlate to elevated turbidity in the sample and may indicate iron and manganese that are in soil/rock particles in the sample and not actually dissolved in the water (County of Madera, 2002). Based on the groundwater quality of wells in the eastern area of Madera County, an on-site groundwater well may produce water requiring treatment.

4.1.4 Off-site Water from the City of North Fork

The Madera County Maintenance District 8A serves water to the town of North Fork and the U.S. Forest Service complex. The district has 49 residential connections, 9 commercial connections having 27.56 equivalent dwelling units (EDUs), and 22 standby connections. The water system has one well, designated the Library well, pumping 240 gpm into a 200,000-gallon storage tank. The well was drilled in 1994 to a depth of 520 feet. An additional existing well, known as the North Fork Center Well, is currently inactive but available for future use. Water shortages have not been an issue for this district (County of Madera, 2002). If the casino were to hook up to the City's water system (as shown in **Figure 4-4**), it is likely that the City will require an investigation to the North Fork Center Well's capacity and treatment requirements. The connection to the water line would be at the intersection of Minarets Road (Road 225) and Road 274. Additionally, if fire flow capacity is not met with the City's existing 200,000-gallon storage tank, then an on-site water storage tank will be required.

4.2 Potable Water Demand

As discussed in Section 2, two potable water demands were developed for each alternative: one as a total water demand and one with recycled water to supplement potable water consumption. **Table 4-3** presents a comparison of the average daily water demand with and without the use of recycled water for each alternative. The water demand presented is a weighted average between the weekday and weekend flows, and includes landscaping water demand.

Table 4-3: Comparison of Average Day Water Demand with and without Recycled Water

	Alternative			
	A	B	C	D
Water demand [a]	400,000	251,000	23,000	27,000
Water demand if water is recycled [b]	273,000	166,000	11,000	14,000

[a] Includes landscape irrigation. See Table 2-5.

[b] Recycled water includes landscape irrigation, toilet flushing, and process water. See Table 2-8.

Water demands rounded to the nearest 1,000 gpd.

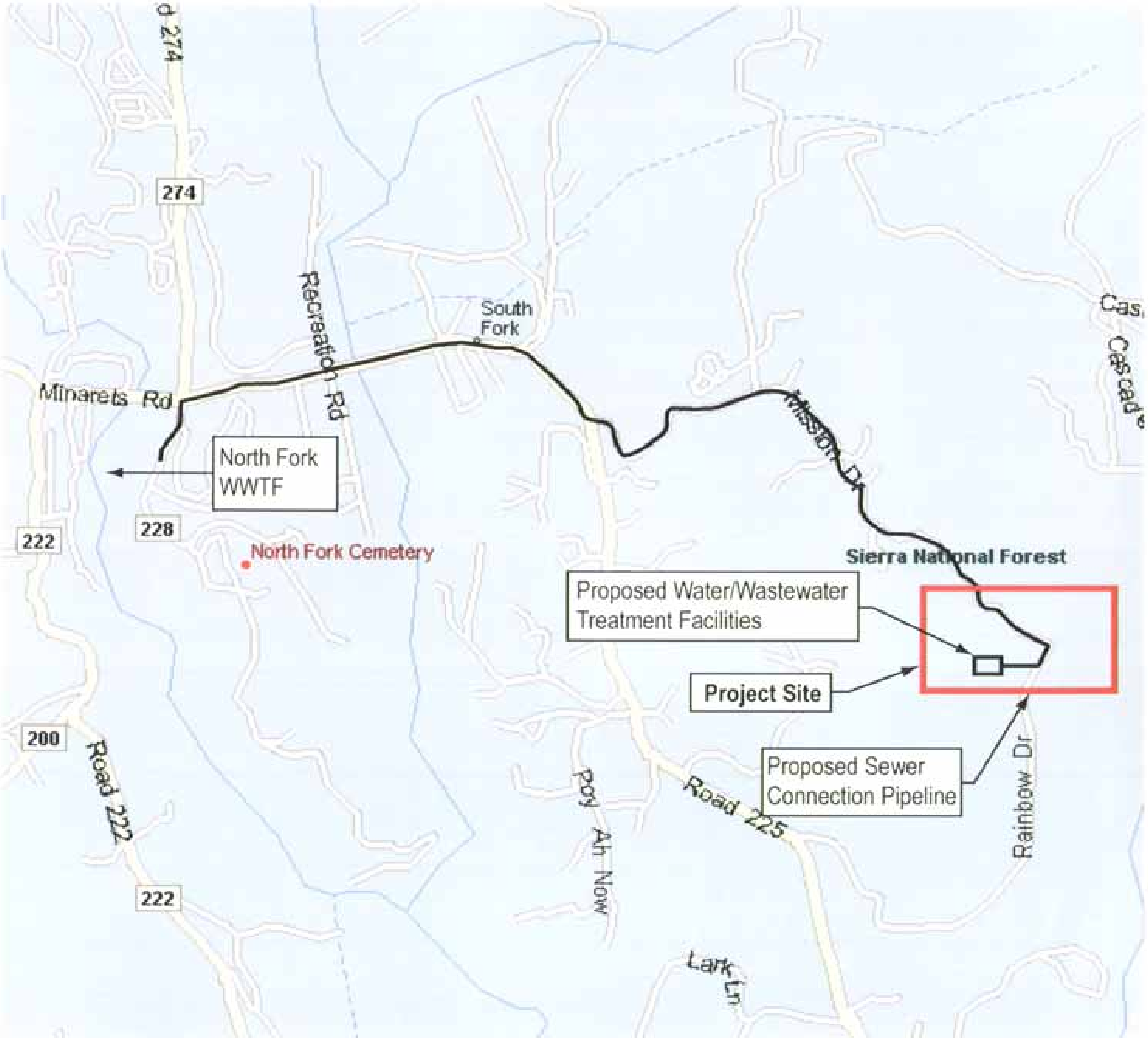


Figure 4-4
North Fork
Water and Wastewater Feasibility Study
Public Water/Wastewater Facilities Option for Alternative D

HydroScience Engineers, Inc.

4.3 Water Treatment Plant

There are two viable water sources to fulfill potable water demands for the proposed facilities for Alternatives A, B, and C: (1) on-site groundwater; and (2) potable water from the City of Madera. Treatment may be necessary for on-site groundwater, therefore an on-site water treatment plant would need to be constructed. Manganese could be an issue based on other wells the City of Madera has recently drilled in the area, particularly at depths of greater than 600 feet. Groundwater sampling and analyses should be performed to determine if treatment is necessary. Potable water from the City of Madera would require no treatment. A Source Water Assessment of the City of Madera's potable water is included in **Appendix C.**

There are two viable water sources to fulfill potable water demands for the proposed facilities for Alternative D: (1) on-site groundwater; and (2) potable water from the City of North Fork. Treatment may be necessary for on-site groundwater; therefore an on-site water treatment plant would need to be constructed. Manganese could be an issue based on the water quality from the well supplying the City of North Fork. Groundwater sampling and analyses should be performed to determine if treatment is necessary.

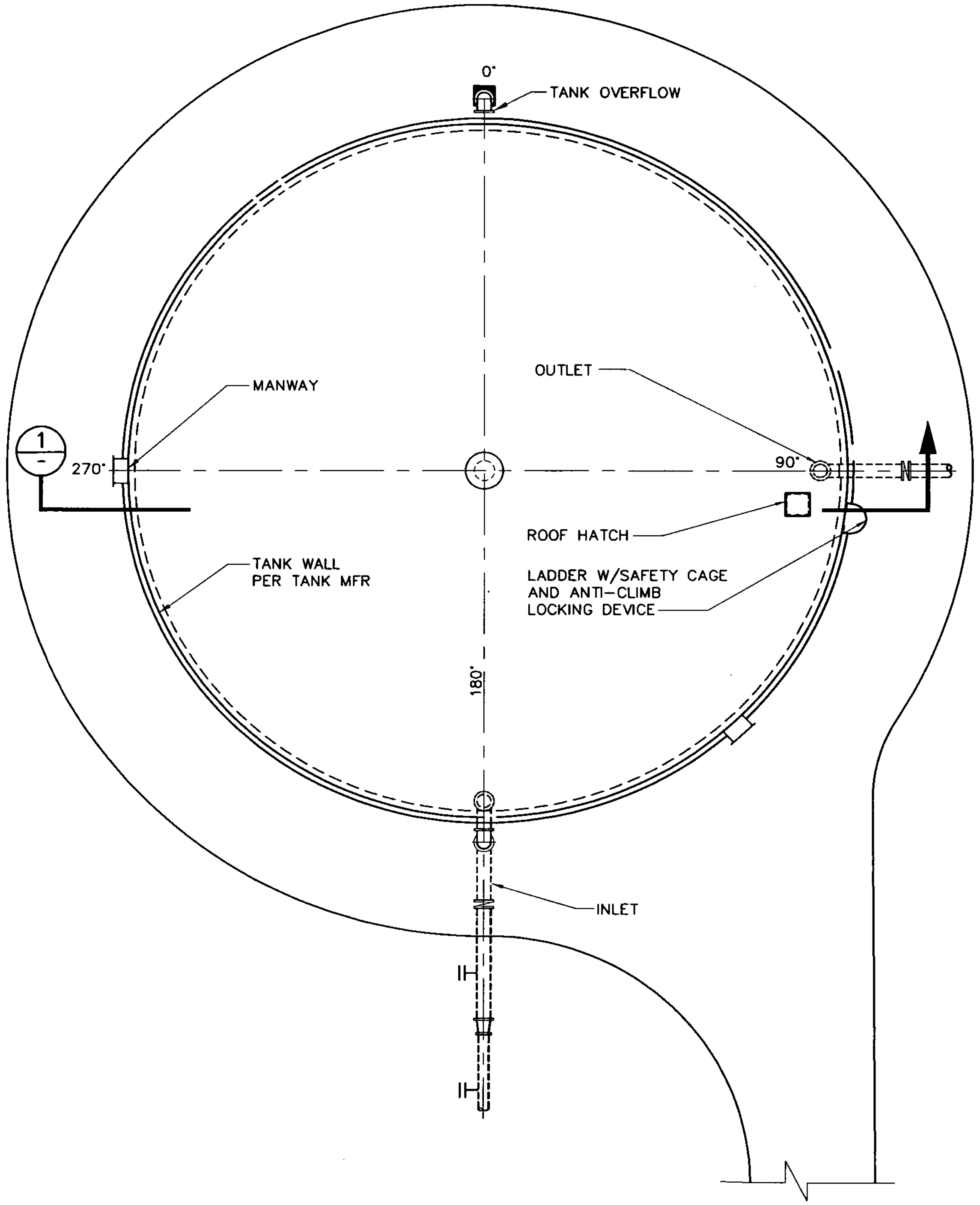
4.4 Water Storage Tank and Pump Station

A water storage tank would be constructed for each project alternative to store water produced by any on-site wells. The actual required capacity of the tank is dependent on the project site's fire flow requirements; however, the anticipated capacity of the tank for each of the project alternatives is summarized in **Table 4-4**. The tank would be of welded steel construction, meeting all American Water Works Association (AWWA) specifications for welded steel tanks. A typical section of a tank is shown in **Figure 4-5**. It should be noted that the recommended capacity of the domestic water storage tank is affected by the use of recycled water to satisfy fire suppression and could reduce the domestic water storage tank requirements.

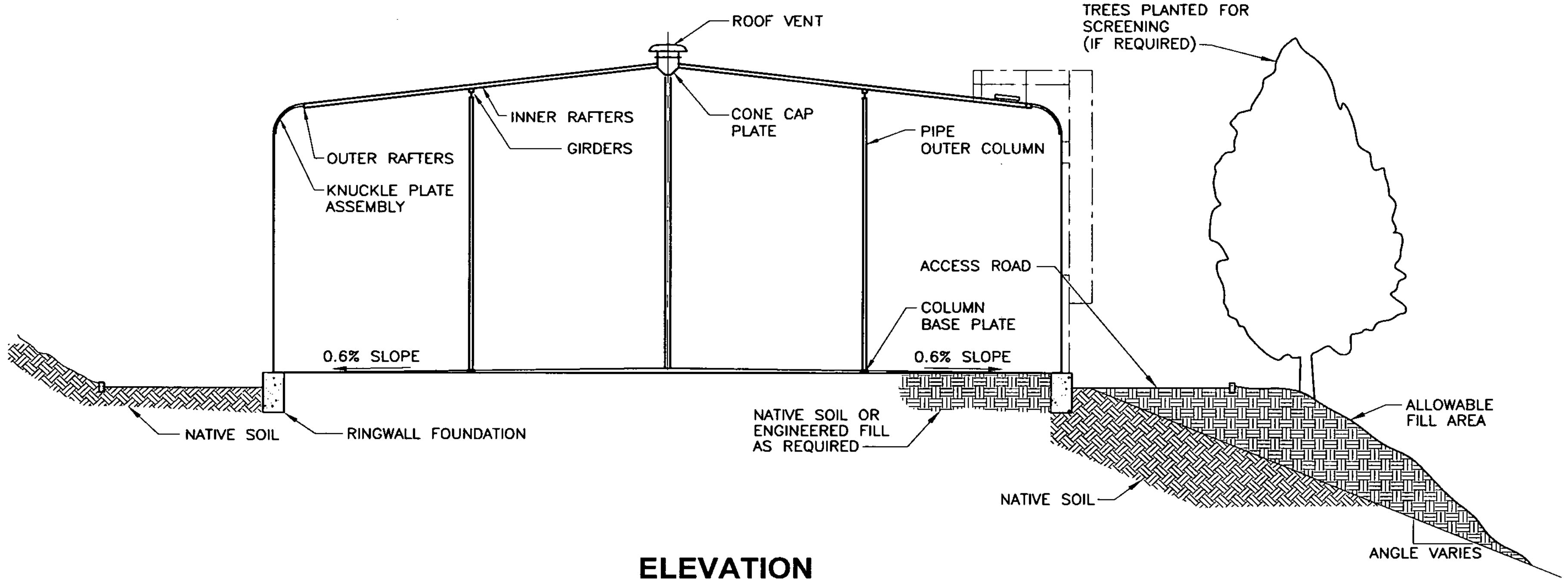
Table 4-4: Domestic Water Storage Requirements if Water is Recycled

	Alternative			
	A	B	C	D
Domestic water storage [a]	650,000	392,000	32,000	38,000
Fire suppression [b]	500,000	500,000	500,000	500,000
Domestic water storage tank capacity [c]	1,150,000	892,000	532,000	538,000
Recommended approximate domestic water storage tank capacity [d]	1,200,000	1,000,000	600,000	600,000

[a] 2.0 times the weekend day water demand if water is recycled. See Table 2-8.
[b] Assumed storage required.
[c] Domestic water storage plus fire suppression.
[d] Rounded up to the nearest common tank size increment.
Water demands rounded up to the nearest 1,000 gal.



PLAN
NTS



ELEVATION
NTS

HydroScience Engineers, Inc.

Figure 4-5
North Fork
Water and Wastewater Feasiblity Study
Typical Welded Steel Water Storage Tank

The tank would be cylindrical. A shorter tank would be easier to hide and camouflage from the site's guests. The tank sizing would be based on standard pre-engineered tank dimensions, which are typically in 8-foot increments. It is also possible that the tank would be partially or completely buried, but for the purposes of this analysis, it is assumed that the tank would be located at grade. The Madera project site is relatively flat; therefore, it is recommended that a pump station be utilized to maintain pressure in the distribution system. The North Fork project site topography varies and a pump station may be required, if the storage tank cannot be placed in a location such that the distribution system is pressurized. This potable water pump station is required to convey water from the storage tank to the facilities and the ultimate pumping capacity will be dependent on fire flow requirements. These requirements would be satisfied by two fixed-speed high-service pumps that are half the capacity of the projected flow requirement. **Table 4-5** shows the design criteria for the water storage tank and pump station.

Table 4-5: Recommended Water Storage Tank and Pump Station Design Criteria

Parameter	Value	Unit
Water Storage Tank		
Approximate Size	1.2, 1.0, or 0.6	MG
Construction	Welded steel	NA
Potable Water Pump Station		
Low service pump quantity	2	pumps
Low service pump type	Variable speed centrifugal	NA
High service pump quantity	2	pumps
High service pump type	Constant speed	NA
Hydropneumatic tank approximate size	To be determined	gallons

The overall water facilities will be located based on the final design of the selected alternative. Note that the recycled water facilities are shown and described separately in Section 5. All of the recommended water supply facilities described in this section are preliminary, and should be utilized for planning purposes only.

5.0 Wastewater Assessment

This study evaluates the feasibility of various options for treated wastewater disposal, including on-site and off-site alternatives. The on-site alternatives were spray field disposal, leach field disposal, surface water discharge, and water reuse. Two off-site disposal alternatives were evaluated: connecting to the City of Madera WWTP and connecting to the City of North Fork WWTP. Section 5.1 summarizes the results of that evaluation and discusses the disposal options.

The remainder of Section 5 identifies the components necessary for on-site wastewater treatment of the projected wastewater flows for the various North Fork Hotel and Casino project alternatives. Any on-site wastewater facilities are to comply with all applicable permitting requirements. Maximizing on-site water reuse is evaluated. Also, the wastewater and recycled water facilities are to be designed in a manner that does not limit existing uses or future expansion.

The overall wastewater facilities would be located based on the final design of the project facilities for the selected alternative. All of the recommended treatment facilities described in this section are preliminary, and should be utilized for planning purposes only.

5.1 Wastewater Disposal Alternatives

Tertiary treatment utilizing an MBR was assessed because it provides the greatest flexibility for reuse and disposal. Tertiary treatment is typically defined as a process that has undergone primary treatment consisting of a gravity settling process, secondary treatment consisting of a biological process, and a tertiary process consisting of both filtration and disinfection.

A seasonal storage basin would be necessary for most of the disposal options or combinations of options. The regulatory requirements for the operation of seasonal storage basins are typically minor, and the primary consideration is the disposition of the effluent contained therein.

5.1.1 Spray Field Disposal

If spray fields are to be used for disposal of the treated effluent, water would be applied to the spray fields at agronomic rates throughout the year, which take into account plant uptake and nutrient use. During rain events, however, spray fields cannot be used. Spray fields will be designed so that all wastewater runoff is captured and not allowed to run off the site or enter waters of the U.S. This is a typical regulatory requirement for spray field disposal. Other anticipated regulatory requirements for this type of disposal are described in Section 3.1, Land Disposal. If no alternate discharges are utilized, a large seasonal storage basin will be necessary. Adding a seasonal discharge to a nearby surface water body, such as Dry Creek, which passes through the Madera site, or the unnamed tributary of Willow Creek, which passes through the North Fork site, would reduce the size of the seasonal storage basin required. The water balances for each project alternative for on-site disposal options is presented in more detail in Section 5.1.3.

The City of Madera's golf course is south of Avenue 17, between Road 23 and the municipal airport (**Figure 4-2**). Another spray field disposal alternative to on-site spray fields would be to irrigate the golf course. This would benefit the City because currently groundwater is being used for all of the golf course's irrigation demand, which is estimated to be 977,000 gpd in the summer. During the winter, irrigation with recycled water would have the same restrictions at the golf course as described above for the on-site spray fields. The casino's treated wastewater effluent could provide approximately 25% of the irrigation demand for the golf course.

5.1.2 Leach Field Disposal

As previously mentioned in Section 3.2, subsurface disposal is regulated under the Federal UIC program. The UIC Program, which is a crucial component of the Source Water Protection Program (Section 3.6) is administered by the EPA.

Conventional and nonconventional leach fields are discussed in this section. In order to produce a disposal system design appropriate for the proposed project sites, soil testing is recommended for the selected project location. Soil testing would include mantle and percolation tests to define any confining soil layers, shallow groundwater table, soil types and soil structures, directions of water transport, and percolation rates. A general discussion of the area's geology and soils is presented below.

5.1.2.1 Geology for Madera Site for Alternatives A, B, and C

The United States Department of Agriculture (USDA) Soil Survey of the Madera Area was published in 1962 (USDA, 1962). Soils in the area are described in detail below based on that report; however, this may not be an entirely accurate representation of the site in spite of the level of detail in the soil descriptions. As mentioned previously, percolation and mantle testing should be performed at the selected project site.

Based on the maps in the USDA Soil Survey, approximately 85 percent of the surface and near-surface soils at the Madera site are San Joaquin sandy loams (SaA). The San Joaquin series consists of shallow, iron-silica hardpan soils developed in old alluvium derived mostly from granitic rocks. Internal drainage is restricted by the impervious hardpan. The San Joaquin sandy loams have the following representative profile:

- 0 to 5 inches, yellowish-red and very hard (reddish-brown and very friable when moist) sandy loam; medium acid; very weak, very fine, granular structure when moist, and essentially massive when dry; low in organic matter.
- 5 to 11 inches, yellowish-red and hard loam (reddish-brown and friable when moist); slightly acid; moderate, fine, subangular blocky structure.
- 11 to 19 inches, reddish-yellow and extremely hard (yellowish-red and firm when moist) sandy clay with colloidal coatings; slightly acid; medium, fine, blocky structure.
- 19 to 23 inches, reddish-yellow (red to yellowish-red when moist) hardpan, iron-silica cemented; smooth, very dense, and indurated in upper part; less strongly cemented in lower part; some dark-colored manganese stains; some segregated lime in lower part.
- 23 to 60 inches, light yellowish-brown and hard (dark yellowish-brown and firm when moist) gritty sandy loam; massive; softly consolidated; neutral to mildly alkaline; few yellowish-red mottles and stains, which are most prominent when soil is moist; less hard and less consolidated with increasing depth.

Approximately 10 percent of the surface soils are Atwater loamy sand (AwA), moderately deep and deep over hardpan. The soils of the Atwater series are well drained and very deep. They were derived from somewhat older, wind-reworked, granitic alluvium and typically occur on the leeward side of present or abandoned stream courses, principally on low terraces. In places, a hardpan substratum of an older, unrelated soil underlies the profile. The remaining surface soils are Hanford sandy loam (HgA), moderately deep and deep over hardpan, and Tujunga loamy sand (TwA). The soils of the Hanford series consist of moderately coarse textured recent alluvium derived chiefly from granitic rocks high in micaceous minerals. The alluvial deposits were stratified and channeled during deposition. The profile is nearly uniform throughout and shows little modification other than a slightly darker color and higher organic-matter content in the surface soil. The Tujunga loamy sand usually occurs as narrow streaks as is the case at this site. The Tujunga series consists of pale-brown, noncalcareous, coarse-textured, somewhat excessively drained soils derived from granitic sediments deposited on recent alluvial fans and flood plains. Except for having a coarser texture, a lower organic-matter content, and lower moisture-holding capacity, these soils are similar to the Hanford soils, which formed from material derived from similar sources but of finer texture. It consists of approximately five feet of pale-brown and loose loamy sand that is very low in organic matter, with coarse sand and gravel at a depth of two feet and deeper (USDA, 1962).

5.1.2.2 Geology for North Fork Site for Alternative D

The proposed project site for Alternative D lies just outside of the USDA Soil Survey of the Madera Area, which was published in 1962. The National Forest Service in cooperation with the USDA and the Regents of the University of California (Agricultural Experiment Station) conducted a soil survey of the Sierra National Forest Area (National Forest Service, 1962). The soils are described below based on the soils in the vicinity of the project site utilizing the National Forest Service report; however, this may not be an entirely accurate representation of the site in spite of the level of detail in the soil descriptions. As mentioned previously, percolation and mantle testing should be performed at the selected project site.

Based on the maps in the USDA Soil Survey, the surface and near-surface soils in the vicinity of the Alternative D project site are Holland sandy loams, 15 to 30 percent slopes (HoD). The Holland series consists of shallow residuum weathered from coarse-grained granitic rocks. They resemble the Auberry soils, which occur at lower elevations and are brownish throughout. Internal drainage is restricted by the impervious hardpan. The Holland sandy loams have the following representative profile:

- 0 to 6 inches, grayish-brown and slightly hard (very dark brown and friable when moist) sandy loam; slightly acidic; highly micaceous; moderate, medium and fine, granular structure; moderate in organic matter.
- 6 to 11 inches, brown and slightly hard (dark-brown and friable when moist) heavy sandy load; medium acid; weak fine, granular structure when moist, and nearly massive when dry; somewhat lower in organic matter than layer above.
- 11 to 22 inches, light-brown and hard (dark-brown and firm when moist) light sandy clay loam; medium acid; weak, coarse, subangular blocky structure.
- 22 to 44 inches, reddish-brown and very hard (yellowish-red and firm when moist) sand clay loam; strong acid; moderate, medium, subangular blocky structure.
- 44 to 58 inches, very pale brown and hard (yellowish-brown and friable when moist) sandy loam; medium acid; massive.
- 58 inches +, varicolored, weathered, disintegrating granitic rock, less altered with increasing depth.

The Auberry soils are well-drained upland and deep. The soils were derived from coarse-grained granitic rocks. The soils of Auberry have good natural drainage. Surface runoff is slow. Internal drainage is medium to moderately slow. The moisture-holding capacity and natural fertility are moderate, and the erosion hazard is slight (USDA, 1962).

5.1.2.3 Conventional Leach Fields

The EPA would regulate conventional on-site subsurface leach fields as Class V injection wells under the UIC program (Section 3.2), which is a component of the Source Water Protection Program (Section 3.6). Subsurface disposal permitting would likely be based on groundwater quality degradation criteria. Successful permitting of subsurface disposal discharge may require a limited hydrogeological study to establish pollutant transport patterns in the nearest identifiable groundwater basin. An analysis may also be required to determine the downgradient environmental impacts to other beneficial users of the groundwater basin. The primary beneficial users of groundwater in this area are humans who use the groundwater for potable water.

In addition to good percolation, leach fields typically require a minimum of several feet of clearance above the highest groundwater levels. High groundwater is not anticipated at this site.

Leach fields are used to dispose of treated wastewater effluent by distributing it underground to the infiltrative soil surfaces. Conventional leach field design uses a series of looped or lateral trenches 1.5 to 3 feet wide and 2 to 5 feet deep. The trenches are filled with stone or gravel and covered to reduce surface water inflow. Perforated pipes run along the trenches to disperse the effluent into the soil. Conventional leach fields generally require large areas, well-drained soils, and mostly level ground to operate adequately. Based on the USDA Soil Survey, shallow hardpan encountered at this site would be at a depth of less than 2 feet in the San Joaquin sandy loams, so the leach field would provide drainage directly into the soils beneath the hardpan where drainage should be adequate in the sandy loam. Leach field design would be according to typical Madera County standards.

To utilize the shallow soils, the wastewater would need to be treated to a sufficient level that ensures compliance with the RWQCB's Basin Plan objectives for the protection of surrounding groundwater. Because effluent would be treated to tertiary levels prior to placement in the leach fields, further aerobic treatment in the soil, typical of conventional leach field design, would not be required. Typically, wastewater effluent treated to tertiary levels by Membrane Bioreactors contains low solids and nutrient concentrations. Consequently, the leach fields can be constructed within shallower soil cover and possibly loaded at much higher hydraulic rates, provided that the subsurface discharge of treated wastewater does not increase the risk of exceeding the RWQCB's groundwater objective for the area.

Leach Fields are advantageous because they provide a year-round or, at the very least, a winter disposal alternative. Used in conjunction with spray field or landscape irrigation disposal, leach fields can reduce or eliminate seasonal storage requirements. Before these leach fields can be developed, detailed geotechnical investigations at candidate sites would be required to locate and provide detailed design criteria for leach fields.

5.1.2.4 Non-conventional Leach Fields

Non-conventional leach fields are high-capacity designs that can accept higher hydraulic loading rates than conventional leach fields. This is possible since the water quality of the MBR effluent being discharged to the non-conventional leach field is treated to such a high level that reliance on the soil media to provide additional treatment, typical of a conventional leach field design, is not required. As a result, these non-conventional, high-capacity leach fields can and have been designed and installed throughout the country at much higher hydraulic loading rates than high organic loading rates. Table 4-3 of the EPA Onsite Wastewater Treatment System Manual (EPA, 2002) provides a chart for the hydraulic and organic loading rates based on soil types and structure. The EPA would regulate non-conventional on-site subsurface leach fields as Class V injection wells under the UIC program (Section 3.2), which is a component of the Source Water Protection Program (Section 3.6).

5.1.3 Water Balance for On-Site Disposal

A water balance was performed to determine the disposal area requirements without recycling for each project alternative. Three combinations of disposal methods were considered for each project alternative, which were: (1) subsurface disposal and seasonal storage, (2) spray fields and seasonal storage, and (3) subsurface disposal, spray fields, and seasonal storage. **Table 5-1** summarizes the results from the water balance analyses performed by HSe. Copies of the more in-depth analyses are included in **Appendix D.** This is a preliminary estimate only. A final design by a licensed engineer would be necessary to determine actual size and placement.

Table 5-1: Water Balance and Estimated Wastewater Disposal Requirements

	Alternative			
	A	B	C	D
Average Day Disposal Flows [a]	270,000	160,000	20,000	20,000
Landscape Irrigation (acres) [b]	4	4	1	1
Spray Disposal Only (acres) [b]	29	18	2	2
Seasonal Storage Basin with Spray Disposal Only (MG)	43	28	4	4
Sub-Surface Disposal Only (acres)	78	46	5	5
Seasonal Storage Basin with Sub-Surface Disposal Only (MG)	4	4	2	2
Combination of Spray and Sub-Surface Disposal (acres)	31	15	2	2
Seasonal Storage Basin for Spray and Sub-Surface Disposal (MG)	31	21	3	3

[a] Disposal Flow without recycled water rounded to nearest 10,000. See Tables 2-1 through 2-4.

[b] Areas rounded to the nearest acre.

If spray fields are used at the site as the sole disposal option, they could be located on the various project sites as shown in **Figure 5-1a through Figure 5-1d.** Based on the water balance analyses, the spray field area required to dispose of the effluent from the WWTP ranges from 2 to 29 acres, depending on the project alternative. Additionally, a seasonal storage basin would be needed to store effluent during rain events.

If leach fields are the sole disposal option, then 5 to 78 acres would be required to dispose of the effluent from the WWTP. While this may be possible at the Madera site because it has at least 128 acres of potential disposal area (**Figure 1-5**) and at the North Fork site if some of the soil stabilization area is useable (**Figure 1-8**), field-testing may reveal that only certain portions of the respective sites have soils conducive to leach field disposal. Design of leach fields is dependent on the percolation characteristics of the soil. Different percolation rates yield varying hydraulic loading rates. In addition, hydraulic loading rates also vary depending on the effluent quality—untreated wastewater discharged to leach fields would require a lower hydraulic loading rate to allow additional treatment by microorganisms in the soil. For the proposed non-conventional leach field, a hydraulic loading of 0.3 gpd/ft^2 was selected for use in preliminary sizing. A preliminary location for leach fields and 4-MG seasonal storage basins are shown in **Figure 5-2a and Figure 5-2b. Figure 5-2c and Figure 5-2d** show the leach field areas required for Alternatives C and D, with 2-MG seasonal storage basins.

If spray fields are used in conjunction with leach fields and a seasonal storage basin, approximately 31-acres of spray field disposal, 31-acres of leach field disposal, and 31 MG of seasonal storage would be required for project Alternative A. A preliminary site plan for this configuration is shown in **Figure 5-3a.** Similarly, **Figure 5-3b through Figure 5-3d** show the combination leach field and spray field areas required to dispose of the effluent from the WWTP for project Alternatives B, C, and D. Note, these calculations are based on an assumed percolation rate of 0.3 gpd/ft^2 for the leach field and would need to be determined by field-testing.

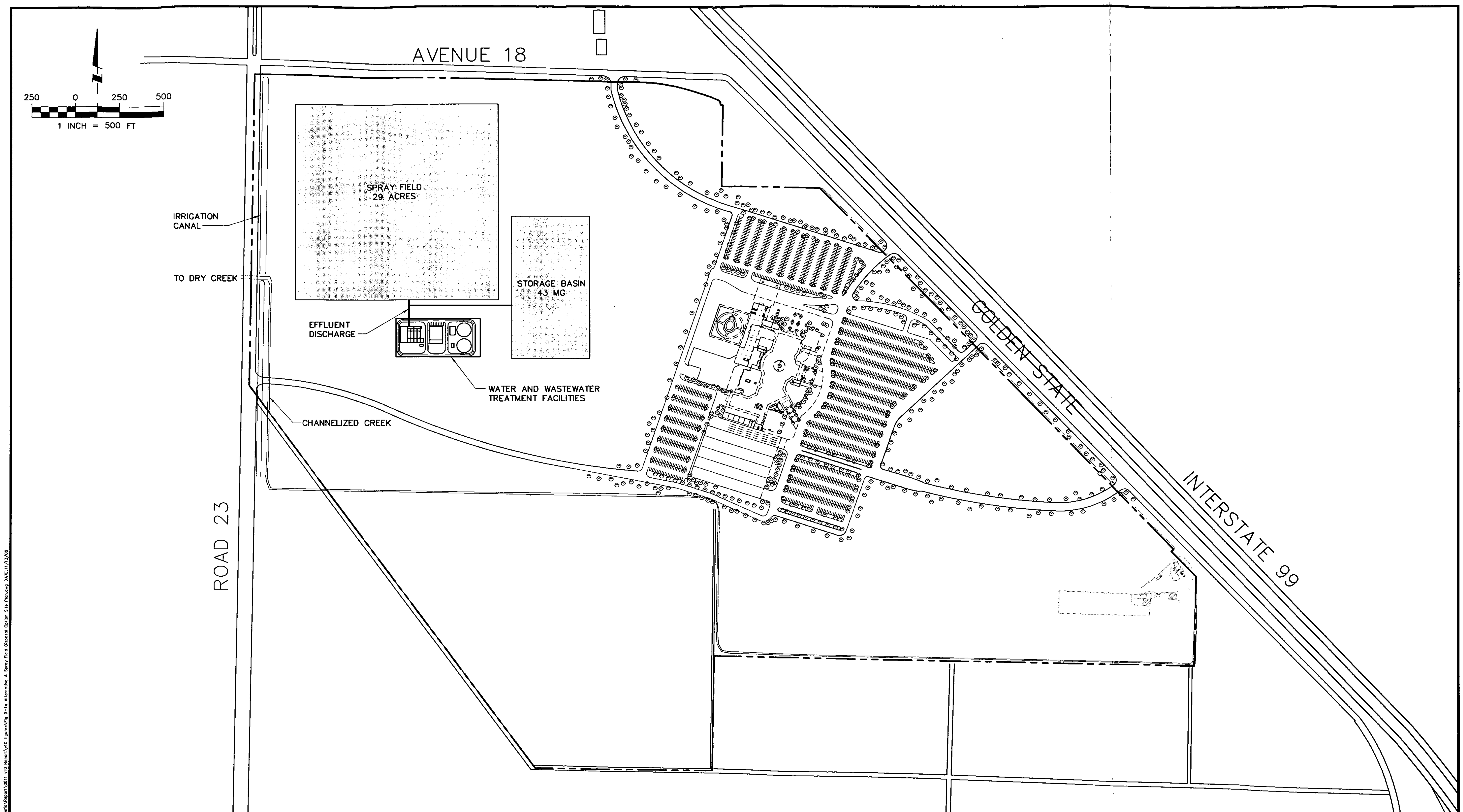
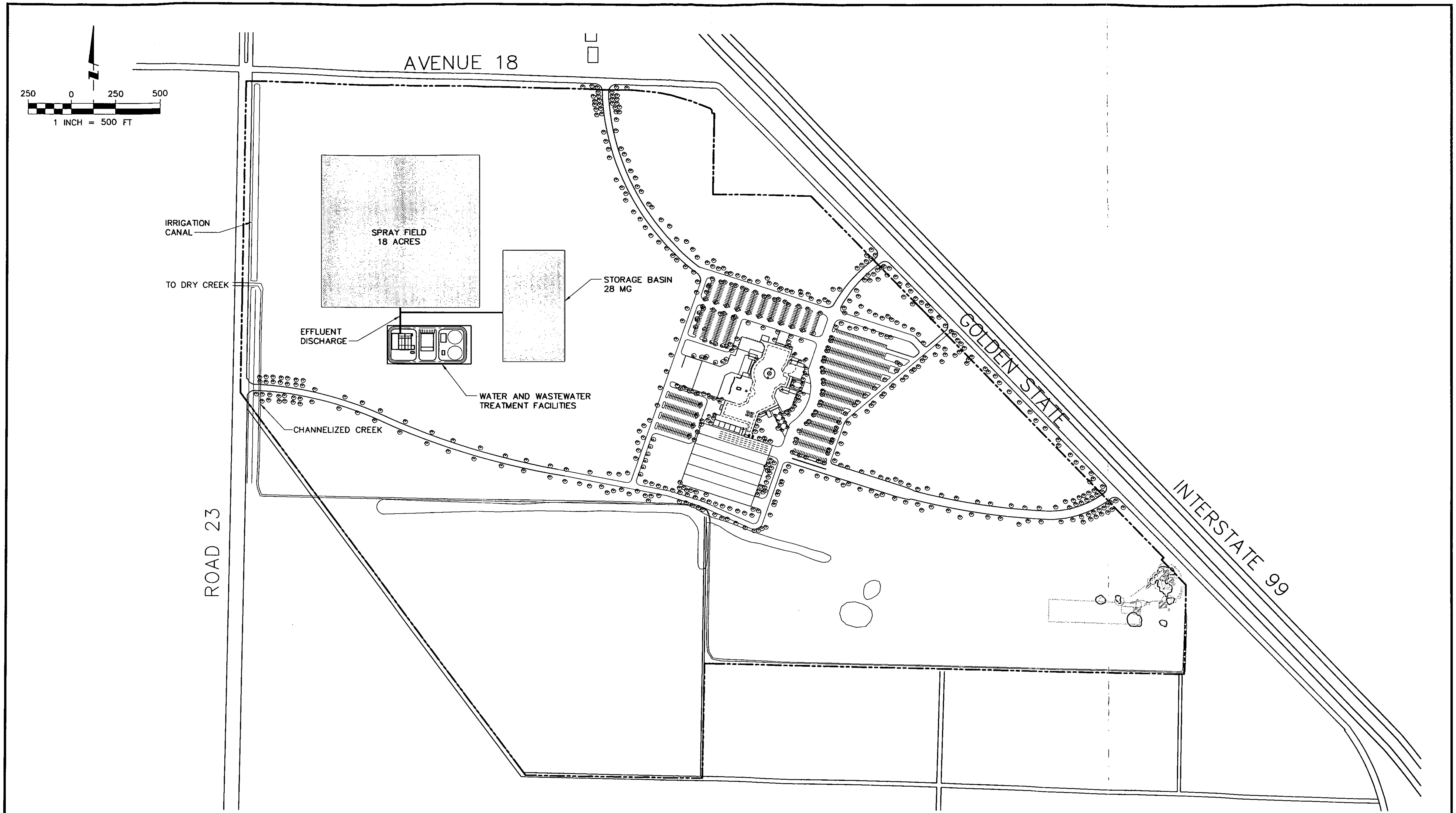


Figure 5-1a
North Fork
Water and Wastewater Feasibility Study
Alternative A - Spray Field Disposal Option Site Plan

HydroScience Engineers, Inc.



HydroScience Engineers, Inc.

Figure 5-1b
North Fork
Water and Wastewater Feasibility Study
Alternative B - Spray Field Disposal Option Site Plan

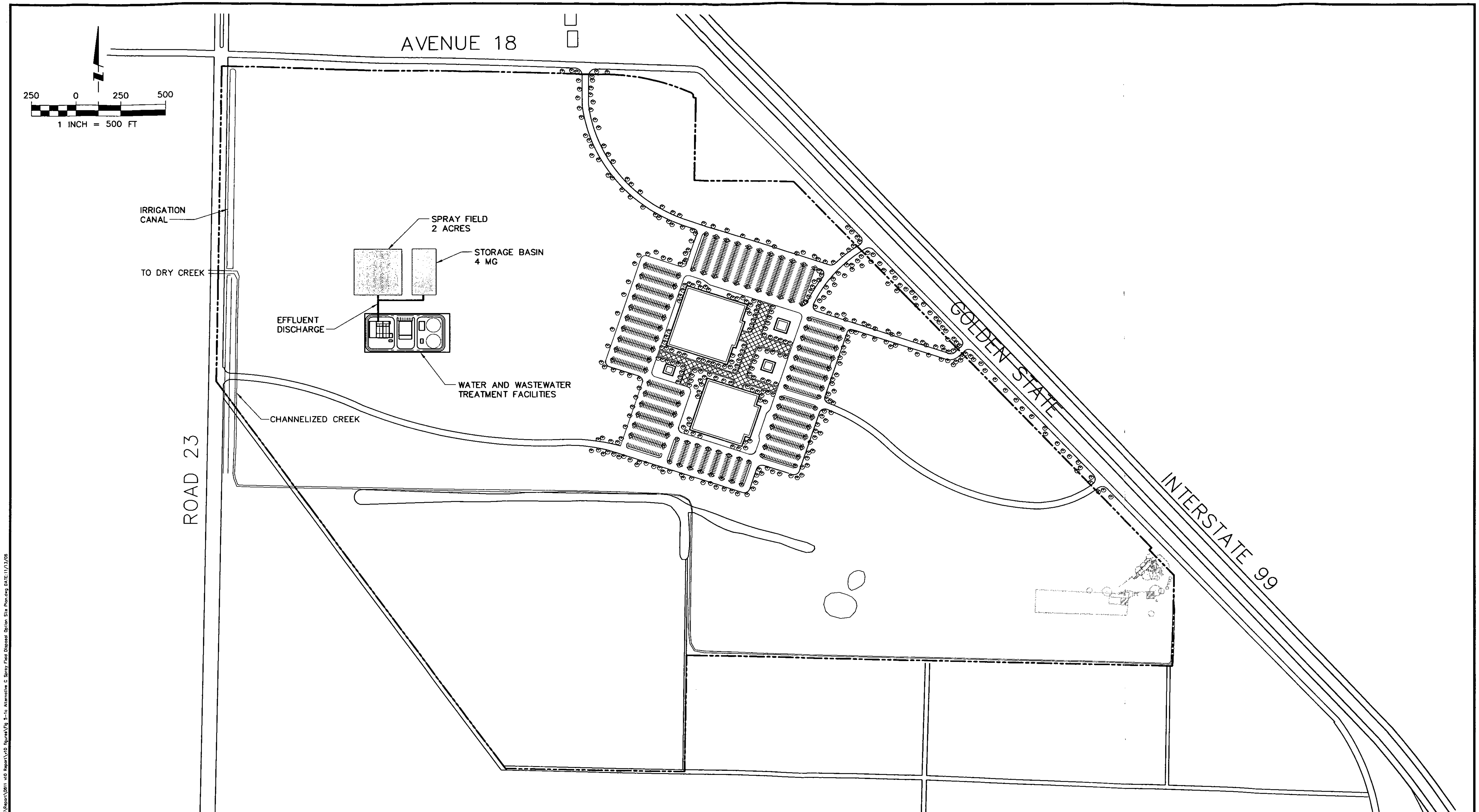


Figure 5-1c
North Fork
Water and Wastewater Feasibility Study
Alternative C - Spray Field Disposal Option Site Plan

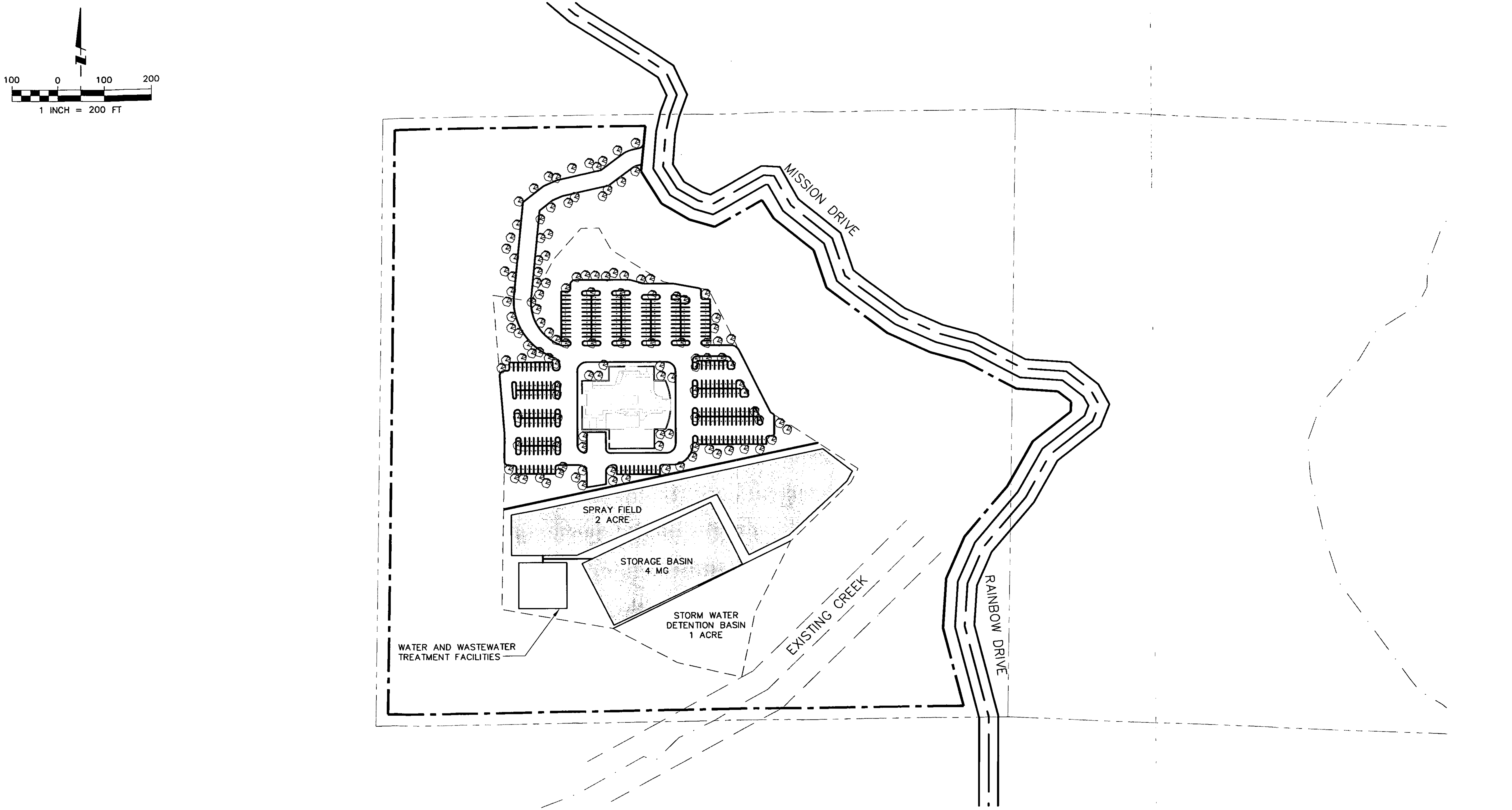


Figure 5-1d
North Fork
Water and Wastewater Feasibility Study
Alternative D - Spray Field Disposal Option Site Plan

HydroScience Engineers, Inc.

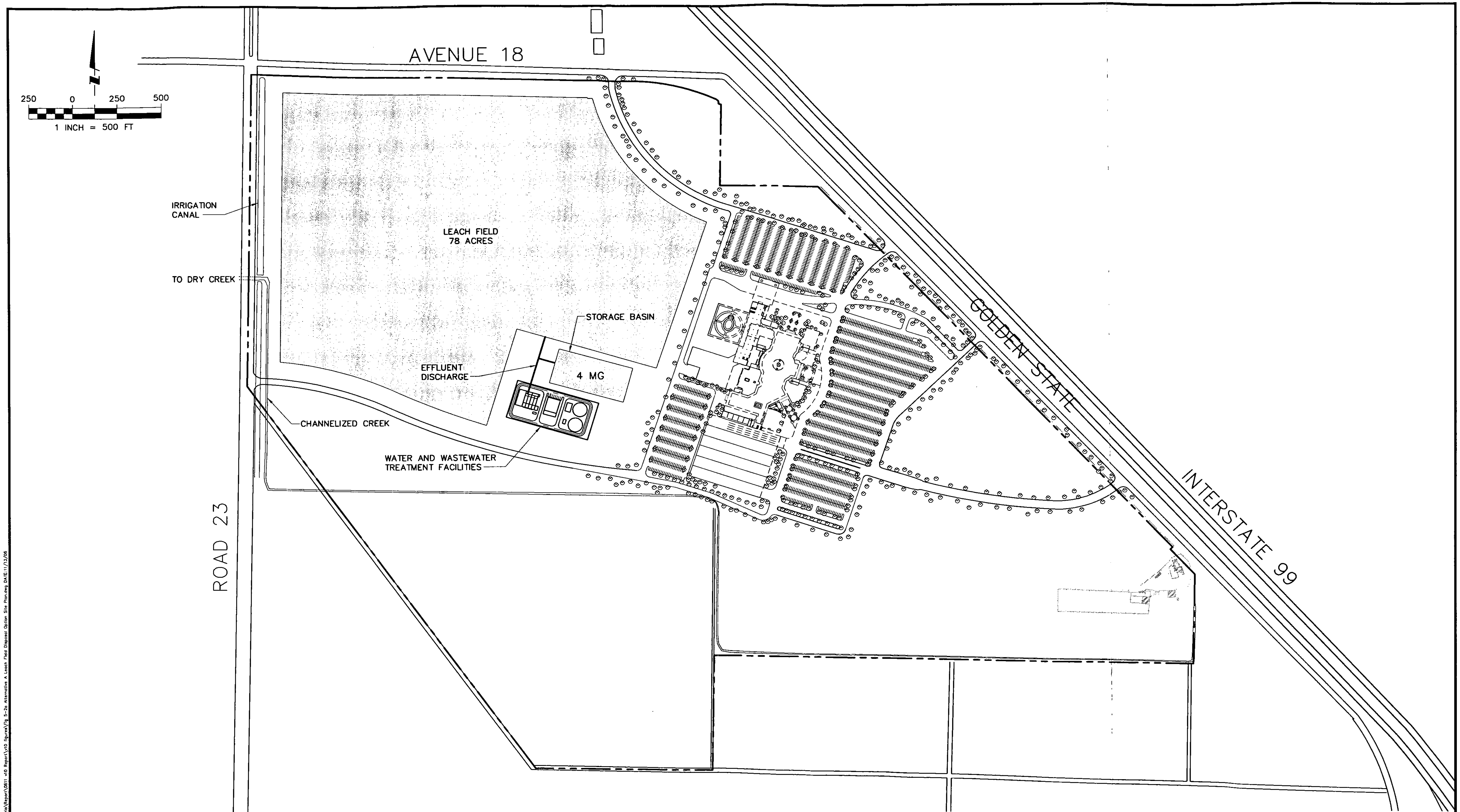


Figure 5-2a
North Fork
Water and Wastewater Feasibility Study
Alternative A - Leach Field Disposal Option Site Plan

HydroScience Engineers, Inc.

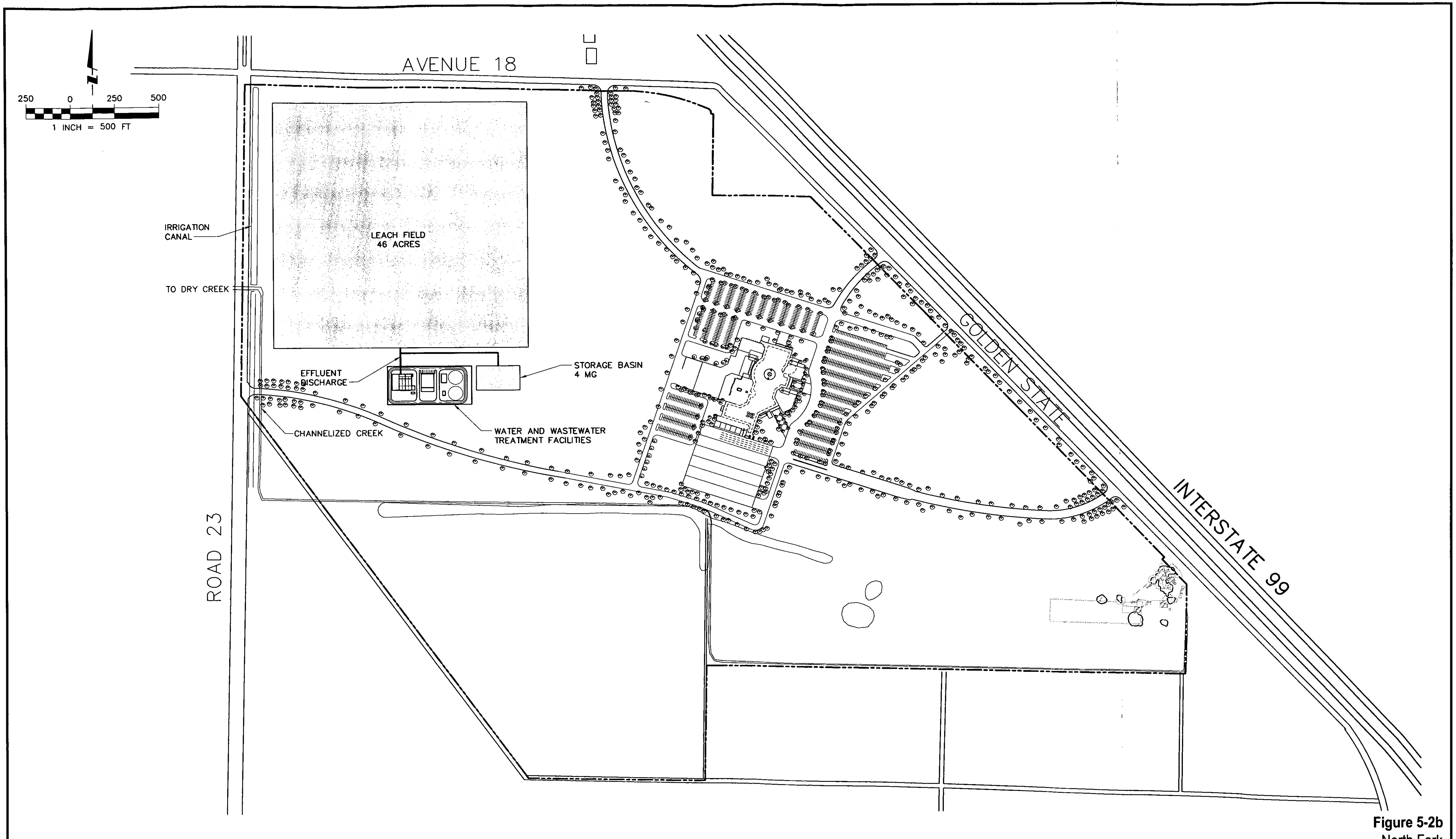


Figure 5-2b
North Fork
Water and Wastewater Feasibility Study
Alternative B - Leach Field Disposal Option Site Plan

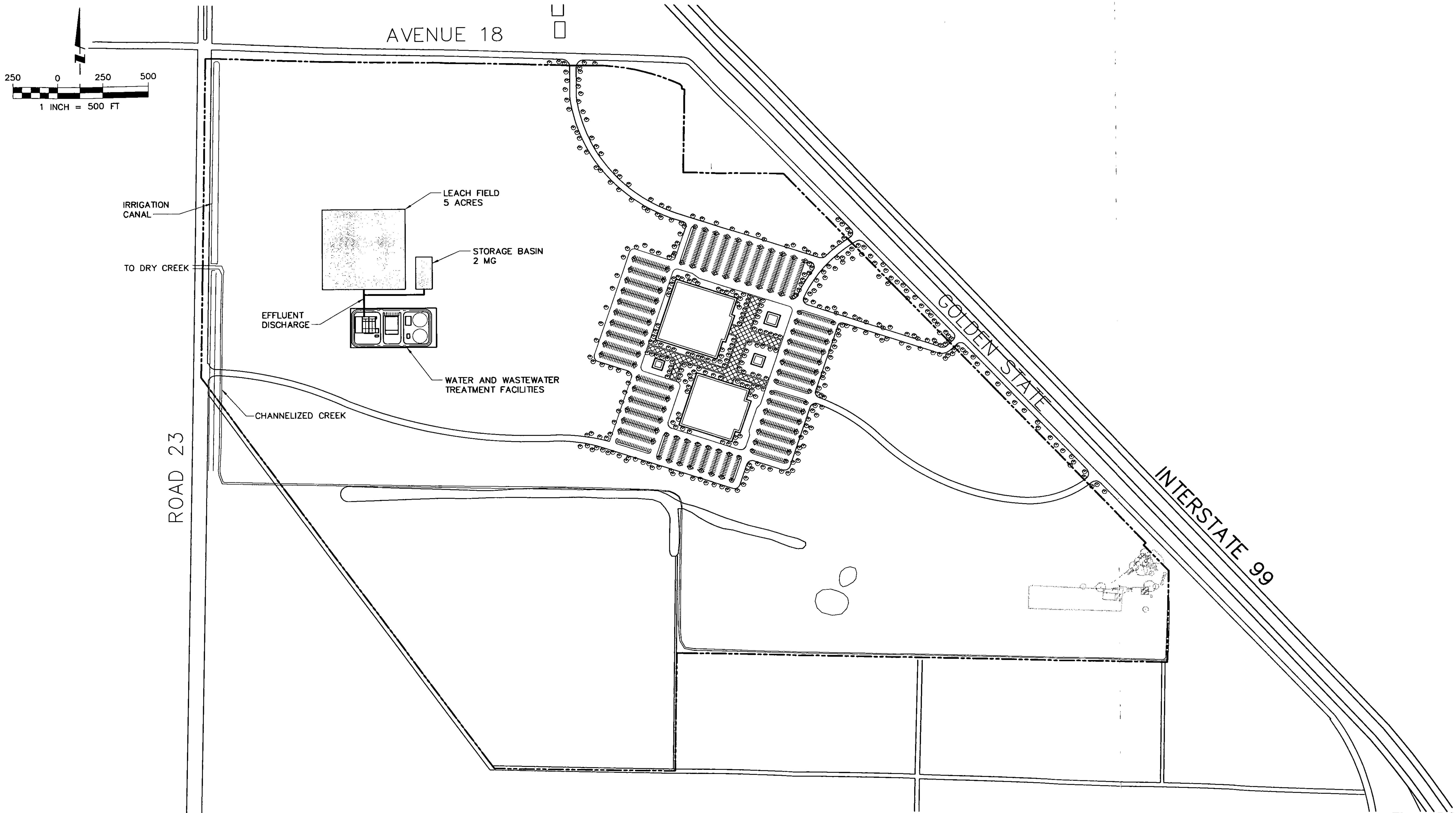


Figure 5-2c
North Fork
Water and Wastewater Feasibility Study
Alternative C - Leach Field Disposal Option Site Plan

HydroScience Engineers, Inc.

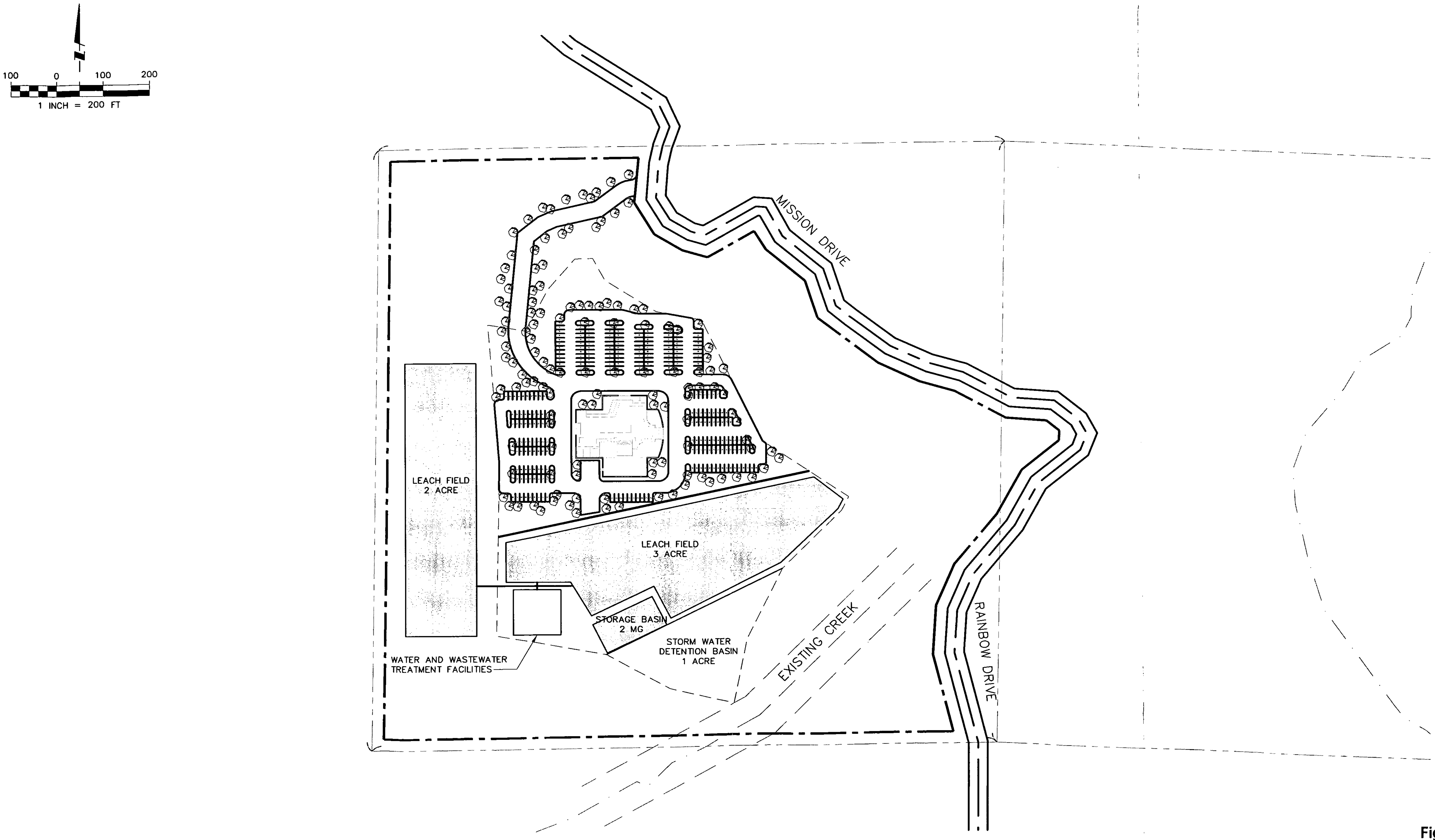


Figure 5-2d

North Fork

Water and Wastewater Feasibility Study

Alternative D - Leach Field Disposal Option Site Plan

HydroScience Engineers, Inc.

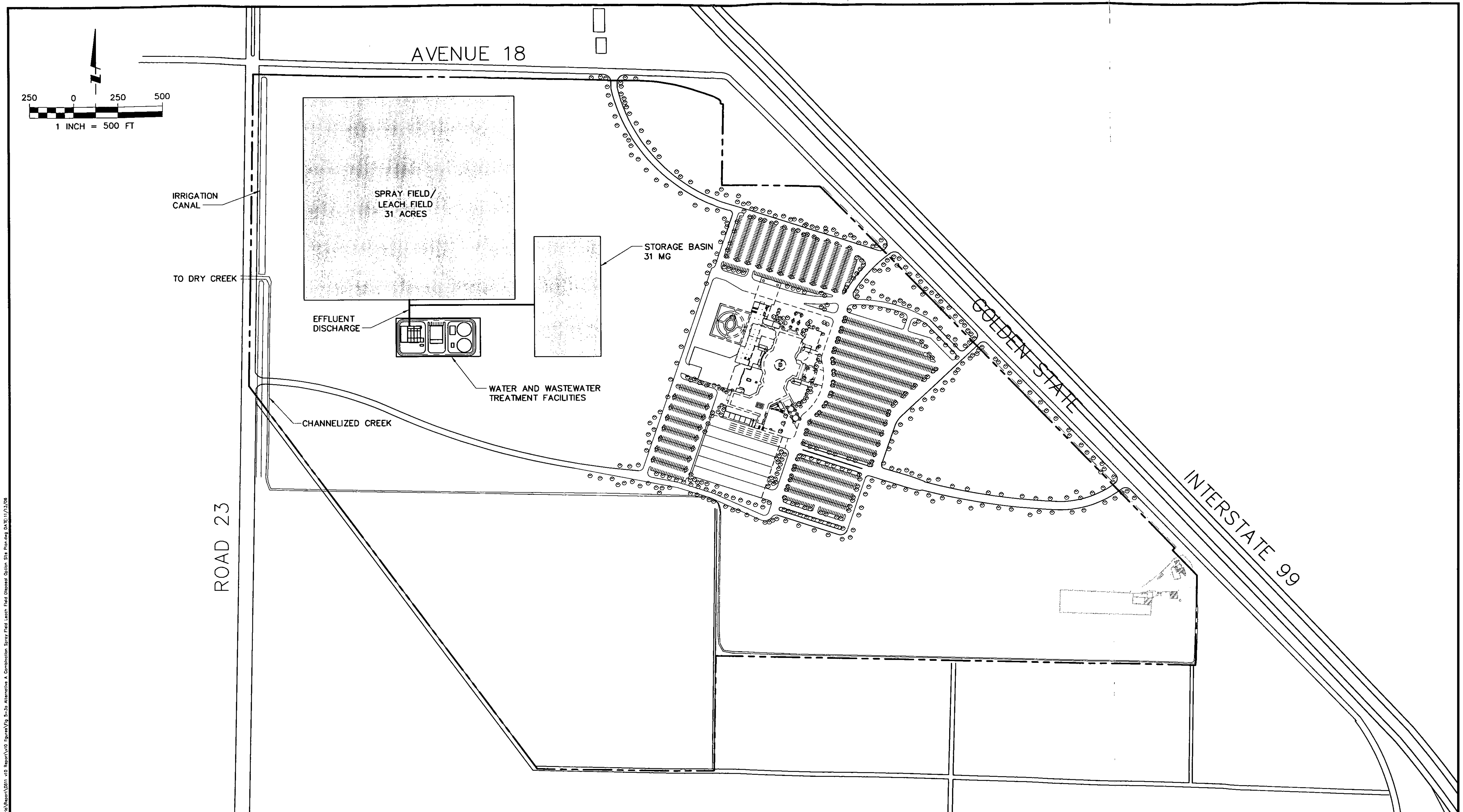


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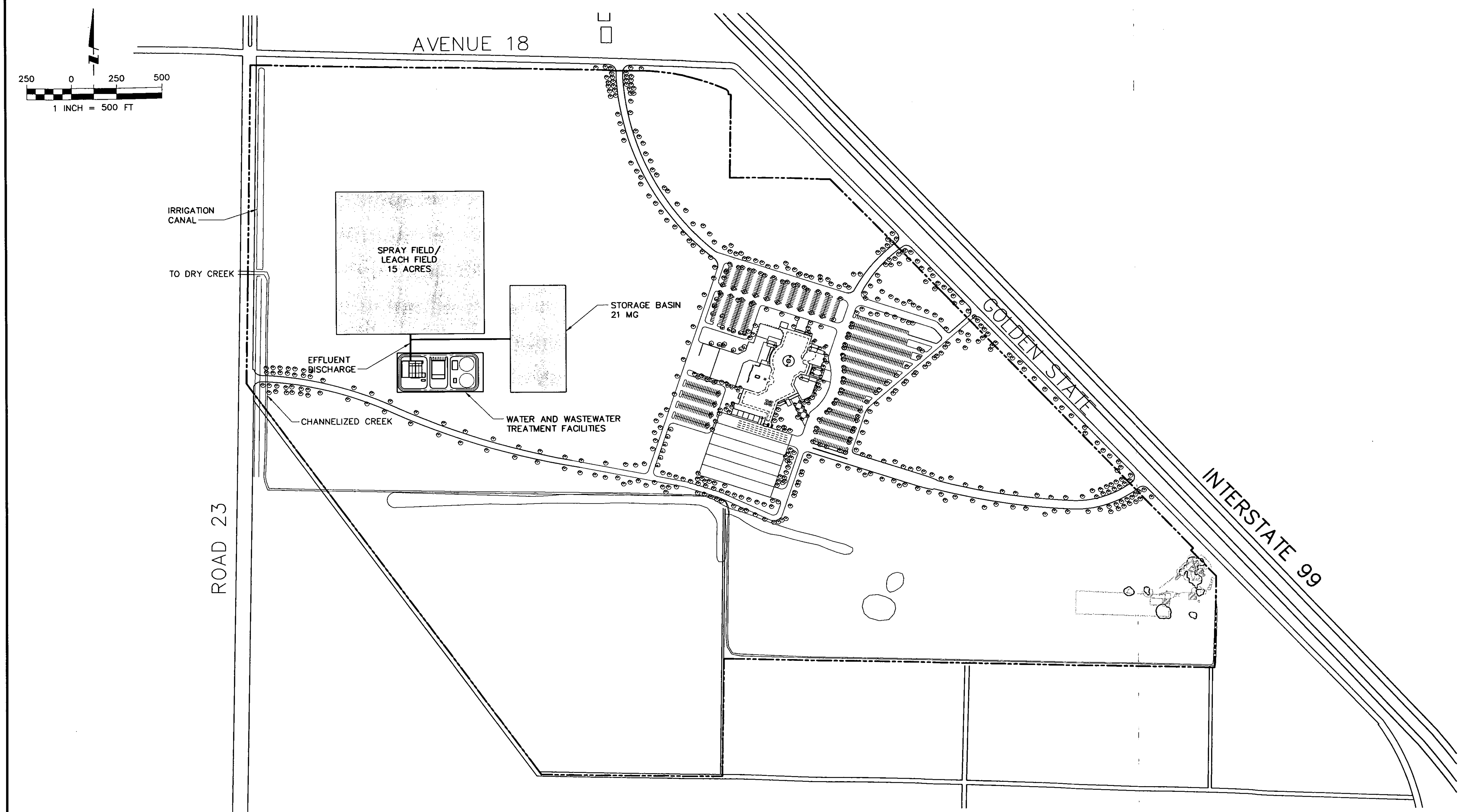
Figure 5-3a
North Fork
Water and Wastewater Feasibility Study
Alternative A - Combination Spray Field / Leach Field Disposal Option Site Plan



HydroScience Engineers, Inc.

Figure 5-3b
North Fork
Water and Wastewater Feasibility Study
Alternative B - Combination Spray Field / Leach Field Disposal Option Site Plan

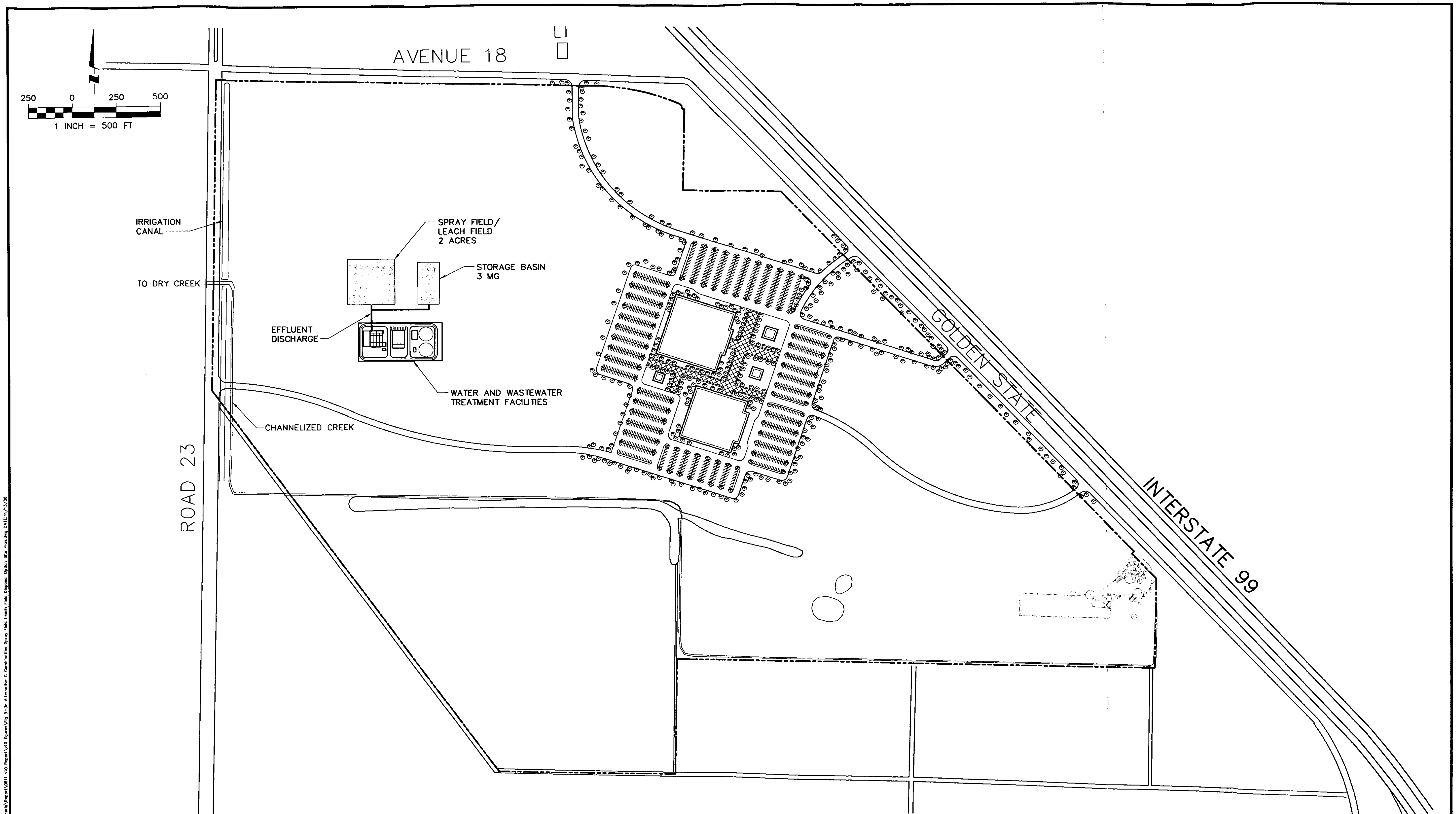
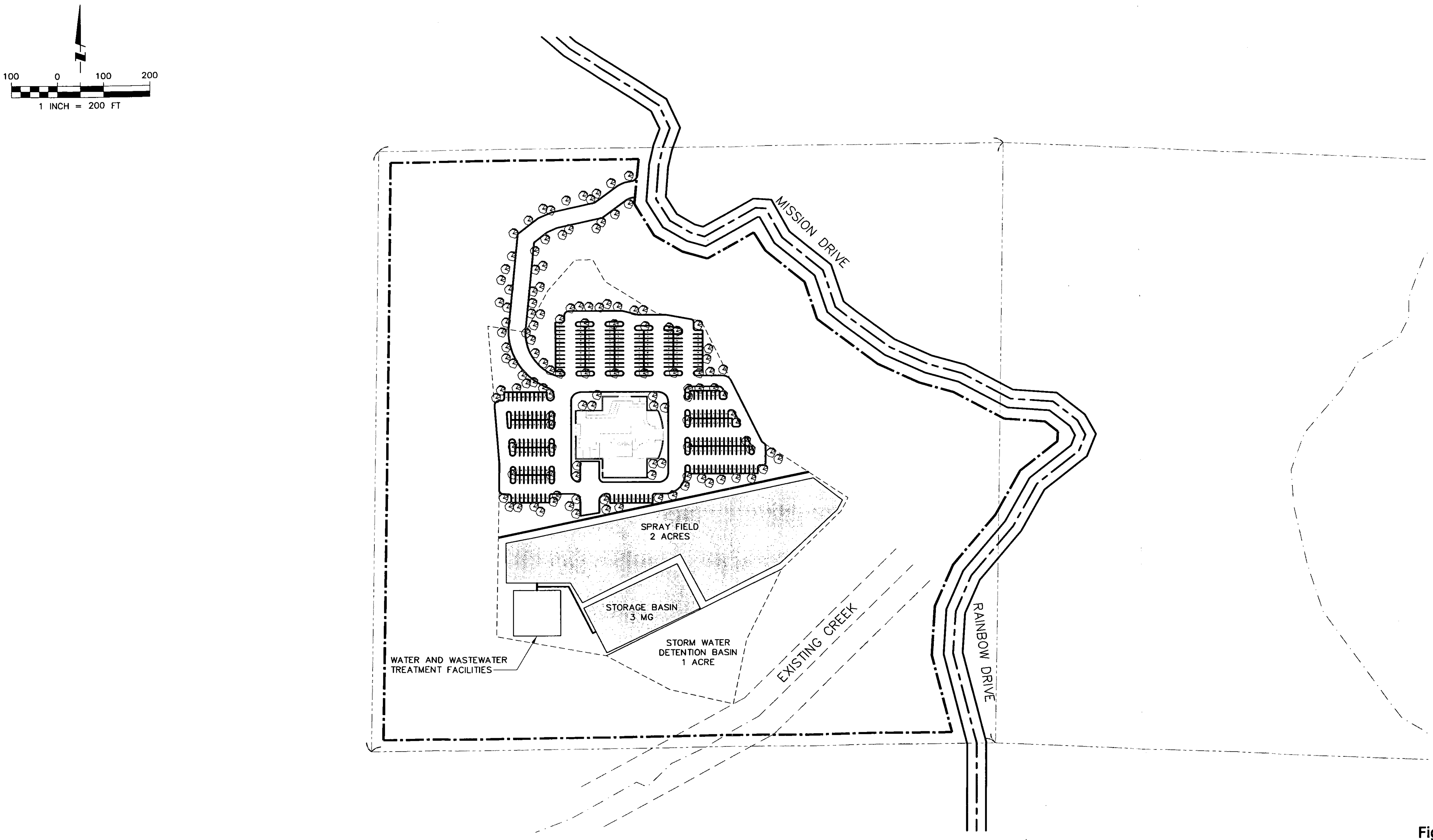


Figure 5-3c
North Fork
Water and Wastewater Feasibility Study
Alternative C - Combination Spray Field / Leach Field Disposal Option Site Plan

HydroScience Engineers, Inc.



HydroScience Engineers, Inc.

Figure 5-3d
North Fork
Water and Wastewater Feasibility Study
Alternative D - Combination Spray Field / Leach Field Disposal Option Site Plan

5.1.4 Surface Water Discharge

5.1.4.1 Alternatives A, B, and C

A channelized creek flows through the project site for Alternatives A, B, and C to Dry Creek, and then to the Fresno River as shown in **Figure 5-4**. The Fresno River is designated as a beneficial use surface water body for municipalities, communities, industries and warm freshwater habitat established along the river. The Fresno River is not designated as part of the RWQCB's 303(d) listing of impaired water bodies but it drains into the San Joaquin River, which is listed. The channelized creek is the proposed discharge point and is located within the Rancheria. In order to discharge wastewater produced on-site to local surface waters, and despite the discharge point being on trust lands; the receiving waters are designated by the RWQCB to have existing beneficial use, so an NPDES permit is required. Typically, the NPDES permit application process takes at least 1 to 2 years to complete. Since the treatment facilities and point of discharge are fully contained within trust lands, the NPDES permit will be issued and regulated by the EPA instead of the local RWQCB. Normally, the EPA sets treatment and discharge requirements in the NPDES permit in accordance with the requirements of the local RWQCB Basin Plan.

5.1.4.2 Alternative D

An unnamed tributary of Willow Creek flows through the project site for Alternative D, and then to the San Joaquin River upstream of Millerton Lake as shown in **Figure 5-5.** The San Joaquin River is designated as a beneficial use surface water body for municipalities, communities, industries, and warm freshwater habitat established along the river. The San Joaquin River is designated as part of RWQCB's 303(d) listing of impaired water bodies. The unnamed tributary is the proposed discharge point and is located within the Rancheria. In order to discharge wastewater produced on-site to local surface waters, and despite the discharge point being on trust lands; the receiving waters are designated by the RWQCB to have existing beneficial use, so an NPDES permit is required. Typically, the NPDES permit application process takes at least 1 to 2 years to complete. Since the treatment facilities and point of discharge are fully contained within trust lands, the NPDES permit will be issued and regulated by the EPA instead of the local RWQCB. Normally, the EPA sets treatment and discharge requirements in the NPDES permit in accordance with the requirements of the local RWQCB Basin Plan.

5.1.4.3 Anticipated NPDES Permit Effluent Limitations

Preliminary research was done to identify and obtain a copy of current NPDES permits. The El Dorado Sanitation District and the San Andreas Sanitation District have current NPDES permits for WWTPs within the Sacramento and San Joaquin River Basins and are governed by the same Basin Plan. These permits are included in **Appendix E**. The current permits aid in anticipating the requirements that would likely be placed on the North Fork Rancheria and also suggests that an on-site wastewater treatment facility could probably be permitted for surface water discharge. However, high quality effluent would probably be required. Moreover, pending additional stream flow data and additional engineering investigation, limitations on the discharge during low flow periods can be expected (i.e. seasonal discharge).

Figure 5-4
North Fork
Water and Wastewater Feasibility Study
Downstream Waterways of Project Alternatives A, B, and C

HydroScience Engineers, Inc.

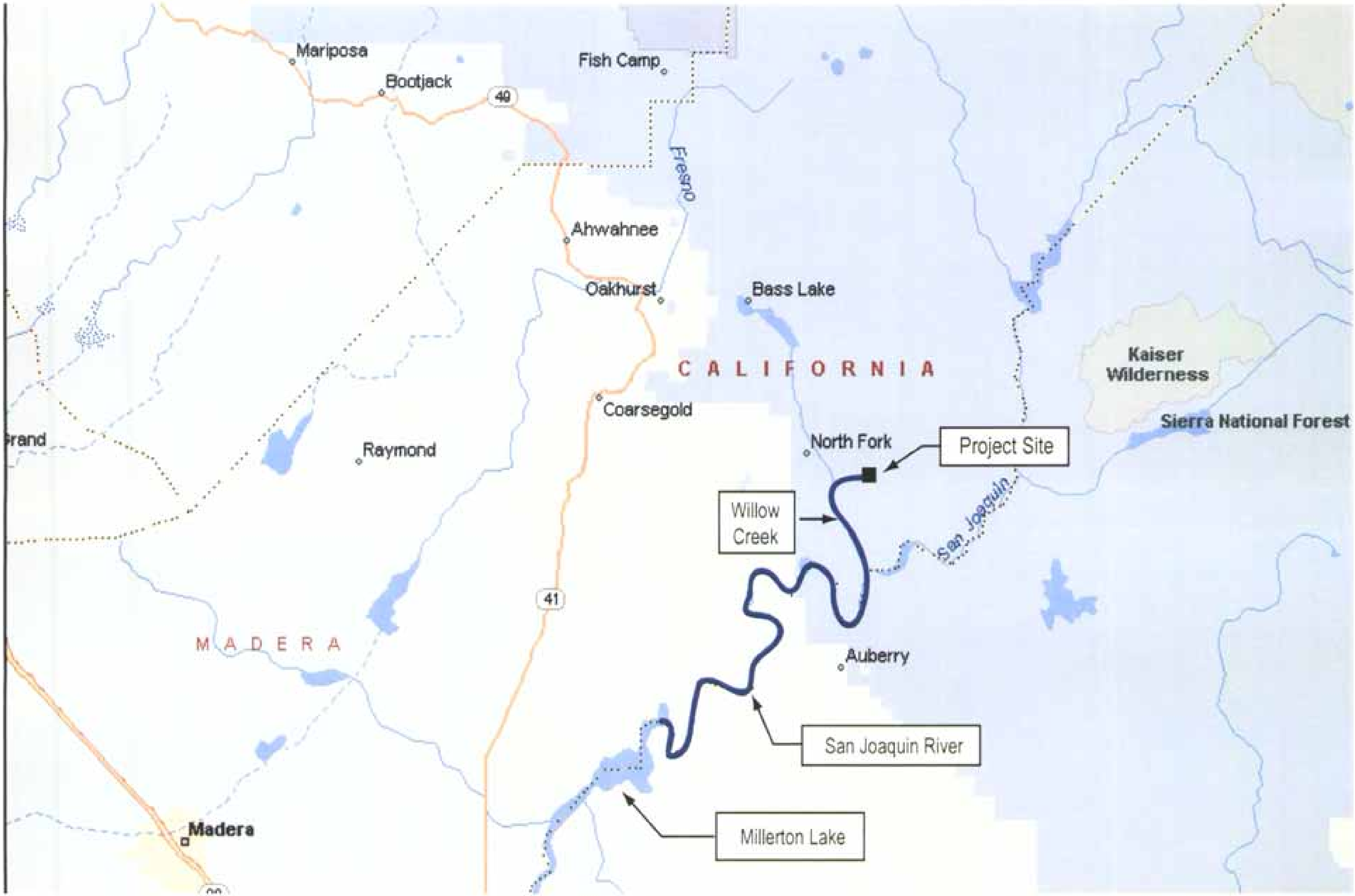


Figure 5-5
Water and Wastewater Feasibility Study
Downstream Waterways of Project Alternative D

HydroScience Engineers, Inc.

Table 5-2 sets forth some of the significant requirements and limitations anticipated in an NPDES Permit that may be issued for the on-site wastewater treatment facility. In addition to those considerations listed in **Table 5-2**, the CTR, which lists some 126 other constituents of wastewater that may be of concern, would also have to be evaluated. Although most of these CTR constituents are typically not present in significant quantities in domestic wastewater, they may be added by industrial discharges or may be present in the groundwater used to supply potable water.

The foregoing is an overview of the significant requirements and possible constraints to surface discharge of the treated wastewater. Additional data relating to dry weather flows in the stream would have to be obtained and evaluated in order to determine if year-round discharge would be permitted and the extent, if any, that dilution can be relied upon to achieve water quality objectives and standards. If this were the only discharge option used, discharge limitations could make a storage basin necessary. Alternatively, this discharge option could be used in combination with on-site disposal using either spray fields or leach fields, or a combination of both spray fields and leach fields. There appears to be enough acreage available for any combination of discharge options desired. The size of the basin and the spray field or leach field will depend on how they are used in combination with surface water discharge. Based upon the identified limitations and requirements for discharge to a stream, a tertiary wastewater treatment facility providing disinfection (ultraviolet [UV] or chlorination/ dechlorination) is required.

Table 5-2: Anticipated NPDES Limitations

Parameter	Anticipated Limitations
Biochemical Oxygen Demand (BOD)[a,b]	10 milligrams per liter (mg/L)
Suspended Solids [a,b]	10 mg/L
Turbidity [a,b]	<2 NTU increase in stream resulting from discharge
pH [a,b]	<0.5 pH unit change in stream resulting from discharge
Temperature [a,b]	<5 degree Fahrenheit increase in stream resulting from discharge
Conductivity/total dissolved solids[b]	< Approx. 700 Micromhos per centimeter (cm)/450 mg/L (450 ppm)
Total Coliform Bacteria [a,b]	< 2.2 MPN/100 ml (7-day median), 23 MPN/100ml (daily max)
Chlorine Residual [a,b]	None detected
Nitrite [a]	1 mg/L (as Nitrogen [N])
Nitrate + Nitrite [a,b]	<10 mg/L (as N)
Ammonia [b]	9 mg/L (Total)
Receiving Water Dilution Ratio [a,b]	20:1 minimum

[a] RWQCB Central Valley Region: WDRs for El Dorado Irrigation District Deer Creek WWTP, El Dorado County (Appendix E).

[b] RWQCB Central Valley Region: WDRs for San Andreas Sanitary District WWTP, Calaveras County (Appendix E).

5.1.5 Connect to City of Madera WWTP

The City of Madera has a trickling filter WWTP approximately 5 miles southwest of the project site, at 13048 Road 21 ½ (at the intersection of Road 21 ½ and Avenue 13). The 7 MGD WWTP currently treats an average of about 5.7 MGD. Construction is expected to begin in the summer of 2005 to expand the plant's capacity to 10.1 MGD (Chumley, 2004). During the expansion, the trickling filter system will be replaced with an activated sludge system. The treated wastewater is conveyed to percolation beds for disposal.

The City of Madera Wastewater Treatment Plant Predesign Report (Boyle, 2004) presents estimated flows for the City of Madera. **Table 5-3** lists those flows along with the WWTP's capacity before and after expansion. The table also lists the North Fork Hotel and Casino (Alternative A) average daily flow estimates and the total combined flows.

There are a lot of unknown factors in long range planning. While the City's growth rate may vary and other conditions could change, a 10.1-MGD WWTP will probably be adequate for the City until the year 2023 without the North Fork flows. As can be seen in the table, the projected increase in flow from the year 2020 to 2023 for the City of Madera is 0.95 MGD, or 0.32 MGD per year. This is a flow of approximately 9.79 MGD for the City in 2022. If the 0.27 MGD North Fork flow is added to that, the combined flow in 2022 would be 10.1 MGD. Therefore, a 10.1-MGD WWTP will probably be adequate for the City and for the North Fork flows until the year 2022. By adding the North Fork flows to the City of Madera WWTP, the plant would probably exceed capacity approximately a year earlier than the City has projected.

Table 5-3: Projected Flows for the City of Madera WWTP

Year	WWTP Capacity [a] (MGD)	City of Madera Projected Average Daily Flow [a] (MGD)	North Fork Hotel and Casino Projected Average Daily Flow (MGD)	Total Combined Flow (MGD)
2005	7	5.70	0.27	5.97
2010	10.1[b]	6.67	0.27	6.94
2015	10.1	7.81	0.27	8.08
2020	10.1	9.15	0.27	9.42
2023	10.1	10.1	0.27	10.37

[a] Source: City of Madera WWTP Predesign Report, July 22, 2004.
[b] Expansion is scheduled for completion in early 2007.

Conveyance to the WWTP would involve a connection to the City sewer system. One possible connection would be at Avenue 17 (Airport Drive Option), as shown in **Figure 5-6.** The City's sewer line drains southeast along Aviation Drive to a small lift station and conveys the wastewater to Avenue 16 and from there to Westberry Boulevard. The existing sewer lift station may require expansion (i.e. additional pumps and possibly a backup generator) to convey flows to the treatment plant. Two additional alternatives for connecting to the City sewer system have also been identified. The second option (State Road 99 Option) would provide a connection to a 24-inch sewer line that is planned for completion in late Spring of 2008. The connection would be just west of Highway 99 where the new pipeline will cross beneath the highway from the northeast. The third option (Road 23 Option) would be to construct a new sewer line from the project site west to Road 23 and south

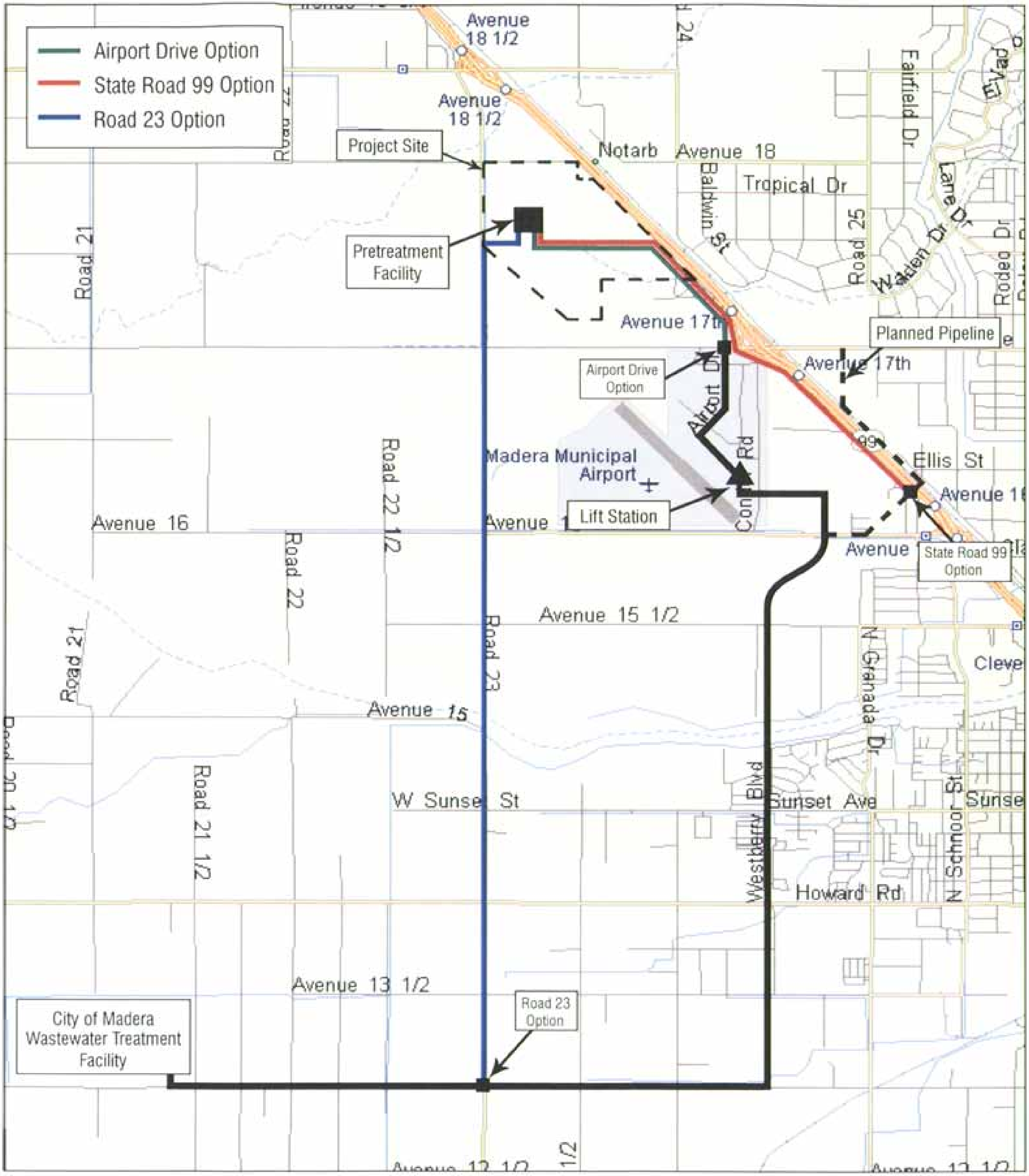


Figure 5-6
North Fork
Water & Wastewater Feasibility Study
Preliminary Pipeline Alignment Options

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along Road 23 to Avenue 13 where it would connect to the City's pipeline that leads west along Avenue 13 to the City of Madera WWTP. A new lift station would probably be part of this option. An engineering analysis should be performed to determine the best option for conveying wastewater to the City WWTP. In any case, only enough additional capacity is to be included in any of the options to fulfill the casino's requirements, and thus, not be growth inducing.

The City of Madera requires industrial users to pretreat wastewater if levels of BOD are above 200 mg/L and/or levels of TSS are above 180 mg/L. The Tribe would be required to pretreat wastewater to these levels, thereby incurring capital costs and operating costs in addition to fees for treatment of the wastewater at the City's WWTP. The City may be willing to make an agreement with the Tribe to impose a fee when levels of BOD and TSS exceed the allowable limits in lieu of the requirement to pretreat. See Section 5.2.2 for typical casino influent levels of BOD and TSS for a casino with a hotel. If the Tribe decides to pretreat the wastewater instead of incurring additional fees for the wastewater when levels exceed the City's requirements, then a pretreatment facility would be built at the location where the proposed water and wastewater treatment facilities are located for Alternatives A, B, and C (Figures 5-1a, 5-1b, and 5-1c). A pretreatment facility would consist of a package plant placed within the boundary of the proposed on-site MBR treatment facilities. The package plant would consist of an overall 60-ft diameter tank that has a concentric clarifier in the center, and flow equalization, aeration, and sludge storage in the outer annulus. Other facilities not included in the package would be designed separately, including the piping and wiring outside the tanks, odor control, sludge dewatering, sludge digester, concrete slab, and landscaping. At least one operator would be needed to run the equipment, and periodically sludge would have to be hauled off-site to a landfill.

5.1.6 Connect to the County WWTP Serving the City of North Fork

The County-operated WWTP for North Fork has an extended aeration treatment plant approximately 1 mile northwest of the proposed Alternative D project site, near the intersection of Road 225 and Road 228. The 31,000 gallon per day (gpd) WWTP is composed of a raw sewage pump station, an extended aeration treatment process, chlorine disinfection, effluent pump station, storage pond, and a distribution pump station. The WWTP currently utilizes spray fields to dispose of the disinfected effluent.

Currently, the WWTP is near maximum capacity with 99 service connections and 22 standby connections. However, plans are underway to expand the existing WWTP to a capacity of 60,000 gpd (Dunavan, 2004). The WWTP expansion will use leachfields, in addition to the existing spray fields, for disposal of the disinfected effluent.

By adding the Alternative D wastewater flows to the expanded WWTP, the plant would be near capacity again and would require an additional expansion to the WWTP to allow further growth of the City of North Fork. Conveyance to the WWTP would involve a connection to the City sewer system, as shown previously in **Figure 4-4.**

5.2 On-Site Wastewater Treatment Plant

A new WWTP to treat wastewater discharge from the various uses planned for the proposed project is an alternative to connecting to the City of Madera or the City of North Fork. Various treatment designs are possible and process selection ultimately involves consideration of many factors, including:

- Wastewater strength,
- Effluent disposal,
- Process reliability,
- Operational requirements,
- Treatment flexibility,
- Available space,
- Solid waste disposal,
- Nuisance odor,
- Visual aesthetics,
- Noise, and
- Capital and operating costs.

Of the factors identified above, the method of effluent disposal and the restrictions imposed therein have the greatest impact on the type of treatment required. The production of recycled water that meets California Code of Regulations (CCR) Title 22 requirements ultimately requires advanced tertiary treatment of wastewater to produce effluent containing very low concentrations of organics, solids, nutrients, and pathogens. State and Federal governments generally encourage the use of existing regional wastewater treatment facilities, rather than multiple, individual systems, especially when septic systems are proposed. However, the quality of treatment proposed for this project is higher than that of the regional treatment plant. Therefore, it is assumed that the EPA, as the permitting agency, would not have any issues permitting treatment through the proposed on-site facility rather than connecting into the existing regional facility. The EPA has permitted similar facilities on Indian reservations. Some examples include Cache Creek Casino, Rolling Hills Casino, and Thunder Valley Casino.

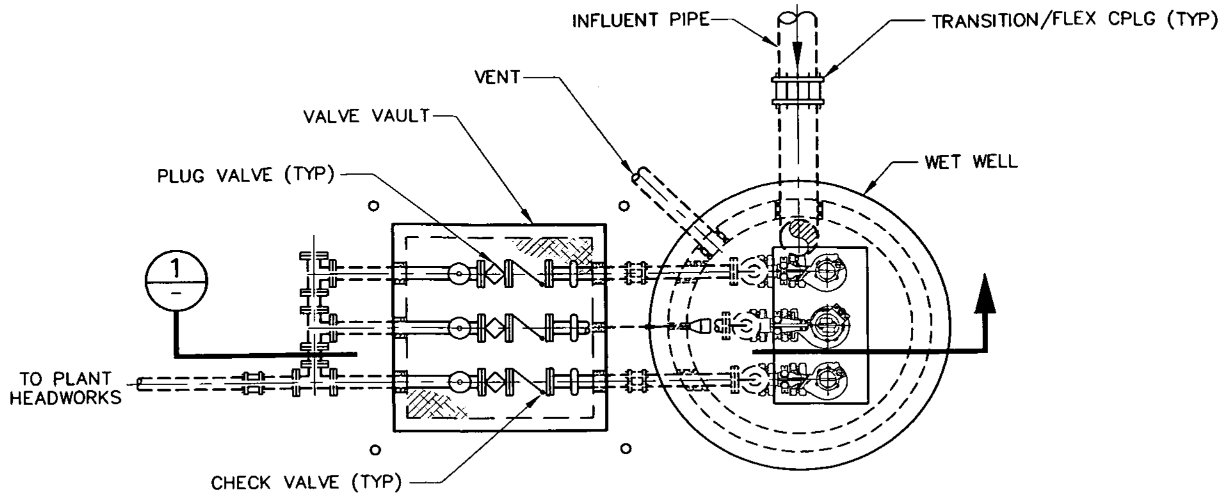
5.2.1 Wastewater Collection System

A sewage transmission pipeline from the casino raw wastewater lift station will convey casino wastewater to the headworks of the WWTP. Due to the site topography, the main pipeline to the WWTP at both of the proposed project locations will be a pressurized force main. It is likely that a triplex sewage lift station will be required to convey sanitary sewage to the treatment plant.

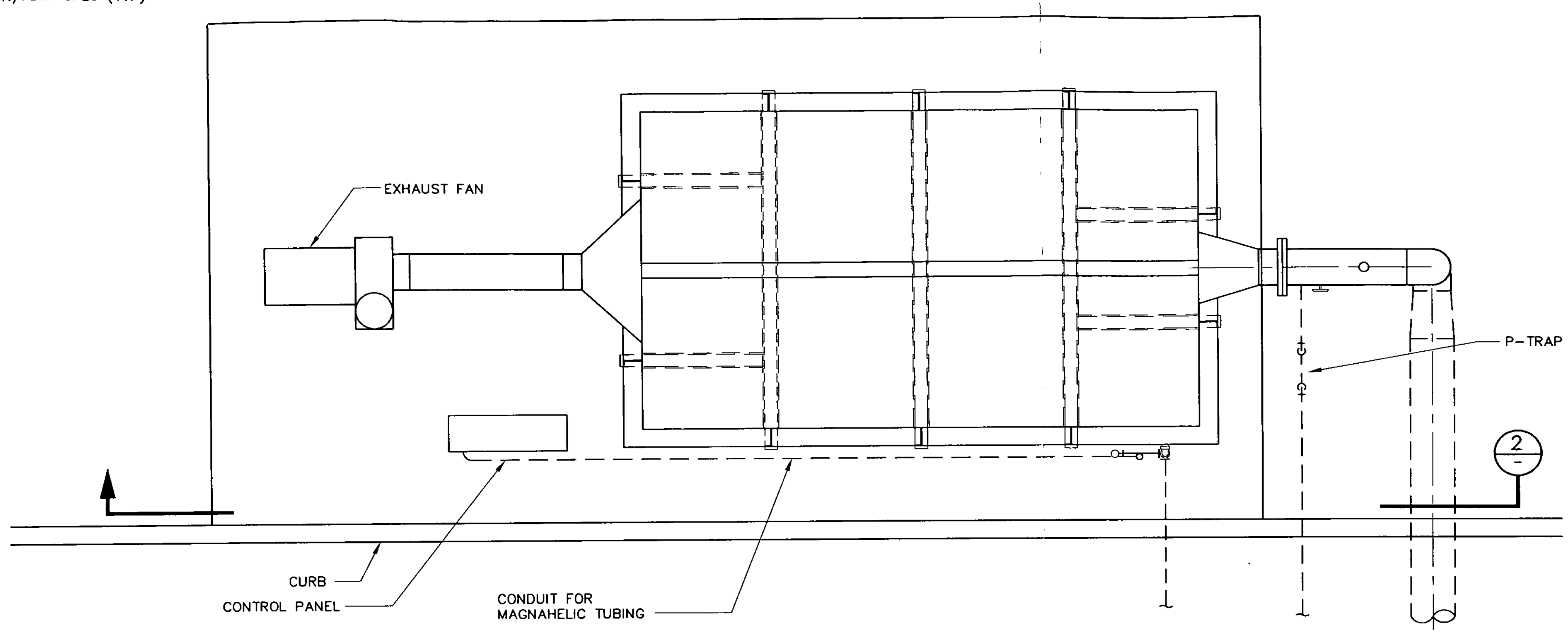
Recommended design criteria for the lift station are shown in **Table 5-4**. The station should be designed to lift the maximum daily flow with one pump out of service. **Figure 5-7** is an example of a typical sewage lift station and odor control equipment.

Table 5-4: Recommended Sanitary Sewage Lift Station Design Criteria

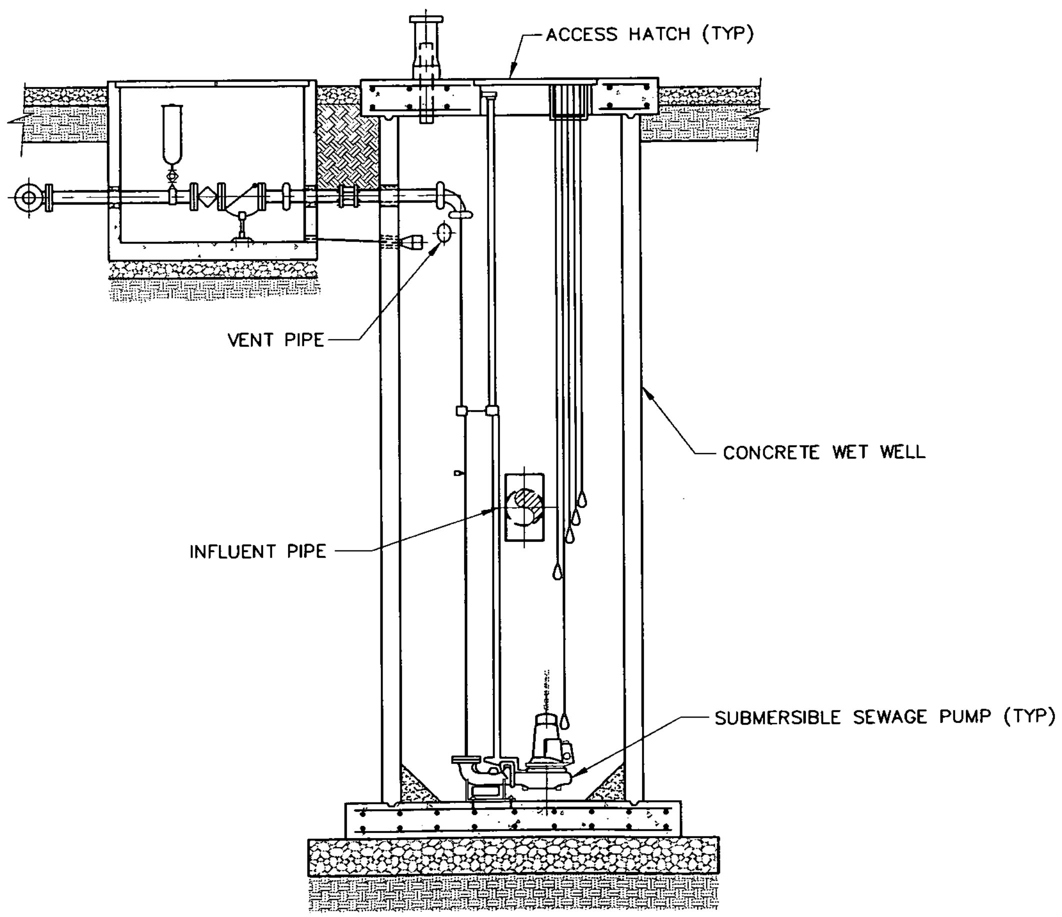
Parameter	Value
Purpose	Pump raw wastewater to WWTP facilities
Type	Submersible non-clog centrifugal
Quantity	Three (Lead-Lag configuration, 2 duty, 1 standby)
Controls	Constant speed, level switch start and shutoff
Other Features	Motorized Grinder, Odor Control, Remote control and monitoring



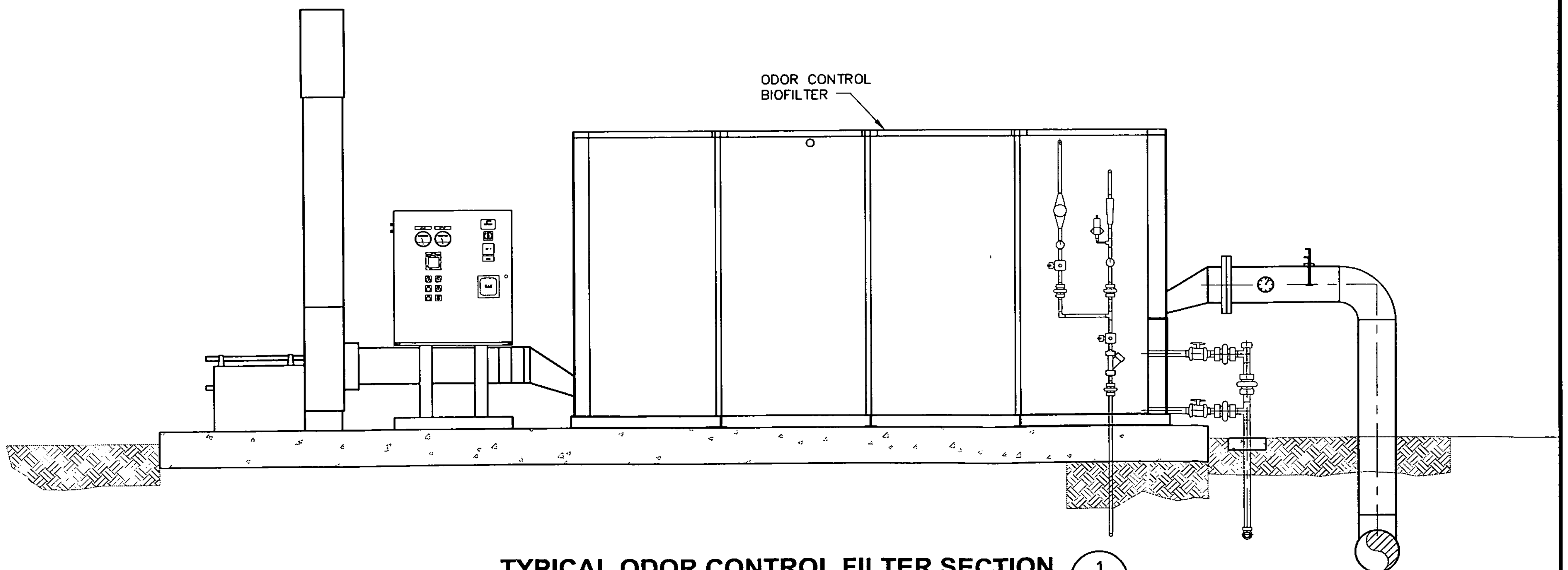
TYPICAL INFLUENT LIFT STATION PLAN
NTS



TYPICAL ODOR CONTROL FILTER PLAN
NTS



TYPICAL INFLUENT LIFT STATION SECTION (1)
NTS



TYPICAL ODOR CONTROL FILTER SECTION (1)
NTS

HydroScience Engineers, Inc.

Figure 5-7
North Fork Hotel and Casino
Water and Wastewater Feasiblity Study
Typical Influent Lift Station and Odor Control Filter Plan and Section

5.2.2 Wastewater Quality

The wastewater influent to the treatment plant is expected to have a strength exceeding that typically found in municipal wastewater. **Table 5-5** summarizes the expected range of influent wastewater quality. These concentrations are based on water qualities observed at other similar facilities.

Table 5-5: Typical Casino Influent Wastewater Quality and City of Madera Limits

	Units	TSS	BOD
Casino with Hotel	mg/L	250	430
City of Madera Limits	mg/L	180	200

5.2.3 Wastewater Treatment Process

Due to its ability to reliably produce high-quality effluent, MBRs are recommended to treat wastewater for the project. They are widely used throughout the country for flows up to 5.0 million gallons per day (MGD) and are ideal for the project where reliable wastewater treatment is critical to meeting strict discharge standards. The primary reasons for selecting an MBR for wastewater treatment for the North Fork Hotel, casino, or retail alternatives are:

- Ability to comply with Title 22 criteria for on-site irrigation of landscaping
- Ability to nitrify/denitrify to meet low nitrate requirements in the Basin Plan – Central Valley Region 5 (RWQCB, 1998).

The MBR is a state-of-the-art, advanced wastewater treatment process that utilizes membrane technology, comparable to that used for production of potable water. The membranes are classified as microfiltration (MF) and have microscopic pores that strain solids greater than 0.1 micrometer (μm) to produce effluent with a very low solids concentration. MBRs are also known for high rates of organics removal and can be further designed to achieve removal of nutrients, such as nitrogen (e.g. ammonia, nitrates, and nitrite) and, to a limited extent, phosphorous. Typical effluent from an MBR process includes:

- < 1 mg/L BOD,
- < 0.2 mg/L NH_4 (Ammonium) –N,
- < 8 mg/L NO_3 (Nitrate),
- < 2.2 MPN/100 mL total coliform, and
- < 0.1 NTU.

Compared to alternative wastewater treatment designs, MBRs are able to more reliably and consistently produce high-quality effluent ideal for a variety of disposal and reuse alternatives. For systems treating to a tertiary level, the cost of the MBR system also becomes competitive with more conventional treatment processes. The non-economic advantages and disadvantages of the MBR system are summarized in **Table 5-6**.

Table 5-6: Non-Economic Advantages and Disadvantages of the MBR

Advantages	Disadvantages
Small footprint.	Requires fine screening.
Extremely high-quality effluent; state-of-the-art treatment.	Limited equipment manufacturers.
Achieves nitrogen removal.	Relatively new process.
Combines clarification and filtration with oxidation process.	Requires emergency storage basin.
High MLSS provides resistance to loading shocks.	
Does not produce an odor nuisance.	
Certified for CCR Title 22 use by California DHS.	
Significantly reduces disinfection requirements.	
Provides pretreatment for TDS removal by RO.	

While the area around the proposed site is rural to the north and west, a housing development is proposed to the southwest. Future urbanization may occur surrounding the site, so the proposed on-site wastewater treatment plant will be sited with this in mind. An MBR plant has a small footprint and can be above or below ground. Plant equipment can be shielded from sight with landscaping and operations buildings can be designed to be aesthetically pleasing. Even above ground MBR plants can be architecturally enhanced to blend with the site surroundings. For example, a plant in Europe was made to resemble an old cottage-like building and in the United States, a plant made to resemble a clubhouse was installed at a golf course. Wastewater treatment plants in the past were usually ponds where physical removal of suspended solids and organic matter by sedimentation occurred, where often there were objectionable odors that made it necessary to site them away from urban development. Even then, odor complaints were a common problem. The MBR process, however, does not produce odors. MBR plants have been used at numerous sites with no odor complaints. A local example in California is Thunder Valley Casino, which has an MBR plant adjacent to its parking lot.

This section provides a description of the recommended wastewater treatment facilities required for the North Fork project. A process flow diagram using an MBR for treatment and spray fields or subsurface leach fields for disposal is shown in **Figure 5-8.** A preliminary water and WWTP layout with recycled water is shown in **Figure 5-9**.

5.2.4 Headworks

The raw influent would be pumped by the collection system pump station through the headworks facility (**Figure 5-10**). After flow measurement, influent would be routed to a covered headworks influent box for distribution to two influent channels. During normal operation, one channel would be in-service, with the other available as a standby. Slide gates would control flow to each channel. Each headworks channel would be sized to match the hydraulic capacity of the plant. Within the channels would be fine screens to remove inorganic materials from the raw influent. **Table 5-7** shows some of the design criteria for the headworks facility.

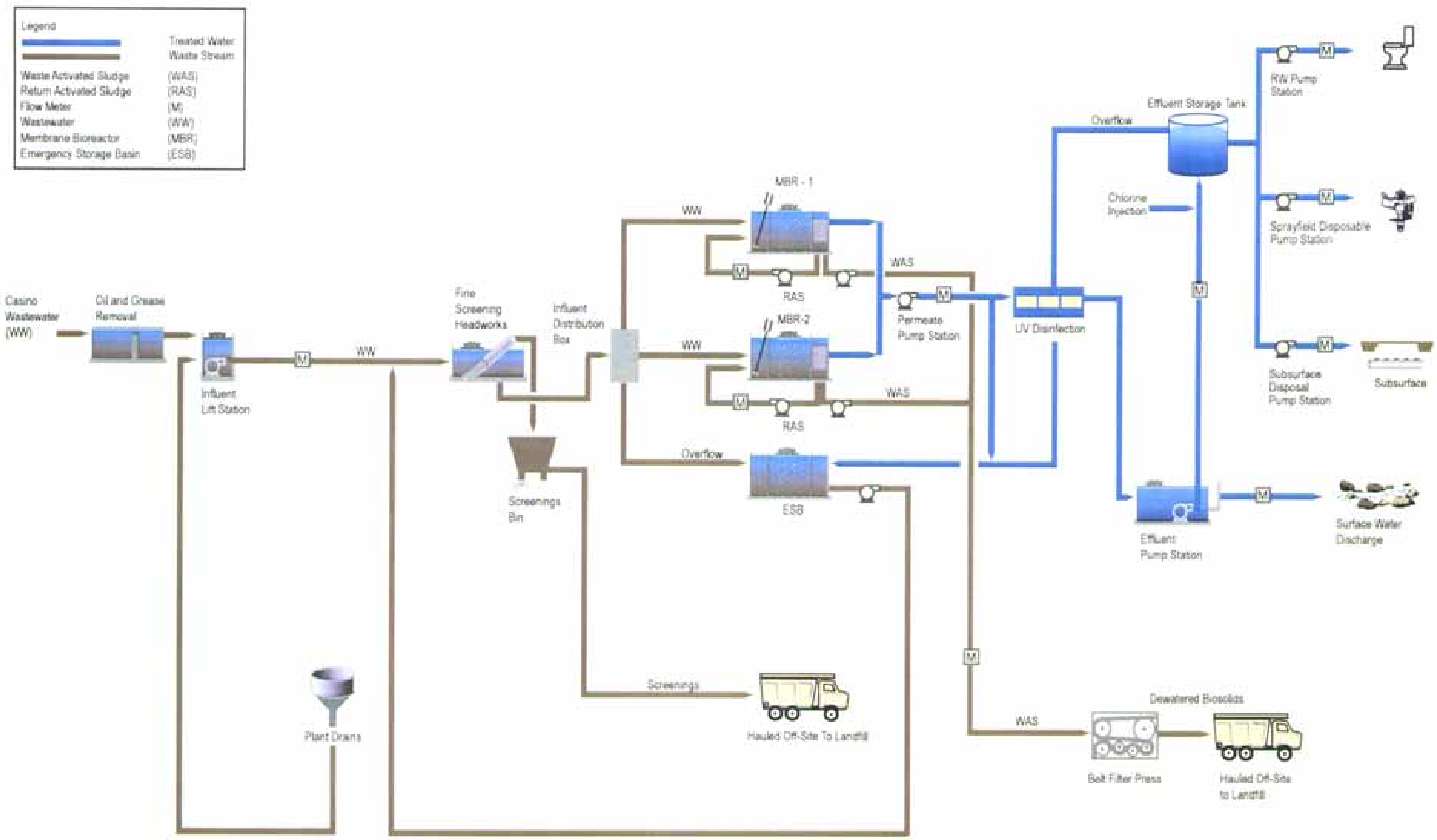


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Figure 5-8
North Fork
Water and Wastewater Feasibility Study
MBR Wastewater Treatment Process Flow Diagram

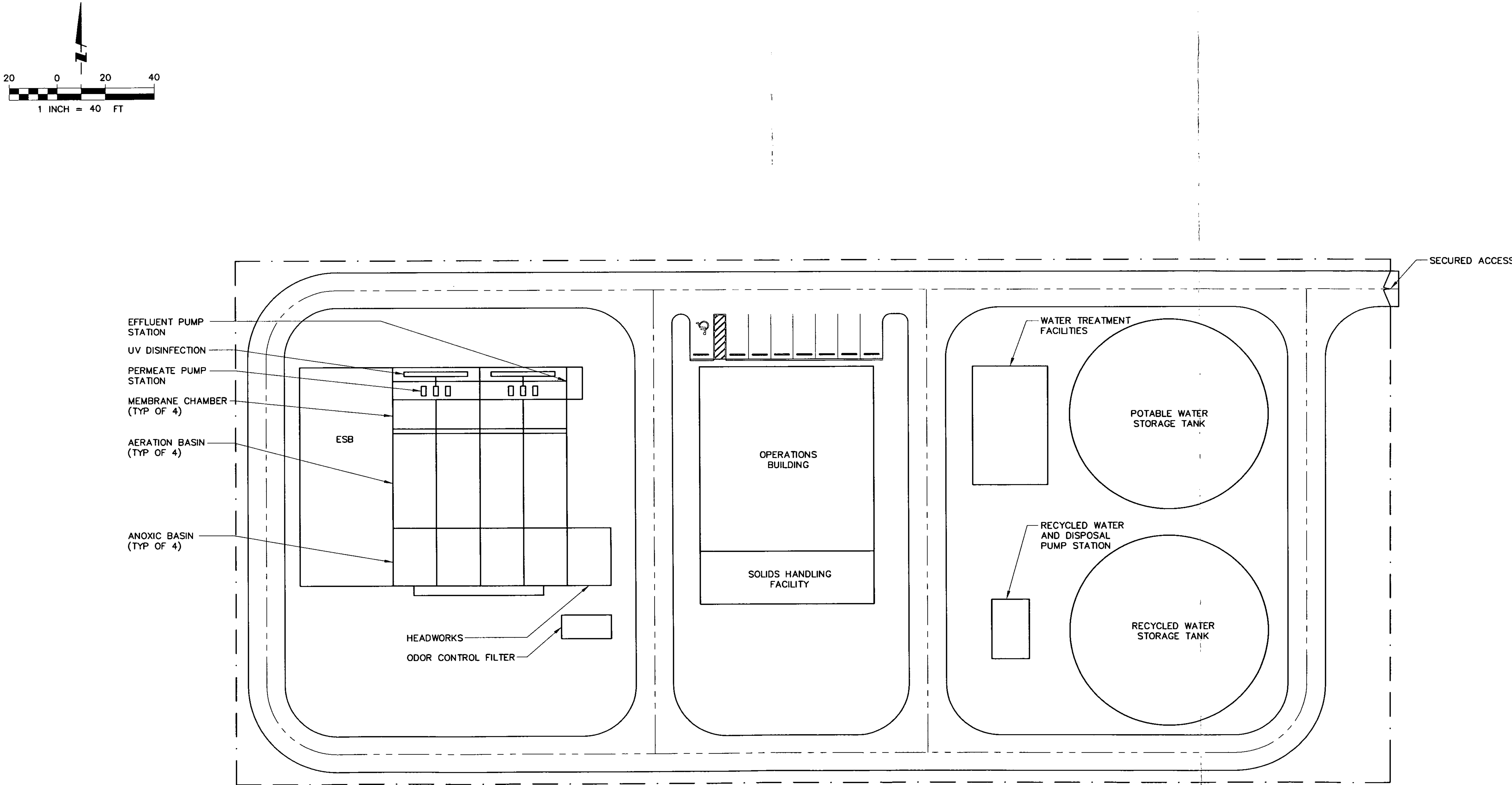

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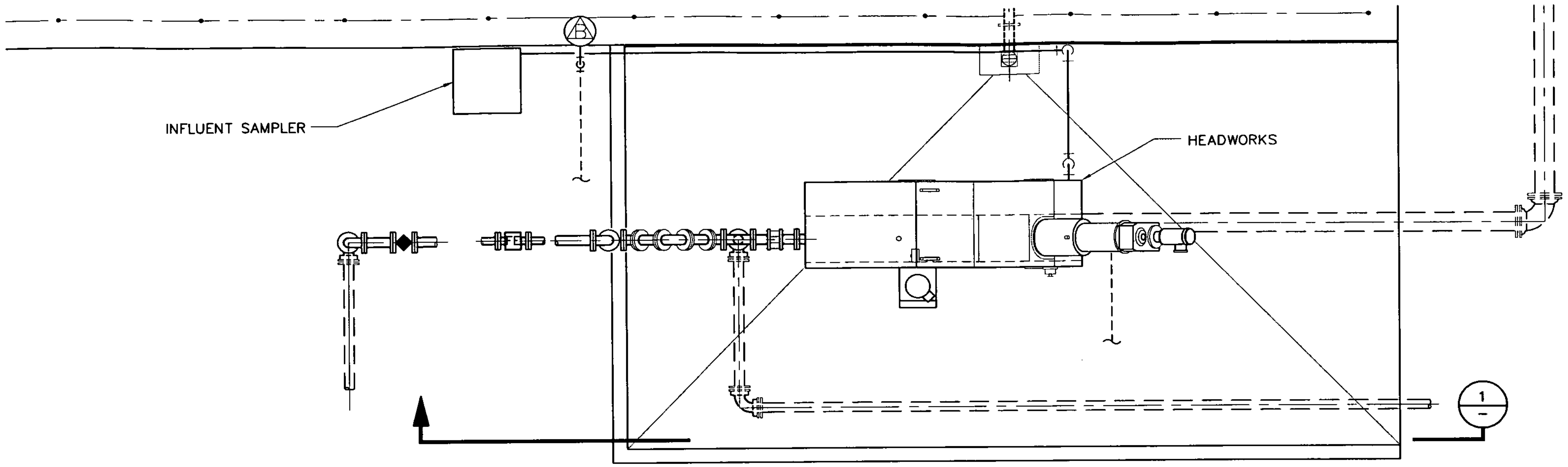
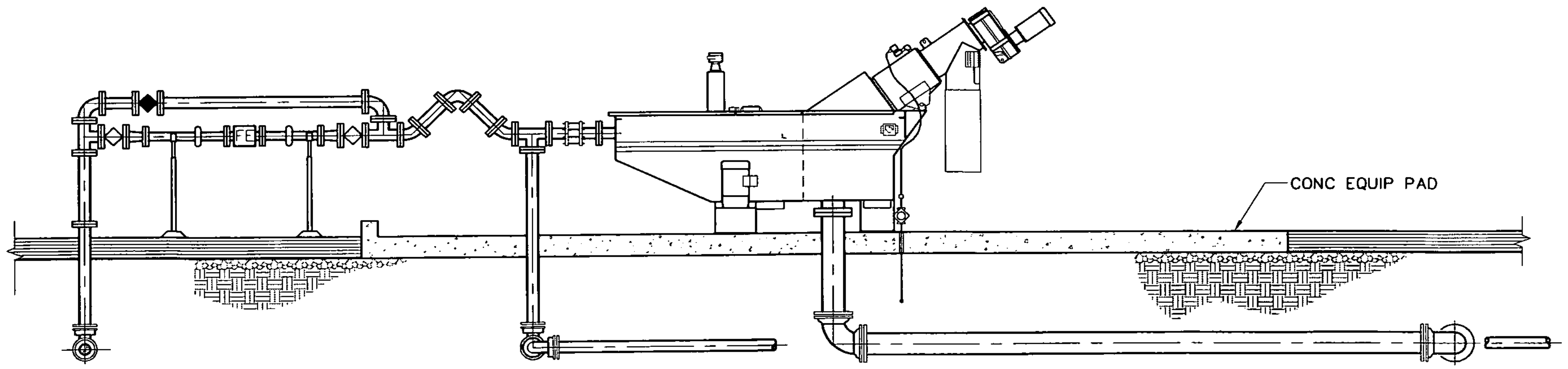
Figure 5-9
North Fork Hotel and Casino
Water and Wastewater Feasibility Study
Preliminary Water and Wastewater Treatment Plant Layout



TYPICAL INFLUENT METERING STATION AND HEADWORKS PLAN

NTS



TYPICAL INFLUENT METERING STATION AND HEADWORKS SECTION

NTS

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Figure 5-10

North Fork Hotel and Casino

Water and Wastewater Feasiblity Study

Typical Influent Metering Station and Headworks

Table 5-7: Headworks Design Criteria

Component	Criteria
Screening facilities	Enclosed cylindrical screen with 1 to 3-millimeter circular perforations, integral shaftless helical scraper/conveyor and compactor, mechanical washer to break up fecal material
Metering facilities	Magnetic flow meter on influent pipe
Odor control	Corrosion resistant plate covered channels, soil filter
Control	Continuous operation
Other Features	Equipping the treatment facility with an additional unit provides redundancy

5.2.5 Immersed Membrane Bioreactor System

An MBR WWTP is recommended because of the ease of permitting the plant due to the high quality effluent, and the effluent's potential suitability for either reuse or discharge. Sewage would travel between the headworks and the MBRs within a covered influent distribution force main. The force main would pass through headworks to an influent distribution box that would evenly distribute the flow to the two MBR process trains. Sluice gates would be provided to isolate basins for maintenance.

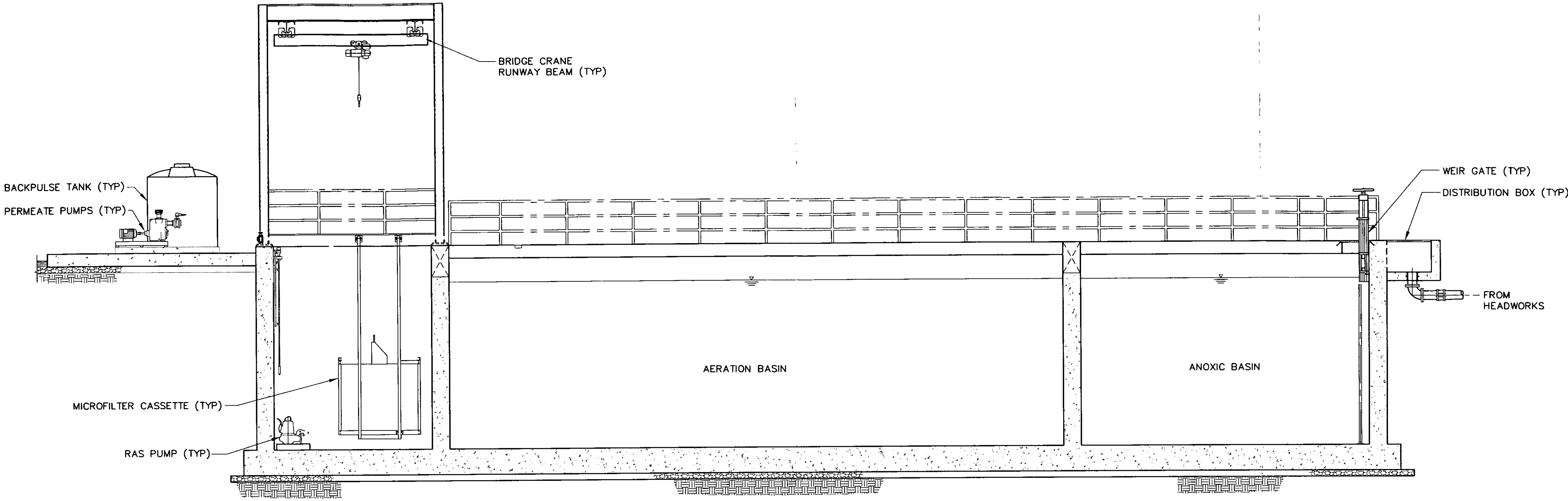
Each MBR process train is divided into two sections; an anoxic section, and an aerobic section containing the immersed membranes. Recommended minimum design criteria for MBRs are shown in **Table 5-8**. The project design engineer would determine final design criteria. A single process train is designed to handle peak wastewater flows, and a second train is often provided for full redundancy. Also, additional storage basins are typically designed into the system as emergency storage. These basins are designed to prevent leakage and are not located near drinking water wells under the Source Water Protection Program (Section 3.6). A typical MBR section is shown in **Figure 5-11** and a typical MBR plan is shown in **Figure 5-12**.

Table 5-8: Recommended Minimum MBR Design Criteria

		Alternative			
Parameter	**Unit**	**A**	**B**	**C**	**D**
Weekend day flow [a]	gpd	350,000	210,000	30,000	30,000
MBR Process Trains	trains	2	2	2	2
Process train basins		Anoxic basin, aeration/microfiltration membrane (all basins concrete).			

[a] See Tables 2-1 through 2-4. Rounded up to nearest 10,000.

Anoxic/Denitrification Basins: An anoxic/denitrification basin can be provided, if required, for nitrate removal in each process train. Nitrate removal will be accomplished by an anoxic suspended growth bacterial process. In the absence of oxygen, denitrifying bacteria obtain energy for cell growth from the conversion of nitrates to nitrogen gas. Recirculated mixed liquor from the membrane basins will be continuously pumped to the anoxic basin at a rate of approximately 3 (recirculated flow) to 1 (raw wastewater flow). The recirculation of mixed liquor provides a continuous feed of nitrified wastewater and bacteria for denitrification. The incoming raw wastewater provides a continuous carbon source for denitrifying bacteria cell synthesis. In addition, some carbon will be supplied in the recirculated biomass through endogenous decay. From the



TYPICAL SECTION
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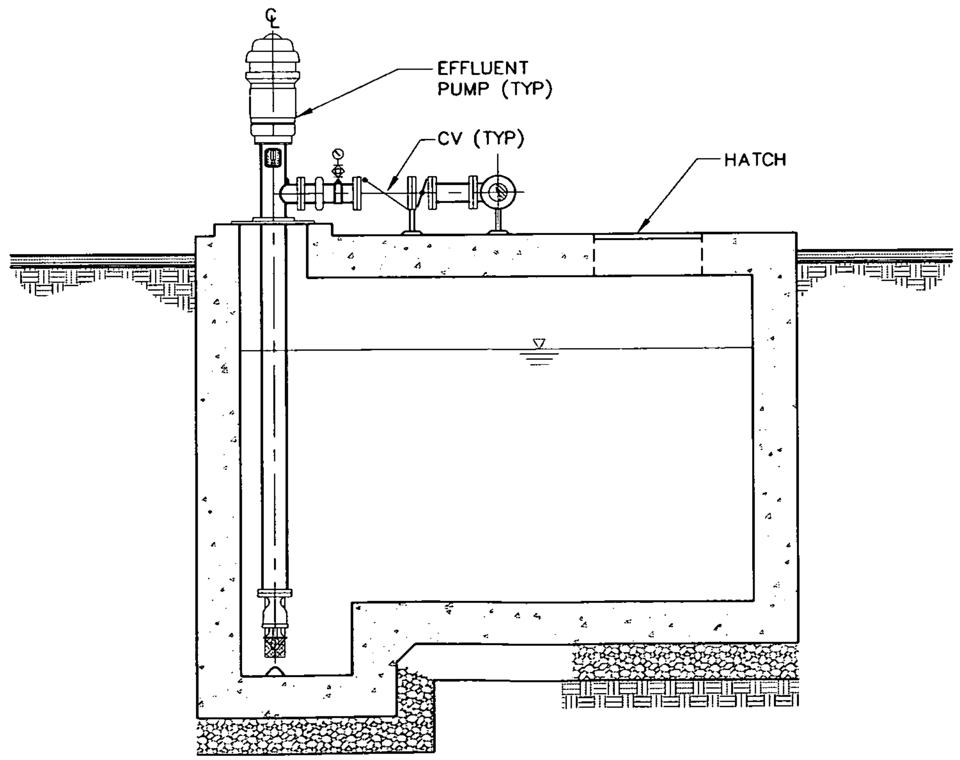

TYPICAL EFFLUENT PUMP STATION SECTION
NTS

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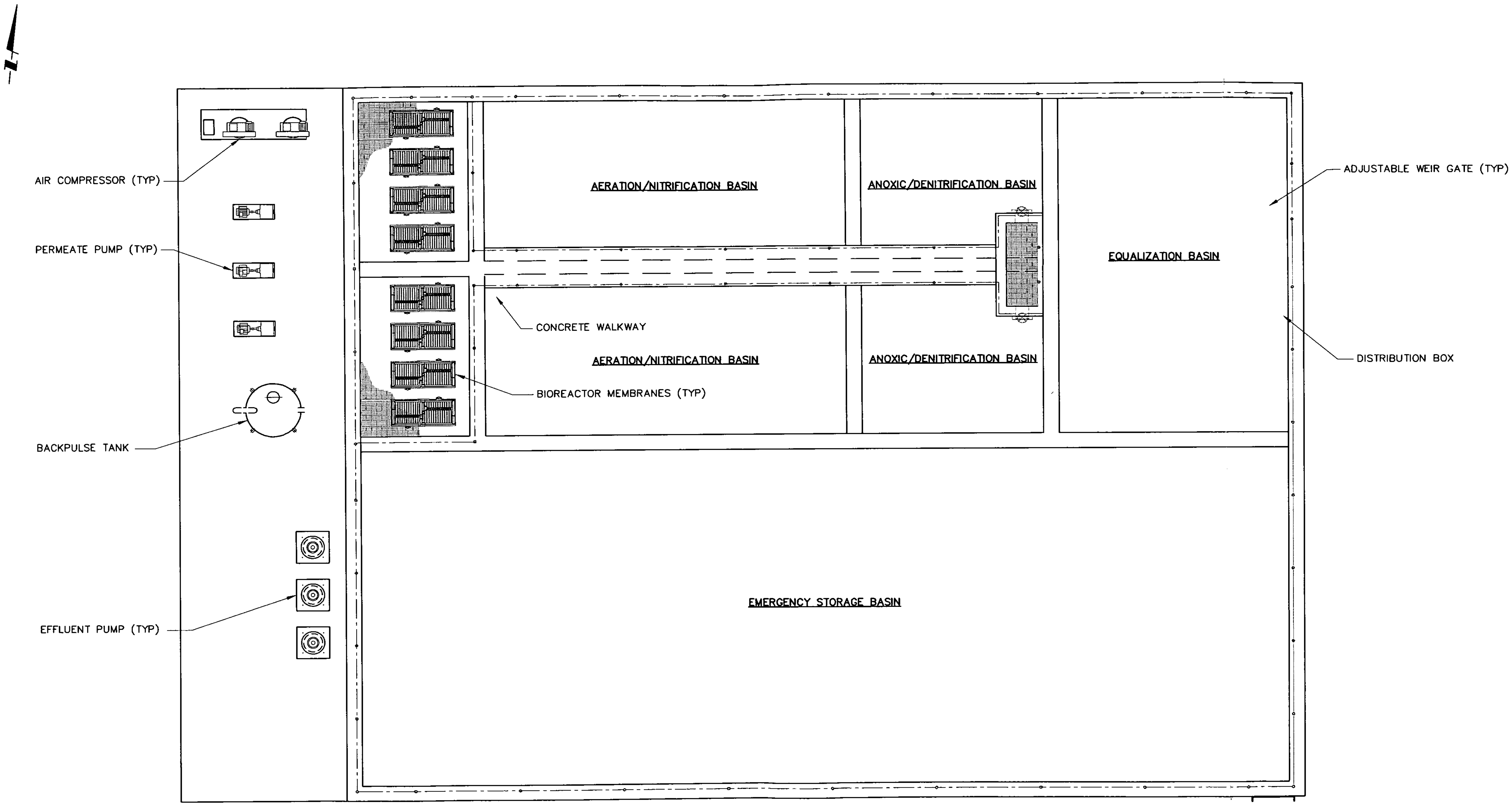
Figure 5-11
North Fork Hotel and Casino
Water and Wastewater Feasiblity Study
Typical MBR Section



PLAN

SCALE: 3/16" = 1'-0"

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Figure 5-12
North Fork
Water and Wastewater Feasibility Study
Typical MBR Plan

anoxic/denitrification basins, the wastewater flows through wall openings to the aeration basins. Typical anoxic basins are shown in **Figures 5-11 and 5-12**.

Aeration/Nitrification Basins: An aeration/nitrification basin will be provided for each process train. Dissolved BOD will be converted into filterable solid material by an aerobic suspended growth process. In this process, aerobes use carbon in the wastewater for energy and cellular synthesis. The recirculated mixed liquor entering the aeration basin from the anoxic basin provides a continuous source of bacteria. Conversion of ammonia to nitrates (nitrification) occurs in the aeration basin. Nitrifying aerobic bacteria incorporate ammonia-nitrogen into respiration and cell synthesis processes and produce nitrates as a byproduct. A fine bubble diffuser system will be installed at the bottom of the aeration tank to provide the oxygen required for the biological processes. Air will be supplied by process air blowers (see Blowers below). Typical aeration basins are shown in **Figures 5-11 and 5-12**.

Membranes: The membranes have a nominal pore size of 0.1 to 0.4 microns, depending on the manufacturer. The membranes are located at one end of the aeration basins, opposite the anoxic basins. Membrane cassettes are immersed in the mixed liquor in the membrane basin. Wastewater flows from outside through the membrane to the hollow inner portion. Wastewater that has passed through the membranes is called *permeate or tertiary-treated effluent.*

Scour Air: Scour air will be continuously applied (coarse bubble) at the bottom of the membrane cassettes. The air is supplied by a scour air blower (see *Blowers* below). As the scour air moves up through the membranes, the air removes solids that otherwise accumulate between and on the surface of the membrane modules. A typical microfiltration membrane layout is depicted in **Figures 5-10 and 5-11**.

Membrane Cleaning System: The membranes are periodically cleaned using a backpulse or relax mode, depending on the manufacturer. A PLC controls the timing and sequencing of the cleaning operation. Generally, membrane cleaning occurs every 15 minutes to an hour and lasts for approximately 1 or 2 minutes. During membrane cleaning, solids that accumulate on the surface of the membranes are removed.

Sodium hypochlorite will be injected into the backpulse flow during a period of the backpulse sequence to inhibit biogrowth in the membrane modules. One chemical metering pump is dedicated to the backpulsing cycle.

Process Equipment Area: The permeate pumps, backpulse storage tanks, piping, and valves associated with the MBR process are typically located on a concrete slab at the end of the MBR basins, as shown in **Figure 5-12**.

Blowers: As indicated above, a set of blowers supplies process air to the fine bubble diffuser systems in the aeration basins to support the biological treatment processes. A second set of blowers provides scour air to the microfiltration membranes. Positive displacement blowers driven by electric motors are proposed. Positive displacement blowers provide a constant airflow under varying water level (head) conditions. The blowers are located in a blower room in the Operations Building (**Figure 5-9**).

Solids Handling: The WAS will be dewatered using a belt filter press or other equivalent type of dewatering equipment prior to disposal into a waste bin. The dewatered solids will periodically be picked up and transferred to a landfill. A typical plan and section for a belt filter press is shown in **Figure 5-13.**

5.2.6 UV Disinfection

Disinfection to meet discharge and reclamation virus and coliform water quality standards would be provided by constructing an UV disinfection system adjacent to the MBR. UV disinfection facilities are typically contained within a long, narrow steel channel tank, with banks of UV lamps situated in a laminar flowing channel. A weir would control the water level in the channel, ensuring that the lamps are always submerged. Each UV lamp emits a light with a specific wavelength that is capable of inactivating bacteria and virus, preventing them from reproducing. **Table 5-9** shows a summary of the recommended UV disinfection design criteria. A typical UV disinfection plan is shown in **Figure 5-14**.

Table 5-9: UV Disinfection Design Criteria

Parameter	Value
Lamp location	Inline
Type of lamps	2020 Watt medium pressure UV lamps
Transmittance	65% through quartz sleeve
Flow metering	Magnetic flow meter

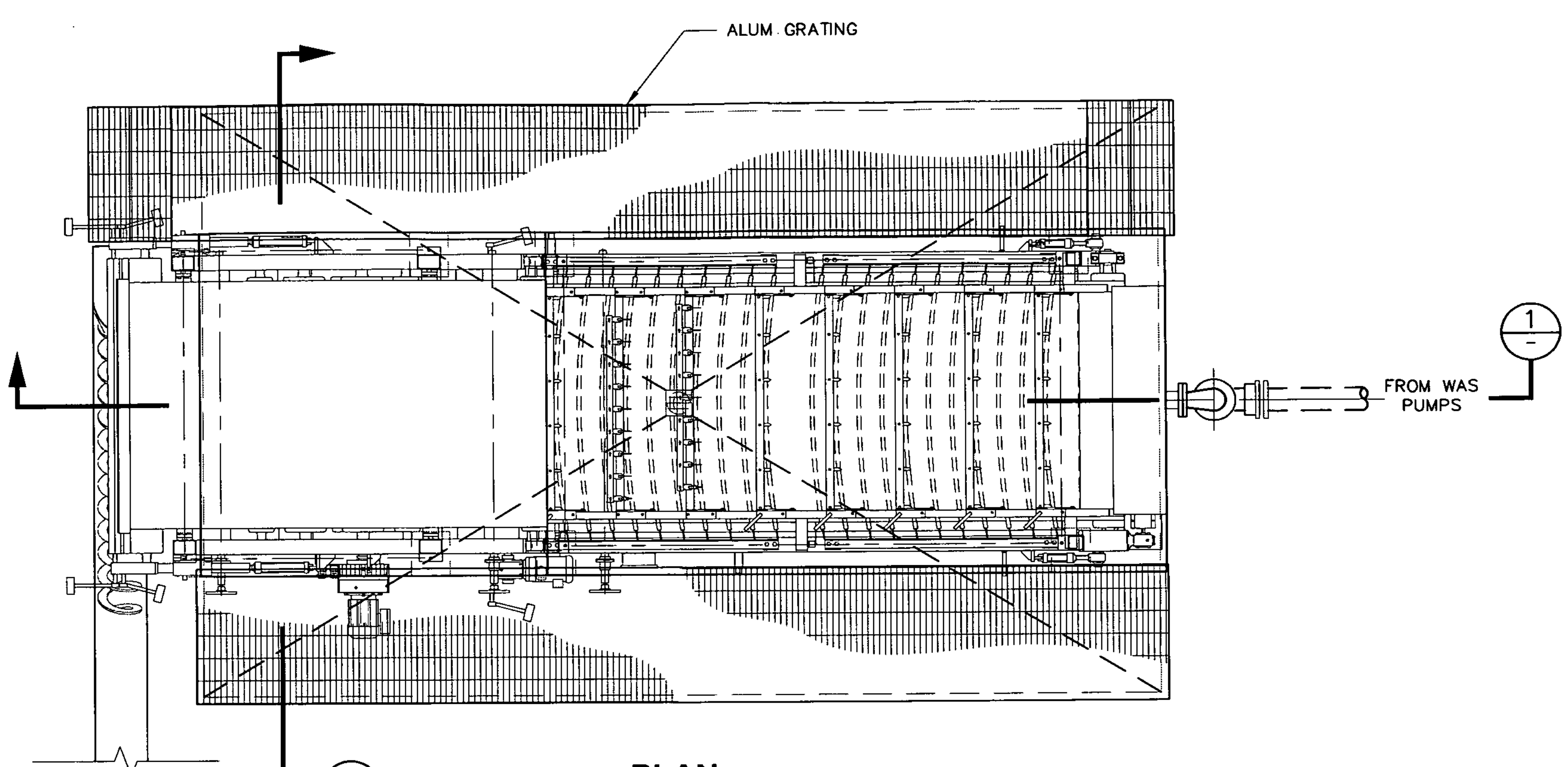
5.2.7 Chlorine Disinfection

Though the UV facilities would be designed to disinfect the treated wastewater, they do not continue to disinfect the wastewater after it leaves the UV channel. In order to prevent regrowth of bacteria in the recycled water distribution system, sodium hypochlorite is typically added in small quantities. The introduction of this chemical creates a residual concentration of chlorine that persists in the recycled water, and ensures that it is safe to use after it leaves the wastewater treatment facility.

Typical recycled water distribution systems require at least a positive chlorine residual at the point of use, and the dosing of sodium hypochlorite will be adjusted to meet this goal. It is believed that a dose of between 2-3 mg/l for recycled water used for on-site irrigation, cooling, or toilet/urinal flushing would suffice. Chlorine would be dosed at a location downstream of the UV disinfection facilities, and before recycled water is pumped to the recycled water storage tank.

5.2.8 Biosolids Disposal

If on-site wastewater treatment is selected, biosolids produced by the treatment plant must also be disposed of in accordance with the CCR, Water Code, Resource Conservation and Recovery Act, and the RWQCB policy. These regulations are commonly referred to as the 40 CFR Part 503 Biosolids Rule promulgated by the EPA. It is not anticipated that biosolids produced by the project WWTP will be able to comply with these guidelines, due to the lack of a pathogen reduction process capable of producing Class A or Class B biosolids. The biosolids produced by the North Fork project will be dewatered, utilizing a belt filter press, and hauled off-site and disposed of at a designated landfill.



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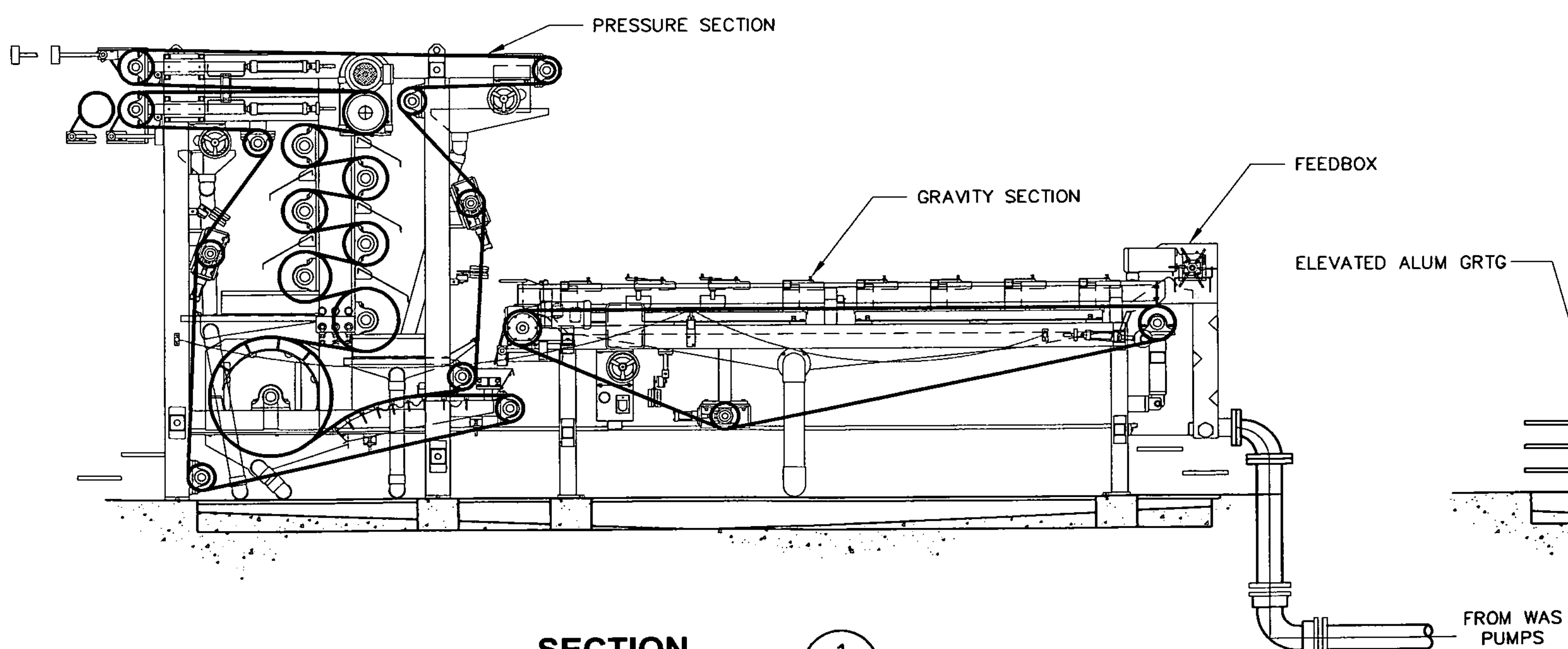

SECTION 1
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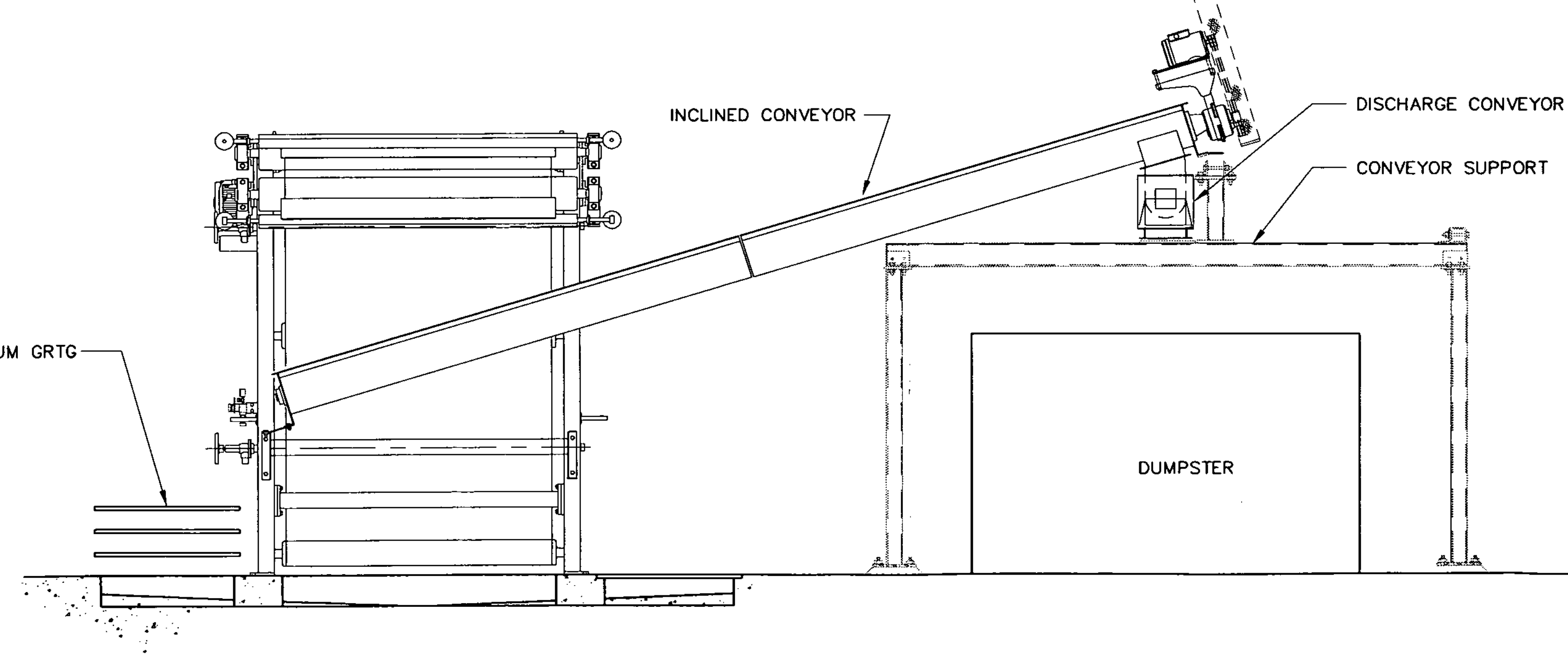

SECTION 2
NTS

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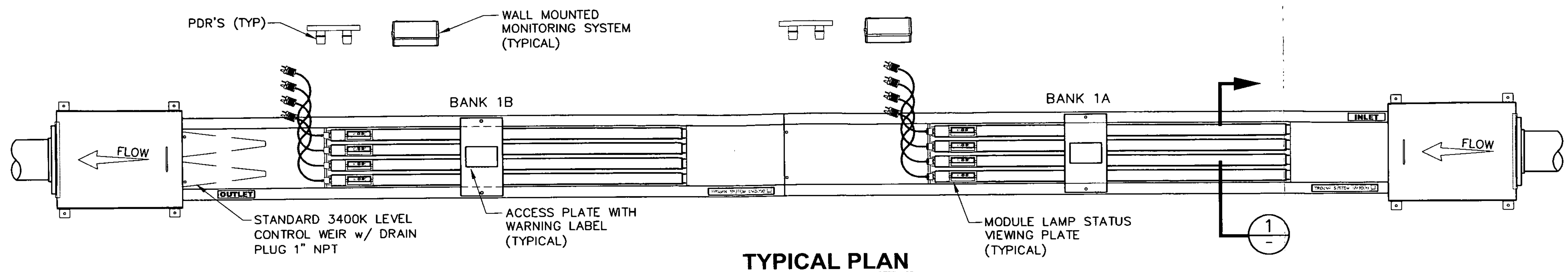
Figure 5-13
North Fork
Water and Wastewater Feasibility Study
Typical Belt Filter Press Plan and Section



TYPICAL PLAN
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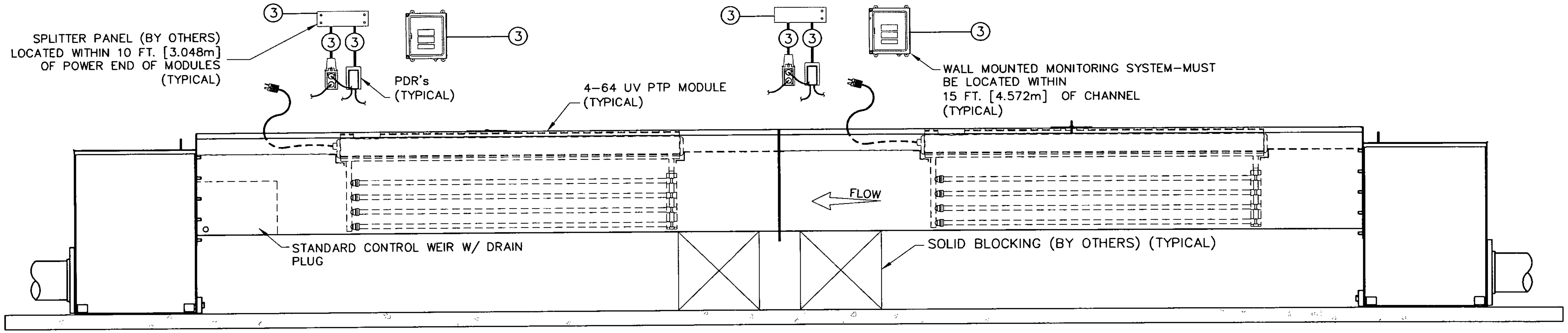

TYPICAL SECTION
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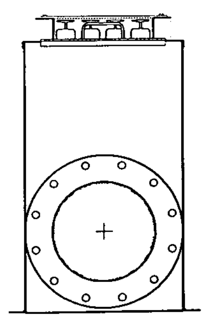

END VIEW
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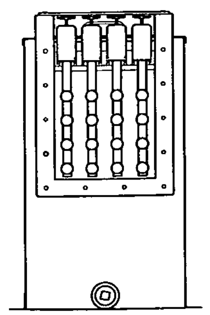

SECTION
NTS

1
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Figure 5-14
North Fork
Water and Wastewater Feasiblity Study
Typical UV Disinfection Plan and Section

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5.3 Effluent Disposal and Reuse Facilities

This section discusses the recommended design criteria for the North Fork project's recycled water facilities. The recommended on-site recycled water facilities include:

- Recycled Water Storage Tank
- Recycled Water Pump Station
- On-site Landscape Irrigation/Dual Plumbing Facilities
- Spray Fields
- Subsurface Leach Fields

Each of the recycled water facilities is described in the following sections. The overall recycled facilities will be located based on the final design of the project facilities. All of the recommended water supply facilities described in this Chapter are preliminary, and should be utilized for planning purposes only.

5.3.1 Recycled Water Storage Tank

The purpose of this tank would be to provide equalization storage for on-site recycled water use for toilet flushing, on-site landscaping, spray fields, subsurface leach fields, and other uses. If desired, recycled water could be utilized to supply water for fire protection, such as the sprinkler systems and fire hydrants.

A typical section for the tank would be similar to the potable water tank shown in **Figure 4-5**. The recycled water storage tank would be constructed near the water treatment plant site. Since the Madera site is relatively flat, the tank would not be able maintain pressure via gravity in the recycled water distribution system. The North Fork site varies in topography and depending on the elevation difference between the recycled storage tank and the various facilities, a recycled booster station may be required to maintain pressure in the recycled water distribution system. The storage tank would also be similar to the potable water storage tank with respect to construction methods. The preliminary estimates of the tank's dimensions are presented in **Table 5-10.** The final size of the recycled water tank is dependent on the recommended wastewater disposal strategy.

Table 5-10: Recycled Water Storage Tank Preliminary Design Criteria

	Alternative			
Parameter	**A**	**B**	**C**	**D**
Approximate size	900,000 gal	550,000 gal	100,000 gal	100,000 gal
Construction	Welded steel	Welded steel	Welded steel	Welded steel

5.3.2 Recycled Water Pump Station

Up to four separate recycled water pump stations are required for the recycled water facilities. All of the required pump sizes and the pump configuration would be determined during design. However, the strategy described below assumes that recycled water is produced and maximized on-site, and that the flows are similar to those identified in Section 2.

The first pump station would transfer tertiary disinfected treated wastewater from the WWTP to the recycled water storage tank. The second pump station would deliver water from the recycled water storage tank to the project's recycled water facilities. The third and fourth pumps would be used for disposal and if only one disposal alternative is selected, only one pump would be necessary. However, both pump stations would be needed if spray fields and subsurface leach fields were both used as part of the recommended wastewater disposal strategy.

5.3.3 On-site Recycled Water Facilities

If water is reused for the casino, then the casino building will need to be dual-plumbed with both potable and recycled water. The primary uses of recycled water will be for toilet flushing, on-site landscape irrigation, and cooling water. The on-site recycled water reuse facilities will be designed to ensure that they comply with all DHS standards. The required on-site facilities will be identified upon completion of a site plan and preliminary engineering. The primary on-site design requirements include:

- Recycled water irrigation facilities marked in a purple color.
- Signage informing the public recycled water is used.
- Pipelines in separate trenches a minimum distance away from other water pipelines.
- Labeling of recycled water valves, boxes, and sprinkler heads.

Within the building, the interior plumbing system will have to be plumbed separately from the building's potable water system, and contain no cross connections. The dual plumbing piping systems must be distinctly marked and color-coded.

5.3.4 Spray Field System

There is no existing network of recycled water conveyance pipes located on the proposed project sites. It will be necessary to construct recycled water transmission piping from the treatment plant site to the spray fields.

The spray fields would be irrigated using traditional rows of impact head sprinklers mounted on wheels. The sprinklers would be moved within the spray field site as needed to ensure even application of recycled water and to minimize the piping infrastructure required.

5.3.5 Subsurface Leach Fields

The loading rate of a subsurface disposal field or leach field is limited by the project site's soil characteristics and ability to accept and move water vertically and horizontally away from the disposal site. The quality of the wastewater effluent being sent to a leach field also greatly affects the loading rate. As a reference, Table 4-3 of the EPA Onsite Wastewater Treatment System Manual (EPA, 2002) shows higher soil loading rates for a high quality effluent with a BOD_5 of 30-mg/L than that from a conventional on-site system with a BOD_5 of 150-mg/L. The reduced organic loading on the leach field soils reduces the risk of soil clogging and system failure, increases the lifespan of the leach field, and increases the hydraulic loading rate. The higher loading rate allows for a smaller disposal field.

6.0 Conclusions and Recommendations

Each of the four project alternatives was evaluated and found to be feasible in terms of water, wastewater, and recycled water service. The potable water supply requirements can be satisfied through either on-site wells or from either the City of Madera or the City of North Fork. Wastewater service could be provided by the City of Madera or the County-operated WWTP serving the City of North Fork. Specific conclusions are summarized below.

6.1 Wastewater Treatment

It is recommended that wastewater treatment be one of the following for the selected project alternative:

1. City of Madera WWTP (Alternatives A, B, and C)
    a. See Section 5.1.5
    b. Requires a connection to the City sewer system (see **Figure 5-6**)
    c. May require expansion of an existing sewer lift station
    d. Requires monthly fees
    e. Advantages: (1) lower capital costs; and (2) disposal of treated wastewater and biosolids is the City's responsibility
    f. Disadvantages: (1) monthly fees; (2) no ability to recycle; (3) pretreatment or additional fees required to meet BOD and TSS limits; and (4) uncertainty of adequate capacity if future expansion is desired

2. County of Madera WWTP for the City of North Fork (Alternative D)
    a. See Section 5.1.6
    b. Requires expansion of existing or construction of new County WWTP
    c. Requires a connection to the North Fork sewer system
    d. May require expansion of existing or construction of new sewer lift stations
    e. Requires monthly fees
    f. Advantages: (1) lower capital costs; and (2) disposal of treated wastewater and biosolids is the County's responsibility
    g. Disadvantages: (1) monthly fees; (2) no ability to recycle water; and (3) uncertainty of adequate capacity if future expansion is desired

3. On-site WWTP (Alternatives A, B, C, and D)
    a. See Section 5.2.
    b. Requires conveyance and treatment facilities be built and operated on-site.
    c. Advantages: (1) provides tertiary-treated effluent, (2) recycled water may be used for toilets, urinals, cooling towers, and landscape irrigation, (3) provides greater flexibility for disposal options; and (4) can accommodate future expansion, if needed
    d. Disadvantages: (1) requires on-site construction; (2) requires on-site operation; and (3) responsible for disposal of treated wastewater and biosolids

If connection to a municipal or county wastewater treatment plant is infeasible, it is recommended that a tertiary wastewater treatment plant capable of producing high quality effluent suitable for reuse be constructed. As recycled water becomes available for use, it is recommended that it be supplemented for toilet flushing, landscape irrigation, and process water in the cooling towers.

If on-site treatment is selected, it is recommended that wastewater disposal be either (1) via surface water disposal; (2) spray field disposal; or (3) through a combination of spray field disposal, and leach field disposal. For any of these alternatives, it is recommended that water be recycled to reduce wastewater disposal requirements. **For on-site disposal, the following tasks should be performed concurrently**:

1. Conduct percolation testing for leach field design
2. Conduct a limited hydrogeological evaluation to identify possible siting constraints
3. Apply for an NPDES permit for discharge to the on-site creek at either site

6.1.1 Lift Stations

Wastewater collection would likely require lift stations. Due to the topography on the two proposed project sites, lift stations would likely be required to collect and convey raw wastewater from the facilities to the WWTP.

6.1.2 On-Site MBR WWTP

MBR technology is recommended for the on-site WWTP, if connection to the City of Madera or to the County WWTP serving the City of North Fork is infeasible. MBRs represent state-of-the-art technology for treatment of wastewater to extremely high levels of treatment. MBRs are easy to permit for multiple disposal options. MBRs have a history of successful performance at gaming facilities in California and have been approved by the California DHS for a wide range of reuse applications. This process not only produces high-quality effluent, but it does so consistently and reliably. MBR facilities are compact systems ideal for close proximity to populated areas. Noise from mechanical equipment, which is typically enclosed in buildings, can be attenuated and nuisance odors mitigated. Tertiary treatment using an MBR is recommended because it can produce treated water that is in compliance with Title 22 criteria for on-site irrigation of landscaping and provides greater flexibility for disposal and reuse options.

Table 6-1 contains a summary of the demands and flows for the four project alternatives. Preliminarily, the MBR should be sized for the weekend design capacity of the selected project alternative. The maximization of recycled water use reduces the potable water demand, thereby reducing impacts to on-site water sources and saving on the annual cost for water supplied by outside water distributors.

Table 6-1: Summary of Demands and Flows

	Units	Alternative A	Alternative B	Alternative C	Alternative D
Recycled Water					
Average Day Recycled Water Demand (without landscape irrigation demand) [a]	gpd	107,000	65,000	7,000	8,000
Recycled Water Storage [b]	gal	900,000	550,000	100,000	100,000
Water					
Water Demand if Water is not Recycled [c]	gpd	400,000	260,000	20,000	30,000
Water Demand if Water is Recycled [d]	gpd	280,000	170,000	20,000	20,000
Recommended Pumping Rate without Recycled Water [e]	gpm	420	270	30	30
Recommended Pumping Rate with Recycled Water [e]	gpm	290	180	20	20
Domestic Water Storage [f]	MG	1.2	1.0	0.6	0.6
Wastewater Treatment					
Weekday flow [g]	gpd	240,000	150,000	10,000	20,000
Weekend flow [g h]	gpd	350,000	210,000	20,000	30,000
Average day flow [i]	gpd	270,000	160,000	20,000	20,000
Wastewater Disposal					
Average Day Disposal Flows if Water is not Recycled [g]	gpd	270,000	160,000	20,000	20,000
Landscape Irrigation [j]	acres	4	4	1	1
Spray Disposal Only [j]	acres	29	18	2	2
Seasonal Storage Basin for Spray Disposal Only [j]	MG	43	28	4	4
Sub-Surface Disposal Only [j]	acres	78	46	5	5
Seasonal Storage Basin for Sub-Surface Disposal Only [j]	MG	4	4	2	2
Combination of Spray and Sub-Surface Disposal [j]	acres	31	15	2	2
Seasonal Storage Basin for Spray and Sub-Surface Disposal [j]	MG	31	21	3	3

[a] Estimated at 40% of average day domestic water demand. See Table 2-7.

[b] Operational storage only. Does not include fire hydrant storage. See Table 5-10.

[c] Includes landscape irrigation. See Table 2-5. Rounded up to nearest 10,000 gpd.

[d] See Table 2-8. Rounded up to the nearest 10,000 gpd.

[e] Note that recommended pumping rate is based on weekend flow with a 1.5 safety factor to ensure that the well pump does not operate at full capacity 24-hours per day.

[f] 2.0 times weekend day demand plus 500,000 gal of fire storage. See Table 4-4.

[g] See Tables 2-1 through 2-4.

[h] See Table 5-8.

[i] 5/7 * weekday day + 2/7 * weekend day. See Tables 2-1 through 2-4.

[j] See Table 5-1 and Appendix D.

6.2 Wastewater Disposal

It is recommended that wastewater disposal be one of the following for the selected project alternative:

1. Surface Water Discharge
    a. See Section 5.1.4
    b. Requires an NPDES Permit
2. Sprayfields
    a. See Section 5.1.1
    b. An alternative to on-site sprayfields would be to irrigate part of the Madera City Golf Course (Section 5.1.1)
    c. Requires a geotechnical investigation
    d. Requires a seasonal storage basin
3. A combination of Leachfields and/or Sprayfields
    a. See Sections 5.1.1 and 5.1.2
    b. Requires a geotechnical investigation
    c. Requires a storage basin

It is recommended that water be recycled to significantly reduce wastewater disposal requirements. A process diagram with all discharge options is shown in **Figure 6-1**.

6.3 Water Supply

It is recommended that water be supplied by one of the following or a combination of these:

1. On-Site groundwater
    a. See Section 4.1.1 (Alternatives A, B, and C at the Madera site)
    b. See Section 4.1.3 (Alternative D at the North Fork site)
    c. Requires 72-hour drawdown testing
    d. Requires water quality analysis
    e. May require water treatment
2. Off-site water
    a. See Section 4.1.2 (Alternatives A, B, and C at the Madera site)
    b. See Section 4.1.4 (Alternative D at the North Fork site)
    c. Negotiate firm supply
    d. Design and construct a pipeline connection, including permits and easements

It is recommended that water be recycled to significantly reduce water demand. The use of recycled water for non-potable applications as an alternative water supply source significantly reduces potable water demand. The potable water demand with and without recycled water for each project alternative is also included in **Table 6-1**.

The project may require the construction of the following water supply facilities: on-site wells, on-site water treatment plant, a steel potable water storage tank, a water distribution pump station, a steel recycled water storage tank, and a recycled water distribution pump station.

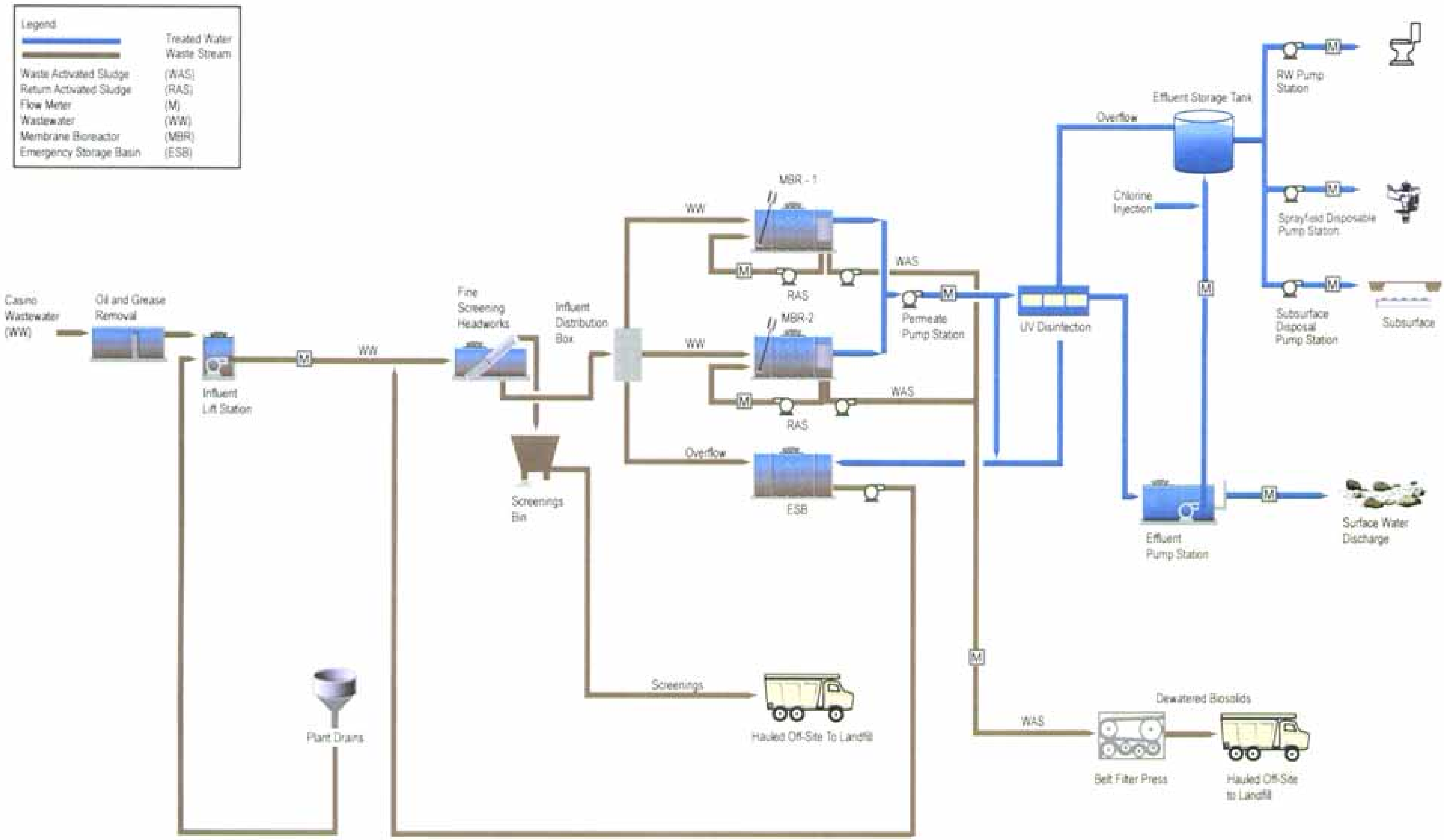

Figure 6-1
North Fork
Water and Wastewater Feasibility Study
Preliminary Process Flow Diagram

HydroScience Engineers, Inc.

7.0 Abbreviations

AES	Analytical Environmental Services
AwA	Atwater loamy sand
AWWA	American Water Works Association
BOD	biochemical oxygen demand
CCR	California Code of Regulations
cm	centimeter
CT	Contact Time (product of chlorine residual and modal contact time measured at the same point)
CTR	California Toxics Rule
DHS	Department of Health Services
DTRW	disinfected tertiary recycled water
EDU	equivalent dwelling unit
EPA	Environmental Protection Agency
ft	feet
ft^2	feet squared
gal	gallon
gpd	gallons per day
gpm	gallons per minute
HgA	Hanford sandy loam
HSe	HydroScience Engineers, Inc.
I&I	inflow and infiltration
MBR	membrane bioreactor
MF	microfiltration
MG	million gallon
mg/L	milligrams per liter
MGD	million gallons per day
mL	milliliter
MPN	most probable number
N	Nitrogen
NF	nanofiltration
NH_4	Ammonium
NO_3	Nitrate
NPDES	National Pollutant Discharge Elimination System
NTNC	Non-Transient/Non-Community
NTU	nephelometric turbidity units
RO	reverse osmosis
ROWD	Report of Waste Discharge
RWQCB	Regional Water Quality Control Board
SaA	San Joaquin sandy loam
SDWQ	Safe Drinking Water Act
TDS	total dissolved solids
TwA	Tujunga loamy sand
UF	ultrafiltration
UIC	Underground Injection Control
μm	micrometer
USDA	United States Department of Agriculture
UV	ultraviolet
WAS	Waste activated sludge
WDR	Waste Discharge Requirement
WWTP	Wastewater Treatment Plant

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Appendix A

Flow Calculations

Table 2-1

Estimated Wastewater Flows for Alternative A

	Square Footage (ft^2)	Unit (gpd/ft^2)	Base Flow (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	Typical WEEKDAY Flows (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	Typical WEEKEND Flows (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	AVERAGE Day Flows a (gpd)
CASINO / ENTERTAINMENT																		
Casino	121,630	1.25	151,680	45%	68,256	70%	106,176	87,216	70%	106,176	100%	151,680	128,928	52%	79,091	79%	119,177	99,134
Back of House	50,000	1.37	68,500	30%	20,550	50%	34,250	27,400	50%	34,250	71%	48,451	41,350	36%	24,464	56%	38,307	31,386
Retail	1,185	0.01	12	40%	5	50%	6	5	70%	8	80%	10	9	52%	6	79%	9	8
Food and Beverage	67,365	1.56	105,240	31%	32,934	65%	68,406	50,670	70%	73,668	100%	105,240	89,454	42%	44,571	75%	78,930	61,751
Entertainment/Lounge	7,000	0.54	3,780	30%	1,134	50%	1,890	1,512	50%	1,890	75%	2,835	2,363	36%	1,350	57%	2,160	1,755
HOTEL																		
Hotel Lobby	16,680	0.16	2,730	30%	819	50%	1,365	1,092	50%	1,365	70%	1,911	1,638	36%	975	56%	1,521	1,248
Hotel Rooms and Spa	191,000	0.16	30,000	50%	15,000	50%	15,000	15,000	100%	30,000	100%	30,000	30,000	64%	19,286	64%	19,286	19,286
Pool and Spa	16,850	0.35	4,320	32%	1,392	53%	2,304	1,848	70%	3,024	100%	4,320	3,672	43%	1,858	67%	2,880	2,369
Central Plant/Cooling Towers	21,300	3.10	66,000	50%	33,000	100%	66,000	49,500	50%	33,000	100%	66,000	49,500	50%	33,000	100%	66,000	49,500
GRAND TOTAL	493,010		432,262		173,090	gpd	295,397 gpd			283,381	gpd	410,446 gpd			204,600	gpd	328,271 gpd	
Subtotal Daily Flows							234,244 gpd	234,244				346,914 gpd	346,914				266,435 gpd	266,435
I&I						0%	0 gpd	0			0%	0 gpd	0			0%	0 gpd	0
Daily Flows						**Weekday Flow[b]**	**234,244 gpd**	**234,244**			**Weekend Flow[b]**	**346,914 gpd**	**346,914**			**Average Day flow**	**266,435 gpd**	**266,435**
Calculated Peaking Factor							1.0	1.0				1.48	1.48				1.14	1.14

[a]Average Day Flow = 5/7 Weekday + 2/7 Weekend

[b]Used for calculation purposes only.

Peaking factors are back-calculated as an internal check only and are not used to calculate flows

Table 2-2

Estimated Wastewater Flows for Alternative B

	Square Footage (ft^2)	Unit (gpd/ft^2)	Base Flow (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	Typical WEEKDAY Flows (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	Typical WEEKEND Flows (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	AVERAGE Day Flows a (gpd)
CASINO / ENTERTAINMENT																		
Casino	90,255	1.02	91,824	45%	41,321	70%	64,277	52,799	70%	64,277	100%	91,824	78,050	52%	47,880	79%	72,147	60,014
Food and Beverage	53,725	1.46	78,640	31%	24,610	65%	51,116	37,863	70%	55,048	100%	78,640	66,844	42%	33,306	75%	58,980	46,143
Entertainment	7,000	0.54	3,780	30%	1,134	50%	1,890	1,512	50%	1,890	75%	2,835	2,363	36%	1,350	57%	2,160	1,755
Back of House	37,825	1.39	52,415	30%	15,725	50%	26,208	20,966	50%	26,208	71%	37,074	31,641	36%	18,719	56%	29,312	24,016
HOTEL																		
Hotel Lobby	0	0.00	0	30%	0	50%	0	0	50%	0	70%	0	0	36%	0	56%	0	0
Hotel Rooms and Spa	0	0.00	0	50%	0	50%	0	0	100%	0	100%	0	0	64%	0	64%	0	0
Pool Area	0	0.00	0	32%	0	53%	0	0	70%	0	100%	0	0	43%	0	67%	0	0
Central Plant/Cooling Towers	9,000	4.44	40,000	50%	20,000	100%	40,000	30,000	50%	20,000	100%	40,000	30,000	50%	20,000	100%	40,000	30,000
GRAND TOTAL	197,805		266,659		102,789	gpd	183,490 gpd			167,422	gpd	250,373 gpd			121,255	gpd	202,600 gpd	
Subtotal Daily Flows							143,140 gpd	143,140				208,897 gpd	208,897				161,927 gpd	161,927
I&I						0%	0 gpd	0			0%	0 gpd	0			0%	0 gpd	0
Daily Flows					**Weekday Flow[b]**		**143,140 gpd**	**143,140**		**Weekend Flow[b]**		**208,897 gpd**	**208,897**		**Average Day flow**		**161,927 gpd**	**161,927**
Calculated Peaking Factor							1.0	1.0				1.46	1.46				1.13	1.13

[a]Average Day Flow = 5/7 Weekday + 2/7 Weekend

[b]Used for calculation purposes only.

Peaking factors are back-calculated as an internal check only and are not used to calculate flows

Table 2-3

Estimated Wastewater Flows for Alternative C

	Square Footage (ft^2)	Unit (gpd/ft^2)	Base Flow (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	Typical WEEKDAY Flows (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	Typical WEEKEND Flows (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	AVERAGE Day Flows a (gpd)
COMMERCIAL DEVELOPMENT																		
Food and Beverage	12,000	0.63	7,500	31%	2,347	65%	4,875	3,611	70%	5,250	100%	7,500	6,375	42%	3,176	75%	5,625	4,401
RETAIL	225,000	0.12	27,700	30%	8,310	50%	13,850	11,080	50%	13,850	75%	20,775	17,313	36%	9,892	57%	15,831	12,861
GRAND TOTAL	237,000		35,200		10,657	gpd	18,725 gpd			19,100	gpd	28,275 gpd			13,068	gpd	21,456 gpd	
Subtotal Daily Flows							14,691 gpd	14,691				23,688 gpd	23,688				17,262 gpd	17,262
I&I						0%	0 gpd	0			0%	0 gpd	0			0%	0 gpd	0
Daily Flows					**Weekday Flow[b]**		**14,691 gpd**	**14,691**		**Weekend Flow[b]**		**23,688 gpd**	**23,688**		**Average Day flow**		**17,262 gpd**	**17,262**
Calculated Peaking Factor							1.0	1.0				1.61	1.61				1.17	1.17

[a]Average Day Flow = 5/7 Weekday + 2/7 Weekend

[b]Used for calculation purposes only.

Peaking factors are back-calculated as an internal check only and are not used to calculate flows

Table 2-4

Estimated Wastewater Flows for Alternative D

	Square Footage (ft^2)	Unit (gpd/ft^2)	Base Flow (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	Typical WEEKDAY Flows (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	Typical WEEKEND Flows (gpd)	A.M. (%)	A.M. (gpd)	P.M. (%)	P.M. (gpd)	AVERAGE Day Flows a (gpd)
CASINO / ENTERTAINMENT																		
Casino	15,451	1.00	*15,504*	45%	6,977	70%	10,853	8,915	70%	10,853	100%	15,504	13,178	52%	8,084	79%	12,182	10,133
Food and Beverage	4,550	2.87	13,050	31%	4,084	65%	8,483	6,283	70%	9,135	100%	13,050	11,093	42%	5,527	75%	9,788	7,657
Entertainment	0	0.00	0	30%	0	50%	0	0	50%	0	75%	0	0	36%	0	57%	0	0
Back of House	6,000	1.18	7,050	30%	2,115	50%	3,525	2,820	50%	3,525	71%	4,987	4,256	36%	2,518	56%	3,943	3,230
HOTEL																		
Hotel Lobby	0	0.00	0	30%	0	50%	0	0	50%	0	70%	0	0	36%	0	56%	0	0
Hotel Rooms and Spa	0	0.00	0	50%	0	50%	0	0	100%	0	100%	0	0	64%	0	64%	0	0
	0	0.00																
Pool Area	0	0.00	0	32%	0	53%	0	0	70%	0	100%	0	0	43%	0	67%	0	0
Central Plant/Cooling Towers	0	0.00	0	50%	0	100%	0	0	50%	0	100%	0	0	50%	0	100%	0	0
GRAND TOTAL	26,001		35,604		13,176	gpd	22,860 gpd			23,513	gpd	33,541 gpd			16,129	gpd	25,912 gpd	
Subtotal Daily Flows							18,018 gpd	18,018				28,527 gpd	28,527				21,020 gpd	21,020
I&I						0%	0 gpd	0			0%	0 gpd	0			0%	0 gpd	0
Daily Flows					**Weekday Flow[b]**		**18,018 gpd**	**18,018**		**Weekend Flow[b]**		**28,527 gpd**	**28,527**		**Average Day flow**		**21,020 gpd**	**21,020**
Calculated Peaking Factor							1.0	1.0				1.58	1.58				1.17	1.17

[a]Average Day Flow = 5/7 Weekday + 2/7 Weekend

[b]Used for calculation purposes only.

Peaking factors are back-calculated as an internal check only and are not used to calculate flows

Appendix B

Recycled Water Uses – Title 22

Recycled Water Use

Recycled water in this report means wastewater that has been treated sufficiently to meet the California Department of Health Services' (DHS) comprehensive recycled water regulations that define treatment processes, water quality criteria, and treatment reliability requirements for public use of recycled water. These regulations are contained in Title 22, Division 4, Chapter 3 of the California Administrative Code, more commonly referred to as Title 22.

Approved by the State in December 2000, Title 22 prescribes recycled water criteria and divides them into several categories based upon the extent of public access or risk of exposure. In general, Title 22 regulations are more stringent for uses with high potential for public contact and less stringent for uses with low potential for public contact. Depending on the use, Title 22 establishes four levels of treatment required for recycled water: undisinfected secondary, undisinfected secondary–23, undisinfected secondary–2.2, and disinfected tertiary.

Undisinfected Secondary Recycled Water. This category of recycled water is wastewater that has been treated to a secondary treatment level and is commonly referred to as secondary effluent. Secondary effluent is wastewater that contains dissolved oxygen (DO) and has undergone an oxidation process in which the organic matter content of the water has been stabilized and made nonputrescible.

Undisinfected Secondary–23 Recycled Water. This category of recycled water is secondary effluent that has been disinfected to a level such that the most probable number (MPN) of coliform bacteria in the water does not exceed 23 per 100 mL. Disinfection is the process whereby pathogenic bacteria and viruses are inactivated by chemical, physical, or biological means.

Disinfected Secondary–2.2 Recycled Water. This category of recycled water includes secondary effluent that has been disinfected to a level such that the coliform bacteria in the water does not exceed 2.2 MPN per 100 mL.

Disinfected Tertiary Recycled Water. This category of recycled water includes secondary effluent that has undergone tertiary treatment and has been disinfected to a level such that the median coliform bacteria in the water does not exceed 2.2 MPN per 100 mL. Title 22 defines the tertiary treatment process as wastewater that has been oxidized, coagulated, clarified, and filtered. The recycled water turbidity should not exceed 2 NTU on average, should not exceed 5 NTU more than five percent of the time during any 24-hour period, and should never exceed 10 NTU.

A summary of approved uses for various types of recycled water is presented in the following table.

SUITABLE USES OF RECYCLED WATER [A]

Use of recycled water	Treatment level		
	Tertiary	Secondary –2.2	Secondary –23
Irrigation of:			
Food crops—contact with edible portion of crop	Allowed	Not Allowed	Not Allowed
Parks and playgrounds	Allowed	Not Allowed	Not Allowed
School yards	Allowed	Not Allowed	Not Allowed
Residential landscaping	Allowed	Not Allowed	Not Allowed
Unrestricted access golf courses	Allowed	Not Allowed	Not Allowed
Any other irrigation uses not prohibited by other provisions of CCR	Allowed	Not Allowed	Not Allowed
Food crops—edible portion above ground/not in contact with reclaimed water	Allowed	Allowed	Not Allowed
Cemeteries	Allowed	Allowed	Allowed
Freeway landscaping	Allowed	Allowed	Allowed
Restricted-access golf courses	Allowed	Allowed	Allowed
Ornamental nursery stock and sod farms	Allowed	Allowed	Allowed
Pasture for milk animals	Allowed	Allowed	Allowed
Any nonedible vegetation with access control to prevent use, as if it were a park, playground, or schoolyard	Allowed	Allowed	Allowed
Orchards with no contact between edible portion and reclaimed water	Allowed	Allowed	Allowed
Vineyards with no contact between edible portion and reclaimed water	Allowed	Allowed	Allowed
Non–food bearing trees not irrigated <14 days of harvest	Allowed	Allowed	Allowed
Fodder crops (e.g., alfalfa) and fiber crops (e.g., cotton)	Allowed	Allowed	Allowed
Seed crops not eaten by humans	Allowed	Allowed	Allowed
Food crops that undergo commercial pathogen-destroying processing before human consumption (e.g., sugar beets)	Allowed	Allowed	Allowed
Food crops—contact with edible portion of crop	Allowed	Not Allowed	Not Allowed
Supply for impoundments:			
Nonrestricted rec. impound., with supplemental monitoring for pathogenic organisms	Allowed [b]	Not Allowed	Not Allowed
Restricted impoundment and fish hatcheries	Allowed	Allowed	Not Allowed
Landscape impoundment. Without decorative fountains	Allowed	Allowed	Allowed

SUITABLE USES OF RECYCLED WATER [A] (CONT'D)

Use of recycled water	Treatment level		
	Tertiary RW	**Secondary –2.2 RW**	**Secondary –23 RW**
Supply for cooling or air conditioning:			
Industrial or commercial cooling or air conditioning with cooling tower, evaporative condenser, or a spraying that creates a mist	Allowed [c]	Not Allowed	Not Allowed
Industrial or commercial cooling or air conditioning with cooling tower, evaporative condenser, or a spraying that does not create a mist	Allowed	Allowed	Allowed
Nonrestricted rec. impound., with supplemental monitoring for pathogenic organisms.	Allowed [b]	Not Allowed	Not Allowed
Other uses:			
Flushing toilets and urinals	Allowed	Not Allowed	Not Allowed
Priming drain tap	Allowed	Not Allowed	Not Allowed
Industrial process water that may contact workers	Allowed	Not Allowed	Not Allowed
Structural fire fighting	Allowed	Not Allowed	Not Allowed
Decorative fountains	Allowed	Not Allowed	Not Allowed
Commercial laundries	Allowed	Not Allowed	Not Allowed
Consolidation of backfill material around potable water pipelines	Allowed	Not Allowed	Not Allowed
Artificial snow-making for commercial outdoor uses	Allowed	Not Allowed	Not Allowed
Industrial boiler feed	Allowed	Allowed	Allowed
Nonstructural fire fighting	Allowed	Allowed	Allowed
Backfill consolidation around nonpotable piping	Allowed	Allowed	Allowed
Soil compaction	Allowed	Allowed	Allowed
Mixing concrete	Allowed	Allowed	Allowed
Dust control on roads and streets	Allowed	Allowed	Allowed
Cleaning roads, sidewalks, and outdoor work areas	Allowed	Allowed	Allowed
Flushing sanitary sewers	Allowed	Allowed	Allowed
Flushing toilets and urinals	Allowed	Not Allowed	Not Allowed
Priming drain tap	Allowed	Not Allowed	Not Allowed
Industrial process water that may contact workers	Allowed	Not Allowed	Not Allowed

[a] Refer to full text of the current version of Title 22.
[b] Additional monitoring may be necessary with conventional treatment.
[c] Drift eliminators and/or biocides are required if public or employees can be exposed to mist.

Appendix C

City of Madera
Source Water Assessment

CITY OF MADERA

SOURCE WATER ASSESSMENT

A source water assessment was conducted for the City of Madera water system during February and March 2004. A completed copy of this report may be viewed at or, you may request a summary copy by contacting:

Marvin Ward, Water Quality Specialist II
City of Madera, Public Works Department
1030 South Gateway Drive
Madera, CA 93637
(559) 661-5466

The summary for this assessment indicates that the following City of Madera water wells (sources) are considered most vulnerable to the following activities not associated with any detected contaminants:

1.1.1.1 Activities	1.1.1.2 Water Wells
Airports - Maintenance/fueling areas	#26
Automobile - Body shops, Historic gas stations, Machine shops, Junk/scrap salvage yards	#25
Automobile – Gas stations	#17, #18, #20, #21, #22, #26
Automobile - Repair shops	#18, #25
Boat services/repair/refinishing, sewer collection systems, pesticide/fertilizer/petroleum storage & transfer area	#18
Chemical/petroleum processing/storage, dry cleaners, injection wells/dry wells/sumps	#28
Dry cleaners, injection wells/dry wells/sumps	28
Fertilizer/pesticide/herbicide application, storm drain discharge points	#29
Grazing (>5 large animals or equivalent per acre)	#23
Historic waste dumps/landfills	#25, #26
Housing – high density (>1 house / 0.5 acres)	#15, #16, #29
Known contaminant plumes	#27
Metal plating/finishing/fabricating	#26, #27, #30
Military installations	#24
Transportation corridors - Road right - of - ways (herbicides use areas)	#15, #16, #17, #29

DISCUSSION OF VULNERABILITY

There are no current Maximum Contaminant Level (MCL) exceedances from the Water Quality Inquiry (WQI) database and from the State Department of Health Services system files for Water Wells #15, #16, #17, #18, #20, #22, #23, #24, #25, #26, #28, #29 and #30.

The following constituents were found by review of the current MCL exceedances reports from the Water Quality Inquiry (WQI) and from the State Department of Health Services system files.

1.1.1.3

1.1.1.4 Water Well	1.1.1.5 1.1.2 Chemical	1.1.1.6 Sample Date	1.1.1.7 Level Detected	1.1.2.1 MCL
#21	DBCP	5/11/00	0.30 ug/L	0.20 ug/L
#27	DBCP	2/19/03	0.24 ug/L	0.20 ug/L
#27	EDB	2/19/03	0.75 ug/L	0.05 ug/L

ADDITIONAL COMMENTS:

Water Well 21 A routine water well sample was collected for Dibromochloropropane (DBCP) on 5/11/00 and a confirmation sample was collected on 6/11/00. The average of those two samples exceeded the MCL. This well was then tested for DBCP monthly for six months, quarterly for six months and is now being tested annually. Water samples collected from Well #21 after 6/11/00 have not exceeded the MCL for DBCP.

Water Well 27 This water well is equipped with a granular activated carbon filtration system. This system has four vessels with approximately 20,000 pounds of carbon per vessel. Raw water from the well is filtered to remove all (DBCP) and Ethylene Dibromide (EDB) before it enters the City water distribution system. DBCP and EDB results for samples collected on 2/19/03 were for unfiltered water only. DBCP or EDB is non-detect in water routinely sampled from downstream of the filtration system.

Primary Standards	MCL	PHG (MCLG)	RANGE OF DETECTION			AVERAGE	U.O.M.	TYPICAL SOURCE OF CONTAMINANT
Arsenic	50.00	NA	N/D	TO	4.00	0.67	ug/L	Erosion of natural deposits; runoff from orchards; glass and electronics production wastes.
Barium	1000.00	2000.00	N/D	TO	180.00	30.00	ug/L	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits.
Nitrate (as NO3)	45.00	45.00	3.00	TO	29.00	8.89	mg/L	Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits.
Dibromochloropropane (DBCP)	0.20	NA	N/D	TO	0.20	0.02	ug/L	Banned nematocide that may still be present in soils due to runoff/leaching from former use on soybeans, cotton, vineyards, tomatoes, and tree fruit.
Ethylene dibromide (EDB)	0.05	0.01	0.00	TO	0.51	0.03	ug/L	
Tetrachloroethylene(PCE)	5.00	NA	N/D	TO	2.00	0.22	ug/L	Discharge from factories, dry cleaners, or auto shops
Secondary Standards								
Chloride	500.00		16.00	TO	42.00	22.40	mg/L	Runoff/leaching from natural deposits; seawater influence.
Iron	300.00		N/D	TO	220.00	14.67	ug/L	Leaching from natural deposits; industrial wastes.
Odor	3.00		1.00	TO	1.00	1.00	TON	Naturally occurring organic materials.
pH (Laboratory)	6.5 - 8.5		5.90	TO	7.40	6.55	Std. Units	
Specific Conductance	1600.00		190.00	TO	600.00	273.33	umho/cm	Substances that form ions when in water; seawater influence.
Total Filterable Residue (TDS)	1000.00		140.00	TO	400.00	200.00	mg/L	Runoff/Leaching from natural deposits
Sulfate	500.00		3.00	TO	17.00	6.75	mg/L	Runoff/leaching from natural deposits; industrial wastes.
Lab Turbity	5.00		0.00	TO	0.40	0.12	NTU	
Toatal Chromium			0.00	TO	4.00	1.53	ug/L	
General Minerals								
Bicarbonate			46.00	TO	200.00	88.53	mg/L	
Calcium			14.00	TO	57.00	24.20	mg/L	
Copper	1.30	0.17	0.0	TO	0.19	0.114	mg/L	Internal corrosion of household plumbing systems, erosion of natural deposits, leaching from wood preservatives.
Fluoride	2000.00	100.00	ND	TO	100.00	13.35	ug/L	Erosion of natural deposits, from water additive that promotes strong teeth.
Lead	0.02	0.002	ND	TO	0.01	0.0002	mg/L	Internal corrosion of household plumbing systems, discharge from industrial manufacturers, erosion of natural deposits.
Magnesium			4.40	TO	16.00	7.15	mg/L	
Potassium			1.50	TO	9.00	3.83	mg/L	
Sodium			18.00	TO	48.00	24.67	mg/L	
Total Alkalinity			46.00	TO	200.00	88.53	mg/L	
Total Hardness (as CaCO3)			53.00	TO	210.00	83.57	mg/L	

Primary Standards	MCL	PHG (MCLG)	RANGE OF DETECTION			AVERAGE	U.O.M.	TYPICAL SOURCE OF CONTAMINANT
Organics								
Tetrachloroethylene (PCE)	5.00	60.00	0.00	TO	2.00	0.22	ug/L	Discharge from factories, dry cleaners and auto shops (metal degreaser)
Radioactivity								
Gross Alpha	15 pCi/L		-0.24	TO	11.30	0.96	pCi/L	Erosion of natural and man-made deposits
Uranium	20 pCi/L		-0.05	TO	8.41	0.97	pCi/L	Erosion of natural deposits
Unregulated Organics								
1,2,3 Trichloropropane	N/A	0.005	0.00	TO	0.01	0.00	ug/L	
Methyl Ethyl Ketone	N/A	5.00	0.00	TO	16.00	1.23	ug/L	
Vanadium	N/A	3.00	10.00	TO	27.00	18.40	ug/L	
Unregulated Inorganics								
Hexavalent Chromium IV			ND	TO	2.50	0.69	ug/L	N/A

The State allows City to monitor for some contaminants less than once per year because the consentration of these contaminants do not change frequently. Some of the above data, though representative, is more than one year old, the data ranges from 1996 to 2005.

ABBREVIATION KEY

MCL = Maximum Contaminant Level
mg/L = Milligrams per Liter or parts per million
ug/L = Micrograms per Liter or parts per billion
NTU = Nephelometric Turbidity Units
PHG = Public Heath Goal
MCLG= Maximum Contaminant Level Goal

N/A = Not Aplicable
pCi/L =
N/D = Non-Detect
U.O.M. =
Ton =
umho/cm=

REQUIRED PUBLIC NOTICE

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders,some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their heath care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

DEFINITIONS

Maximum Contaminant Level or (MCL): The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs(or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Primary Drinking Water Standard or PDWS: MCLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements

Public Health Goals or PHG: The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Maximum Contaminant Level Goal or MCLG: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the U.S. Environmental Protection Agency.

HEALTH EFFECTS FOR CONTAMINANTS

Nitrate: Nitrate in drinking water at levels above 45 mg/L is a health risk for infants of less than six months of age. Such nitrate levels in drinking water can interfere with the capacity of the infant's blood to carry oxygen, resulting in a serious illness; symptoms include shortness of breath and blueness of the skin. Nitrate levels above 45 mg/L may also affect the ability of the blood to carry oxygen in other individuals, such as pregnant women and those with certain specific enzyme deficiencies. If you are caring for an infant, or you are pregnant, you should ask advice from your health care provider.

TREATMENT

Chlorination: Each well site has a chlorine generation system which produces a 0.8% chlorine solution and doseage to the distribution system is set at 0.25 Parts Per Million.

GAC Filtration: Water Well No. 27 has a Granular Activated Carbon Filtration system. This system utilizes four vessels with approximately 20,000 pounds of Carbon each. Water passes through this filtration system where Dibromochloropropane(DBCP) and Ethylene dibromide(EDB) is removed. When this well is in use, it is tested weekly to ensure the effectiveness of the filter.

REQUIRED PUBLIC INFORMATION

1. The sources of drinking water(both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

2. Contaminants that could be present in source water include:

(a) Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

(**b**) Inorganic contaminants, such as salts and metals, that can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

(**c**) Pesticides and herbicides, that may come from a variety of sources such as agriculture, urban water runoff, and residential uses.

(**d**) Organic chemical contaminants, including synthetic and volatile organic chemicals, that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.

(**e**) Radioactive contaminants, that can be naturally-occurring or be the result of oil and gas production and mining activities.

3. In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency(USEPA) and the State Department of Health Services (DHS) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that provide the same protection or public health.

4. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline 1(800) 426-4791.

Appendix D

Water Balance Calculations

Water Balance for Seasonal Storage and Disposal Sizing
North Fork

INITIAL CONDITIONS

270,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 0.0 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	0	0.00		
Sprayfield	224,213	28.9		
Landscaping	21,770	4.0		
Storage		11.0	12.0	42.9

SEASONAL OPERATIONAL USE

Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	20%	100%	0%
% in use during dry weather (Apr-Oct)	100%	100%	0%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft^2)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscaping (MG)	Out to winter landscaping (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.89	0.00	8.10	*8.99*			0.08		0.77		*0.86*	8.13	8.13
December	31	0.96	0.00	8.37	*9.33*			0.03		0.31		*0.34*	8.98	17.12
January	31	1.17	0.00	8.37	*9.54*			0.05		0.41		*0.46*	9.09	26.20
February	28	1.18	0.00	7.56	*8.74*			0.07		0.60		*0.67*	8.07	34.28
March	31	1.20	0.00	8.37	*9.57*		0.01	0.11		1.04		*1.17*	8.40	42.68
April	30	0.30	0.00	8.10	*8.40*	1.02	0.78		6.46			*8.26*	0.14	42.82
May	31	0.13	0.00	8.37	*8.50*	1.81	1.17		12.01			*14.99*	-6.49	36.33
June	30	0.03	0.00	8.10	*8.13*	2.34	1.39		16.31			*20.05*	-11.92	24.42
July	31	0.00	0.00	8.37	*8.37*	2.58	1.45		17.68			*21.72*	-13.35	11.07
August	31	0.01	0.00	8.37	*8.38*	2.23	1.28		13.82			*17.33*	-8.95	2.12
September	30	0.07	0.00	8.10	*8.17*	1.58	0.94		8.29			*10.81*	-2.65	0.00
October	31	0.22	0.00	8.37	*8.59*	0.82	0.57		4.13			*5.52*	3.07	3.07
Average	30.4	0.51	0.00	8.21	*8.73*	1.03	0.63	0.03	6.56	0.26	0.00	8.51	0.21	21
Total	365	6.16	0.00	98.55	*104.71*	12.38	7.60	0.34	78.70	3.13	0.00	102.17	2.54	248
Max	31	1.20	0.00	8.37	*9.57*	2.58	1.45	0.11	17.68	1.04	0.00	21.72	9.09	42.82
Min	28	0.00	0.00	7.56	*8.13*	0.00	0.00	0.00	0.00	0.00	0.00	0.34	-13.35	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

270,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 77.1 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	251,913	19.28		
Sprayfield	0	0.0		
Landscaping	20,789	4.0		
Storage		0.8	12.0	3.2

SEASONAL OPERATIONAL USE			
Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	0%	0%	100%
% in use during dry weather (Apr-Oct)	100%	0%	100%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft²)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscaping (MG)	Out to winter landscaping (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.07	0.00	8.10	*8.17*			0.00	0.00	0.00	7.56	*7.56*	0.61	0.61
December	31	0.07	0.00	8.37	*8.44*			0.00	0.00	0.00	7.81	*7.81*	0.63	1.24
January	31	0.09	0.00	8.37	*8.46*			0.00	0.00	0.00	7.81	*7.81*	0.65	1.89
February	28	0.09	0.00	7.56	*7.65*			0.00	0.00	0.00	7.05	*7.05*	0.60	2.49
March	31	0.09	0.00	8.37	*8.46*			0.00	0.00	0.00	7.81	*7.81*	0.65	3.14
April	30	0.02	0.00	8.10	*8.12*	0.08	0.78	0.00	0.00	0.00	7.56	*8.41*	-0.29	2.85
May	31	0.01	0.00	8.37	*8.38*	0.14	1.17	0.00	0.00	0.00	7.81	*9.12*	-0.74	2.11
June	30	0.00	0.00	8.10	*8.10*	0.18	1.39	0.00	0.00	0.00	7.56	*9.13*	-1.02	1.09
July	31	0.00	0.00	8.37	*8.37*	0.19	1.45	0.00	0.00	0.00	7.81	*9.46*	-1.09	0.00
August	31	0.00	0.00	8.37	*8.37*	0.17	1.28	0.00	0.00	0.00	7.81	*9.26*	-0.89	0.00
September	30	0.01	0.00	8.10	*8.11*	0.12	0.94	0.00	0.00	0.00	7.56	*8.62*	-0.51	0.00
October	31	0.02	0.00	8.37	*8.39*	0.06	0.57	0.00	0.00	0.00	7.81	*8.44*	-0.05	0.00
Average	30.4	0.04	0.00	8.21	*8.25*	0.08	0.63	0.00	0.00	0.00	7.66	8.37	-0.12	1
Total	365	0.46	0.00	98.55	*99.01*	0.93	7.59	0.00	0.00	0.00	91.95	100.47	-1.46	15
Max	31	0.09	0.00	8.37	*8.46*	0.19	1.45	0.00	0.00	0.00	7.81	9.46	0.65	3.14
Min	28	0.00	0.00	7.56	*7.65*	0.00	0.00	0.00	0.00	0.00	7.05	7.05	-1.09	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

270,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 31.0 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	101,171	7.74		
Sprayfield	231,128	31.0		
Landscaping	20,789	4.0		
Storage		7.7	12.0	30.1

SEASONAL OPERATIONAL USE

Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	0%	0%	100%
% in use during dry weather (Apr-Oct)	100%	100%	0%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft^2)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscaping (MG)	Out to winte landscapinc (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.62	0.00	8.10	*8.72*			0.00		0.00	3.04	*3.04*	5.69	5.69
December	31	0.67	0.00	8.37	*9.04*			0.00		0.00	3.14	*3.14*	5.90	11.59
January	31	0.82	0.00	8.37	*9.19*			0.00		0.00	3.14	*3.14*	6.06	17.65
February	28	0.83	0.00	7.56	*8.39*			0.00		0.00	2.83	*2.83*	5.56	23.20
March	31	0.84	0.00	8.37	*9.21*			0.00		0.00	3.14	*3.14*	6.08	29.28
April	30	0.21	0.00	8.10	*8.31*	0.71	0.78	0.00	6.93	0.00		*8.42*	-0.11	29.17
May	31	0.09	0.00	8.37	*8.46*	1.27	1.17	0.00	12.87	0.00		*15.31*	-6.85	22.32
June	30	0.02	0.00	8.10	*8.12*	1.64	1.39	0.00	17.48	0.00		*20.52*	-12.40	9.93
July	31	0.00	0.00	8.37	*8.37*	1.81	1.45	0.00	18.95	0.00		*22.22*	-13.85	0.00
August	31	0.00	0.00	8.37	*8.37*	1.56	1.28	0.00	14.81	0.00		*17.66*	-9.28	0.00
September	30	0.05	0.00	8.10	*8.15*	1.11	0.94	0.00	8.89	0.00		*10.94*	-2.79	0.00
October	31	0.15	0.00	8.37	*8.52*	0.58	0.57	0.00	4.43	0.00		*5.57*	2.95	2.95
Average	30.4	0.36	0.00	8.21	*8.57*	0.72	0.63	0.00	7.03	0.00	1.27	9.66	-1.09	13
Total	365	4.32	0.00	98.55	*102.87*	8.68	7.59	0.00	84.36	0.00	15.28	115.91	-13.04	152
Max	31	0.84	0.00	8.37	*9.21*	1.81	1.45	0.00	18.95	0.00	3.14	22.22	6.08	29.28
Min	28	0.00	0.00	7.56	*8.12*	0.00	0.00	0.00	0.00	0.00	0.00	2.83	-13.85	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

160,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 0.0 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	0	0.00		
Sprayfield	135,119	17.4		
Landscaping	21,770	4.0		
Storage		7.0	12.0	27.4

SEASONAL OPERATIONAL USE			
Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	20%	100%	0%
% in use during dry weather (Apr-Oct)	100%	100%	0%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft²)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscapinc (MG)	Out to wint landscapinc (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.57	0.00	4.80	*5.37*			0.08		0.47		*0.55*	4.82	4.82
December	31	0.61	0.00	4.96	*5.57*			0.03		0.19		*0.22*	5.35	10.17
January	31	0.75	0.00	4.96	*5.71*			0.05		0.25		*0.29*	5.42	15.58
February	28	0.75	0.00	4.48	*5.23*			0.07		0.36		*0.43*	4.81	20.39
March	31	0.77	0.00	4.96	*5.73*		0.01	0.11		0.63		*0.76*	4.97	25.36
April	30	0.19	0.00	4.80	*4.99*	0.65	0.78		3.89			*5.32*	-0.33	25.03
May	31	0.08	0.00	4.96	*5.04*	1.16	1.17		7.24			*9.56*	-4.52	20.51
June	30	0.02	0.00	4.80	*4.82*	1.50	1.39		9.83			*12.72*	-7.90	12.61
July	31	0.00	0.00	4.96	*4.96*	1.65	1.45		10.66			*13.76*	-8.80	3.82
August	31	0.00	0.00	4.96	*4.96*	1.42	1.28		8.33			*11.03*	-6.07	0.00
September	30	0.04	0.00	4.80	*4.84*	1.01	0.94		5.00			*6.95*	-2.10	0.00
October	31	0.14	0.00	4.96	*5.10*	0.52	0.57		2.49			*3.58*	1.52	1.52
Average	30.4	0.33	0.00	4.87	*5.19*	0.66	0.63	0.03	3.95	0.16	0.00	5.43	-0.24	12
Total	365	3.93	0.00	58.40	*62.33*	7.90	7.60	0.34	47.43	1.89	0.00	65.17	-2.84	140
Max	31	0.77	0.00	4.96	5.73	1.65	1.45	0.11	10.66	0.63	0.00	13.76	5.42	25.36
Min	28	0.00	0.00	4.48	*4.82*	0.00	0.00	0.00	0.00	0.00	0.00	0.22	-8.80	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

160,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 45.1 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	147,466	11.28		
Sprayfield	0	0.0		
Landscaping	20,789	4.0		
Storage		1.0	12.0	3.9

SEASONAL OPERATIONAL USE

Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	0%	0%	100%
% in use during dry weather (Apr-Oct)	100%	0%	100%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft^2)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscaping (MG)	Out to winter landscaping (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.08	0.00	4.80	*4.88*			0.00	0.00	0.00	4.42	*4.42*	0.46	0.46
December	31	0.09	0.00	4.96	*5.05*			0.00	0.00	0.00	4.57	*4.57*	0.48	0.93
January	31	0.11	0.00	4.96	*5.07*			0.00	0.00	0.00	4.57	*4.57*	0.50	1.43
February	28	0.11	0.00	4.48	*4.59*			0.00	0.00	0.00	4.13	*4.13*	0.46	1.89
March	31	0.11	0.00	4.96	*5.07*			0.00	0.00	0.00	4.57	*4.57*	0.50	2.38
April	30	0.03	0.00	4.80	*4.83*	0.09	0.78	0.00	0.00	0.00	4.42	*5.29*	-0.47	1.92
May	31	0.01	0.00	4.96	*4.97*	0.16	1.17	0.00	0.00	0.00	4.57	*5.91*	-0.93	0.98
June	30	0.00	0.00	4.80	*4.80*	0.21	1.39	0.00	0.00	0.00	4.42	*6.03*	-1.23	0.00
July	31	0.00	0.00	4.96	*4.96*	0.23	1.45	0.00	0.00	0.00	4.57	*6.26*	-1.30	0.00
August	31	0.00	0.00	4.96	*4.96*	0.20	1.28	0.00	0.00	0.00	4.57	*6.06*	-1.10	0.00
September	30	0.01	0.00	4.80	*4.81*	0.14	0.94	0.00	0.00	0.00	4.42	*5.51*	-0.70	0.00
October	31	0.02	0.00	4.96	*4.98*	0.07	0.57	0.00	0.00	0.00	4.57	*5.21*	-0.23	0.00
Average	30.4	0.05	0.00	4.87	*4.91*	0.09	0.63	0.00	0.00	0.00	4.49	5.21	-0.30	1
Total	365	0.56	0.00	58.40	*58.96*	1.12	7.59	0.00	0.00	0.00	53.83	62.54	-3.58	10
Max	31	0.11	0.00	4.96	*5.07*	0.23	1.45	0.00	0.00	0.00	4.57	6.26	0.50	2.38
Min	28	0.00	0.00	4.48	*4.59*	0.00	0.00	0.00	0.00	0.00	4.13	4.13	-1.30	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

160,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 14.2 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	46,406	3.55		
Sprayfield	106,017	14.2		
Landscaping	20,789	4.0		
Storage		5.4	12.0	21.0

SEASONAL OPERATIONAL USE

Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	0%	0%	100%
% in use during dry weather (Apr-Oct)	100%	100%	0%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft^2)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscaping (MG)	Out to winte landscapinc (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.43	0.00	4.80	*5.23*			0.00		0.00	1.39	*1.39*	3.84	3.84
December	31	0.47	0.00	4.96	*5.43*			0.00		0.00	1.44	*1.44*	3.99	7.83
January	31	0.57	0.00	4.96	*5.53*			0.00		0.00	1.44	*1.44*	4.09	11.92
February	28	0.58	0.00	4.48	*5.06*			0.00		0.00	1.30	*1.30*	3.76	15.68
March	31	0.59	0.00	4.96	*5.55*			0.00		0.00	1.44	*1.44*	4.11	19.79
April	30	0.15	0.00	4.80	*4.95*	0.50	0.78	0.00	3.18	0.00		*4.45*	0.49	20.29
May	31	0.06	0.00	4.96	*5.02*	0.88	1.17	0.00	5.90	0.00		*7.96*	-2.94	17.35
June	30	0.02	0.00	4.80	*4.82*	1.15	1.39	0.00	8.02	0.00		*10.56*	-5.74	11.61
July	31	0.00	0.00	4.96	*4.96*	1.26	1.45	0.00	8.69	0.00		*11.41*	-6.45	5.16
August	31	0.00	0.00	4.96	*4.96*	1.09	1.28	0.00	6.79	0.00		*9.17*	-4.20	0.96
September	30	0.03	0.00	4.80	*4.83*	0.77	0.94	0.00	4.08	0.00		*5.79*	-0.96	0.00
October	31	0.11	0.00	4.96	*5.07*	0.40	0.57	0.00	2.03	0.00		*3.00*	2.07	2.07
Average	30.4	0.25	0.00	4.87	*5.12*	0.50	0.63	0.00	3.22	0.00	0.58	4.94	0.17	10
Total	365	3.01	0.00	58.40	*61.41*	6.05	7.59	0.00	38.70	0.00	7.01	59.34	2.07	117
Max	31	0.59	0.00	4.96	*5.55*	1.26	1.45	0.00	8.69	0.00	1.44	11.41	4.11	20.29
Min	28	0.00	0.00	4.48	*4.82*	0.00	0.00	0.00	0.00	0.00	0.00	1.30	-6.45	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

20,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 0.0 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	0	0.00		
Sprayfield	12,728	1.6		
Landscaping	5,442	1.0		
Storage		0.8	12.0	3.3

SEASONAL OPERATIONAL USE

Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	20%	100%	0%
% in use during dry weather (Apr-Oct)	100%	100%	0%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft^2)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscaping (MG)	Out to winter landscaping (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.07	0.00	0.60	*0.67*			0.02		0.04		*0.06*	0.60	0.60
December	31	0.07	0.00	0.62	*0.69*			0.01		0.02		*0.03*	0.67	1.27
January	31	0.09	0.00	0.62	*0.71*			0.01		0.02		*0.03*	0.68	1.95
February	28	0.09	0.00	0.56	*0.65*			0.02		0.03		*0.05*	0.60	2.55
March	31	0.09	0.00	0.62	*0.71*		0.00	0.03		0.06		*0.09*	0.62	3.17
April	30	0.02	0.00	0.60	*0.62*	0.08	0.19		0.37			*0.64*	-0.02	3.15
May	31	0.01	0.00	0.62	*0.63*	0.14	0.29		0.68			*1.11*	-0.48	2.67
June	30	0.00	0.00	0.60	*0.60*	0.18	0.35		0.93			*1.45*	-0.85	1.82
July	31	0.00	0.00	0.62	*0.62*	0.20	0.36		1.00			*1.57*	-0.94	0.87
August	31	0.00	0.00	0.62	*0.62*	0.17	0.32		0.78			*1.28*	-0.66	0.22
September	30	0.01	0.00	0.60	*0.61*	0.12	0.24		0.47			*0.83*	-0.22	0.00
October	31	0.02	0.00	0.62	*0.64*	0.06	0.14		0.23			*0.44*	0.20	0.20
Average	30.4	0.04	0.00	0.61	*0.65*	0.08	0.16	0.01	0.37	0.01	0.00	0.63	0.02	2
Total	365	0.47	0.00	7.30	*7.77*	0.95	1.90	0.09	4.47	0.18	0.00	7.58	0.19	18
Max	31	0.09	0.00	0.62	*0.71*	0.20	0.36	0.03	1.00	0.06	0.00	1.57	0.68	3.17
Min	28	0.00	0.00	0.56	*0.60*	0.00	0.00	0.00	0.00	0.00	0.00	0.03	-0.94	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

20,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 4.4 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	14,275	1.09		
Sprayfield	0	0.0		
Landscaping	5,197	1.0		
Storage		0.4	12.0	1.4

SEASONAL OPERATIONAL USE

Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	0%	0%	100%
% in use during dry weather (Apr-Oct)	100%	0%	100%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft²)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscaping (MG)	Out to winte landscaping (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.03	0.00	0.60	*0.63*			0.00	0.00	0.00	0.43	*0.43*	0.20	0.20
December	31	0.03	0.00	0.62	*0.65*			0.00	0.00	0.00	0.44	*0.44*	0.21	0.41
January	31	0.04	0.00	0.62	*0.66*			0.00	0.00	0.00	0.44	*0.44*	0.22	0.62
February	28	0.04	0.00	0.56	*0.60*			0.00	0.00	0.00	0.40	*0.40*	0.20	0.82
March	31	0.04	0.00	0.62	*0.66*			0.00	0.00	0.00	0.44	*0.44*	0.22	1.04
April	30	0.01	0.00	0.60	*0.61*	0.03	0.19	0.00	0.00	0.00	0.43	*0.66*	-0.05	0.99
May	31	0.00	0.00	0.62	*0.62*	0.06	0.29	0.00	0.00	0.00	0.44	*0.79*	-0.17	0.82
June	30	0.00	0.00	0.60	*0.60*	0.08	0.35	0.00	0.00	0.00	0.43	*0.85*	-0.25	0.57
July	31	0.00	0.00	0.62	*0.62*	0.08	0.36	0.00	0.00	0.00	0.44	*0.89*	-0.27	0.30
August	31	0.00	0.00	0.62	*0.62*	0.07	0.32	0.00	0.00	0.00	0.44	*0.84*	-0.22	0.09
September	30	0.00	0.00	0.60	*0.60*	0.05	0.24	0.00	0.00	0.00	0.43	*0.71*	-0.11	0.00
October	31	0.01	0.00	0.62	*0.63*	0.03	0.14	0.00	0.00	0.00	0.44	*0.61*	0.02	0.02
Average	30.4	0.02	0.00	0.61	*0.62*	0.03	0.16	0.00	0.00	0.00	0.43	0.63	0.00	0
Total	365	0.20	0.00	7.30	*7.50*	0.40	1.90	0.00	0.00	0.00	5.21	7.51	-0.01	6
Max	31	0.04	0.00	0.62	*0.66*	0.08	0.36	0.00	0.00	0.00	0.44	0.89	0.22	1.04
Min	28	0.00	0.00	0.56	*0.60*	0.00	0.00	0.00	0.00	0.00	0.40	0.40	-0.27	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

20,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 1.4 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	4,707	0.36		
Sprayfield	11,181	1.4		
Landscaping	5,442	1.0		
Storage		0.7	12.0	2.7

SEASONAL OPERATIONAL USE

Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	20%	100%	100%
% in use during dry weather (Apr-Oct)	100%	100%	0%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft^2)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscaping (MG)	Out to winte landscapinc (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.06	0.00	0.60	*0.66*			0.02		0.04	0.14	*0.20*	0.46	0.46
December	31	0.06	0.00	0.62	*0.68*			0.01		0.02	0.15	*0.17*	0.51	0.97
January	31	0.07	0.00	0.62	*0.69*			0.01		0.02	0.15	*0.18*	0.52	1.48
February	28	0.08	0.00	0.56	*0.64*			0.02		0.03	0.13	*0.18*	0.46	1.94
March	31	0.08	0.00	0.62	*0.70*		0.00	0.03		0.05	0.15	*0.23*	0.47	2.41
April	30	0.02	0.00	0.60	*0.62*	0.06	0.19		0.32			*0.58*	0.04	2.45
May	31	0.01	0.00	0.62	*0.63*	0.12	0.29		0.60			*1.01*	-0.38	2.07
June	30	0.00	0.00	0.60	*0.60*	0.15	0.35		0.81			*1.31*	-0.71	1.36
July	31	0.00	0.00	0.62	*0.62*	0.16	0.36		0.88			*1.41*	-0.79	0.57
August	31	0.00	0.00	0.62	*0.62*	0.14	0.32		0.69			*1.15*	-0.53	0.04
September	30	0.00	0.00	0.60	*0.60*	0.10	0.24		0.41			*0.75*	-0.15	0.00
October	31	0.01	0.00	0.62	*0.63*	0.05	0.14		0.21			*0.40*	0.23	0.23
Average	30.4	0.03	0.00	0.61	*0.64*	0.07	0.16	0.01	0.33	0.01	0.06	0.63	0.01	1
Total	365	0.39	0.00	7.30	*7.69*	0.79	1.90	0.09	3.92	0.16	0.71	7.57	0.13	14
Max	31	0.08	0.00	0.62	*0.70*	0.16	0.36	0.03	0.88	0.05	0.15	1.41	0.52	2.45
Min	28	0.00	0.00	0.56	*0.60*	0.00	0.00	0.00	0.00	0.00	0.00	0.17	-0.79	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

20,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 0.0 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	0	0.00		
Sprayfield	0	1.7		
Landscaping	5,197	1.0		
Storage		0.9	12.0	3.5

SEASONAL OPERATIONAL USE			
Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	0%	0%	0%
% in use during dry weather (Apr-Oct)	100%	100%	0%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft²)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	Net in (MG)	Out to evaporation (MG)	Out to landscapinç (MG)	Out to wint landscapinç (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	Net out (MG)	Net (MG)	Accum storage (MG)
November	30	0.07	0.00	0.60	*0.67*			0.00		0.00		*0.00*	0.67	0.67
December	31	0.08	0.00	0.62	*0.70*			0.00		0.00		*0.00*	0.70	1.37
January	31	0.10	0.00	0.62	*0.72*			0.00		0.00		*0.00*	0.72	2.09
February	28	0.10	0.00	0.56	*0.66*			0.00		0.00		*0.00*	0.66	2.75
March	31	0.10	0.00	0.62	*0.72*			0.00		0.00		*0.00*	0.72	3.47
April	30	0.02	0.00	0.60	*0.62*	0.08	0.19	0.00	0.39	0.00		*0.67*	-0.04	3.42
May	31	0.01	0.00	0.62	*0.63*	0.15	0.29	0.00	0.72	0.00		*1.16*	-0.53	2.89
June	30	0.00	0.00	0.60	*0.60*	0.19	0.35	0.00	0.98	0.00		*1.52*	-0.92	1.98
July	31	0.00	0.00	0.62	*0.62*	0.21	0.36	0.00	1.06	0.00		*1.64*	-1.02	0.96
August	31	0.00	0.00	0.62	*0.62*	0.18	0.32	0.00	0.83	0.00		*1.33*	-0.71	0.25
September	30	0.01	0.00	0.60	*0.61*	0.13	0.24	0.00	0.50	0.00		*0.86*	-0.26	0.00
October	31	0.02	0.00	0.62	*0.64*	0.07	0.14	0.00	0.25	0.00		*0.46*	0.18	0.18
Average	30.4	0.04	0.00	0.61	*0.65*	0.09	0.16	0.00	0.39	0.00	0.00	0.64	0.01	2
Total	365	0.51	0.00	7.30	*7.81*	1.02	1.90	0.00	4.72	0.00	0.00	7.64	0.17	20
Max	31	0.10	0.00	0.62	*0.72*	0.21	0.36	0.00	1.06	0.00	0.00	1.64	0.72	3.47
Min	28	0.00	0.00	0.56	*0.60*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.02	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

20,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 4.5 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	14,810	1.13		
Sprayfield	0	0.0		
Landscaping	5,197	1.0		
Storage		0.4	12.0	1.4

SEASONAL OPERATIONAL USE

Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	0%	0%	100%
% in use during dry weather (Apr-Oct)	100%	0%	100%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft^2)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscapinc (MG)	Out to wint landscapinc (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.03	0.00	0.60	*0.63*			0.00	0.00	0.00	0.44	*0.44*	0.18	0.18
December	31	0.03	0.00	0.62	*0.65*			0.00	0.00	0.00	0.46	*0.46*	0.19	0.38
January	31	0.04	0.00	0.62	*0.66*			0.00	0.00	0.00	0.46	*0.46*	0.20	0.58
February	28	0.04	0.00	0.56	*0.60*			0.00	0.00	0.00	0.41	*0.41*	0.18	0.76
March	31	0.04	0.00	0.62	*0.66*			0.00	0.00	0.00	0.46	*0.46*	0.20	0.96
April	30	0.01	0.00	0.60	*0.61*	0.03	0.19	0.00	0.00	0.00	0.44	*0.67*	-0.06	0.90
May	31	0.00	0.00	0.62	*0.62*	0.06	0.29	0.00	0.00	0.00	0.46	*0.81*	-0.19	0.71
June	30	0.00	0.00	0.60	*0.60*	0.08	0.35	0.00	0.00	0.00	0.44	*0.87*	-0.27	0.44
July	31	0.00	0.00	0.62	*0.62*	0.08	0.36	0.00	0.00	0.00	0.46	*0.91*	-0.29	0.16
August	31	0.00	0.00	0.62	*0.62*	0.07	0.32	0.00	0.00	0.00	0.46	*0.85*	-0.23	0.00
September	30	0.00	0.00	0.60	*0.60*	0.05	0.24	0.00	0.00	0.00	0.44	*0.73*	-0.13	0.00
October	31	0.01	0.00	0.62	*0.63*	0.03	0.14	0.00	0.00	0.00	0.46	*0.63*	0.00	0.00
Average	30.4	0.02	0.00	0.61	*0.62*	0.03	0.16	0.00	0.00	0.00	0.45	0.64	-0.02	0
Total	365	0.20	0.00	7.30	*7.50*	0.40	1.90	0.00	0.00	0.00	5.41	7.70	-0.20	5
Max	31	0.04	0.00	0.62	*0.66*	0.08	0.36	0.00	0.00	0.00	0.46	0.91	0.20	0.96
Min	28	0.00	0.00	0.56	*0.60*	0.00	0.00	0.00	0.00	0.00	0.41	0.41	-0.29	0.00

Water Balance for Seasonal Storage and Disposal Sizing

North Fork

INITIAL CONDITIONS

20,000 Wastewater flow (gpd)
0% Percent RDI/I

Leachfield Area/25% efficiency = Total Leachfield Area 1.6 acres

	Capacity (gpd)	Area (acre)	Depth (ft)	Capacity (MG)
Leachfield	5,132	0.39		
Sprayfield	12,191	1.6		
Landscaping	5,442	1.0		
Storage		0.7	12.0	2.6

SEASONAL OPERATIONAL USE

Period	Landscaping	Sprayfield	Leachfield
% in use during wet weather (Nov-Mar)	20%	100%	100%
% in use during dry weather (Apr-Oct)	100%	100%	0%

0.3 Soil application (hydraulic loading) rate for percolation (gpd/ft^2)

WATER BALANCE

Month (-)	Days (-)	In from rainfall (MG)	In from RDI/I (MG)	In from wastewater (MG)	*Net in (MG)*	Out to evaporation (MG)	Out to landscaping (MG)	Out to winte landscapinç (MG)	Out to sprayfield (MG)	Out to winter sprayfield (MG)	Out to leachfield (MG)	*Net out (MG)*	Net (MG)	Accum storage (MG)
November	30	0.05	0.00	0.60	0.65			0.02		0.04	0.15	0.22	0.44	0.44
December	31	0.06	0.00	0.62	0.68			0.01		0.02	0.16	0.18	0.49	0.93
January	31	0.07	0.00	0.62	0.69			0.01		0.02	0.16	0.19	0.50	1.43
February	28	0.07	0.00	0.56	0.63			0.02		0.03	0.14	0.19	0.44	1.86
March	31	0.07	0.00	0.62	0.69		0.00	0.03		0.06	0.16	0.25	0.44	2.31
April	30	0.02	0.00	0.60	0.62	0.06	0.19		0.35			0.61	0.01	2.32
May	31	0.01	0.00	0.62	0.63	0.11	0.29		0.65			1.05	-0.43	1.89
June	30	0.00	0.00	0.60	0.60	0.14	0.35		0.89			1.37	-0.77	1.12
July	31	0.00	0.00	0.62	0.62	0.15	0.36		0.96			1.48	-0.86	0.26
August	31	0.00	0.00	0.62	0.62	0.13	0.32		0.75			1.21	-0.58	0.00
September	30	0.00	0.00	0.60	0.60	0.09	0.24		0.45			0.78	-0.18	0.00
October	31	0.01	0.00	0.62	0.63	0.05	0.14		0.22			0.42	0.22	0.22
Average	30.4	0.03	0.00	0.61	0.64	0.06	0.16	0.01	0.36	0.01	0.06	0.66	-0.02	1
Total	365	0.37	0.00	7.30	7.67	0.74	1.90	0.09	4.28	0.17	0.77	7.95	-0.28	13
Max	31	0.07	0.00	0.62	0.69	0.15	0.36	0.03	0.96	0.06	0.16	1.48	0.50	2.32
Min	28	0.00	0.00	0.56	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.18	-0.86	0.00

Appendix E

Waste Discharge Requirements
El Dorado Irrigation District
and
San Andreas Sanitary District

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2002-0210

NPDES NO. CA 0078662

WASTE DISCHARGE REQUIREMENTS
FOR
EL DORADO IRRIGATION DISTRICT
DEER CREEK WASTEWATER TREATMENT PLANT
EL DORADO COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

BACKGROUND

1. El Dorado Irrigation District (hereafter Discharger) submitted a Report of Waste Discharge, dated 22 March 2002, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the Deer Creek Wastewater Treatment Plant (DCWWTP). Supplemental information to complete filing of the application was submitted on 15 July 2002.

2. The Discharger owns and operates a wastewater collection, treatment, reclamation and disposal system, and provides sewerage service to the Cameron Park and Mother Lode Service Area. The treatment plant is in Section 16, T9N, R9E, MDB&M, as shown on Attachment A, a part of this Order. Treated municipal wastewater is discharged to Deer Creek, a water of the United States and a tributary to the Cosumnes River at the point, latitude N38°37'42" and longitude W120°59'11". Treated wastewater discharged for reclamation is regulated under separate waste discharge requirements and must meet the requirements of California Code of Regulations, Title 22.

3. The treatment system main components consists of an influent siphon, headworks, primary clarifier, three aeration basins, an emergency storage basin, three secondary clarifiers, eleven tertiary filters, two chlorine contact chambers, one primary sludge thickener, one waste activated sludge thickener, four aerobic digesters, two belt filter presses, two sludge lime addition stations, and a plant drain sump. Sludge is dewatered by the belt filter presses and disposed off-site on farmland or at the local landfill. The Report of Waste Discharge describes the discharge as follows:

Monthly Average Flow:	2.86	million gallons per day (mgd)
Daily Peak Wet Weather Flow:	8.04	mgd
Design Flow (dry weather):	2.5	mgd
Mean Effluent Temperature:	75.5°F Summer; 59.6 °F Winter	

Constituent	mg/l	lb/Day[2]
CBOD[1]	2.53	60.35
Total Suspended Solids	2.63	62.73

[1] 5-day, 20°C biochemical oxygen demand
[2] Based on an average daily flow of 2.86 mgd

4. The DCWWTP has been significantly upgraded over the past five years. With the exception of the tertiary treatment system, improvements to the primary, secondary, and ancillary treatment processes have been constructed to accommodate an ADWF of 3.6 mgd. The environmental impact report for the expansion of the DCWWTP for 2.5 to 3.6 mgd states that the capacity of the existing tertiary filtration system is rated at 1.5 mgd. Additional filtration capacity is provided by using the tertiary filtration system that was designed and constructed for use as part of the reclamation treatment system, which can be utilized for discharge to Deer Creek when not being used to produce reclaimed water.

The Discharger has not accurately defined the capacity of the reclamation treatment system. There are occasions during peak wet weather flows when the filter capacity is exceeded. As an interim measure, until additional filter capacity is added, the Discharger modified the flow splitter to the tertiary filters so that flows that could not be handled by the filters are diverted from the secondary treatment system to a 1 million gallon seasonally used storage tank. When flows subside in the plant, the stored secondary treated wastewater is returned to the headworks, via the plant drain, for retreatment. After use as flow equalization in the winter, the storage tank is drain and cleaned before use as part of the reclamation distribution system.

The Discharger is in the initial stages of the process to add additional tertiary treatment capacity to accommodate an ADWF of 3.6 MGD. In addition, due to the variability of the receiving water dilution capacity, there are times when 20-to-1-dilution capacity is not available during peak wet weather events. Without this amount of dilution the effluent coliform limit of 2.2 MPN/100 ml (7-day median) will be required. Design parameters for the expanded tertiary system will have to take into consideration the peak wet weather events, when 20-to-1 dilution is not available, and the 2.2 MPN/100 ml (7-day median) is in effect.

A time schedule is included in the permit to allow the Discharger adequate time to construct the necessary facilities to fully expand to 3.6 MGD, and achieve compliance with the coliform limit. Upon completion of the upgrades to the tertiary treatment system, to be capable of treating both an average dry weather flow of 3.6 MGD, and peak wet weather flows, the capacity of the facility will be rated at 3.6 MGD. At that time mass limits will be calculated using 3.6 MGD. Upon completion of the improvements, the expansion of the facility shall be certified, by a Registered Civil Engineer with experience in the design and operation of wastewater treatment plants, that the facility expansion has been completed and the facility was designed and constructed to achieve the limits established in the permit.

5. The U.S. Environmental Protection Agency (EPA) and the Regional Board have classified this discharge as a major discharge.

6. The Regional Board adopted a *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

BENEFICIAL USES OF THE RECEIVING STREAM

7. The Basin Plan at page II-2.00 states: "Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams." The Basin Plan does not specifically identify beneficial uses for Deer Creek, but the Basin Plan does identify present and potential uses for the Cosumnes River, to which is tributary.

The Basin Plan identifies the following beneficial uses for the Cosumnes River: municipal and domestic supply; agricultural irrigation, agricultural stock watering, body contact water recreation, canoeing and rafting, non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, and wildlife habitat. In addition, State Board Resolution No 88-63, incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056, requires the Regional Board to assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in Table II-1.

The Basin Plan on page II-1.00 states: "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning…" and with respect to disposal of wastewaters states that "...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses."

In reviewing whether the existing and/or potential uses of the Cosumnes River apply to the Deer Creek, the Regional Board has considered the following facts:

a. *Domestic Supply and Agricultural Supply*

The State Water Resources Control Board (SWRCB) Resolution No. 88-63 "Sources of Drinking Water" provides that "All surface and ground waters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards…"

The SWRCB has issued water rights to existing water users along Deer Creek and the Cosumnes River downstream of the discharge for domestic and irrigation uses. Since Deer Creek is an ephemeral stream the creek likely provides groundwater recharge during periods of low flow. The groundwater is a source of drinking water. In addition to the existing water uses, growth in the area, downstream of the discharge is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in Deer Creek.

b. *Water Contact and Noncontact Recreation and Esthetic Enjoyment*

The Regional Board finds that the discharge flows through residential areas, there is ready public access to Deer Creek, exclusion of the public are unrealistic and contact recreational activities currently exist along Deer Creek and downstream waters and these uses are likely to increase as the population in the area grows. Prior to discharge into the Cosumnes River, Deer Creek flows through areas of general public access, meadows, residential areas and parks, to the Cosumnes River. The Cosumnes River also offers recreational opportunities.

c. *Groundwater Recharge*

In areas where groundwater elevations are below the stream bottom, water from the stream will percolate to groundwater. Since Deer Creek is at times dry, it is reasonable to assume that the stream water is lost by evaporation, flow downstream and percolation to groundwater providing a source of municipal and irrigation water supply.

d. *Freshwater Replenishment*

When water is present in Deer Creek, there is hydraulic continuity between Deer Creek and the Cosumnes River. During periods of hydraulic continuity, Deer Creek adds to the water quantity and may impact the quality of water flowing down stream in the Cosumnes River.

e. *Preservation and Enhancement of Fish, Wildlife and Other Aquatic Resources.*

Deer Creek flows to the Cosumnes River. The California Department of Fish and Game (DFG) has verified that the fish species present in Deer Creek and downstream waters are consistent with both cold and warm water fisheries, that there is a potential for anadromous fish migration necessitating a cold water designation and that trout, a cold water species, have been found both upstream and downstream of the wastewater treatment plant. The Basin Plan (Table II-1) designates the Cosumnes River as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote (2)), the cold designation applies to Deer Creek. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l.

Upon review of the flow conditions, habitat values, and beneficial uses of Deer Creek, and the facts described above, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Cosumnes River are applicable to Deer Creek.

The Regional Board also finds that based on the available information and on the Discharger's application, that Deer Creek, absent the discharge, is an ephemeral stream. The ephemeral nature of Deer Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within Deer Creek help support the aquatic life. Both conditions may exist within a short time span, where Deer Creek would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Cosumnes River. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water standards, agricultural water quality goals and aquatic life. Significant dilution may occur during and immediately following high rainfall events.

8. The beneficial uses of the underlying ground water are municipal and domestic, industrial service, industrial process and agricultural supply.

BASIN PLAN AMENDMENT PROCESS

9. Discharge from the DCWWTP can at times dominate the flow in Deer Creek. This condition caused violation of the Basin Plan water quality objectives for inland surface waters for pH, dissolved oxygen, temperature, and turbidity. The Discharger has made significant upgrades to the facility, however during low flow conditions in the creek, receiving water limitations for theses pollutants are not being consistently achieved. The Regional Board issued Cease and Desist Order (CDO) No. 95-255 on 7 December 1995 requiring the Discharger implement corrective actions to comply with these and other permit limitations. Subsequent to the CDO being issued, significant improvements to the facilities were made which brought the facility into compliance with the dissolved oxygen limit, however, pH, turbidity, and temperature remained problematic. When the current WDRs were issued in 1997, a CDO with compliance time schedules was also adopted to allow further time to comply with the Basin Plan objectives for pH, turbidity, and temperature.

The Discharger chose to pursue a Site-Specific Basin Plan Amendment (SSBPA) in lieu of making physical improvements to the treatment plant for compliance with Basin Plan objectives for pH, turbidity, and temperature. Due to the lengthy SSBPA process, the time schedule was modified to reflect the additional time needed to complete the Basin Plan Amendments (BPAs). CDO No. 5-000-033, Amendment 1, requires the Discharger to complete the BPAs by 30 December 2003. On 19 July 2002, the Regional Board adopted the BPAs for pH and turbidity. The State of California Office of Administrative Law (OAL) and U.S. EPA must also approve the BPAs before becoming effective.

The Regional Board has not yet considered the BPA for temperature. Since the existing Basin Plan Objectives for pH, turbidity, and temperature remain in effect, this Order contains limitations based those objectives.

EFFLUENT LIMITATIONS AND REASONABLE POTENTIAL

10. U.S. EPA adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan (SIP)), which contains guidance on implementation of the NTR and the CTR.

11. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. This Order contains provisions that:

    a. require the Discharger to conduct a study to provide information as to whether the levels of NTR and CTR constituents, EPA Priority Pollutants, or other pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a water quality standard, including Basin Plan numeric and narrative objectives and NTR and CTR criteria;

    b. if the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard, require the Discharger to submit information to calculate effluent limitations for those constituents; and

    c. allow the Regional Board to reopen this Order and include effluent limitations for those constituents.

    On 10 September 2001, the Executive Officer issued a letter, in conformance with State Water Code, Section 13267, requiring the Discharger to prepare a technical report assessing water quality. This Order is intended to be consistent with the requirements of the technical report in requiring sampling for NTR, CTR, and additional constituents to determine the full water quality impacts of the discharge. The technical report requirements are intended to be more detailed, listing specific constituents, detection levels, and acceptable time frames and shall take precedence in resolving any conflicts.

12. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality objectives. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs the Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above a water quality objective for ammonia, chloroform, coliform, copper, dichlorobromomethane, dibromochloromethane, and nitrates. Effluent limitations for these constituents are included in this Order.

13. Section 13263.6(a), California Water Code, requires that "the Regional Board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response

commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRKA) indicate as discharged into the POTW, for which the state board or the regional board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective".

The Regional Board has adopted a narrative objective for toxicity in the Basin Plan. The narrative toxicity objective and the Basin Plan *Policy for Application of Water Quality Objectives* provides that the objective may be translated using numerical limits published by other agencies and organizations. As detailed elsewhere in this Permit, available effluent quality data indicate that effluent concentrations of ammonia, chloroform, coliform, copper, dichlorobromomethane, dibromochloromethane, nitrate, and nitrite does have a reasonable potential to cause or contribute to an excursion above numeric or narrative water quality objectives. The EPCRKA Section 313 toxic chemical release data report indicates that ammonia, coliform, copper, and nitrate discharge into the Discharger's collection system. Effluent limitations for ammonia, chloroform, coliform, copper, dichlorobromomethane, dibromochloromethane, nitrate, and nitrite are included in this permit pursuant to CWC Section 13263.6(a).

14. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

15. **Chlorine-** The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. The Discharger uses chlorine for disinfection of the effluent waste stream. Chlorine can cause toxicity to aquatic organisms. U.S. EPA Ambient Water Quality Criteria for the Protection of Fresh Water Aquatic Life recommends a maximum 1-hour average of 0.019 (0.02) mg/l and 4-day average of 0.011 (0.01) mg/l for chlorine. The use of chlorine as a disinfectant presents a reasonable potential that it could be discharged in toxic concentrations. Effluent Limitations for chlorine have been included in this Order to protect the receiving stream aquatic life beneficial uses. The effluent limitations have been established at the ambient water quality criteria for chlorine since Deer Creek is a low-flow stream and at times provides no dilution.

16. **Ammonia and Nitrates -** Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. Nitrate and nitrite are known to cause adverse health effects in humans. The Basin Plan prohibits the discharge of chemical constituents in concentrations that adversely affect beneficial uses. Domestic water supply is a beneficial use of Deer Creek. U.S. EPA has developed Drinking Water Standards for protection of human health for nitrite and nitrate and Ambient Water

Quality Criteria for ammonia. The discharge from the DCWWTP has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for ammonia, nitrite, and nitrate. Effluent limitations for ammonia, nitrite, and nitrate are included in this Order to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the beneficial uses of the receiving stream and to prevent aquatic toxicity.

Under current operational conditions, due to the variable inflow conditions of wastewater into the treatment plant, nitrification on a consistent basis has been achievable. In addition to nitrification, to achieve ammonia limits, de-nitrification is necessary to meet nitrate and nitrite limits. Upgrades to the facility will be necessary to achieve these limits.

17. **Coliform** - The beneficial uses of Deer Creek and the Cosumnes River include contact recreation uses and irrigation. To protect these beneficial uses, the Regional Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered) to protect contact recreational and food crop irrigation uses. The method of treatment is not prescribed by Order No. R5-2002-0210; however, wastewater must be treated to a level equivalent to that specified in Title 22 and in other recommendations by the DHS.

The DHS is consulted by the Regional Board and makes recommendations for protection of the public's health when contacting wastewater effluent. Generally, DHS recommends that it is necessary to treat wastewater to a tertiary level or provide a 20-to-1 dilution for secondary treated wastewater, in order to protect the public health for contact recreational activities or the irrigation of food crops. The Discharger has been unable to quantify significant dilution within Deer Creek. The Discharger has, however, requested this Order contain secondary treatment effluent limitations to provide relief under a significant storm event when a 20-to-1 dilution is available. The Discharger will be required to establish an in-stream flow measuring system to accurately determine periods when 20-to-1 dilution exists. During these high flow periods, assimilative capacity has not been quantified for individual pollutants and end-of-pipe limits have been established. The BOD and TSS limits for secondary treatment are 30 mg/l as a monthly average and the total coliform limit is 23 MPN as a 7-day median. When there is less than 20-to-1 dilution full tertiary treatment is required. The tertiary limits for both BOD and TSS are 10 mg/l, and the effluent limit for total coliform organisms is 2.2 MPN/100 ml as a 7-day median. The effluent limits are based on the critical low flow, or zero dilution, and have also resulted in "end-of-pipe" limits.

The DHS has developed reclamation criteria, California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 m*l* as a 7-day median. Title 22 is not directly applicable to surface waters; however, the Regional Board finds that it is appropriate to apply the DHS reclamation criteria because Deer Creek and the Cosumnes River are used for irrigation of agricultural land and for contact recreation purposes. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

In addition to coliform testing, a turbidity effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is also capable of reliably meeting a reduced turbidity limitation of 2 NTU as a daily average, 5 NTU at least 95 percent of the time within a day, and 10 NTU at all times. Failure of the filtration system, such that virus removal is impaired, would normally result in increased particles in the effluent and higher effluent turbidity. Turbidity monitoring has a major advantage over coliform monitoring for evaluating filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours to days to identify high coliform concentrations.

18. This Order requires a tertiary level of treatment or 20-to-1 dilution in order to meet the requirements of the beneficial uses of Deer Creek. Sampling at the facility has shown that it can meet the 7-day 2.2 MPN/100 ml coliform standard and the 2 NTU monthly averages for turbidity the majority of the time. There is not a correlation between receiving water dilution capacity and violation of the 7-day 2.2 MPN/100 ml coliform standard. The DCWWTP tertiary treatment system must be upgraded to achieve compliance with tertiary limits up to peak wet weather flow to insure compliance with the coliform limit. With the exception of the tertiary treatment portion of the facility, the DCWWTP has been upgraded to handle peak wet weather flows. Additional tertiary filtration capacity is necessary to insure full compliance with the coliform standard.

The Discharger is currently in the process of design to upgrade the tertiary system. A time schedule is included in this Order to achieve compliance with the 7-day 2.2 MPN/100 ml coliform standard. The Discharger has not defined the actual capacity of the existing tertiary filtration system. Based on the discharger self monitoring reports and other available information, the tertiary filtration system has consistently achieved compliance with the 7-day median 2.2 MPN/100 ml coliform standard when flows to the plant are less than or equal to 5.0 MGD. Until the upgrades are completed, an interim limit for coliform is included in this Order, as follows: when the average daily flow exceeds 5.0 MGD the daily coliform standard will be 23 MPN/100 ml; and, when the daily average flow subsides to less than 5.0 MGD, the 7-day 2.2 MPN/100 ml coliform standard applies. When calculating the 7-day median, days that exceed 5.0 MGD are excluded from the calculation.

19. This Order contains Effluent Limitations and a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water. In accordance with California Water Code, Section 13241, the Regional Board has considered the following:

As stated in the above Findings, the past, present and probable future beneficial uses of the receiving stream include municipal and domestic supply, agricultural irrigation, agricultural stock watering, body contact water recreation, canoeing and rafting, non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, and wildlife habitat.

The environmental characteristics of the hydrographic unit including the quality of water available will be improved by the requirement to provide tertiary treatment for this wastewater discharge. Tertiary treatment will allow for the reuse of the undiluted wastewater for food crop irrigation and contact recreation activities which would otherwise be unsafe according to recommendations from the DHS.

Fishable and swimable water quality conditions can be reasonably achieved through the coordinated control of all factors which affect water quality in the area.

The economic impact of requiring an increased level of treatment has been considered. The current monthly domestic sewer user fee is $42.94, approximately double the California average monthly domestic sewer user fee of $20.46. The Discharger has already expanded the capacity of the treatment facility to 3.6 MGD, except for the tertiary treatment system. In 2001 the District estimated the cost to expand the tertiary treatment capacity to be $4.9 million. The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, include prohibiting the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact. In addition to pathogen removal to protect irrigation and recreation, tertiary treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for advanced treatment.

The requirement to provide tertiary treatment for this discharge will not adversely impact the need for housing in the area. The potential to develop housing in the area will be facilitated by improved water quality, which protects the contact recreation and irrigation uses of the receiving water. DHS recommends that, in order to protect the public health, undiluted wastewater effluent must be treated to a tertiary level, for contact recreational and food crop irrigation uses. Without tertiary treatment, the downstream waters could not be safely utilized for contact recreation or the irrigation of food crops.

It is the Regional Board's policy, (Basin Plan, page IV-15.00, Policy 2) to encourage the reuse of wastewater. The Regional Board requires Dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water is facilitated by providing a tertiary level of wastewater treatment, which will allow for a greater variety of uses in accordance with California Code of Regulations, Title 22.

20. In accordance with a previous permit, Order No, 97-211, the Discharger performed a study entitled "Phase II Effluent and Receiving Water Quality Assessment for the El Dorado Irrigation District's Deer Creek Wastewater Treatment Plant, dated 12 February 1999. The purpose of this report was to accurately identify contaminant levels in the treated effluent

discharged from the DCWWTP into Deer Creek, and to assess the potential for effluent discharges to cause a receiving water exceedance of the water quality standards, including chronic toxicity. The study provided a significant amount of data to determine compliance with the CTR and other applicable water quality objectives. From the study the following constituents were determined to have a reasonable potential to exceed water quality objectives.

a. **Total Trihalomethanes and Chloroform -** Municipal and domestic supply is a beneficial use of the receiving stream. The narrative toxicity objective and this beneficial use designation comprise a water quality standard applicable to pollutants in the receiving stream. The Basin Plan contains the *Policy for Application of Water Quality Objectives*, which provides that narrative objectives may be translated using numerical limits published by other agencies and organizations. The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within Cal/EPA. The OEHHA cancer potency value for oral exposure to chloroform is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicologic assumptions used by OEHHA and USEPA in evaluating health risks via drinking water exposure of 70 kg body weight and 2 liters per day water consumption, this cancer potency factor is equivalent to a concentration in drinking water of 1.1 ug/L (ppb) at the 1-in-a-million cancer risk level. This risk level is consistent with that used by the DHS to set *de minimus* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water. The one-in-a-million cancer risk level is also mandated by USEPA in applying human health protective criteria contained in the NTR and the CTR to priority toxic pollutants in California surface waters. A recent decision by the State Water Resources Control Board, Order No. WQ2002-0015, found that application of a chloroform limitation for a discharge to an ephemeral stream based on a cancer risk analysis was not appropriate since the U.S. EPA is evaluating the science used to develop the CTR and has reserved application of a water quality standard. This Order establishes an Effluent Limitation at the maximum contaminate level (MCL) for total trihalomethanes, the sum of bromoform, bromodichloromethane, chloroform and dibromochloromethane, based on protection of the municipal beneficial use of 80 μg/l. Based on information included in analytical laboratory results submitted by the Discharger, the discharge was found to have an average concentration of 48 μg/l, with a maximum concentration of 76 μg/l of chloroform. The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the water quality objective for municipal uses by causing exceedance of the primary MCL for trihaolmethanes. Therefore, an Effluent Limitation for total trihalomethanes is included in this Order and is based on the Basin Plan objective for municipal use. If U.S. EPA or the State Board develop a water quality objective for chloroform and/or total trihalomethanes, this Order may be reopened and a new Effluent Limitation established.

b. **Chlorodibromomethane -** Based on information included in analytical laboratory results submitted by the Discharger, the discharge had an average concentration of 1.07 μg/l and a maximum concentration of 1.90 µg/l, and has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for chlorodibromomethane. The CTR establishes numeric water quality standards for chlorodibromomethane. The criterion for waters from which both water and organisms are consumed is 0.41 ug/l. An Effluent Limitation for chlorodibromomethane is included in this Order.

c. **Dichlorobromomethane -** Based on information included in analytical laboratory results submitted by the Discharger, the discharge was found to have a average concentration of 9.40 µg/l and a maximum concentration of 12.0 µg/l, and has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for dichlorobromomethane. The CTR establishes numeric water quality standards for dichlorobromomethane. The criterion for waters from which both water and organisms are consumed is 0.56 ug/l. An Effluent Limitation for dichlorobromomethane is included in this Order.

d. **Copper-** Based on analytical results of effluent samples collected by the Discharger, the discharge has been measured up to 30.7 µg/l, with an average concentration of 19.4 µg/l, and has a reasonable potential to cause or contribute to an in-stream excursion above the CTR standards for copper; therefore, effluent limitations for copper are included in the Order. At the worst-case hardness of 70 mg/l, the criterion continuous concentration and criterion maximum concentration limitations for copper are 6.6 µg/l and 9.6 µg/l, respectively. The CTR standards for metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for copper in freshwater are 0.960 for both the acute and the chronic criteria. The effluent limitations for copper are presented in total recoverable concentrations, and are based on the CTR.

e. **Diethyl phthalate and Dimethyl phthalate-** Ten samples were taken monthly and analyzed for Diethyl phthalate and Dimethyl phthalate, all of the samples were non-detect except for the first sample taken. Diethyl phthalate and Dimethyl phthalate were present in the first round of samples at concentrations of 78 µg/l and 17 µg/l, respectively. Diethyl phthalate and Dimethyl phthalate are used in the manufacturing of plastics and polyvinyl chloride (PVC) pipe and tubing. The presence in the first round of sampling may have been due to the use of new sampling equipment that was not properly sanitized before it's first use. The CTR standards for Diethyl phthalate and Dimethyl phthalate are 23 mg/l and 313 mg/l, respectively. There is no reasonable potential to exceed the CTR standard.

GENERAL

21. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

22. The discharge is presently governed by Waste Discharge Requirements Order No. 99-130, adopted by the Regional Board on 17 September 1999.

23. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.

24. The El Dorado Irrigation District has certified a final environmental impact report (EIR) in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.), and the State CEQA Guidelines. The Regional Board has reviewed the EIR and concurs that with adoption of these waste discharge requirements there are no significant impacts on water quality.

25. The Regional Board has considered the information in the attached Information Sheet in developing the Findings of this Order. The attached Information Sheet is part of this Order.

26. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

27. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

28. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon the date of hearing, provided EPA has no objections.

IT IS HEREBY ORDERED that Order No. 99-130 is rescinded and El Dorado Irrigation District, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.

2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)"].

3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

B. Effluent Limitations:

1. Wastewater shall be oxidized, coagulated and filtered, or equivalent treatment provided, and the effluent shall not exceed the following limits when flow Deer Creek provides less dilution than 20:1 (stream flow:effluent):

Constituents	Units	Monthly Average	Weekly Average	7-day Median[6]	Daily Maximum	1-hour Average
Ammonia[5]	mg/l	Table A	---	---	Table B	---
	lbs/day[3]	calculated	---	---	calculated	---
BOD[1]	mg/l	10[2]	15[2]	---	30[2]	---
	lbs/day[3]	208	313	---	626	---
Chlorine Residual	mg/l	---	0.01	---	---	0.02
	lbs/day[3]	---	0.21	---	---	0.42
Chlorodibromomethane[7]	µg/l	0.41	---	---	---	---
	lbs/day[3]	0.009	---	---	---	---
Copper[5]	µg/l	Table C	---	---	Table D	---
	lbs/day[3]	calculated	---	---	calculated	---
Dichlorobromomethane	µg/l	0.56	---	---	---	---
	lbs/day[3]	0.012	---	---	---	---
Nitrite (as N)	mg/l	1	---	---	---	---
	lbs/day[3]	21	---	---	---	---
Nitrate + Nitrite (as N)	mg/l	10	---	---	---	---
	lbs/day[3]	208	---	---	---	---
Settleable Solids	ml/l	0.1	---	---	0.2	---
Total Coliform Organisms	MPN/100 ml	---	---	2.2	23[6]	---
Total Suspended Solids	mg/l	10[2]	15[2]	---	30[2]	---
	lbs/day[3]	208	313	---	626	---
Total Trihalomethanes[7]	µg/l	80[7]	---	---	---	---
	lbs/day[3]	1.66	---	---	---	---
Turbidity[4]	NTU	2[4]	---	---	5[4]	---

[1] 5-day, 20°C biochemical oxygen demand (BOD)
[2] To be ascertained by a 24-hour flow proportional composite sample.
[3] Based upon a design treatment capacity of 2.5 mgd (x mg/l x 8.345 x 2.5 mgd = y lbs/day)
[4] The daily average turbidity shall not exceed 2 NTU. Turbidity shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period. At no time shall the turbidity exceed 10 NTU.

Footnotes continued on next page.

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5 The mass limit (lb/day) for ammonia and copper shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 2.5 mgd and the unit conversion factor of 8.345 (see footnote 3 for equation).

6 7-day median is based on the previous seven daily sample results. The total coliform organisms concentration shall not exceed 23 MPN/100 m*l* more than once in any 30-day period. No sample shall exceed a concentration of 240 MPN/100 m*l*.

7 The monthly average for total trihalomethanes shall not exceed 80µg/l. Total trihalomethanes is the sum of bromoform, bromodichloromethane, chloroform and dibromochloromethane.

2. When flow in Deer Creek provides a minimum dilution of 20:1 (stream flow:effluent) full secondary treatment shall be provided and the coagulation system and filters shall be used to the maximum extent possible and effluent shall not exceed the following limits:

Constituents	Units	Monthly Average	Weekly Average	7-day Median[5]	Daily Maximum	1-hour Average
Ammonia[4]	mg/l	Table A	---	---	Table B	---
	lbs/day[3]	calculated	---	---	calculated	---
BOD[1]	mg/l	30[2]	45[2]	---	60[2]	---
	lbs/day[3]	625	938	---	1251	---
Chlorine Residual	mg/l	---	0.01	---	---	0.02
	lbs/day[3]	---	0.21	---	---	0.42
Chlorodibromomethane	µg/l	0.41	---	---	---	---
	lbs/day[3]	0.009	---	---	---	---
Copper[4]	µg/l	Table C	---	---	Table C	---
	lbs/day[3]	calculated	---	---	calculated	---
Dichlorobromomethane	µg/l	0.56	---	---	---	---
	lbs/day[3]	0.012	---	---	---	---
Nitrite (as N)	mg/l	1	---	---	---	---
	lbs/day[3]	21	---	---	---	---
Nitrate + Nitrite (as N)	mg/l	10	---	---	---	---
	lbs/day[3]	208	---	---	---	---
Settleable Solids	ml/l	0.1	---	---	0.2	---
Total Coliform Organisms	MPN/100 ml	---	---	23	230	---
Total Suspended Solids	mg/l	30[2]	45[2]	---	60[2]	---
	lbs/day[3]	250	376	---	750	---
Total Trihalomethanes[6]	µg/l	80[6]	---	---	---	---
	lbs/day[3]	1.66	---	---	---	---

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1 5-day, 20°C biochemical oxygen demand (BOD)

2 To be ascertained by a 24-hour flow proportional composite sample.

3 Based upon a design treatment capacity of 2.5 mgd (x mg/l x 8.345 x 2.5 mgd = y lbs/day)

4 The mass limit (lb/day) for ammonia and copper shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 2.5 mgd and the unit conversion factor of 8.345 (see footnote 3 for equation).

5 7-day median is based on the previous seven daily sample results.

6 The monthly average for total trihalomethanes shall not exceed 80µg/l. Total trihalomethanes is the sum of bromoform, bromodichloromethane, chloroform and dibromochloromethane.

3. The arithmetic mean of 20°C BOD (5-day) and total suspended solids in effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the

values for influent samples collected at approximately the same times during the same period (85 percent removal).

4. The discharge shall not have a pH less than 6.5 nor greater than 8.5.

5. The average dry weather discharge flow shall not exceed 2.5 million gallons per day. With the exception of the tertiary treatment system, the facility has been upgraded to 3.6 MGD (average daily flow). Upon completion of the upgrades to the tertiary treatment system, to be capable of treating both an average dry weather flow of 3.6 MGD, and peak wet weather flows, the capacity of the facility will be rated at 3.6 MGD. At that time mass limits will be calculated using 3.6 MGD. Upon completion of the improvements, the expansion of the facility shall certified, by a Registered Civil Engineer with experience in the design and operation of wastewater treatment plants, that the facility expansion has been completed and the facility was designed and constructed to achieve the limits established by this Order.

6. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

   Minimum for any one bioassay - - - - - - - - - 70%
   Median for any three or more consecutive bioassays - - - - 90%

C. Sludge Disposal:

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.

2. Any proposed change in sludge use or disposal practice from a previously approved practice shall be reported to the Executive Officer and EPA Regional Administrator at least **90 days** in advance of the change.

3. Use and disposal of sewage sludge shall comply with existing Federal and State laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

   If the State Water Resources Control Board and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.

4. The Discharger is encouraged to comply with the "Manual of Good Practice for Agricultural Land Application of Biosolids" developed by the California Water Environment Association.

5. By 1 May 2003, the Discharger shall submit a sludge disposal plan describing the annual volume of sludge generated by the plant and specifying the disposal practices.

D. Receiving Water Limitations:

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit.

The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/l. The monthly median of the mean daily dissolved oxygen concentration shall not fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75 percent of saturation.

2. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

3. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

4. Esthetically undesirable discoloration.

5. Fungi, slimes, or other objectionable growths.

6. The turbidity to increase as follows:

    a. (The 30-day average turbidity to increase) More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.

    b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

    c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.

    d. More than 10 percent where natural turbidity is greater than 100 NTUs.

7. The ambient pH to fall below 6.5, exceed 8.5, or the 30-day average ambient pH to change by more than 0.5 units.

8. The ambient temperature to increase more than 5°F.

9. Deposition of material that causes nuisance or adversely affects beneficial uses.

10. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or

aquatic life; or 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.

11. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

12. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

13. Violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder.

14. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.

15. The fecal coliform concentration in any 30-day period to exceed a geometric mean of 200 MPN/100 ml or cause more than 10 percent of total samples to exceed 400 MPN/100 ml.

E. Groundwater Limitations:

Release of waste constituents from any storage, treatment, or disposal component associated with the WWTP shall not degrade groundwater.

F. Provisions:

1. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and 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.

2. There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality objectives. The constituents are specifically listed in a technical report requirement issued by the Executive Officer on 10 September 2001 and include NTR, CTR and additional constituents, which could exceed Basin Plan numeric or narrative water quality objectives. The Discharger shall comply with the following time schedule in conducting a study of these constituents potential effect in surface waters:

Task	Compliance Date
Submit Study Report	**1 March 2003**
Submit Study Report for dioxins	**1 March 2004**

This Order is intended to be consistent with the requirements of the 10 September 2001 technical report. The technical report requirements shall take precedence in resolving any conflicts. The Discharger shall submit to the Regional Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

If after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective this Order will be reopened and effluent limitations added for the subject constituents.

3. New or revised effluent limitations for coliform, copper, dichlorobromomethane, and dibromochloromethane, have been included in this Order. To comply with these limits, it will be necessary for the Discharger to modify the existing treatment facility.

Additional tertiary filtration capacity is necessary during peak wet weather events to achieve total coliform limits when 20-to-1 dilution is not available in Deer Creek. A time schedule is included in this Order for the Discharger to expand the tertiary capacity of the facility to comply with Effluent Limitation B.1. for total coliform. The facility has demonstrated that it can reliable comply with this limit up to 5.0 MGD. The Discharger can not achieve immediate compliance with the total coliform limit during peak wet weather events, therefore an interim limit is provided until the construction of the additional facilities are completed. The interim limit is as follows:

When the average daily flow exceeds 5.0 MGD the daily coliform standard will be 23 MPN/100 ml; and, when the daily average flow subsides to less than 5.0 MGD, the 7-day 2.2 MPN/100 ml coliform standard applies. When calculating the 7-day median, days that exceed 5.0 MGD are excluded from the calculation.

To allow for these modifications a time schedule to comply with these new limits and construction of additional tertiary capacity is included. The Discharger shall comply with the following time schedule to complete the necessary improvements and fully comply with the new discharge limits.

Task	Compliance Date
Submit Workplan and Time Schedule	**6 February 2003**
Identify and Scope of Projects	**31 December 2003**
Complete Facility Modifications	**30 September 2006**
Full Compliance	**30 December 2006**

The Discharger shall submit to the Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Board by letter when it returns to compliance with the time schedule.

4. The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Resources Control Board, this Order may be reopened and a limitation based on that objective included.

5. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986.

6. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."

7. The Discharger shall comply with Monitoring and Reporting Program No. R5-2002-2010, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

8. When requested by USEPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger Self Monitoring Reports.

9. This Order expires on **31 December 2007** and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.

10. The Discharger shall enforce the Pretreatment Standards promulgated under Sections 307(b), 307(c) and 307(d) of the Clean Water Act. The Discharger shall perform the pretreatment functions required by 40 CFR Part 403 including but not limited to:

    a. Adopting the legal authority required by 40 CFR 403.8(f)(1);

    b. Enforcing the Pretreatment Standards of 40 CFR 403.5 and 403.6;

c. Implementing procedures to ensure compliance as required by 40 CFR 403.8(f)(2); and

d. Providing funding and personnel for implementation and enforcement of the pretreatment program as required by 40 CFR 403.8(f)(3).

11. The Discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this permit. If the Discharger fails to perform the pretreatment functions, the Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board (SWRCB) or the U.S. Environmental Protection Agency (U.S. EPA) may take enforcement actions against the Discharger as authorized by the Clean Water Act.

12. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:

a. Wastes which create a fire or explosion hazard in the treatment works;

b. Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;

c. Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;

d. Any waste, including oxygen demanding pollutants (BOD, etc.), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;

e. Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the Regional Board approves alternate temperature limits;

f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and

h. Any trucked or hauled pollutants, except at points predesignated by the Discharger.

13. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the legal authorities, programs, and controls necessary to ensure that indirect discharges do not

introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:

a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or

b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

14. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of, or clearance from the State Water Resources Control Board (Division of Water Rights).

15. Minimum detection levels for monitoring required by this Order shall, unless impracticable, be adequate to demonstrate compliance with permit limitations.

16. In the event the Discharger does not comply with an effluent limitation or receiving water limitation of this Order, the Discharger shall resample for the specific constituent for which the limitation was exceeded. The Discharger shall continue sampling at an increased frequency sufficient to determine the duration and severity of the violation. The frequency for constituents sampled using 24-hour composites on a 7-day a week schedule are exempted. This information shall be compiled in a written notification, which shall state nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the noncompliance and, prevent recurrence. All permit violations must be reported to the Board by telephone (916) 255-3000 within 24 hours of having knowledge of such noncompliance.

17. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

    To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Regional Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on **6 December 2002**.

THOMAS R. PINKOS, Executive Officer

rke:11/12/02

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM ORDER NO. R5-2002-0210

NPDES NO. CA0078662

FOR
EL DORADO IRRIGATION DISTRICT
DEER CREEK WASTEWATER TREATMENT PLANT
EL DORADO COUNTY

The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program. Specific sample station locations shall be established under direction of the Regional Board's staff, and a description of the stations shall be attached to this Order.

INFLUENT MONITORING

Samples shall be collected at approximately the same time as effluent samples and should be representative of the influent. Influent monitoring shall include at least the following:

Constituent	Sampling Units	Type of Sample	Frequency
20°C BOD_5	mg/l, lbs/day	24 hr. Composite[1]	Twice Weekly
Total Suspended Solids	mg/l, lbs/day	24 hr. Composite[1]	Twice Weekly
Flow	mgd	Meter	Continuous

[1] 24-hour samples shall be flow proportional.

EFFLUENT MONITORING

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall and after dechlorination. Effluent samples should be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
Chlorine Residual [5,6] (after dechlorination)	mg/l	Meter/Grab	Continuous/Weekly
Sodium Bisulfite [5,6] mg/l	*Meter*		*Continuous/Weekly*
Flow (effluent and reclamation)	*mgd*		*Meter Continuous*
Turbidity NTU	*Meter[7]*		*Continuous*
pH	Number	Grab	Daily
Settleable Solids	ml/l	Grab	Daily
Constituents	*Units Type of Sample*		*Sampling Frequency*

Temperature	°F	Grab	Daily
20°C BOD_5	mg/l, lbs/day	24 hr. Composite[1]	Five days/week
Suspended Solids	mg/l, lbs/day	24 hr. Composite[1]	Five days/week
Total Coliform Organisms	*MPN/100 ml*	*Grab*	*Five days/week*
Ammonia[3]	*mg/l*	*Grab*	*Weekly*
Copper	*µg/l*	*Grab*	*Weekly*
Electrical Conductivity	*µmhos/cm*	*Grab*	*Weekly*
Hardness (as $CaCO_3$)	mg/l	Grab	Weekly
Nitrate (N)	*mg N/l*	*Grab*	*Weekly*
Chloroform	µg/l	Grab	Bi-Monthly
Dichlorobromomethane	*µg/l*	*Grab*	*Bi-Monthly*
Dibromochloromethane	*µg/l*	*Grab*	*Bi-Monthly*
Total Trihalomethanes[8]	µg/l	Grab	Bi-Monthly
Acute Toxicity[2]	% Survival	Grab	Quarterly
EPA Priority Pollutants[4]	µg/l	As appropriate	Bi-Annually

1 Composite samples shall be flow proportional.

2 The bioassay shall be 96-hour acute toxicity tests conducted in accordance with EPA/600/4-90/027F, or later amendment approved by Board staff. The bioassay shall sample undiluted effluent after the dechlorination process and prior to discharge to Deer Creek. Larval stage rainbow trout (Oncorhynchus mykiss) shall be used as the test species. The bioassay shall be started on different days to assure representative sampling of the wastestream. Temperature and pH shall be recorded each day of the test.

3 Concurrent with bioassay, pH, and temperature monitoring.

4 EPA priority pollutants shall include NTR and CTR constituents and aluminum.

5 Use of continuous monitoring instrumentation for chlorine and sodium bisulfite residual in the effluent is an appropriate method of process control, however, the accuracy of the chlorine analyzers are not low enough to meet minimum detection levels. Residual sodium bisulfite in the effluent indicates that chlorine is not present in the effluent, which can validate a zero residual reading on the chlorine analyzer. Reporting of these two constituents, when sodium bisulfite is present and chlorine is zero, sufficiently insures compliance with the chlorine residual limit, as long as the instruments are maintained and calibrated in accordance with the manufactures recommendations. In addition to the continuous recorder, a weekly grab sample of the effluent shall be analyzed by a certified laboratory for chlorine and sodium bisulfite. Readings from the residual analyzers shall be taken at the time of sampling, and reported with the laboratory results to validate the accuracy of the process control instrumentation.

6 Report magnitude and duration of all non-zero residual events. Non-zero events are defined as a reading of zero for chlorine residual and sodium bisulfite is below the minimum detection limit of the continuous residual monitoring device. If the continuous monitoring device is out of service, then one grab chlorine residual sample shall be collected per day.

7 The turbidity meter shall be stationed immediately after the filters, prior to chlorination and dechlorination.

8 Total trihalomethanes is the sum of bromoform, bromodichloromethane, chloroform and dibromochloromethane.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples. Receiving water monitoring shall include at least the following:

Station	Description
R-1	Gaging station upstream of the point of discharge at the first bridge crossing Deer Creek as part of the access road to the WWTP.
R-2	100 feet downstream of the confluence of the secondary channel and the main stem of Deer Creek.

Constituents	Units	Station	Sampling Frequency
Flow	mgd	Meter (R-1)	Continuous
Dissolved Oxygen	mg/l	R-1, R-2	Weekly
Electrical Conductivity	µmhos/cm	R-1, R-2	Weekly
Hardness (as $CaCO_3$)	mg/l	R-1, R-2	Weekly
pH	Number	R-1, R-2	Weekly
Temperature	°F (°C)	R-1, R-2	Weekly
Turbidity	NTU	R-1, R-2	Weekly
Radionuclides	pCi/l	R-1, R-2	Annually

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-1 and R-2. Notes on receiving water conditions shall be summarized in the monitoring report. Attention shall be given to the presence or absence of:

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

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to Deer Creek. The testing shall be conducted as specified in EPA 600/4-91-002. Chronic toxicity samples shall be collected at the discharge of the wastewater treatment plant prior to its entering Deer Creek. Composite (24-hour) samples shall be representative of the volume and quality of the discharge. The effluent tests must be conducted with concurrent reference toxicant tests. Monthly laboratory reference toxicant tests may be substituted upon approval. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 14 days. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas, Ceriodaphnia dubia, and Selenastrum capricornutum*
Frequency: Four times per year
Dilution Series:

	Dilutions (%)					Controls	
	100	75	50	25	12.5	Creek Water	Lab Water
% WWTP Effluent	100	75	50	25	12.5	0	0
% Dilution Water[1]	0	25	50	75	87.5	100	0
% Lab Water[2]	0	0	0	0	0	0	100

[1] Dilution water shall be receiving water from Deer Creek taken upstream from the discharge point. The dilution series may be altered upon approval of Board staff.

SLUDGE MONITORING

A composite sample of sludge shall be collected annually in accordance with EPA's *POTW Sludge Sampling and Analysis Guidance Document, August 1989*, and tested for the following metals:

Cadmium	Lead
Chromium	Nickel
Copper	Zinc
	Mercury

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

REPORTING

Monitoring results shall be submitted to the Regional Board by the **first day** of the second month following sample collection. Quarterly and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter, semi-annual period, and year,** respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and removal efficiencies (%) for BOD and Suspended Solids, should be determined and recorded.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **30 January of each year**, the Discharger shall submit a written report to the Executive Officer containing the following:

a. The names, certificate grades, and general responsibilities of all persons employed at the WWTP (Standard Provision A.5).

b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.

c. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).

d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

The Discharger may also be requested to submit an annual report to the Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

Ordered by: THOMAS R. PINKOS, Executive Officer

6December 2002
(Date)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2002- 0211

REQUIRING THE
EL DORADO IRRIGATION DISTRICT
DEER CREEK WASTEWATER TREATMENT PLANT
TO CEASE AND DESIST
FROM DISCHARGING CONTRARY TO REQUIREMENTS

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds:

1. On 6 December 2002 the Regional Board adopted Waste Discharge Requirements (WDR) Order No. R5-2002- 0210, for the El Dorado Irrigation District, (Discharger) Deer Creek Wastewater Treatment Plant. WDR Order No. R5-2002-0210 regulates the discharge of approximately 2.5 million gallons per day (mgd) of treated domestic wastewater to Deer Creek, which is tributary to the Cosumnes River.

2. WDR Order No. R5-2002-0210 contains Effluent Limitations for total trihaolmethanes, nitrite, and nitrate plus nitrite as contained in B.1 and B.2., which read in part as follows:

Constituents	Units	Monthly Average	Weekly Average	7-day Median	Daily Maximum	1-hour Average
Nitrite (as N)	mg/l	1	---	---	---	---
	lbs/day [3]	21	---	---	---	---
Nitrate + Nitrite (as N)	mg/l	10	---	---	---	---
	lbs/day[3]	208	---	---	---	---
Total Trihalomethanes[7]	µg/l	80[7]	---	---	---	---
	lbs/day[3]	1.66	---	---	---	---

[3] Based upon a design treatment capacity of 2.5 mgd (*x* mg/*l* x 8.345 x 1.12 mgd = *y* lbs/day).[3]
[7] The monthly average for total trihalomethanes shall not exceed 80µg/l. Total trihalomethanes is the sum of bromoform, bromodichloromethane, chloroform and dibromochloromethane.

3. The use of chlorine as a disinfectant may result in the formation of total trihalomethanes that exceed the Effluent Limitation. Past sampling of the discharge shows total trihalomethanes above 80 µg/l. The discharge threatens to violate the Waste Discharge Requirement Effluent Limitation for total trihalomethanes.

4. The current facility design and operation result in incomplete denitrification of wastewater and increased effluent nitrate and nitrite concentrations. Failure to denitrify the wastewater would result in concentrations of nitrate and nitrite that exceed Effluent Limitations.

5. Based on the above findings, this discharge represents a threatened discharge of waste in violation of WDR Order No. R5-2002- 0210, Effluent Limitations for nitrite, and nitrate plus nitrite.

6. In order to consistently comply with the nitrite and nitrate plus nitrite Effluent Limitations, denitrification of the wastewater is necessary.

7. In accordance with California Water Code (CWC) Section 13385(j)(3), the Regional Board finds that, based upon operational capabilities, the Discharger can no consistently comply with nitrite and nitrate plus nitrite effluent limitations. The nitrite and nitrate plus nitrite limitations are new requirements that become applicable to the permit after the effective date of adoption of the waste discharge requirements for which new or modified control measures are necessary in order to comply with the limitation, and the new or modified control measures cannot be designed, installed, and put into operation within 30 calendar days.

   Since the time schedules for completion of actions necessary to achieve full compliance exceed one year, interim requirements and dates for there achievement are included in this Order. This time schedule does not exceed five years. Treatment actions can be taken to correct the violations that would otherwise be subject to mandatory penalties under California Water Code section 13385(h) and (i), and the Discharger can take reasonable measures to achieve compliance within five (5) years from the date the waste discharge requirements were required to be reviewed pursuant to Section 13380.

Compliance with this Order exempts the Discharger from mandatory minimum penalties for violations of effluent nitrate limitations only, in accordance with California Water Code Section 13385(j)(3).

8. On 6 December 2002, in Sacramento, California, after due notice to the Discharger and all other affected persons, the Regional Board conducted a public hearing at which evidence was received to consider a Cease and Desist Order to establish a time schedule to achieve compliance with waste discharge requirements.

9. Issuance of this Order is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, *et seq.*), in accordance with Section 15321 (a)(2), Title 14, California Code of Regulations.

10. Any person adversely affected by this action of the Regional Board may petition the State Water Resources Control Board (State Board) to review the action. The petition must be received by the State Board Office of the Chief Counsel, P.O. Box 100, Sacramento, CA, 95812-0100, within 30 days of the date on which the action was taken. Copies of the law and regulations applicable to filing petitions will be provided on request.

IT IS HEREBY ORDERED THAT:

1. Cease and Desist Order No. 5-00-003 is hereby rescinded and the El Dorado Irrigation District, Deer Creek Wastewater Treatment Plant, shall cease and desist from discharging and threatening to discharge contrary to Waste Discharge Requirements Order No. R5-2002-0210, Effluent Limitations for total trihalomethanes, nitrite and nitrate plus nitrite.

2. The El Dorado Irrigation District, Deer Creek Wastewater Treatment Plant, shall comply with the following time schedule to assure compliance with the total trihalomethanes, nitrite and nitrate plus nitrite Effluent Limitations B.1. and B.2. contained in Waste Discharge Requirements Order No. R5-2002-0210:

Task	Compliance Date
Submit Workplan and Time Schedule	**6 February 2003**
Identify Scope of Projects	**31 December 2003**
Complete Facility Modifications	**30 September 2006**
Full Compliance	**30 December 2006**

3. Until full compliance with Waste Discharge Requirements Order No. R5-2002-0210, and Effluent Limitations B.1 and B.2 is achieved for nitrite and nitrate plus nitrite, the Discharger shall operate the treatment plant in a denitrification mode to the maximum extent practicable.

4. The El Dorado Irrigation District shall comply with the Receiving Water Limitations for pH, turbidity and temperature contained in Waste Discharge Requirements Order No. R5-2002-0210 **by 1 December 2003.**

5. If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may apply to the Attorney General for judicial enforcement or issue a complaint for Administrative Civil Liability.

I, THOMAS R. PINKOS, Executive Officer, do herby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 6 December 2002.

THOMAS R. PINKOS, Executive Officer

RKE:rke *11/12/02*

INFORMATION SHEET

ORDER NO. R5-2002-0210
EL DORADO IRRIGATION DISTRICT
DEER CREEK WASTEWATER TREATMENT PLANT
EL DORADO COUNTY
NPDES NO. CA0078662

SCOPE OF PERMIT

This renewed Order regulates the discharge of up to 2.5 million gallons per day (mgd), design average dry weather flow (ADWF), of effluent from the El Dorado Irrigation District (Discharger), Deer Creek Wastewater Treatment Plant (DCWWTP). This Order includes effluent, water supply, sludge, and surface water limitations, monitoring and reporting requirements, additional study requirements, and reopener provisions for effluent constituents.

BACKGROUND INFORMATION

The Discharger owns and operates a wastewater collection, treatment, reclamation and disposal system, and provides sewerage service to the Cameron Park and Mother Lode Service Area. The treatment plant is in Section 16, T9N, R9E, MDB&M, as shown on Attachment A, a part of this Order. Treated municipal wastewater is discharged to Deer Creek, a water of the United States and a tributary to the Cosumnes River. Treated wastewater discharged for reclamation is regulated under separate waste discharge requirements and must meet the requirements of California Code of Regulations, Title 22.

The treatment system main components consists of an influent siphon, headworks, primary clarifier, three aeration basins, an emergency storage basin, three secondary clarifiers, eleven tertiary filters, two chlorine contact chambers, one primary sludge thickener, one waste activated sludge thickener, four aerobic digesters, two belt filter presses, two sludge lime addition stations, and a plant drain sump. Sludge is dewatered by the belt filter presses and disposed off-site on farmland or at the local landfill.

The DCWWTP has been significantly upgraded over the past five years. With the exception of the tertiary treatment system, improvements to the primary, secondary, and ancillary treatment processes have been constructed to accommodate an ADWF of 3.6 mgd. The environmental impact report for the expansion of the DCWWTP for 2.5 to 3.6 mgd states that the capacity of the existing tertiary filtration system is rated at 1.5 mgd. Additional filtration capacity is provided by using the tertiary filtration system that was designed and constructed for use as part of the reclamation treatment system, which can be utilized for discharge to Deer Creek when not being used to produce reclaimed water.

The Discharger has not accurately defined the capacity of the reclamation treatment system. There are occasions during peak wet weather flows when the filter capacity is exceeded. As an interim measure, until additional filter capacity is added, the Discharger modified the flow splitter to the tertiary filters so that flows that could not be handled by the filters are diverted from the secondary treatment system to a 1 million gallon seasonally used storage tank. When flows subside in the plant, the stored secondary treated wastewater is returned to the headworks, via the plant drain, for retreatment.

The Discharger is in the initial stages of the process to add additional tertiary treatment capacity to accommodate an ADWF of 3.6 MGD. In addition, due to the variability of the receiving water dilution capacity, there are times when 20-to-1-dilution capacity is not available during peak wet weather events. Without this amount of dilution the effluent coliform limit of 2.2 MPN/100 ml (7-day median) will be required. Design parameters for the expanded tertiary system will have to take into consideration the peak wet weather events, when 20-to-1 dilutions is not available, and the 2.2 MPN/100 ml (7-day median) is in effect.

A time schedule is included in the permit to allow the Discharger adequate time to construct the necessary facilities to fully expand to 3.6 MGD, and achieve compliance with the coliform limit. Upon completion of the upgrades to the tertiary treatment system, to be capable of treating both an average dry weather flow of 3.6 MGD, and peak wet weather flows, the capacity of the facility will be rated at 3.6 MGD. At that time mass limits will be calculated using 3.6 MGD. Upon completion of the improvements, the expansion of the facility shall be certified, by a Registered Civil Engineer with experience in the design and operation of wastewater treatment plants, that the facility expansion has been completed and the facility was designed and constructed to achieve the limits established in the permit.

RECEIVING WATER BENEFICIAL USES

The DCWWTP discharges treated effluent to Deer Creek, which is tributary to the Cosumnes River. The Basin Plan at page II-2.00 states: "Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams." The Basin Plan does not specifically identify beneficial uses for Deer Creek, but the Basin Plan does identify present and potential uses for the Cosumnes River, to which is tributary.

The Basin Plan identifies the following beneficial uses for the Cosumnes River: municipal and domestic supply; agricultural irrigation, agricultural stock watering, body contact water recreation, canoeing and rafting, non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, and wildlife habitat. In addition, State Board Resolution No 88-63, incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056, requires the Regional Board to assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in Table II-1.

The Basin Plan on page II-1.00 states: "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning…" and with respect to disposal of wastewaters states that "...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses."

In reviewing whether the existing and/or potential uses of the Cosumnes River apply to the Deer Creek, the Regional Board has considered the following facts:

a. *Domestic Supply and Agricultural Supply*

The State Water Resources Control Board (SWRCB) Resolution No. 88-63 "Sources of Drinking Water" provides that "All surface and ground waters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards…"

The SWRCB has issued water rights to existing water users along Deer Creek and the Cosumnes River downstream of the discharge for domestic and irrigation uses. Since Deer Creek is an ephemeral stream the creek likely provides groundwater recharge *during periods of low flow. The groundwater is a source of drinking water. In addition to the existing water uses, growth in the area, downstream of the discharge is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in Deer Creek.*

b. *Water Contact and Noncontact Recreation and Esthetic Enjoyment*

The Regional Board finds that the discharge flows through residential areas, there is ready public access to Deer Creek, exclusion of the public are unrealistic and contact recreational activities currently exist along Deer Creek and downstream waters and these uses are likely to increase as the population in the area grows. Prior to discharge into the Cosumnes River, Deer Creek flows through areas of general public access, meadows, residential areas and parks, to the Cosumnes River. The Cosumnes River also offers recreational opportunities.

c. *Groundwater Recharge*

In areas where groundwater elevations are below the stream bottom, water from the stream will percolate to groundwater. Since Deer Creek is at times dry, it is reasonable to assume that the stream water is lost by evaporation, flow downstream and percolation to groundwater providing a source of municipal and irrigation water supply.

d. *Freshwater Replenishment*

When water is present in Deer Creek, there is hydraulic continuity between Deer Creek and the Cosumnes River. During periods of hydraulic continuity, Deer Creek adds to the water quantity and may impact the quality of water flowing down stream in the Cosumnes River.

e. *Preservation and Enhancement of Fish, Wildlife and Other Aquatic Resources.*

Deer Creek flows to the Cosumnes River. The California Department of Fish and Game (DFG) has verified that the fish species present in Deer Creek and downstream waters are consistent with both cold and warm water fisheries, that there is a potential for anadromous fish migration necessitating a cold water designation and that trout, a cold water species, have been found both upstream and downstream of the wastewater treatment plant. The Basin Plan (Table II-1) designates the Cosumnes River as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote (2)), the cold designation applies to Deer Creek. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l.

Upon review of the flow conditions, habitat values, and beneficial uses of Deer Creek, and the facts described above, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Cosumnes River are applicable to Deer Creek.

The Regional Board also finds that based on the available information and on the Discharger's application, that Deer Creek, absent the discharge, is an ephemeral stream. The ephemeral nature of Deer Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flows within Deer Creek help support the aquatic life. Both conditions may exist within a short time span, where Deer Creek would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Cosumnes River. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water standards, agricultural water quality goals and aquatic life. Significant dilution may occur during and immediately following high rainfall events.

WATER RIGHTS

On 22 June 1995, the State Water Resources Control Board (SWRCB) adopted Water Rights Order No. WR95-9. The Order established that the Discharger is required to maintain specified quantities of discharge to Deer Creek. Terms and conditions of the water rights decisions to allow reclamation of a portion of the discharge from the WWTP are as follows:

"IT IS HEREBY ORDERED THAT treated waste water change petition WW-20 filed by El Dorado Irrigation District on September 14, 1992 pursuant to Water Code sections 1210 and 1211 is approved, subject to the following terms and conditions:

1. *The source of treated wastewater shall be from the Deer Creek Waste Water Treatment Plant located within Section 15, T9N, R9E, MDB&M: California Coordinate System: Zone 2, North 353,200, East 2,290,750.*

2. *Irrigation shall be added as a purpose of use of the treated wastewater. This purpose of use is in addition to the existing purposes of use for habitat and fish and wildlife preservation within Deer Creek.*

3. *The added place of use and point of discharge shall be within the El Dorado Hills Development, north of Highway 50 near Cameron Park, as shown on a map on file with the State Water Resources Control Board. This place of use and point of discharge are in addition to the existing point of discharge to Deer Creek and in addition to the existing place of use of treated wastewater in Deer Creek downstream from the wastewater treatment plant.*

4. *EID shall install continuous recording devices at the outlet to Deer Creek and in the pipe used for delivery to the added place of use from the wastewater treatment plant. Such measuring devices shall be satisfactory to the SWRCB and capable of measuring the flows discharged to Deer Creek and to the added place of use. Said measuring devices shall be installed and operational no later than August 1, 1995, and shall be properly maintained thereafter. The measuring devices shall be monitored on a- weekly basis. A record of the measurements and their sum shall he maintained by EID and made available for inspection by interested parties upon reasonable request. A copy of the records shall be submitted*

annually to the Chief, Division of Water Rights. Construction, operation, and maintenance costs of the measuring devices are the responsibility of EID.

5.a.. Whenever the Deer Creek Waste Water Treatment Plant produces less than a daily average of 2.5 million gallons per day, EID may discharge up to 1.5 million gallons per day of treated waste water through the added point of discharge to the added place of use within the El Dorado Hills Development as described in term 3, provided that EID shall discharge a minimum of 0.5 million gallons per day of treated waste water into Deer Creek as measured at the point of discharge to Deer Creek.

5.b. Whenever the Deer Creek Waste Water Treatment Plant produces more than a daily average of 2.5 million gallons per day, EID shall discharge a minimum of 1.0 million gallons per day of treated waste water to Deer Creek, and may discharge to the added point of discharge and place of use within the El Dorado Hills Development described in term 3 any treated waste water in excess of the 1.0 million gallons per day released to Deer Creek.

5.c. EID shall continue such releases so long as the California Regional Water Quality Control Board, Central Valley Region, permits discharge to the creek.

6. The SWRCB reserves jurisdiction in the public interest to modify the terms and conditions of this order, including imposition of requirements-to alter project facilities or operations and to modify instream flow releases. SWRCB action will be taken only after notice to interested parties and opportunity for hearing."

Water Rights Order No. WR95-9 is a condition of operation of the DCWWTP. The Monitoring and Reporting Program, requires the Discharger to report to the influent, effluent, and reclamation flows on a daily basis in order to validate compliance with the water rights order.

EFFLUENT LIMITATIONS

Chlorine- The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. The Discharger uses chlorine for disinfection of the effluent waste stream. Chlorine can cause toxicity to aquatic organisms. U.S. EPA Ambient Water Quality Criteria for the Protection of Fresh Water Aquatic Life recommends a maximum 1-hour average of 0.019 (0.02) µg/l and 4-day average of 0.011 (0.01) µg/l chlorine. The use of chlorine as a disinfectant presents a reasonable potential that it could be discharged in toxic concentrations. Effluent Limitations for chlorine have been included in this Order to protect the receiving stream aquatic life beneficial uses. The effluent limitations have been established at the ambient water quality criteria for chlorine since Deer Creek is a low-flow stream and at times provides no dilution.

Ammonia and Nitrates - Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. Nitrate and nitrite are known to cause adverse health effects in humans. The Basin Plan prohibits the discharge of chemical constituents in concentrations that adversely affect beneficial uses. Domestic water supply is a beneficial use of Deer Creek. U.S. EPA has developed Drinking Water Standards for protection of human health for nitrite and nitrate and Ambient Water Quality Criteria for ammonia. The discharge from the DCWWTP has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for ammonia, nitrite, and nitrate. Effluent limitations for ammonia, nitrate, and nitrite are included in this Order to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the beneficial uses of the receiving stream and to prevent aquatic toxicity.

Under current operational conditions, due to the variable inflow conditions of wastewater into the treatment plant, nitrification on a consistent basis has been achievable. In addition to nitrification, to achieve ammonia limits, de-nitrification is necessary to meet nitrate and nitrite limits. Upgrades to the facility will be necessary to achieve these limits.

Coliform - The beneficial uses of Deer Creek and the Cosumnes River include contact recreation uses and irrigation. To protect these beneficial uses, the Regional Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered) to protect contact recreational and food crop irrigation uses. The method of treatment is not prescribed by Order No. R5-2002-0210; however, wastewater must be treated to a level equivalent to that specified in Title 22 and in other recommendations by the DHS.

The DHS is consulted by the Regional Board and makes recommendations for protection of the public's health when contacting wastewater effluent. Generally, DHS recommends that it is necessary treat wastewater to a tertiary level or provide a 20-to-1 dilution for secondary treated wastewater, in order to protect the public health for contact recreational activities or the irrigation of food crops. The Discharger has been unable to quantify significant dilution within Deer Creek. The Discharger has, however, requested this Order contain secondary treatment effluent limitations to provide relief under a significant storm event when a 20-to-1 dilution is available. The Discharger will be required to establish an in-stream flow measuring system to accurately determine periods when 20-to-1 dilution exists. During these high flow periods, assimilative capacity has not been quantified for individual pollutants and end-of-pipe limits have been established. The BOD and TSS limits for secondary treatment are 30 mg/l as a monthly average and the total coliform limit is 23 MPN as a 7-day median. When there is less than 20-to-1 dilution full tertiary treatment is required. The tertiary limits for both BOD and TSS are 10 mg/l, and the effluent limit for total coliform organisms is 2.2 MPN/100 ml as a 7-day median. The effluent limits are based on the critical low flow, or zero dilution, and have also resulted in "end-of-pipe" limits.

The DHS has developed reclamation criteria, California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 m*l* as a 7-day median. Title 22 is not directly applicable to surface waters; however, the Regional Board finds that it is appropriate to apply DHS's reclamation criteria because Deer Creek and the Consumnes River are used for irrigation of agricultural land and for contact recreation purposes. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

The permit contains Effluent Limitations and a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water. In accordance with California Water Code, Section 13241, the Board has considered the following:

As stated in the above Findings, the past, present and probable future beneficial uses of the receiving stream include municipal and domestic supply, agricultural irrigation, agricultural stock watering, body contact water recreation, canoeing and rafting, non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, and wildlife habitat.

The environmental characteristics of the hydrographic unit including the quality of water available will be improved by the requirement to provide tertiary treatment for this wastewater discharge. Tertiary treatment will allow for the reuse of the undiluted wastewater for food crop irrigation and contact recreation activities which would otherwise be unsafe according to recommendations from the DHS.

Fishable and swimable water quality conditions can be reasonably achieved through the coordinated control of all factors which affect water quality in the area.

The economic impact of requiring an increased level of treatment has been considered. The economic impact of requiring an increased level of treatment has been considered. The current monthly domestic sewer user fee is $42.94, approximately double the California average monthly domestic sewer user fee of $20.46. The Discharger has already expanded the capacity of the treatment facility to 3.6 MGD, except for the tertiary treatment system. In 2001 the District estimated the cost to expand the tertiary treatment capacity to be $4.9 million. The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, include prohibiting the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact. In addition to pathogen removal to protect irrigation and recreation, tertiary treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for advanced treatment.

The need to develop housing in the area will be facilitated by improved water quality, which protects the contact recreation and irrigation uses of the receiving water. DHS recommends that, in order to protect the public health, undiluted wastewater effluent must be treated to a tertiary level, for contact recreational and food crop irrigation uses. Without tertiary treatment, the downstream waters could not be safely utilized for contact recreation or the irrigation of food crops.

It is the Regional Board's policy, (Basin Plan, page IV-15.00, Policy 2) to encourage the reuse of wastewater. The Regional Board requires Dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water is facilitated by providing a tertiary level of wastewater treatment, which will allow for a greater variety of uses in accordance with California Code of Regulations, Title 22.

Turbidity- In addition to coliform testing, a turbidity effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is also capable of reliably meeting a reduced turbidity limitation of 2 NTU as a daily average, 5 NTU at least 95 percent of the time within a day, and 10 NTU at all times. Failure of the filtration system, such that virus removal is impaired, would normally result in increased particles in the effluent and higher effluent turbidity. Turbidity monitoring has a major advantage over coliform monitoring for evaluating filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours to days to identify high coliform concentrations.

Phase II Effluent and Receiving Water Quality Assessment

In accordance with a previous permit, Order No, 97-211, the Discharger performed a study entitled "Phase II Effluent and Receiving Water Quality Assessment for the El Dorado Irrigation District's Deer Creek Wastewater Treatment Plant, dated 12 February 1999. The purpose of this report was to accurately identify contaminant levels in the treated effluent discharged from the DCWWTP into Deer Creek, and to assess the potential for effluent discharges to cause a receiving water exceedance of the water quality standards, including chronic toxicity. The study provided a significant amount of data to determine compliance with the CTR and other applicable water quality objectives. From the study the following constituents were determined to have a reasonable potential to exceed water quality objectives.

a. **Total Trihalomethanes and Chloroform -** Municipal and domestic supply is a beneficial use of the receiving stream. The narrative toxicity objective and this beneficial use designation comprise a water quality standard applicable to pollutants in the receiving stream. The Basin Plan contains the *Policy for Application of Water Quality Objectives*, which provides that narrative objectives may be translated using numerical limits published by other agencies and organizations. The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) has published the Toxicity Criteria Database, which contains cancer potency factors for chemicals, including chloroform, that have been used as a basis for regulatory actions by the boards, departments and offices within Cal/EPA. The OEHHA cancer potency value for oral exposure to chloroform is 0.031 milligrams per kilogram body weight per day (mg/kg-day). By applying standard toxicologic assumptions used by OEHHA and USEPA in evaluating health risks via drinking water exposure of 70 kg body weight and 2 liters per day water consumption, this cancer potency factor is equivalent to a concentration in drinking water of 1.1 ug/L (ppb) at the 1-in-a-million cancer risk level. This risk level is consistent with that used by the DHS to set *de minimus* risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water. The one-in-a-million cancer risk level is also mandated by USEPA in applying human health protective criteria contained in the NTR and the CTR to priority toxic pollutants in California surface waters. A recent decision by the State Water Resources Control Board, Order No. WQ2002-0015, found that application of a chloroform limitation for a discharge to an ephemeral stream based on a cancer risk analysis was not appropriate since the U.S. EPA is evaluating the science used to develop the CTR and has reserved application of a water quality standard. This Order establishes an Effluent Limitation at the maximum contaminate level (MCL) for total trihalomethanes, the sum of bromoform, bromodichloromethane, chloroform and dibromochloromethane, based on protection of the municipal beneficial use of 80 μg/l. Based on information included in analytical laboratory results submitted by the Discharger, the discharge was found to have an average concentration of 48 μg/l, with a maximum concentration of 76 μg/l of chloroform. The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the water quality objective for municipal uses by causing exceedance of the primary MCL for trihaolmethanes. Therefore, an Effluent Limitation for total trihalomethanes is included in this Order and is based on the Basin Plan objective for municipal use. If U.S. EPA or the State Board develop a water quality objective for chloroform and/or total trihalomethanes, this Order may be reopened and a new Effluent Limitation established.

b. ***Chlorodibromomethane*** - Based on information included in analytical laboratory results submitted by the Discharger, the discharge had an average concentration of 1.07 μg/l and a maximum concentration of 1.90 μg/l, and has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for chlorodibromomethane. The CTR establishes numeric water quality standards for chlorodibromomethane. The criterion for waters from which both water and organisms are consumed is 0.41 ug/l. An Effluent Limitation for chlorodibromomethane is included in the permit.

f. ***Dichlorobromomethane*** - Based on information included in analytical laboratory results submitted by the Discharger, the discharge was found to have a average concentration of 9.4 μg/l and a maximum concentration of 12.0 μg/l, and has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for dichlorobromomethane. The CTR establishes numeric water quality standards for dichlorobromomethane. The criterion for waters from which both water and organisms are consumed is 0.56 ug/l. An Effluent Limitation for dichlorobromomethane is included in the permit.

g. ***Copper***- Based on analytical results of effluent samples collected by the Discharger, the discharge has been measured up to 30.7 μg/l, with an average concentration of 19.4 μg/l, and has a reasonable potential to cause or contribute to an in-stream excursion above the CTR standards for copper; therefore, effluent limitations for copper are included in the Order. At the worst case hardness of 70 mg/l, the criterion continuous concentration and criterion maximum concentration limitations for copper are 6.6 μg/l and 9.6 μg/l, respectively. The CTR standards for metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for copper in freshwater are 0.960 for both the acute and the chronic criteria. The effluent limitations for copper are presented in total recoverable concentrations, and are based on the CTR.

The Discharger is considering conducting a Water Effect Ration (WER) study for copper, to determine the site-specific toxicity of copper in the effluent and Deer Creek. The default value for the WER, in calculating the copper effluent limits is 1. The reason for performing this study is to determine if the WER ratio for the site-specific conditions in Deer Creek is greater than the default value, and if that value allows for a higher effluent limit for copper. Upon completion of the study, Regional Board Staff will evaluate the results of the study, and may reopen the permit to account for a sites-specific WER for discharge from the DCWWTP.

h. ***Diethyl phthalate and Dimethyl phthalate***- Ten samples were taken monthly and analyzed for Diethyl phthalate and Dimethyl phthalate, all of the samples were non-detect except for the first sample taken. Diethyl phthalate and Dimethyl phthalate were present in the first round of samples at concentrations of 78 μg/l and 17 μg/l, respectively. Diethyl phthalate and Dimethyl phthalate are used in the manufacturing of plastics and polyvinyl chloride (PVC) pipe and tubing. The presence in the first round of sampling may have been due to the use of new sampling equipment that was not properly sanitized before it's first use. The CTR standards for Diethyl phthalate and Dimethyl phthalate are 23 mg/l and 313 mg/l, respectively. There is no reasonable potential to exceed the CTR standard.

Toxicity—The Basin Plan states that "[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances." The Basin Plan requires that "[a]s a minimum, compliance with this objective...shall be evaluated with a 96-hour bioassay." Order No. R5-2002-0210 requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective.

The low-flow nature of Deer Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. The use of a dilution series to evaluate compliance with the narrative toxicity objective contained in the Basin Plan is, therefore, inappropriate.

The Basin Plan further states that "...effluent limits based upon acute biotoxicity tests of effluents will be prescribed...". Effluent limitations for acute toxicity have been included in the Order.

GENERAL EFFLUENT LIMITATION INFORMATION

Selected 40 CFR §122.2 definitions:

'*Average monthly discharge limitation* means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities.

Daily discharge means the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonable represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum daily discharge limitation means the highest allowable "daily discharge".'

The SIP contains similar definitions. These definitions were used in the development of Order No. 0210. Alternate limitation period terms were used in the permit for the sake of clarity. Alternates are shown in the following table:

Term Used in Permit	SIP/40 CFR 122.2 Term
Monthly average	Average monthly discharge limitation. 30-day averages may have been converted to monthly averages to conform with 40 CFR §122.45 (see below)
1-Day average	Maximum daily discharge limitation. Since the daily discharge for limitations expressed in concentrations is defined as the average measurement of the pollutant over the day, the term '1-Day Average' was used in the Order.

40 CFR §122.45 states that:

(1) "In the case of POTWs, permit effluent limitations...shall be calculated based on design flow."

(2) "For continuous discharges all permit effluent limitations...shall unless impracticable be stated as...[a]verage weekly and average monthly discharge limitations for POTWs."

(3) "All pollutants limited in permits shall have limitations...expressed in terms of mass except...[f]or pH, temperature, radiation, or other pollutants which cannot appropriately be expressed by mass...Pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations."

U.S. EPA recommends a maximum daily limitation rather than an average weekly limitation for water quality based permitting.

RECEIVING WATER LIMITATIONS AND MONITORING

Dissolved Oxygen—By the tributary rule, Deer Creek has been designated as having the beneficial use of cold freshwater aquatic habitat (COLD). For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/*l* of dissolved oxygen. Since, by the tributary rule, the beneficial use of COLD does apply to Deer Creek, a receiving water limitation of 7.0 mg/*l* for dissolved oxygen was included in the Order.

For surface water bodies outside of the Delta, the Basin Plan includes the water quality objective that "...the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation." This objective was included as a receiving water limitation in the Order.

pH—For all surface water bodies in the Sacramento River and San Joaquin River basins, the Basin Plan includes water quality objectives stating that "[t]he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses." By the tributary rule, Deer Creek has the beneficial uses of both COLD and WARM (warm freshwater habitat); therefore, the Order includes receiving water limitations for both pH range and pH change.

The Basin Plan allows an appropriate averaging period for pH change in the receiving stream. Since there is no technical information available that indicates that aquatic organisms are adversely affected by shifts in pH within the 6.5 to 8.5 range, an averaging period is considered appropriate and a monthly averaging period for determining compliance with the 0.5 receiving water pH limitation is included in the Order.

Temperature—By the tributary rule, Deer Creek has the beneficial uses of both COLD and WARM. The Basin Plan includes the objective that "[a]t no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature." The Order includes a receiving water limitation based on this objective.

Turbidity—The Basin Plan includes the following objective: "Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- (The 30-day average turbidity to increase) More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.
- Where natural turbidity is between 5 and 10 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTU.

- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent."

The Basin Plan states: *"In determining compliance with the above limits, appropriate averaging periods may be applied provided that the beneficial uses will be fully protected."*. Based upon studies performed by the Discharger, in consultation with the Department of Fish and Game, a 30-day averaging period is protective of the beneficial uses for turbidity when the turbidity of the receiving water is between 0 and 5 NTUs.

Narrative Limitations—Receiving Water Limitations 2 (biostimulatory substances), 3 (color), 5 (floating material), 4 (oil and grease), 5 (radioactivity), 6 (settleable material), 7 (tastes and odors), and 8 (toxicity) are based on narrative Basin Plan objectives. The objectives are located in Chapter III: Water Quality Objectives, under the Water Quality Objectives for Inland Surface Waters heading.

BASIN PLAN AMENDMENT PROCESS

Discharge from the DCWWTP can at times dominate the flow in Deer Creek. This condition caused violation of the Basin Plan water quality objectives for inland surface waters for pH, dissolved oxygen, temperature, and turbidity. The Discharger has made significant upgrades to the facility, however during low flow conditions in the creek, receiving water limitations for theses pollutants are not being consistently achieved. The Regional Board issued Cease and Desist Order (CDO) No. 95-255 on 7 December 1995 requiring the Discharger implement corrective actions to comply with these and other permit limitations. Subsequent to the CDO being issued, significant improvements to the facilities were made which brought the facility into compliance with the dissolved oxygen limit, however, pH, turbidity, and temperature remained problematic. When the current WDRs were issued in 1997, a CDO with compliance time schedules was also adopted to allow further time to comply with the Basin Plan objectives for pH, turbidity, and temperature.

The Discharger chose to pursue a Site-Specific Basin Plan Amendment (SSBPA) in lieu of making physical improvements to the treatment plant for compliance with Basin Plan objectives for pH, turbidity, and temperature. Due to the lengthy SSBPA process, the time schedule was modified to reflect the additional time needed to complete the Basin Plan Amendments (BPAs). CDO No. 5-000-033, Amendment 1, requires the Discharger to complete the BPAs by 30 December 2003. On 19 July 2002, the Regional Board adopted the BPAs for pH and turbidity. The State of California Office of Administrative Law (OAL) and U.S. EPA must also approve the BPAs before becoming effective.

The Regional Board has not yet considered the BPA for temperature. Since the existing Basin Plan Objectives for pH, turbidity, and temperature remain in effect, this Order contains limitations based those objectives.

RKE:rke 11/12/02

Temperature- and pH-Dependent Effluent Limits for Ammonia
Criterion Continuous Concentration, Maximum Average Monthly Concentration

Ammonia Concentration Limitation (mg N/*l*)										
Temperature, °C (°F)										
pH	0 (32)	14 (57)	16 (61)	18 (64)	20 (68)	22 (72)	24 (75)	26 (79)	28 (82)	30 (86)
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

$$CCC = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) x\ MIN\ \left(2.85, 1.45 \cdot 10^{0.028(25-T)} \right)$$

Where: CCC = criteria continuous concentration
T = temperature in degrees Celsius (°C)

pH-Dependent Effluent Limits for Ammonia
Criterion Maximum Concentration, Maximum 1-hour Average

pH	Ammonia Concentration Limit (mg N/*l*)
6.5	32.6
6.6	31.3
6.7	29.8
6.8	28.0
6.9	26.2
7.0	24.1
7.1	21.9
7.2	19.7
7.3	17.5
7.4	15.3
7.5	13.3
7.6	11.4
7.7	9.64
7.8	8.11
7.9	6.77
8.0	5.62
8.1	4.64
8.2	3.83
8.3	3.15
8.4	2.59
8.5	2.14
8.6	1.77
8.7	1.47
8.8	1.23
8.9	1.04
9.0	0.885

$$CMC_{salmonids\ present} = \left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}} \right)$$

Where: CMC = criteria maximum concentration

Hardness-Dependent Effluent Limits for Copper

U.S. EPA National Ambient Water Quality Criteria
Recommended To Protect Freshwater Aquatic Life

Copper Concentration Limitations (Expressed as dissolved metal)		
Hardness (mg/l as $CaCO_3$)	**Continuous Conc. 4-Day Avg. (µg/l)** [1]	**Maximum Conc. 1-hour Avg. (µg/l)** [2]
<25	Must Calculate	Must Calculate
25	2.7	3.6
30	3.2	4.3
35	3.7	5.0
40	4.1	5.7
45	4.5	6.3
50	5.0	7.0
55	5.4	7.7
60	5.8	8.3
65	6.2	9.0
70	6.6	9.6
75	7.0	10
80	7.4	11
85	7.8	12
90	8.2	12
95	8.6	13
100	9.0	13
110	9.7	15
120	11	16
130	11	17
140	12	19
150	13	20
160	13	21
170	14	22
180	15	23
190	16	25
200	16	26
210	17	27
220	18	28
230	18	30
240	19	31
250	20	32
260	20	33
270	21	34
280	22	36
290	22	37
300	23	38

[1] Criteria Continuous Concentration (4-day Average) =
(e{0.8545[ln(hardness)] - 1.702}) x (0.960)

[2] Criteria Maximum Concentration (1-hour Average =
(e{0.9422[ln(hardness)] - 1.700}) x (0.960)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0151

NPDES NO. CA0079464

WASTE DISCHARGE REQUIREMENTS
FOR
SAN ANDREAS SANITARY DISTRICT
WASTEWATER TREATMENT PLANT
CALAVERAS COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

1. The San Andreas Sanitary District, (hereafter Discharger) submitted a Report of Waste Discharge (RWD), dated 27 March 2003, and applied for a permit revision to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the San Andreas Sanitary District Wastewater Treatment Plant (WWTP).

2. The Discharger owns and operates a domestic wastewater collection, treatment, and disposal system, and provides sewerage service to the community of San Andreas, in Calaveras County. The San Andreas Sanitary District was formed as a public agency in the early 1950's. The District includes all of San Andreas as well as some outside areas, encompassing approximately 1,260 acres. The WWTP provides sewer services to approximately 2,700 residents. There are approximately 1140 service connections, of which approximately 1000 are residential users and 140 are commercial users. No industries are connected to the system. San Andreas is the county seat of Calaveras County and experiences a substantial influx in population during the day because of the high school, government centers and tourism.

3. The WWTP components include a grit removal chamber, mechanical screen (for solids removal) Parshall flume, flow metering, storm flow by-pass device for diverting excessive storm inflow to the high flow treatment system and storage reservoir, pre-aeration basin, primary clarifier, re-circulating trickling filter, secondary clarifier, sodium hypochlorite contact chamber, sodium bisulfite dechlorination unit, heated unmixed anaerobic digester, sludge drying beds, three post-secondary effluent polishing ponds, and a 6 million gallon storage reservoir. A diesel power generator is on site and used in the event of electrical power loss. The Plant lay out and wastewater flow diagram is shown in Attachment A, a part of this Order.

4. Disposal of treated wastewater is accomplished exclusively to land from 1 May through 31 October of each year. The Discharger owns approximately 180 acres of land for disposal, known as the Dedicated Land Disposal Area (DLDA). Presently, the Discharger uses about 70 of those acres, as the other 110 acres were recently purchased and are currently unimproved land. The treated wastewater is first held in the effluent storage reservoir, then pumped to on-site evaporation, transpiration and percolation ditches. The disposal ditches have a total length of approximately two miles, and vary in depth from about 1.5 to 3.0 feet and in width from about 2 to 4 feet. Storm water run off, or excess effluent from the trenches is returned to the storage

reservoir via a return ditch. Vegetation control in the DLDA is accomplished through prescribed burns by the local public fire agency.

5. From 1 November through 30 April, secondary treated effluent is discharged to the DLDA to the extent feasible. Treated effluent that cannot be discharged to land is currently discharged to San Andreas Creek, a tributary to Murray Creek, a tributary of the North Fork of the Calaveras River. Using the effluent polishing ponds for storage, the WWTP is capable of discharging up to a maximum of 1.5 mgd of treated effluent depending upon receiving water flows and considering the minimum 20:1 dilution requirement. Discharge to surface waters is prohibited during the period of 1 May through 31 October of each year.

   The discharge to San Andreas Creek is disinfected secondary treated wastewater, which requires that adequate dilution water be available in the creek at the time of discharge. Previous Order No. 5-01-118 required the Discharger to install a stream gauge monitor in Murray Creek to assure that when discharges occur, the stream flows of the creek would provide at least a 20:1 (receiving water:effluent) dilution ratio. The California Department of Health Services (DHS) has recommended that discharges of secondary treated domestic wastewater, when not diluted by receiving water flows of at least 20:1, be treated to a tertiary level to reduce the concentration of human pathogens.

   In previous Order No. 5-01-118, the Discharger proposed moving the point of effluent discharge from San Andreas Creek, to Murray Creek, where it was expected that a larger watershed would provide for higher sustained flows and a consistent minimum 20:1 dilution ratio. After installing a stream gauge monitor on Murray Creek, the Discharger determined that moving the effluent discharge point downstream from San Andreas Creek to Murray Creek might not result in a consistent minimum 20 to 1 dilution of receiving water to effluent recommended by the California DHS. The Discharger subsequently completed studies to evaluate all available effluent disposal options. In the February 2003 Effluent Disposal Options Assessment Report, the Discharger considered reclamation, land disposal, winter only surface water discharge, and year-round surface water discharge options. Results of this report indicate viable reclamation alternatives do not exist, and the complete containment of wastewater on land during typical wet winters is infeasible. Considering these findings, this Report concluded that dry season land disposal, combined with maximizing winter land disposal supplemented with a winter surface water discharge was the superior option with regards to public health, the environment, and economics. For the wet season surface water discharge portion of this option, the Discharger determined that moving the point of effluent discharge downstream in the watershed, to the confluence of Murray Creek and the North Fork of the Calaveras River, would provide a consistent minimum dilution of 20 to 1 throughout the wet season period of discharge. The Discharger has proposed moving the discharge location from San Andreas Creek to the Calaveras River by 1 November 2004. The Discharger has also proposed that the water will enter the Calaveras River via a 'cross river diffuser'.

6. A California Environmental Quality Act (CEQA) Mitigated Negative Declaration was prepared by the Discharger in support of the proposal to move the point of effluent discharge downstream to the Calaveras River. This Mitigated Negative Declaration was approved by the Lead Agency

(the Discharger) on 19 March 2003. The Discharger has filed the Notice of Determination with the County Clerk and Office of Planning and Research. The Regional Board has considered the Mitigated Negative Declaration, and these waste discharge requirements will mitigate or avoid the significant impacts on water quality by: (a) ensuring the discharge does not cause a condition of pollution or nuisance, and, (b) establishing effluent limitations and monitoring requirements for toxic and conventional pollutants with the reasonable potential to cause or contribute to exceedence of a water quality standard.

7. The WWTP, DLDA, and discharge points to San Andreas Creek are in Section 18, T4N, R12E, MDB&M, as shown on Attachment B, a part of this Order. The discharge point to the Calaveras River is in Section 12, T4N, R11E, MDB&M, as shown on Attachment B. Treated wastewater is subsequently discharged from the ponds to San Andreas Creek, a water of the United States, at the point lattitude 38°, 12', 11" and longitude 120°, 41', 18". or to the Calaveras River, a water of the United States, at the point lattitude 38°, 12', 38" and longitude 120°, 42', 17" also as shown in Attachment B.

8. The Report of Waste Discharge describes the existing wastewater flows and influent quality as follows:

Average Dry Weather Influent Flow:	0.3	million gallons per day (mgd)
Design Average Dry Weather Flow:	0.4	mgd
Design Hydraulic Capacity:	1.5	mgd
Average Temperature:	76.7°F Summer; 63.2°F Winter	

Constituent	mg/L	lbs/day[2]
BOD[1]	306	1021
Total Suspended Solids	244	814

[1] 5-day, 20°C biochemical oxygen demand
[2] At design average flow

9. The Report of Waste Discharge describes the existing treated wastewater effluent flows and effluent quality as follows:

Average Effluent Flow:	0.31	mgd
Design Wet Weather Flow to Surface Waters:	1.5	mgd

Constituent	mg/L	lbs/day[2]
BOD[1]	16	41
Total Suspended Solids	13	34

[1] 5-day, 20°C biochemical oxygen demand
[2] At average flow

10. The discharge of treated wastewater was previously regulated by Waste Discharge Requirements (WDR) Order No. 5-01-118, NPDES Permit No. CA0079464, which was adopted by the Regional Board on 11 May 2001. Under this Order, the Discharger was permitted to discharge a

maximum of 1.5 million gallons per day (mgd) of treated wastewater to San Andreas or Murray Creek from 1 November through 30 April.

11. The U.S. Environmental Protection Agency (USEPA) and the Regional Board have classified this discharge as a minor discharge.

12. The Regional Board adopted a *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

13. The existing **beneficial uses** of the **Calveras River**, from its source to New Hogan Reservoir, as identified in Table II-1 of the Basin Plan include: body contact recreation, canoeing and rafting, (REC-1); and other non-body contact recreation (REC-2); warm freshwater aquatic habitat (WARM); cold freshwater aquatic habitat (COLD); migration of aquatic organisms (MIGR) in warm habitat, warm and cold habitat spawning, reproduction, and/or early development (SPWN); and wildlife habitat (WILD). Agricultural supply (AGR) including both irrigation and stock watering, is not identified in Table II-1 of the Basin Plan as an existing beneficial use of the Calaveras River. However, active water rights permits (stockwatering), have been identified downstream of the point of discharge along Murray Creek and the North Fork Calveras River. The Regional Board is required to apply the beneficial uses of municipal and domestic supply to the Calaveras River based on SWRCB Resolution No. 88-63 which was incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056. In addition, State Board Resolution No. 88-63, incorporated into the Basin Plan pursuant to Regional Board Resolution No. 89-056, provides that "*Where a a body of water is not currently designated as MUN* (municipal and domestic supply beneficial use) *but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation.* " Based upon ambient receiving water data collected by the Discharger, the North Fork Calveras River, from its source to New Hogan Reservoir, is suitable for MUN, therefore the MUN use is also designated as a beneficial use of this water body. Also, the State Water Resources Control Board (State Board) maintains an active water rights permit for domestic and irrigation supply use from New Hogan Reservoir, downstream of the discharge.

The Basin Plan on page II-1.00 states: "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning…" and with respect to disposal of wastewaters states that "... disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses."

14. The Basin Plan at page II-2.00 states that: "Existing and potential beneficial uses that currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams." The Basin Plan does not specifically identify **beneficial uses** for **San Andreas Creek** or Murray Creek, but the Basin Plan does identify existing beneficial uses for the Calaveras River, as noted above, to which they are tributary.

In reviewing what existing beneficial uses that may apply to San Andreas Creek and Murray Creek, the Regional Board has considered the following facts:

a. *Domestic, Municipal, and Agricultural Irrigation Supply*

The Regional Board is required to apply the beneficial uses of municipal and domestic supply to San Andreas Creek and Murray Creek based on SWRCB Resolution No. 88-63 which was incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056. The State Water Resources Control Board (SWRCB) has issued water rights permits to existing water users along Murray Creek and the Calaveras River downstream of the discharge for domestic and irrigation uses. Since San Andreas Creek and Murray Creek are ephemeral streams, the creeks likely provide groundwater recharge during periods of low flow. The groundwater is a source of drinking water. In addition to the existing water uses, growth in the area, downstream of the discharge is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in San Andreas Creek and Murray Creek.

b. *Groundwater Recharge*

In areas where groundwater elevations are below the stream bottoms, water from the streams will percolate to groundwater. Since San Andreas Creek and Murray Creek are at times almost dry, it is reasonable to assume that the stream water is lost by evaporation, flow downstream and percolation to groundwater thereby providing a source of domestic, municipal, and irrigation water supply.

c. *Freshwater Replenishment*

When water is present in San Andreas Creek and Murray Creek, there is hydraulic continuity between San Andreas Creek, Murray Creek and the Calaveras River. During periods of hydraulic continuity, San Andreas and Murray Creeks add to the water quantity and may impact the quality of water flowing downstream in the Calaveras River.

d. *Water Contact and Non-Contact Recreation and Esthetic Enjoyment*

The Regional Board finds that the discharge flows through areas where there is ready public access to San Andreas and Murray Creek. Exclusion of the public is unrealistic and contact recreational activities currently exist along the creeks. These uses are likely to increase as the population in the area grows.

e. *Preservation and Enhancement of Fish, Wildlife and Other Aquatic Resources.*

San Andreas Creek and Murray Creek flow to the Calaveras River. The California Department of Fish and Game (DFG) has verified that the fish species present in San Andreas and Murray Creeks and downstream waters are consistent with both cold and warm water fisheries, and that a cold water species has been found both upstream and downstream of the wastewater treatment plant. The Basin Plan (Table II-1) designates the Calaveras River source to New Hogan Reservoir, as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote (2)), the cold designation applies to San Andreas and Murray Creeks. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l. This approach recognizes that, if the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/l, the Discharger is not required to improve the naturally occurring level.

Upon review of the flow conditions, habitat values, existing and potential beneficial uses of the Calaveras River, and the facts described above, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Calaveras River, from it's source to New Hogan Reservoir, are applicable to San Andreas Creek and Murray Creek. In addition, beneficial uses not specifically identified in the Basin Plan, as indicated above, exist or potentially exist in San Andreas Creek and Murray Creek and must be protected.

The Board also finds that based on the available information and on the Discharger's application, that San Andreas Creek and Murray Creek, absent the discharge, are at times ephemeral streams. At other times, natural flows within San Andreas Creek and Murray Creek help support the cold-water aquatic life. Both conditions may exist within a short time span, where the Creeks would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Calaveras River. Dry conditions occur primarily in the summer months, but dry conditions, and low flow conditions, may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water-related uses , agricultural water uses and aquatic life. Significant dilution may occur during and immediately following high rainfall events.

15. USEPA adopted the *National Toxics Rule* (NTR) on 22 December 1992, which was amended on 4 May 1995 and 9 November 1999 and the *California Toxics Rule* (CTR) on 18 May 2000, which was amended on 13 February 2001. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board (SWRCB) adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP), which contains guidance on implementation of the NTR and the CTR.

16. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numeric water quality standard. Beneficial uses, together with their corresponding water quality objectives or promulgated water quality criteria, constitute the water quality standards for waters of the state for purposes of compliance with the CWA.

In determining whether a discharge has the reasonable potential to contribute to an in-stream excursion (reasonable potential analysis), the dilution of the effluent in the receiving water may be considered where areas of dilution are defined. The available dilution may also be used to calculate protective effluent limitations by applying water quality criteria at the edge of the defined mixing zone. These calculations include receiving water pollutant concentrations that are typically based on worst-case conditions for flow and concentration.

If limited or no dilution is available, effluent limitations are set equal to the applicable water quality objective or criteria which are applied at the point of discharge so the discharge will not cause the receiving stream to exceed water quality objectives or promulgated criteria established to protect the beneficial uses. In situations where receiving water flows are substantially greater than effluent flows, dilution may be considered in establishing effluent limitations. However, when a receiving water is impaired by a particular pollutant or stressor, limited or no pollutant assimilative capacity may be available in spite of the available dilution. In these instances, and depending upon the nature of the pollutant, effluent limitations may be set equal to or less than the applicable water quality objectives or criteria that are applied at the point of discharge such that the discharge will not cause or contribute to the receiving stream excursion above water quality objectives or promulgated criteria established to protect the beneficial uses.

17. On 10 September 2001 the Executive Officer of the Regional Board issued a letter pursuant to Section 13267 of the California Water Code (CWC) requiring all NPDES Dischargers to conduct effluent and receiving water monitoring and submit results of this monitoring in accordance with a time schedule provided in the letter. The Discharger conducted a study to determine whether levels of NTR, CTR, or other pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a numeric or narrative water quality standard, including Basin Plan numeric or narrative objectives. Results of this study were submitted in March 2003 with the new Report of Waste Discharge (RWD) which proposed moving the point of discharge to the Calaveras River.

18. While the Discharger has proposed moving the point of effluent discharge downstream to the Calaveras River, extension of the pipeline and completion of the project will not be complete until at least November 2004. Until that time, the Discharger will continue to discharge treated effluent during the wet season at the historical location in San Andreas Creek. Only limited information regarding flows in San Andreas Creek or Murray Creek is available, and no information is available regarding critical flow conditions or flow conditions during extended dry periods. Limited flow data from Murray Creek indicates that a consistent 20:1 dilution ratio cannot be maintained during all flow conditions. Considering the limited watershed supporting San Andreas Creek and Murray Creek, it is likely that flows during a dry fall/winter period could be negligible. Considering these conditions, and given the new information on pollutant concentrations in the effluent, the reasonable potential analysis for pollutants in the effluent discharged to San Andreas Creek, and the development of associated effluent limitations, was accomplished considering no credit for dilution. Previous Order No. 5-01-118 included a time schedule requiring tertiary treatment of any effluent discharged that does not receive 20:1 dilution by **1 April 2006**. This Order retains that time schedule.

19. This Order requires a minimum dilution ratio of 20:1 (receiving water to effluent) for the discharge of treated secondary effluent to the Calaveras River. Development and consideration of dilution credits in establishing and determining compliance with water quality-based effluent

limitations for priority pollutants is described in Section 1.4.2. of the SIP. Dilution credit, mixing zones and mixing zone analyses methods are also presented in Section 2 and Section 4 of the USEPA's Technical Support Document For Water Quality-based Toxics Control, 1991 (TSD). Considering minimum dilution ratio of 20:1 required by this Order, a maximum dilution credit of 20 has been used in accomplishing the reasonable potential analysis and developing effluent limitations where appropriate. As the outfall and diffuser configuration and design have not been completed, the Discharger shall be required, prior to commencing the discharge, to conduct a *Dilution/Mixing Zone Study* to verify complete mixing of the discharge and characterize the extent of actual dilution. Points in the receiving water where the applicable criteria/objective shall be met must also be defined in this study. This Order may be reopened if the study indicates the discharge is not completely mixed, or if site specific conditions concerning the discharge and the receiving water indicate that a smaller dilution credit is necessary to protect beneficial uses and meet the conditions of the SIP. This study shall be completed prior to discharge from the new outfall to the Calaveras River.

20. Section 1.4.2.2 of the SIP outlines conditions which must be met in allowing a mixing zone. Considering these conditions, where applicable, maximum daily effluent limitations have been developed for discharge to the Calaveras River considering acute criteria, an acute waste load allocation, and no dilution credit, to prevent acutely toxic conditions at the point of discharge. Also where applicable, average monthly effluent limitations have been developed considering chronic criteria, a chronic wasteload allocation, and available dilution. A mixing zone and dilution credit were not considered for the discharge to San Andreas Creek.

21. Technology-based treatment requirements under section 301(b) of the CWA represent the minimum level of control that must be imposed in a permit issued under section 402 of the CWA. Regulations promulgated at 40 CFR 122.44 (a) require technology-based effluent limitations to be placed in NPDES permits based on national effluent limitations guidelines and standards, best professional judgment (BPJ), or a combination of the two. 40 CFR Part 133 provides information on the level of effluent quality attainable through the application of secondary or equivalent treatment. 40 CFR Part 133.102 describes the minimum level of effluent quality attainable in terms of the parameters for biochemical oxygen demand (BOD), suspended solids (SS), and pH. Results of monitoring indicate the Discharger is capable of meeting these limitations. Effluent limitations for these conventional pollutants using these levels of effluent quality established in 40 CFR Part 133.102 have been retained in the Order.

22. Previous Order No. 5-01-118 included an effluent limitation for total coliform, with a total coliform count not to exceed 23 MPN (Most Probable Number)/100 ml (milliliters) as a monthly median limitation, and 230 MPN/100ml as a daily maximum, with 20:1 dilution. These limitations were established considering recommendations from the California Department of Health Services. Beneficial uses of the Calaveras River, San Andreas Creek, and Murray Creek include body contact recreation (REC-1) and other non-contact recreation (REC-2), and public access is not restricted up or downstream in the vicinity of the discharge. Other beneficial uses include agricultural supply (AGR) and municipal and domestic supply (MUN). The limitations of Order No. 5-01-118 are retained in this new Order. As noted previously, limited flow information from San Andreas Creek and Murray Creek indicate there may be instances where

the dilution ratio falls below 20:1. As noted previously, this Order includes a time schedule requiring tertiary treatment of any effluent discharged that does not receive 20:1 dilution by 1 April 2006. This Order may be reopened to address new information concerning effects on public drinking water supplies.

23. Section 1.3 of the SIP requires a water quality based effluent limitation when the maximum effluent concentration (MEC) or observed maximum background concentration (B) of a priority pollutant exceeds an appropriate pollutant criterion. Based upon the study conducted by the Discharger, the MEC's of copper, zinc, dichlorobromomethane, and bis(2-ethylhexyl) phthalate have exceeded applicable pollutant criteria of the CTR/NTR. Therefore, water quality-based effluent limitations for these pollutants are required. When required, Section 1.4 of the SIP provides four methods that may be used to develop effluent limitations. These four methods include: (1) assigning a loading allocation based upon a completed TMDL; (2) use of a steady state model; (3) use of a dynamic model; or, (4) establishing effluent limitations that consider intake water pollutants. Water quality-based effluent limitations have been developed in this Order using the steady state model described in Section 1.4 of the SIP and the TSD. Since the discharge is permitted only under conditions of a minimum of 20:1 dilution, development of these limitations has, where applicable, considered dilution of the receiving water for pollutants with demonstrated assimilative capacity.

24. In studies conducted by the Discharger, the MEC for total **copper** was reported as 35 µg/L (ppb). The minimum hardness of the effluent was reported as 68 mg/L (ppm) hardness as CaCO3. This MEC exceeds the adjusted freshwater aquatic life water quality acute (Criterion Maximum Concentration, CMC) and chronic (Criterion Continuous Concentration, CCC) criteria for copper established in the USEPA's California Toxics Rule (9.7 µg/L (ppb) and 6.7 µg/L (ppb), respectively at 68 mg/L hardness as CaCO3). As noted above, Section 1.3 of the SIP requires water quality-based effluent limitations when the MEC or observed maximum background concentration (B) of a priority pollutant exceeds an appropriate pollutant criterion. Effluent limitations for discharge to the **Calaveras River** have been developed for total copper as shown in the Information Sheet, a part of this Order. To prevent acutely toxic conditions at the point of discharge and in the zone of initial dilution, a table in Attachment D, a part of this Order, expresses the maximum daily effluent limitation (MDEL) developed for copper considering the acute aquatic life criterion (CMC) without consideration of dilution. Attachment D also includes a table expressing the average monthly effluent limitation (AMEL) developed considering the chronic aquatic life criterion (CCC) for copper and dilution credit.

For discharge to **San Andreas Creek**, a final AMEL and MDEL have been developed for copper considering the critical ECA, and no dilution credit as shown in the Information Sheet. These final limitations are to be adjusted accordingly with results of corresponding receiving water monitoring for upstream receiving water hardness as shown in Attachment C, a part of this Order.

The Discharger cannot currently meet these limitations, whether discharging to San Andreas Creek, or the Calaveras River. The Discharger has no processes specific for the removal of copper. Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish* *a compliance schedule in an NPDES permit.*" As the average monthly and maximum daily effluent limitations for copper are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP (Section 2.1). This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for copper become effective on **17 December 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Board. If a compliance schedule justification is completed and submitted by this date, the final water quality based effluent limitations for copper become effective **1 October 2008**, and this Order includes a Provision outlining studies and a time schedule for compliance with the new final effluent limitations for copper. In accordance with the SIP, Sections 2.2.1 and 2.2.2, a numeric interim limitation for copper has been established in this Order as shown in the Information Sheet based upon current facility performance. The Order may be reopened to include a new interim effluent limitation for copper after additional effluent data have been collected.

25. In studies conducted by the Discharger, the MEC for total **zinc** was reported as 170 µg/L (ppb). The minimum hardness of the effluent was reported as 68 mg/L (ppm) hardness as $CaCO_3$. This MEC exceeds the adjusted freshwater aquatic life water quality acute CMC and chronic CCC criteria for zinc established in the USEPA's CTR (86 µg/L (ppb) and 86 µg/L (ppb), respectively at 68 mg/L hardness as $CaCO_3$). As noted above, Section 1.3 of the SIP requires water quality-based effluent limitations when the MEC or observed maximum background concentration (B) of a priority pollutant exceeds an appropriate pollutant criterion. Effluent limitations for discharge to the **Calaveras River** have been developed for total zinc as shown in the Information Sheet, a part of this Order. To prevent acutely toxic conditions at the point of discharge and in the zone of initial dilution, a table in Attachment F, a part of this Order, expresses the MDEL developed for zinc considering the acute aquatic life criterion (CMC) without consideration of dilution. Attachment F also includes a table expressing the AMEL developed considering the chronic aquatic life criterion (CCC) for zinc and dilution credit.

For discharge to **San Andreas Creek**, a final AMEL and MDEL have been developed for zinc considering the critical ECA, and no dilution credit as shown in the Information Sheet. These final limitations are to be adjusted accordingly with results of corresponding receiving water monitoring for upstream receiving water hardness as shown in Attachment E, a part of this Order.

The Discharger cannot currently meet these limitations, whether discharging to San Andreas Creek, or the Calaveras River. The Discharger has no processes specific to the removal of zinc. Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" As the average monthly and maximum daily effluent limitations for zinc are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP (Section 2.1). This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for zinc become effective on **17 December 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Board. If a compliance schedule justification is completed and submitted by this date, the final water quality based effluent limitations for zinc become effective **1 October 2008**, and this Order includes a Provision outlining studies and a time schedule for compliance with the new final effluent limitations for zinc. In accordance with the SIP, Sections 2.2.1 and 2.2.2, a numeric interim limitation for zinc has been established in this Order as shown in the Information Sheet based upon current facility performance. The Order may be reopened to include a new interim effluent limitation for zinc after additional effluent data have been collected

26. As noted previously, the MUN beneficial use applies to San Andreas Creek, Murray Creek, and the Calaveras River. Section 1.1 of the SIP states in part that "*Designated beneficial uses to which human health criteria/objectives would apply include... municipal and domestic supply (MUN) and water contact recreation (REC 1). Human health criteria/objectives are differentiated by whether organisms alone from the water body are consumed compared to whether both organisms and water from the water body are consumed. Where MUN is designated, the latter situation applies.*"

27. A human health criterion for **dichlorobromomethane** of 0.56 µg/L (ppb), for consumption of both water and organisms, was established in the CTR. In studies conducted by the Discharger, the MEC for dichlorobromomethane was reported as 0.7 µg/L (ppb). This MEC exceeds the human health criterion for dichlorobromomethane established in the CTR. Section 1.3 of the SIP requires water quality-based effluent limitations when the MEC or observed maximum background concentration (B) of a priority pollutant exceeds an appropriate pollutant criterion.

Water quality-based effluent limitations for discharge to the **Calaveras River** have been developed for dichlorobromomethane as shown in the Information Sheet, a part of this Order. These water quality-based effluent limitations are substantially higher than the reported MEC of 0.7 µg/L (ppb). Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using the calculated AMEL and MDEL. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for dichlorobromomethane is needed prior to establishing a final effluent limitation for the discharge to the Calaveras River. This Order includes a time schedule for the Discharger to collect sufficient information for the calculation of final effluent limitations prior to discharge to the Calaveras River. Pursuant to Section 2.2.1 of the SIP, the water quality to be achieved includes prevention of toxic conditions in the Calaveras River as a result of the discharge, and the maintenance of the highest quality water consistent with the maximum benefit to the people of the State. The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for dichlorobromomethane as enforceable limitations.

For discharge to **San Andreas Creek**, an AMEL was developed as shown in the Information Sheet considering the human health criterion for dichlorobromomethane and no dilution credit.

The Discharger cannot currently meet these limitations when discharging to San Andreas Creek. The Discharger has no processes specific to the removal of dichlorobromomethane. Section 2.1

of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" As the average monthly and maximum daily effluent limitations for dichlorobromomethane are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP (Section 2.1). This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for dichlorobromomethane become effective on **17 December 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Board. If a compliance schedule justification is completed and submitted by this date, the final water quality based effluent limitations for dichlorobromomethane become effective **1 October 2008**, and this Order includes a Provision outlining studies and a time schedule for compliance with the new final effluent limitations for dichlorobromomethane. In accordance with the SIP, Sections 2.2.1 and 2.2.2, and as shown in the Information Sheet, a numeric interim limitation for dichlorobromomethane has been established in this Order based upon current facility performance.

28. A human health criterion for **bis(2-ethylhexyl) phthalate** of 1.8 μg/L (ppb), for consumption of both water and organisms, was established in the NTR. In studies conducted by the Discharger, the MEC for bis(2-ethylhexyl) phthalate was reported as 3.6 μg/L (ppb). This MEC exceeds the human health criterion for bis(2-ethylhexyl) phthalate established in the NTR. Section 1.3 of the SIP requires water quality-based effluent limitations when the MEC or observed maximum background concentration of a priority pollutant exceeds an appropriate pollutant criterion. The maximum observed ambient background concentration (B) of bis(2-ethylhexyl) phthalate in the Calaveras River was reported as < 2.0 μg/L (ppb). Considering this result, it is unknown if and how much assimilative capacity exists within the Calaveras River if any. No information is available regarding ambient background concentrations of bis(2-ethylhexyl) phthalate in San Andreas Creek or Murray Creek.

Concerning calculation of final effluent limitations for bis(2-ethylhexyl) phthalate for discharge to the **Calaveras River**, the SIP provides in Section 1.4 that "*If data are insufficient to calculate the effluent limitation, the RWQCB shall establish interim requirements in accordance with Section 2.2.2.*" This Order includes a time schedule for the Discharger to collect sufficient information for the calculation of final effluent limitations prior to discharge to the Calaveras River. Pursuant to Section 2.2.1 of the SIP, the water quality to be achieved includes prevention of toxic conditions in the Calaveras River as a result of the discharge, and the maintenance of the highest quality water consistent with the maximum benefit to the people of the State. The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for bis(2-ethylhexyl) phthalate as enforceable limitations. In accordance with the SIP, Sections 2.2.1 and 2.2.2, for discharge to the Calaveras River, a numeric interim limitation for bis(2-ethylhexyl) phthalate has been established in this Order based upon current facility performance, as shown in the Information Sheet.

For discharge to **San Andreas Creek**, an AMEL was developed as shown in the Information Sheet considering the human health criterion for bis(2-ethylhexyl) phthalate and no dilution credit. The Discharger cannot currently meet these limitations when discharging to San Andreas Creek. The Discharger has no processes specific to the removal of bis(2-ethylhexyl) phthalate. Compliance schedules described in Section 2.1 of the SIP exclude NTR pollutants, therefore this Order does not include a schedule of compliance with the final effluent limitation for bis(2-ethylhexyl) phthalate for discharge to San Andreas Creek.

29. At p.III-8.00 the Basin Plan provides that relative to toxicity : "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" At page 1, the TSD provides that "*Where States have not developed chemical specific numeric criteria, States may interpret their narrative standards for specific chemicals by using EPA criteria updated with current quantitative risk values.*" The TSD further states on page 1 "*The integrated approach must include the control of toxics through implementation of the "no toxics" criterion and/or numeric criteria for the parameter of toxicity, the control of individual pollutants for which specific chemical water quality criteria exist in a state's standard, as well as the use of biological criteria. Reliance solely on the chemical specific numeric criteria or the narrative criterion or biological criteria would result in only a partially effective State toxics control program.*"

Under the CWA Section 304(a), USEPA has developed methodologies and specific criteria guidance to protect aquatic life and human health. These methodologies are intended to provide protection for all surface waters on a national basis. The methodologies have been subject to public review, as have the individual criteria guidance documents. Water quality criteria developed under Section 304(a) of the CWA are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. Section 304(a) criteria do not reflect consideration of economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water. Section 304(a) criteria provide guidance to States in adopting water quality standards that ultimately provide a basis for controlling discharges or releases of pollutants. Staff has used USEPA's ambient water quality criteria as a means of supplementing the integrated approach to toxics control, and in some cases deriving numeric limitations to protect receiving waters from toxicity as required in the Basin Plan's narrative objective of prohibiting toxic constituents in toxic amounts.

30. The Basin Plan does not provide a numeric water quality objective for **aluminum**. However, the USEPA has developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. The USEPA has recommended, as a freshwater ambient water quality criteria for aluminum, a chronic, four day average criterion continuous concentration (CCC) of 87 μg/L, and an acute, one-hour average criterion maximum concentration (CMC) of 750 μg/L expressed in terms of total recoverable metal in the water column. In establishing these criteria, USEPA notes that there are three major reasons why the use of a water-effect ratio (WER) may be appropriate in applying the aluminum criteria including the fact that the 87 μg/L CCC was based on a toxicity test with striped bass in water with low pH and low hardness.

Results of monitoring conducted by the Discharger indicate effluent aluminum concentrations ranged from 160 µg/L to 580 µg/L. The minimum pH of the effluent has been reported as 6.8 pH units, and the minimum hardness of the effluent has been reported as 68 mg/L as $CaCO_3$. Results of monitoring of the Calaveras River indicate ambient background concentrations of aluminum ranged from 40 µg/L to 80 µg/L. The minimum pH of the Calaveras River has been reported as 7.8 pH units during the period of discharge (one data point), and the minimum hardness of the Calaveras River has been reported as 60 mg/L as $CaCO_3$. No information is available on aluminum concentrations in San Andreas or Murray Creek. Results of ambient background pH monitoring in San Andreas Creek during the period of discharge from December 2002 through April 2003 have ranged from 6.9 to 7.2 pH units.

Considering results of monitoring indicate periods of relatively low hardness and neutral pH, the MEC for total aluminum is over 6 times greater than the CCC, the maximum ambient background concentration of aluminum in the Calaveras River has been reported as high as 80 µg/L, the aquatic life beneficial use, the narrative toxicity objective of the Basin Plan, and, the USEPA chronic criterion for aluminum, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

For discharge to the **Calaveras River** or **San Andreas Creek**, AMEL's and MDEL's have been developed for aluminum as shown in the Information Sheet. Based upon the results of effluent monitoring, the Discharger cannot currently comply with these new effluent limitations for aluminum. At Page IV-16.00 the Basin Plan states "*In no event shall an NPDES permit include a schedule of compliance that allows more than ten years (from the date of adoption of the objective or criteria) for compliance with water quality objectives, criteria or effluent limitations based on the objectives or criteria. Schedules of compliance are authorized by this provision only for those water quality objectives or criteria adopted after the effective date of this provision [25 September 1995*]." The narrative toxicity objective is not a new objective, therefore a schedule of compliance for aluminum is not included in this Order.

31. In December 1999, the U.S EPA published an Update of Ambient Water Quality Criteria for **Ammonia** (1999 Ammonia Update). The new criteria in the 1999 Ammonia Update reflect recent research and data since 1984, and are a revision of several elements in the 1984 criteria, including the pH and temperature relationship of the acute and chronic criteria and the averaging period of the chronic criterion. As a result of these revisions, the acute criterion for ammonia is now dependent on pH and fish species present, and the chronic criterion is dependent on pH and temperature. At lower temperatures, the chronic criterion is also dependent on the presence or absence of early life stages of fish (ELS). The beneficial uses of the Calaveras River, from its source to New Hogan Reservoir, and San Andreas Creek include warm freshwater aquatic habitat (WARM), cold freshwater aquatic habitat (COLD), migration of aquatic organisms (MIGR) in warm habitat, warm and cold habitat spawning, and reproduction, and/or early development (SPWN). The early life stages of fish are likely present during the permitted period of discharge.

The reported MEC of total ammonia is 16 mg/L (as N), with an average daily concentration of effluent total ammonia reported as 2.2 mg/L (as N). The maximum effluent pH for the period of discharge from November 1999 through April 2003 was reported as 7.8 pH units. Without regard to dilution, the discharge from the effluent has the reasonable potential to exceed the acute ambient water quality ammonia criteria for the protection of fresh water aquatic life at the point of discharge to the Calaveras River or San Andreas Creek. The maximum total ammonia concentration reported in the Calaveras River was reported as 1.1 mg/L (as N), and the maximum pH was reported as 7.8 pH units. Although simple steady state dilution calculations using the limited ambient data available indicate that assimilative capacity for chronic toxicity is available in the Calaveras River, sufficient information is not available to adequately determine mixing zone and dilution characteristics.

The Regional Board considered the level of ammonia in the effluent in light of the narrative toxicity objective in the Basin Plan. For determining whether there is reasonable potential for an excursion above this narrative objective, the Regional Board used the second method prescribed by 40 CFR 122.44(d)(vi) for determining reasonable potential, which relies on USEPA recommended criteria and other information. The Board chose this method because USEPA's recommended ambient water quality criteria for ammonia have been developed using methodologies that are subject to public review, as is the individual recommended criteria guidance document. Results of monitoring submitted by the Discharger indicate the effluent discharged to the Calaveras River has the reasonable potential to cause or contribute to an excursion above the acute ammonia criterion. Considering no dilution in San Andreas Creek, results of effluent monitoring submitted by the Discharger indicate the effluent discharged to San Andreas Creek has the reasonable potential to cause or contribute to an excursion above the acute and chronic ammonia criteria.

Accordingly, to prevent acutely toxic conditions at the point of discharge to the **Calaveras River**, a one hour maximum effluent limitation for total ammonia has been included in this Order based upon the EPA's ambient water quality acute toxicity criterion (Attachment H). Compliance with this limit will require recording of effluent pH at the time that the samples are collected for ammonia, and may require information regarding the presence or absence of salmonids in the Calaveras River. Because a minimum 20 to 1 dilution is required for discharge, acute toxicity is almost certainly the governing toxic criterion. The extent of the chronic toxicity mixing zone will be evaluated in the *Dilution/Mixing Zone Study.* Based upon the results on the *Dilution/Mixing Zone Study*, this Order may be reopened to include delineation of a chronic toxicity mixing zone and additional chronic effluent limitations for ammonia, if warranted.

To prevent chronic and acutely toxic conditions at the point of discharge to **San Andreas Creek**, a one hour and AMEL for total ammonia have been included in this Order based upon the EPA's ambient water quality chronic and acute toxicity criteria (Attachment G and Attachment H). Compliance with these limits will require recording of effluent pH and temperature at the time that the samples are collected for ammonia, and may require information regarding the presence or absence of salmonids in San Andreas Creek.

Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for total ammonia. As noted previously, the narrative toxicity objective is not a new objective, therefore a schedule of compliance for ammonia is not included in this Order.

32. The Discharger uses **chlorine** for the disinfection of treated wastewater. The Basin Plan does not provide a numeric water quality objective for chlorine, but the Basin Plan does contain a narrative toxicity objective. For determining whether there is reasonable potential for an excursion above this narrative objective, the Regional Board used the second method prescribed by 40 CFR 122.44(d)(vi) for determining reasonable potential, which relies on USEPA criteria and other information. The Board chose this method because USEPA's recommended ambient water quality criteria for chlorine have been developed using methodologies that are subject to public review, as is the individual recommended criteria guidance document. USEPA's ambient water quality criteria for protection of aquatic life are 11 μg/L as a 4-day average (chronic) concentration, and 19 μg/L as a 1-hour average (acute) concentration for total residual chlorine. Continuous use of chlorine for the disinfection of the final effluent presents a reasonable potential for the discharge to cause or contribute to an excursion above the acute and chronic chlorine criteria.

For discharge to the Calaveras River and San Andreas Creek, this Order includes new effluent limitations for chlorine based directly upon the USEPA's ambient water quality criteria. Based upon results of monitoring, and installation of the new dechlorination unit, the Discharger is capable of consistently meeting these limitations.

33. For Chemical Constituents at page III-3.00, the Basin Plan states '*At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations…*' Federal regulations at 40 CFR Section 122.44(d)(1)(vi)(A) allow the state to establish effluent limitations using an explicit state policy interpreting its narrative objectives. Use of MCL's is appropriate to implement the chemical constituent objective of the Basin Plan. The Calaveras River, San Andreas Creek, and Murray Creek are designated for use as domestic or municipal supply (MUN).

The Regional Board has considered the factors specified in California Water Code (CWC) Section 13263, including considering the provisions of CWC Section 13241 where appropriate. The Regional Board is not required to consider the factors in CWC Section 13241 in applying existing water quality objectives, including adopting new effluent limitations in this Order.

The Regional Board must implement the CWC consistent with the Clean Water Act (CWA). The CWA precludes the consideration of costs when developing effluent limitations for NPDES permits necessary to implement water quality standards (See Ackels v. EPA (9^{th} Cir. 1993) 7 F.3d 862, 865-66). The Regional Board may consider costs in developing compliance schedules. The Regional Board finds, on balance, that these requirements are necessary to protect the beneficial uses of the Calaveras River, San Andreas Creek, and Murray Creek.

34. The Basin Plan does not include a numeric objective for **nitrate** or **nitrite**. The USEPA has established a primary Maximum Contaminant Level (MCL) for nitrate of 10 mg/L (as nitrogen (N)), and a primary MCL for nitrite of 1 mg/L (as nitrogen (N)). USEPA has also established in the MCL a limit for total nitrate + nitrite of 10 mg/L. Additionally, USEPA's ambient water quality criteria for nitrates, protective of human health for consumption of water and organisms, is expressed also as a concentration of 10 mg/l (as N). In Title 22, Table 64431-A of the California Code of Regulations (CCR) the California DHS has established a primary MCL for nitrate + nitrite (sum as nitrogen) of 10 mg/L, and a primary MCL for nitrite (as nitrogen) of 1.0.

As reported by the Discharger, the MEC for nitrate + nitrite (as N) was 17.2 mg/L. Independently, the MEC for nitrate was reported as 17 mg/L (as N), and the MEC for nitrite was reported as 0.2 mg/L (as N). The average daily effluent concentration for nitrate + nitrite (as N) has been reported as 12.2 mg/L. These nitrate + nitrite effluent concentrations, without regard to dilution, exceed the California DHS primary MCL for nitrate + nitrite (as N). The maximum observed ambient background concentration of nitrate + nitrite (as N) in the Calaveras River was reported as 1.7 mg/L. Independently, the maximum observed ambient background concentration for nitrates was reported as 1.7 mg/L (as N), and the maximum observed ambient background concentration nitrites was reported as less than 0.03 mg/L (as N). Considering these effluent monitoring results, the MUN beneficial use, the chemical constituent objective of the Basin Plan, and the California DHS primary MCL for nitrate + nitrite, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

An AMEL and MDEL for discharge to the **Calaveras River** were considered for nitrate + nitrite (as N) developed using the USEPA recommendations for permitting for human health protection as described in Section 5.4.4 of the TSD and as shown in the Information Sheet. These water quality-based effluent limitations are substantially higher than the reported MEC of 17.2 mg/L (ppm). Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using the calculated AMEL and MDEL. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for nitrate + nitrite is needed prior to establishing a final effluent limitation for the discharge to the Calaveras River. The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations for discharge to the Calaveras River at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to reopen this Order and include final water quality-based effluent limitations for nitrate + nitrite as enforceable limitations.

For discharge to **San Andreas Creek**, where dilution credit was not considered, an AMEL was developed considering the USEPA recommendations for permitting for human health protection provided in Section 5.4.4 of the TSD. The AMEL was set equal to the WLA, or in this case, the nitrates + nitirites MCL (10 mg/L). Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for nitrates +

nitrites. As the chemical constituent objective is not a new objective, a schedule of compliance for nitrates + nitrites is not included in this Order.

35. In Title 22, Table 64449-A of the CCR, the California DHS has established a secondary MCL for **iron** of 300 µg/L considering consumer acceptance limits. Results of monitoring conducted by the Discharger indicate effluent concentrations of iron ranged from 210 µg/L to 450 µg/L . The MEC, without regard to dilution, exceeds the California DHS secondary MCL for iron. The maximum observed ambient background concentration of iron in the Calaveras River was reported as 130 µg/L. The data indicate that the Calaveras River does have assimilative capacity for iron. Dilution and/or assimilative capacity was not considered for discharge to San Andreas Creek. Considering the MEC, the MUN beneficial use, the chemical constituents objective of the Basin Plan, and the California DHS secondary MCL for iron, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

The criterion used to determine reasonable potential for iron is not related to aquatic toxicity or human health. Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using a calculated AMEL and MDEL based upon a human health WLA. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for iron is needed prior to establishing a final effluent limitation for the discharge to the **Calaveras River**. The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for iron as enforceable limitations.

For discharge to **San Andreas Creek**, where dilution credit was not considered, an AMEL was set equal to the WLA, or in this case, the iron secondary MCL (300 µg/L). Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for iron. As the chemical constituents objective is not a new objective, a schedule of compliance for iron is not included in this Order.

36. In Title 22, Table 64449-A of the CCR, the California DHS has established a secondary MCL for **manganese** of 50 µg/L considering consumer acceptance limits. Results of monitoring conducted by the Discharger indicate effluent concentrations of manganese ranged from 25 µg/L to 82 µg/L . The MEC, without regard to dilution, exceeds the California DHS secondary MCL for manganese. The maximum observed ambient background concentration of manganese in the Calaveras River was reported as 12 µg/L. The data indicate that the Calaveras River does have assimilative capacity for manganese. Dilution and/or assimilative capacity was not considered for discharge to San Andreas Creek. Considering the MEC, the MUN beneficial use, the chemical constituents objective of the Basin Plan, and the California DHS secondary MCL for manganese, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

The criterion used to determine reasonable potential for manganese is not related to aquatic toxicity or human health. Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using a calculated AMEL and MDEL based upon a human health WLA. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for manganese is needed prior to establishing a final effluent limitation for the discharge to the **Calaveras River**. The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for manganese as enforceable limitations.

For discharge to **San Andreas Creek**, where dilution credit was not considered, an AMEL was set equal to the WLA, or in this case, the manganese secondary MCL (50 µg/L). Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for manganese. As the chemical constituents objective is not a new objective, a schedule of compliance for manganese is not included in this Order.

37. In Title 22, Table 64449-A of the CCR, the California DHS has established a secondary MCL for **Methylene Blue Active Substances** (MBAS) of 500 µg/L considering consumer acceptance limits. Results of monitoring conducted by the Discharger indicate effluent concentrations of MBAS ranged from 500 µg/L to 2,000 µg/L . The MEC, without regard to dilution, exceeds the California DHS secondary MCL for MBAS. The maximum observed ambient background concentration of MBAS in the Calaveras River was reported as less than 50 µg/L. The data indicate that the Calaveras River does have assimilative capacity for MBAS. Dilution and/or assimilative capacity was not considered for discharge to San Andreas Creek. Considering the MEC, the MUN beneficial use, the chemical constituents objective of the Basin Plan, and the California DHS secondary MCL for MBAS, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

The criterion used to determine reasonable potential for MBAS is not related to aquatic toxicity or human health. Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using a calculated AMEL and MDEL based upon a human health WLA. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for MBAS is needed prior to establishing a final effluent limitation for the discharge to the **Calaveras River**. The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for MBAS as enforceable limitations.

For discharge to **San Andreas Creek**, where dilution credit was not considered, an AMEL was set equal to the WLA, or in this case, the MBAS secondary MCL (500 µg/L). Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for MBAS. As the chemical constituents objective is not a new objective, a schedule of compliance for MBAS is not included in this Order.

38. **Diazinon** is used for the control of pests in both agricultural and urban settings. For inland surface waters within the Region, there are currently no adopted numeric objectives for diazinon. For diazinon, the USEPA has published a tentative one-hour maximum acute criterion of 0.09 µg/L. The California Department of Fish and Game (DFG) criteria include a one-hour average acute value of 0.08 µg/L and a four-day average chronic value of 0.05 µg/L.

Results of three effluent sampling events indicated one instance where diazinon was detected, at a concentration of 1.6 µg/L. Results of two ambient background monitoring events in the Calaveras River indicate concentrations of diazinon were less than 0.1 µg/L. This information is not sufficient to adequately assess whether the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard in the Calaveras River. This Order contains new monitoring requirements for diazinon, and may be reopened, and effluent limitations established for diazinon if appropriate, based upon additional data collection. Depending upon the nature of collected data, the Discharger may be required to implement a study and develop source control actions, and/or interim or final point of discharge effluent limitations may be established.

Considering the MEC, the aquatic life beneficial uses, the pesticide and narrative toxicity objectives of the Basin Plan, and the California DFG criteria for diazinon, the discharge to **San Andreas Creek** has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

For discharge to San Andreas Creek, an AMEL and MDEL have been developed for diazinon as shown in the Information Sheet. Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for diazinon. Additionally, based upon the use of current analytical methods, routine monitoring may be unable to determine compliance with these limitations. Analytical methods for compliance monitoring purposes will be specified in this Order. As the narrative toxicity and pesticide objectives are not new objectives, a schedule of compliance for diazinon is not included in this Order.

39. **Carbofuran** is a broad spectrum carbamate insecticide with applications for pest control in various food and feed crops. In Title 22, Table 64444-A of the CCR, the California DHS has established a primary MCL for carbofuran of 18 µg/L The California Office of Environmental Health Hazard Assessment (OEHHA) has established a Public Health Goal for carbofuran in drinking water of 1.7 µg/L. In 1992, the California DFG published an interim criterion to protect freshwater aquatic life of 0.5 µg/L as an instantaneous maximum.

Results of three effluent sampling events indicated one instance where carbofuran was reported as greater than the analytical detection method limit, but less than the method reporting limit, at a detected, but not quantified (DNQ) concentration of 2.51 µg/L. Results from the two other rounds of effluent monitoring indicated carbofuran concentrations were less than 1.3 and less than 1.1 µg/L. Results of two ambient background monitoring events in the Calaveras River indicate concentrations of carbofuran were less than 0.5 µg/L and less than 1.1 µg/L. This information is not sufficient to adequately assess whether the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard. This Order contains new monitoring requirements for carbofuran, and may be reopened, and effluent limitations established for carbofuran if appropriate, based upon additional data collection. Depending upon the nature of collected data, the Discharger may be required to implement a study and develop source control actions, and/or interim or final point of discharge effluent limitations may be established.

40. The Basin Plan provides that the **pH** (of surface waters) shall not be depressed below 6.5 nor raised above 8.5 pH Units. The Basin Plan further provides that changes in normal ambient pH levels shall not exceed 0.5 pH units in fresh waters with designated COLD or WARM beneficial uses. Although the discharge will occur under conditions of 20 to 1 dilution, pH can significantly affect the mobility of metals, and toxicity of ammonia, therefore the existing effluent limitation for pH has been retained in this Order. This Order also retains receiving water limitations and monitoring requirements for pH.

41. At Page III-5.00, the Basin Pan provides surface water quality objectives for **dissolved oxygen** (DO), and states, in part: *For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75 percent of saturation. The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time:*

Waters designated WARM 5.0 mg/l
Waters designated COLD 7.0 mg/l
Waters designated SPWN 7.0 mg/l

This Order retains the limitation that the discharge shall not cause the DO of the receiving water to fall below 7.0 mg/l, in support of the COLD and SPWN beneficial uses and associated Basin Plan objective.

42. Effluent and receiving water **temperature** affect numerous water quality conditions including ammonia toxicity (increasing with increasing temperature) and oxygen saturation (decreasing with increasing temperature). Additionally, warm waters may cause detrimental conditions of aquatic aversion or attraction. The Basin Plan states that: "*At no time shall the temperature of... WARM intrastate waters be increased more than 5°F above natural receiving water temperature*". Through the use of the pond system, effluent temperatures are buffered, and under conditions of 20:1 dilution, the potential for the discharge to increase the temperature of the Calaveras River or San Andreas Creek appears unlikely. However, this Order contains receiving water limitations inclusive of the Basin Plan objectives.

43. The Basin Plan states that: "*Waters shall be free of changes in **turbidity** that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:*

- *Where natural turbidity is between 0 and 5 (NTUs), increases shall not exceed 1 NTU*
- *Where natural turbidity is between 5 and 50 NTU's, increases shall not exceed 20 percent*
- *Where natural turbidity is between 50 and 100 NTU's, increases shall not exceed 10 NTU's*
- *Where natural turbidity is greater than 100 NTU's, increases shall not exceed 10 percent"*

This Order includes effluent and receiving water monitoring requirements for turbidity, and retains receiving water limitations and monitoring requirements for turbidity.

44. The Basin Plan states that "*Waters shall not contain oils, greases, waxes, or other materials 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.*" This Order includes effluent monitoring requirements for **oil and grease**.

45. The beneficial uses of the underlying ground water are municipal and domestic, industrial service, industrial process and agricultural supply. The WWTP processes include the use of three polishing ponds, the equalization basin, and the DLDA.

SWRCB Resolution 68-16 requires the Regional Board, in regulating the discharge of waste, to maintain high quality waters of the State (i.e. background water quality) until it is demonstrated that any change in quality will be consistent with the maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board's policies (e.g. quality that exceeds objectives). Some degradation of groundwater beneath the WWTP and associated DLDA is consistent with Resolution 68-16 provided that:

a. the degradation is confined within a specified boundary;

b. The Discharger minimizes degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures;

c. The degradation is limited to waste constituents typically encountered in domestic wastewater as specified in the groundwater limitation in this Order; and,

d. The degradation does not result in water quality less than that prescribed in the Basin Plan.

Some degradation of groundwater by some of the typical waste constituents released with the discharge from a municipal wastewater utility, after effective source control, treatment, and control is consistent with the maximum benefit to the people of the State. The technology, energy, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impact on water quality will be substantially less. Degradation of groundwater by toxic pollutants other than those typically associated with a WWTP, and by pollutants that can be effectively removed by conventional treatment (e.g. total coliform bacteria) is prohibited. When allowed, the degree of degradation permitted depends upon many factors including; background water quality, the pollutant, the beneficial uses of groundwater and most stringent water quality objective, source control measures, and pollutant treatability. Economic prosperity of the local community is of maximum benefit to the people of the State, and therefore sufficient reason exists to accommodate growth and groundwater degradation around the WWTP, provided that the terms of the Basin Plan including SWRCB Resolution 68-16, are met.

As required by previous Order No. 5-01-118, the Discharger is currently installing a series of three wells to assess and monitor the impact of the discharge on groundwater, if any. This Order includes groundwater limitations that allow groundwater to be degraded when compared to background groundwater quality, but not to exceed water quality objectives. If groundwater quality has been degraded by the operation of the WWTP beyond the quality described above, this Order may be reopened, and specific numeric limitations imposed.

46. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and SWRCB Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

47. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

48. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Relations Code Section 21000, et. Seq.), in accordance with Section 13389 of the California Water Code.

49. The Regional Board has considered the information in the attached Information Sheet in developing the Findings of this Order. The attached Information Sheet is part of this Order. Attachments A, B, C, D, E, F, G, and H are also a part of this Order.

50. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

51. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

52. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon the date of hearing, provided EPA has no objections.

53. Any person adversely affected by this action of the Regional Board may petition the SWRCB to review the action. The petition must be received by the State Board Office of the Chief Counsel, P.O. Box 100, Sacramento, CA 95812-0100, within 30 days of the date the action was taken. Copies of the law and regulations applicable to filing petitions will be provided upon request.

IT IS HEREBY ORDERED that Order No. 5-01-118 is rescinded and that the San Andreas Sanitary District, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations, policies, and plans adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. Discharge of wastewater at a location or in a manner different from that described in Findings No.(s) 2 - 5, and No. 7 is prohibited.

2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)"].

3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

4. The discharge of effluent to San Andreas Creek or the Calaveras River is prohibited from **1 May through 31 October** of each year.

5. The discharge of secondary treated effluent to San Andreas Creek in quantities which do not receive a minimum of 20:1 dilution as a daily average (receiving water flow : effluent flow) is prohibited as of **1 April 2006**. The discharge of treated secondary effluent to the Calaveras River in quantities which do not receive a minimum of 20:1 dilution as a daily average (receiving water flow : effluent flow) is prohibited.

B. Effluent Limitations:

1. Secondary treated effluent discharged to **San Andreas Creek** shall not exceed the following limits:

Constituents	Units	Monthly Average	Weekly Average[16]	Monthly Median	Daily Maximum[16]
BOD[1]	mg/L (ppm)	30[2]	45[2]	---	60[2]
	lbs/day[3]	375	563	---	751
Total Suspended Solids	mg/L (ppm)	30[2]	45[2]	---	60[2]
	lbs/day[3]	375	563	---	751
Settleable Solids	ml/l	0.1	---	---	0.2
Total Coliform	MPN/100ml	---	---	23	230
Chlorine Residual	µg/L (ppb)	---	11.0[14]	---	19[15]
	lbs/day[3]	---	0.14	---	0.24
Copper (Total)	µg/L (ppb)	[4]	---	---	[4]
	lbs/day[3]	[5]	---	---	[5]
	µg/L (ppb)	105[8]	---	---	---
	lbs/day[3]	1.3[8]	---	---	---
Zinc (Total)	µg/L (ppb)	[6]	---	---	[6]
	lbs/day[3]	[7]	---	---	[7]
	µg/L (ppb)	510[8]	---	---	---
	lbs/day[3]	6.4[8]	---	---	---
Dichlorobromomethane	µg/L (ppb)	0.56[13]	---	---	1.1[13]
	lbs/day[3]	0.007[13]	---	---	0.014[13]
	µg/L (ppb)	2.1[8]	---	---	---
	lbs/day[3]	0.026[8]	---	---	---
Bis(2-ethylhexyl) phthalate	µg/L (ppb)	1.8	---	---	3.6
	lbs/day[3]	0.023	---	---	0.045
Aluminum (Total)	µg/L (ppb)	83	---	---	143
	lbs/day[3]	1.04	---	---	1.8
Ammonia (Total)	mg/L (ppm)	[9]	---	---	[11]
	lbs/day[3]	[10]	---	---	[12]
Nitrate + Nitrite (as Nitrogen)	mg/L (ppm)	10	---	---	---
	lbs/day[3]	125	---	---	---
Iron	µg/L (ppb)	300	---	---	---
	lbs/day[3]	3.8	---	---	---
Manganese	µg/L (ppb)	50	---	---	---
	lbs/day[3]	0.63	---	---	---
MBAS	µg/L (ppb)	500	---	---	---
	lbs/day[3]	6.3	---	---	---
Diazinon	µg/L (ppb)	0.04	---	---	0.08
	lbs/day[3]	0.0005	---	---	0.001

1 5-day, 20°C Biochemical Oxygen Demand.
2 To be ascertained by a 24-hour composite.
3 Based upon a wet weather design discharge capacity of 1.5 mgd (*x* mg/L x 8.34 x 1.5 mgd = *y* lbs/day).

[4] Calculate limit based upon Attachment C. Final effluent limitation effective 1 October 2008.
[5] Calculate limit based upon Attachment C, where (*x* mg/L x 8.34 x 1.5 mgd = *y* lbs/day). Final effluent limitation effective 1 October 2008.
[6] Calculate limit based upon Attachment E. Final effluent limitation effective 1 October 2008.
[7] Calculate limit based upon Attachment E, where (*x* mg/L x 8.34 x 1.5 mgd = *y* lbs/day). Final effluent limitation effective 1 October 2008.
[8] Interim limits effective until 30 September 2008.
[9] Concentration limits identified in Attachment G.
[10] Calculate limit based upon Attachment G, where (*x* mg/L x 8.34 x 1.5 mgd = *y* lbs/day).
[11] Maximum one hour average concentration limits identified in Attachment H.
[12] Calculate limit based upon Attachment H, where (*x* mg/L x 8.34 x 1.5 mgd = *y* lbs/day).
[13] Final effluent limitation effective 1 October 2008.
[14] Maximum four day average concentration limitation.
[15] Maximum one hour average concentration limitation.
[16] Except as noted.

2. Any effluent discharged to **San Andreas Creek** that does not receive 20:1 dilution as of **1 April 2006**, must then receive tertiary treatment, shall be oxidized, coagulated and filtered, or equivalent treatment provided, and shall not exceed the following limits:

Constituents	Units	Monthly Average	Weekly Average[16]	7-Day Median	Daily Maximum[16]	Daily Average
BOD[1]	mg/L (ppm)	10	15	---	20	---
	lbs/day[3]	125	188	---	250	---
Total Suspended Solids	mg/L (ppm)	10	15	---	20	---
	lbs/day[3]	125	188	---	250	---
Settleable Solids	ml/l	0.1	---	---	0.2	---
Total Coliform	MPN/100ml	---	---	2.2	23	---
Turbidity	NTU's	---	---	---	5	2
Chlorine Residual	µg/L (ppb)	---	11[14]	---	19[15]	---
	lbs/day[3]	---	0.14	---	0.24	---
Copper (Total)	µg/L (ppb)	[4]	---	---	[4]	---
	lbs/day[3]	[5]	---	---	[5]	---
	µg/L (ppb)	105[8]	---	---	---	---
	lbs/day[3]	1.3[8]	---	---	---	---
Zinc (Total)	µg/L (ppb)	[6]	---	---	[6]	---
	lbs/day[3]	[7]	---	---	[7]	---
	µg/L (ppb)	510[8]	---	---	---	---
	lbs/day[3]	6.4[8]	---	---	---	---
Dichlorobromomethane	µg/L (ppb)	0.56[13]	---	---	1.1[13]	---
	lbs/day[3]	0.007[13]	---	---	0.014[13]	---
	µg/L (ppb)	2.1[8]	---	---	---	---
	lbs/day[3]	0.026[8]	---	---	---	---

Constituents	Units	Monthly Average	Weekly Average[16]	7-Day Median	Daily Maximum[16]	Daily Average
Bis(2-ethylhexyl) phthalate	µg/L (ppb)	1.8	---	---	3.6	---
	lbs/day[3]	0.023	---	---	0.045	---
Aluminum (Total)	µg/L (ppb)	83	---	---	143	---
	lbs/day[3]	1.04	---	---	1.8	---
Ammonia (Total)	mg/L (ppm)	[9]	---	---	[11]	---
	lbs/day[3]	[10]	---	---	[12]	---
Nitrate + Nitrite (as Nitrogen)	mg/L (ppm)	10	---	---	---	---
	lbs/day[3]	125	---	---	---	---
Iron	µg/L (ppb)	300	---	---	---	---
	lbs/day[3]	3.8	---	---	---	---
Manganese	µg/L (ppb)	50	---	---	---	---
	lbs/day[3]	0.63	---	---	---	---
MBAS	µg/L (ppb)	500	---	---	---	---
	lbs/day[3]	6.3	---	---	---	---
Diazinon	µg/L (ppb)	0.04	---	---	0.08	---
	lbs/day[3]	0.0005	---	---	0.001	---

1 5-day, 20°C Biochemical Oxygen Demand.
2 To be ascertained by a 24-hour composite.
3 Based upon a wet weather design discharge capacity of 1.5 mgd (x mg/L x 8.34 x 1.5 mgd = y lbs/day).
4 Calculate limit based upon Attachment C. Final effluent limitation effective 1 October 2008.
5 Calculate limit based upon Attachment C, where (x mg/L x 8.34 x 1.5 mgd = y lbs/day). Final effluent limitation effective 1 October 2008.
6 Calculate limit based upon Attachment E. Final effluent limitation effective 1 October 2008.
7 Calculate limit based upon Attachment E, where (x mg/L x 8.34 x 1.5 mgd = y lbs/day). Final effluent limitation effective 1 October 2008.
8 Interim limits effective until 30 September 2008.
9 Concentration limits identified in Attachment G.
10 Calculate limit based upon Attachment G, where (x mg/L x 8.34 x 1.5 mgd = y lbs/day).
11 Maximum one hour average concentration limits identified in Attachment H.
12 Calculate limit based upon Attachment H, where (x mg/L x 8.34 x 1.5 mgd = y lbs/day).
13 Final effluent limitation effective 1 October 2008.
14 Maximum four day average concentration limitation.
15 Maximum one hour average concentration limitation.
16 Except as noted.

3. Effluent discharged to the **Calaveras River** shall not exceed the following limits:

Constituents	Units	Monthly Average	Weekly Average[13]	Monthly Median	Daily Maximum[13]
BOD[1]	mg/L (ppm)	30[2]	45[2]	---	60[2]
	lbs/day[3]	375	563	---	751
Total Suspended Solids	mg/L (ppm)	30[2]	45[2]	---	60[2]
	lbs/day[3]	375	563	---	751
Settleable Solids	ml/L	0.1	---	---	0.2

Constituents	Units	Monthly Average	Weekly Average[13]	Monthly Median	Daily Maximum[13]
Total Coliform	MPN/100ml	---	---	23	230
Chlorine Residual	µg/L (ppb) lbs/day[3]	--- ---	11[11] 0.14	--- ---	19[12] 0.24
Copper (Total)	µg/L (ppb) lbs/day[3] µg/L (ppb) lbs/day[3]	[4] [5] 105[8] 1.3[8]	--- --- --- ---	--- --- --- ---	[4] [5] --- ---
Zinc (Total)	µg/L (ppb) lbs/day[3] µg/L (ppb) lbs/day[3]	[6] [7] 510[8] 6.4[8]	--- --- --- ---	--- --- --- ---	[6] [7] --- ---
Dichlorobromomethane	µg/L (ppb) lbs/day	2.1[8] 0.026[8]	--- ---	--- ---	--- ---
Bis(2-ethylhexyl) phthalate	µg/L (ppb) lbs/day	13.7[8] 0.17[8]	--- ---	--- ---	--- ---
Aluminum (Total)	µg/L (ppb) lbs/day	216 2.7	--- ---	--- ---	373 4.7
Ammonia (Total)	mg/L (ppm) lbs/day	--- ---	--- ---	--- ---	[9] [10]

1 5-day, 20°C Biochemical Oxygen Demand.
2 To be ascertained by a 24-hour composite.
3 Based upon a wet weather design discharge capacity of 1.5 mgd (x mg/L x 8.34 x 1.5 mgd = y lbs/day).
4 Calculate limit based upon Attachment D. Final effluent limitation effective 1 October 2008.
5 Calculate limit based upon Attachment D, where (x mg/L x 8.34 x 1.5 mgd = y lbs/day). Final effluent limitation effective 1 October 2008.
6 Calculate limit based upon Attachment F. Final effluent limitation effective 1 October 2008.
7 Calculate limit based upon Attachment F, where (x mg/L x 8.34 x 1.5 mgd = y lbs/day). Final effluent limitation effective 1 October 2008.
8 Interim limits effective until 30 September 2008.
9 Maximum one hour concentration limits identified in Attachment H.
10 Calculate limit based upon Attachment H, where (x mg/L x 8.34 x 1.5 mgd = y lbs/day).
11 Maximum four day average concentration limitation.
12 Maximum one hour average concentration limitation.
13 Except as noted.

4. The arithmetic mean of 20°C BOD (5-day) and total suspended solids in effluent samples collected over a monthly period shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal).

5. The discharge shall not have a pH less than 6.5 nor greater than 8.5.

6. The peak wet weather flow through the trickling filter treatment facility shall not exceed 0.9 mgd.

7. The discharge flow to San Andreas Creek or the Calaveras River shall not exceed 1.5 mgd.

8. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

   Minimum for any one bioassay - - - - - - - - - 70%
   Median for any three or more consecutive bioassays - - - - 90%

C. Discharge Specifications, Flow Equalization Basin, Designated Land Disposal Area:

1. Treated wastewater discharged to the Designated Land Disposal Area shall not exceed the following limits:

Constituents	Units	Monthly Average	Monthly Median	Daily Maximum
BOD[1]	mg/L	40[2]		80[2]
Settleable Solids	mL/L	0.2		0.5
Total Coliform	MPN/100mL		23	230

[1] 5-day, 20°C biochemical oxygen demand (BOD)
[2] To be ascertained by a 24-hour composite

2. Reclaimed wastewater shall meet the criteria contained in Title 22, Division 4, California Code of Regulations (CCR), Section 60301, et seq.

3. The average dry weather flow through the treatment facility shall not exceed 0.4 mgd.

4. The maximum daily discharge to the Designated Land Disposal Area shall not exceed 0.9 million gallons.

5. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal areas or property owned by the Discharger.

6. As a means of discerning compliance with Limitation C.5, the dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/L.

7. The effluent polishing ponds shall not have a pH less than 6.5 or greater than 8.5 averaged over any 24-hour period. The effluent storage reservoir shall not have a pH less than 6.5 or greater than 9.0 averaged over any 24-hour period.

8. Ponds shall be managed to prevent breeding of mosquitos. In particular,

    a. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.

    b. Weeds shall be minimized.

    c. Dead algae, vegetation, and debris shall not accumulate on the water surface.

9. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.

10. Ponds and disposal trenches shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the irrigation season (May through October). Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns. Freeboard in the storage ponds shall never be less than two feet (measured vertically to the lowest point of overflow).

11. There shall be no run off or overflow of effluent outside the Designated Land Disposal Area. The trenches and ponds shall be protected from inundation from the one in one hundred year storm event.

D. Sludge Disposal:

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.

2. Any proposed change in sludge use or disposal practice from a previously approved practice shall be reported to the Executive Officer and EPA Regional Administrator at least **90 days** in advance of the change.

3. Use and disposal of sewage sludge shall comply with existing Federal and State laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

    If the State Water Resources Control Board and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.

E. Receiving Water Limitations- San Andreas Creek and the Calaveras River:

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit. The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/L (ppm). The monthly median of the mean daily dissolved oxygen concentration at this location shall not fall below 85 percent of saturation in the main water mass, and the 95^{th} percentile concentration shall not fall below 75 percent of saturation.

2. Any individual pesticide or combination of pesticides to be present in concentrations that adversely affect beneficial uses, and total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.

3. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

4. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

5. Aesthetically undesirable discoloration.

6. Fungi, slimes, or other objectionable growths.

7. The turbidity to increase as follows:

   a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.

   b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

   c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.

   d. More than 10 percent where natural turbidity is greater than 100 NTUs.

8. The normal ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 pH units.

9. Deposition of material that causes nuisance or adversely affects beneficial uses.

10. The normal ambient temperature to increase more than 5°F.

11. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or 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.

12. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

13. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

14. Violations of any applicable water quality standard for receiving waters adopted by the Regional Board, the State Water Resources Control Board, or the U.S. Environmental Protection Agency pursuant to the CWA and regulations adopted thereunder.

15. Taste or odor-producing substances to impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.

16. The fecal coliform concentration in any 30-day period to exceed a geometric mean of 200 MPN/100 mL or cause more than 10 percent of total samples to exceed 400 MPN/100 mL.

F. **Groundwater Limitations:** The release of waste constituents from any storage, treatment, or disposal component of the WWTP or DLDA shall not, in combination with other sources, cause the following in groundwater:

1. Beneficial uses to be adversely impacted or water quality objectives to be exceeded.

2. Any constituent concentration, when compared with background, to be incrementally increased beyond the current concentration.

3. Total coliform organisms to equal or exceed a most probable number of 2.2/100 mL over any seven-day period.

G. **Provisions:**

1. The Discharger shall comply with Monitoring and Reporting Program No. R5-2003-0151, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

   When requested by USEPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger Self Monitoring Reports.

2. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

3. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and 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.

4. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986.

5. **Copper, Zinc, Dichlorobromomethane Effluent Limitation Time Schedules**: Effluent Limitations B.1., B.2., and B.3. require the Discharger to comply with new monthly average and daily maximum effluent limitations for CTR Pollutants including total copper, total zinc, and dichlorobromomethane. The new final water quality based effluent limitations for these CTR pollutants required by this Order shall become effective on **1 October 2008**. The Discharger shall comply with the following time schedule in order to study and implement measures necessary to comply with these new limitations, or comply with alternative final limitations developed using a methodology prescribed by Section 1.4 of the SIP:

Task	Compliance Date
Submit Compliance Alternatives Study Workplan	**1 March 2004**
Submit Compliance Alternatives Study Report	**1 July 2005**
Select Alternative(s)	**1 October 2005**
Submit Implementation Plan and Time Schedule for Selected Alternative(s)	**1 January 2006**
Achieve Full Compliance	**1 October 2008**

The Discharger shall submit to the Regional Board on or before each compliance report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

As this schedule is greater than one year, the Discharger shall submit semi-annual progress reports on **15 January** and **15 July** each year until the Discharger achieves compliance with the final water quality based effluent limitations for these pollutants.

6. **Dilution/Mixing Zone Study**: The Discharger shall conduct a *Dilution/Mixing Zone Study* to address requirements of SIP Section 1.4.2, including, but not limited to, whether the

discharge to the Calaveras River is completely or incompletely mixed and mixing zone conditions specified by SIP Section 1.4.2.2. This study shall also specifically address dilution and mixing zone issues as they pertain to final effluent limitations for copper, zinc, dichlorobromomethane, bis(2-ethylhexyl) phthalate, aluminum, ammonia, nitrates + nitrites, iron, manganese, MBAS, and diazinon. This Study shall also include recommendations for receiving water monitoring which can be used to determine compliance with final limitations. Within **one (1) month** of adoption of this Order the Discharger shall complete and submit a *Study Workplan*. The final *Dilution/Mixing Zone Study* shall be completed and submitted within **ten (10) months** of adoption of this Order. The results of this *Study*, in combination with the requirements of Provision E.4., shall be sufficient, considering water year classifications, to conduct the determination of effluent limitations required by Section 1.3 of the SIP and to calculate water quality based effluent limitations in accordance with Section 1.4 of the SIP. In some instances, interim performance-based effluent limits shall be in effect until this *Study* is completed and the permit is reopened to incorporate final effluent limits. This Order may be reopened after review of the final *Study*, and findings and limitations incorporated into the Order as appropriate.

7. **Data Collection, Final/Interim Limits:** The Discharger shall submit within **ten (10) months** of adoption of this Order a ***Pollutant Data Collection Report*** summarizing pollutant data collected pursuant to MRP No. R5-2003-XXX, a part of this Order. This report shall include ambient Calaveras River pollutant data and, in combination with the *Dilution/Mixing Zone Study* requirements of Provision G.6. and results of effluent monitoring, shall be sufficient to calculate final water quality based or performance based interim or final effluent limitations for several constituents including dichlorobromomethane, bis(2-ethylhexyl) phthalate, nitrates + nitrites, iron, manganese, MBAS, diazinon, copper, zinc, aluminum and ammonia. This Order may be reopened upon review of additional data collected pursuant to MRP No. R5-2003-XXX or this summary report to include new findings and limitations if appropriate.

8. **Chronic Toxicity Testing:** The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger shall initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the SWRCB, this Order may be reopened and a limitation based on that objective included.

9. **Adoption of new Minimum Level's (ML's):** Where an approved laboratory analytical method and associated ML cannot, at this time, determine whether a CTR constituent is present in the discharge above the applicable criteria, the Discharger shall resample for these constituents if new ML's are adopted by the SWRCB.

10. **Reopeners**: This Order may be reopened and effluent and/or receiving water limitations modified based on new information, including information on copper, zinc, dichlorobromomethane, bis(2-ethylhexyl) phthalate, aluminum, ammonia, nitrates + nitrites, iron, manganese, MBAS, diazinon, and carbofuran, supplied as required by this Order.

11. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."

12. The Discharger shall use the best practicable control to limit mineralization to no more than a reasonable increment.

13. This Order expires on **15 October 2008** and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.

14. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of or clearance from the SWRCB (Division of Water Rights).

15. In the event of any change in control or ownership of land or waste discharge facilities recently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

16. To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Regional Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 17 October 2003.

THOMAS R. PINKOS, Executive Officer

Amended : JME

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2003-0151

NPDES NO. CA0079464
FOR
SAN ANDREAS SANITARY DISTRICT
WASTEWATER TREATMENT PLANT
CALAVERAS COUNTY

This Monitoring and Reporting Program is issued pursuant to California Water Code Sections 13267 and 13383. For purposes of evaluating compliance with the limitations of Order No. R5-2003-0151, the Discharger shall conduct monitoring and submit reports as specified below. To evaluate compliance with the limitations of this Order, monitoring should occur within a brief enough period to be able to evaluate the effect of the effluent on the ambient water quality. The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program.

Section 13267 of the California Water Code states, in part, "(a) A regional board, in establishing waste discharge requirements may investigate the quality of any waters of the state within its region" and "(b)(1) In conducting an investigation ... , the regional board may require that any person who ... discharges ... waste ... that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires." This Monitoring and Reporting Program to monitor groundwater and surface water required by Order No. R5-2003-0151 is necessary to assure compliance with Order No. R5-2003-0151. The Discharger operates the facility that discharges waste subject to Order No. R5-2003-0151.

INFLUENT MONITORING
(year-round)

When discharging to San Andreas Creek or the Calaveras River, influent samples shall be collected at approximately the same time as effluent samples and should be representative of the influent. Influent monitoring shall be conducted regardless of whether the discharge is to land or surface waters, and shall include at least the following:

Constituent	**Units**	**Type of Sample**	**Sampling Frequency**
Flow	mgd	Meter	Continuous
20° C BOD_5	mg/L, lbs/day	24 hr. Composite	Weekly
Suspended Solids	mg/L, lbs/day	24 hr. Composite	Weekly
Specific Conductivity[1]	µmhos/cm	Grab	Weekly
pH[1]	pH Units	Grab	Weekly
Ammonia (Total, as N)	mg/L	Grab	Monthly
Aluminum	µg/L, lbs/day	Grab	Monthly
Copper (Total)[2]	µg/L, lbs/day	Grab	Monthly
Zinc (Total)[2]	µg/L, lbs/day	Grab	Monthly
Bis(2-ethylhexyl) phthalate[2]	µg/L, lbs/day	Grab	Monthly
Iron	µg/L, lbs/day	Grab	Monthly
Manganese	µg/L, lbs/day	Grab	Monthly
MBAS	µg/L, lbs/day	Grab	Monthly

Constituent	Units	Type of Sample	Sampling Frequency
Diazinon[3]	µg/L, lbs/day	Grab	Twice Yearly

[1] Field Measurements.

[2] At a minimum the Discharger shall comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP), adopted 2 March 2000 by the State Water Resources Control Board. For each priority pollutant use an analytical method from the SIP, Appendix 4 with a Minimum Level (ML) below all applicable pollutant criteria. In accordance with Section 2.4.2 of the SIP, the Discharger is to instruct the laboratory analyzing samples for priority pollutants to establish calibration standards so that the ML is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve. Report all peaks identified by the EPA test methods

[3] Discharger must submit report outlining sample collection, Analytical test methods, and detection limits within 60 days of permit adoption for approval. Report all peaks identified by the EPA test methods.

EFFLUENT MONITORING
DISCHARGE TO SAN ANDREAS CREEK OR CALAVERAS RIVER
(from ponds when discharging to surface waters)

During the period of 1 November through 30 April of each year, effluent samples shall be collected from the outfall when discharging to San Andreas Creek or the Calaveras River. Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall to San Andreas Creek or the Calaveras River. Time of collection of samples shall be recorded. Samples collected from the outfall having passed through the poliching ponds, shall be considered adequately composited. The Effluent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
Flow	mgd	Meter	Continuous
Chlorine Residual	µg/L/, lbs/day	Grab	Daily
Temperature[1]	°F	Meter	Daily
Dissolved Oxygen[1]	mg/L	Meter	Daily
pH[1, 2]	pH Units	Meter	Daily
20° C BOD_5	mg/L, lbs/day	24 hr. Composite	Weekly
Total Suspended Solids	mg/L, lbs/day	24 hr. Composite	Weekly
Settleable Solids	ml/L	Grab	Weekly
Electrical Conductivity @ 25° C[1]	µmhos/cm	Grab	Weekly
Ammonia (Total, as N)	mg/L, lbs/day	Grab	Weekly
Total Coliform Organisms	MPN/100 mL	Grab	Weekly
Copper (Total)[4]	µg/L, lb/day	Grab	Twice Monthly
Zinc (Total)[4]	µg/L, lb/day	Grab	Twice Monthly
Dichlorbromomethane[4]	µg/L, lbs/day	Grab	Twice Monthly
Bis(2-ethylhexyl) phthalate[4]	µg/L, lbs/day	Grab	Twice Monthly
Nitrate + Nitrite	mg/L, lbs/day	Grab	Twice Monthly
Aluminum (Total)	µg/L, lbs/day	Grab	Twice Monthly
Iron (Total)	µg/L, lbs/day	Grab	Twice Monthly
Manganese (Total)	µg/L, lbs/day	Grab	Twice Monthly

Constituent	Units	Type of Sample	Sampling Frequency
MBAS	µg/L, lbs/day	Grab	Twice Monthly
Hardness (as CaCO3)[5]	mg/L	Grab	Twice Monthly
Turbidity	NTU	Grab	Monthly
Oil and Grease	mg/L	Grab	Monthly
Diazinon[7]	µg/L	Grab	Monthly
Acute Toxicity[6]	% Survival	Grab	Quarterly
Standard Minerals[8]	mg/L, as appropriate	Grab	Twice Yearly
Priority Pollutants[4]	[4]	Grab	[9]

[1] Field Measurements.
[2] Concurrent with ammonia monitoring.
[3] Concurrent with ammonia monitoring.
[4] At a minimum the Discharger shall comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP), adopted 2 March 2000 by the State Water Resources Control Board. For each priority pollutant use an analytical method from the SIP, Appendix 4 with a Minimum Level (ML) below all applicable pollutant criteria. In accordance with Section 2.4.2 of the SIP, the Discharger is to instruct the laboratory analyzing samples for priority pollutants to establish calibration standards so that the ML is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve. Report all peaks identified by the EPA test methods.
[5] Concurrent with metals monitoring.
[6] The acute bioassays samples shall be analyzed using EPA-821-R-02-012, Fifth Edition, or later amendment with Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (Pimephales promelas).
[7] Discharger must submit report outlining sample collection, Analytical test methods, and detection limits within 60 days of permit adoption for approval. Report all peaks identified by the EPA test methods.
[8] Standard Minerals shall include pH, hardness, silica, calcium, magnesium, hardness, phosphate, sodium, potassium, bicarbonate alkalinity, carbonate alkalinity, sulfate, and chloride and include verification that the analysis is complete (i.e. cation/anion balance).
[9] Priority Pollutant monitoring to be conducted twice during the life of the permit.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples and be collected only during time of discharge to surface waters. When discharge occurs to San Andreas Creek, the Discharger shall monitor receiving water stations R-1 and R-2. When discharge occurs to the Calaveras River, the Discharger shall monitor receiving water stations R-3 and R-4. Receiving water monitoring shall include:

Station	Description
R-1	100 feet upstream from the point of discharge in San Andreas Creek
R-2	500 feet downstream from the point of discharge in San Andreas Creek
R-3	100 feet upstream from the point of discharge in the Calaveras River
R-4	Downstream from the point of discharge in the Calaveras River, at defined edge of Mixing Zone

Constituents	**Units**	**Station**	**Sampling Frequency**
Flow	cfs or mgd	R-1 or R-3	Daily
Dilution Factor	River Flow/Effluent Flow	R-1 or R-3/Effluent	Daily
Dissolved Oxygen[1]	mg/L	R-1 and R-2 or R-3 and R-4	Weekly
Temperature[1]	°F	R-1 and R-2 or R-3 and R-4	Weekly
Electrical Conductivity @25°C[1]	µmhos/cm	R-1 and R-2 or R-3 and R-4	Weekly
pH[1,2]	pH Units	R-1 and R-2 or R-3 and R-4	Weekly
Turbidity	NTU	R-1 and R-2 or R-3 and R-4	Twice Monthly
Hardness, as CaCO3[5]	mg/L	R-1 or R-3	Twice Monthly
Fecal Coliform Organisms	MPN/100 ml	R-1 and R-2 or R-3 and R-4	Monthly
Ammonia (Total as N)	mg/L	R-1 and R-2 or R-3 and R-4	Monthly
Copper (Total)[4]	µg/L	R-1 and R-2 or R-3 and R-4	Monthly
Zinc (Total)[4]	µg/L	R-1 and R-2 or R-3 and R-4	Monthly
Dichlorbromomethane[4]	µg/L	R-1 and R-2 or R-3 and R-4	Monthly
Bis(2-ethylhexyl) phthalate[4]	µg/L	R-1 and R-2 or R-3 and R-4	Monthly
Nitrate + Nitrite	mg/L	R-1 and R-2 or R-3 and R-4	Monthly
Aluminum (Total)	µg/L	R-1 and R-2 or R-3 and R-4	Monthly
Iron (Total)	µg/L	R-1 and R-2 or R-3 and R-4	Monthly
Manganese (Total)	µg/L	R-1 and R-2 or R-3 and R-4	Monthly
MBAS	µg/L	R-1 and R-2 or R-3 and R-4	Monthly
Diazinon[6]	µg/L	R-1 and R-2 or R-3 and R-4	Monthly

Constituents	**Units**	**Station**	**Sampling Frequency**
Priority Pollutants[4]	4	R-1/R-3	7

1 Field Measurements.
2 Concurrent with ammonia monitoring.
3 Concurrent with ammonia monitoring.
4 At a minimum the Discharger shall comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP), adopted 2 March 2000 by the State Water Resources Control Board. For each priority pollutant use an analytical method from the SIP, Appendix 4 with a Minimum Level (ML) below all applicable pollutant criteria. In accordance with Section 2.4.2 of the SIP, the Discharger is to instruct the laboratory analyzing samples for priority pollutants to establish calibration standards so that the ML is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve. Report all peaks identified by the EPA test methods.
5 Concurrent with metals monitoring.
6 Discharger must submit report outlining sample collection, Analytical test methods, and detection limits within 60 days of permit adoption for approval. Report all peaks identified by the EPA test methods.
7 Priority Pollutant monitoring to be conducted twice during the life of the permit.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-1 and R-2 when discharging to San Andreas Creek, or R-3 and R-4 when discharging to the Calaveras River. Attention shall be given to the presence of:

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

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

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to San Andreas Creek or the Calaveras River. The testing shall be conducted as specified in USEPA Method EPA-821-R-02-013, Fourth Edition, or later amendment. Chronic toxicity samples shall be collected at the outfall prior to its entering either San Andreas Creek or the Calaveras River. Grab samples shall be representative of the volume and quality of the discharge. Time of collection samples shall be recorded. The effluent tests must be conducted with concurrent reference toxicant tests. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 14 days. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas, Ceriodaphnia dubia, and Selenastrum capricornutum*
Frequency: Annually

The Discharger shall conduct the chronic toxicity test using two controls and a minimum of 5 effluent concentrations, using the dilution series listed below:

Dilution Series:	Dilutions (%)					Controls	
	100	50	25	12.5	6.25	Creek or River Water	Lab Water
% Effluent	100	50	25	12.5	6.25	0	0
% Dilution Water*	0	50	75	87.5	93.75	100	0
% Lab Water	0	0	0	0	0	0	100

* Dilution water shall be receiving water from San Andreas Creek or the Calaveras River taken upstream from the discharge point.

DISCHARGE TO LAND

The following shall constitute the minimum monitoring of effluent discharged to the Designated Land Disposal Area.

Constituents	**Units**	**Type of Sample**	**Sampling Frequency**
20°C BOD_5	mg/L	24 hr. Composite	Weekly
Settleable Solids	ml/L	Grab	Weekly
Total Coliform Organisms	MPN/100 mL	Grab	Weekly
Electrical Conductivity @25°C	µmhos/cm	Meter	Weekly
Flow to storage ponds	mgd	Meter	Continuous
Flow to disposal trenches	mgd	Meter	Daily

SLUDGE MONITORING

A composite sample of sludge shall be collected annually in accordance with EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989, and tested for the following metals:

Cadmium	Copper	Nickel
Chromium	Lead	Zinc

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

GROUNDWATER MONITORING

The Discharger shall conduct a groundwater-monitoring program to determine whether wastewater treatment and storage units are impacting underlying groundwater. Monitoring of the three groundwater-monitoring wells (1 up gradient and 2 down gradient) shall be initiated by **1 January 2004**, to assess the groundwater quality down gradient from the treatment plant, storage basins and wastewater disposal trenches, and shall include at least the following:

Constituents	Units	Frequency
Ground water elevation[1]	feet	Quarterly
Electrical conductivity	µmhos/cm	Quarterly
Total Dissolved Solids	mg/L	Semi-annually
pH	pH units	Quarterly
Total coliform organisms	MPN/ 100 ml	Semi-annually
Nitrate (as N)	mg/L	Semi-annually
Standard Minerals[2]	mg/L	Every odd year

1 The groundwater elevation shall be used to calculate the direction and gradient of ground water flow, which must be reported.

2 Standard Minerals shall include pH, hardness, silica, calcium, magnesium, hardness, phosphate, sodium, potassium, bicarbonate alkalinity, carbonate alkalinity, sulfate, and chloride and include verification that the analysis is complete (i.e. cation/anion balance).

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following:

Constituents	Units	Sampling Frequency
Standard Minerals[3]	mg/L	Annually[1]
Electrical Conductivity[2] @ 25°C	µmhos/cm	Annually
Total Dissolved Solids	mg/L	Annually

1 Concurrent with effluent and receiving water samples.

2 If the water supply is from more than one source, the EC shall be reported as a weighted average and include copies of supporting calculations.

3 Standard Minerals shall include pH, hardness, silica, calcium, magnesium, hardness, phosphate, sodium, potassium, bicarbonate alkalinity, carbonate alkalinity, sulfate, and chloride and include verification that the analysis is complete (i.e. cation/anion balance).

REPORTING

Monitoring reports shall be submitted to the Regional Board by the **first day** of the second month following sample collection. Annual monitoring results shall be submitted by the **first day of the second month following each calendar year,** respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and should be determined and recorded.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **1 February** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

a. The names, certificate grades, and general responsibilities of all persons employed at the WWTP (Standard Provision A.5).

b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.

c. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).

d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

The Discharger may also be requested to submit an annual report to the Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this Order shall comply with the signatory requirements of (Standard Provision D.6).

The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

Ordered By: THOMAS R. PINKOS, Executive Officer

17 October 2003
(Date)

JME

INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2003-0151
SAN ANDREAS SANITARY DISTRICT
SAN ANDREAS WASTEWATER TREATMENT PLANT
CALAVERAS COUNTY

Site Description and Background

The San Andreas Sanitary District Wastewater Treatment Plant (WWTP) is a publicly owned and operated facility located in San Andreas, Calaveras County. The San Andreas Sanitary District was formed as a public agency in the early 1950's. The District includes all of San Andreas as well as some outside areas, encompassing approximately 1,260 acres. The WWTP provides sewer services to approximately 2,700 residents. There are approximately 1140 service connections, of which approximately 1000 are residential users and 140 are commercial users. No industries are connected to the system. San Andreas is the county seat of Calaveras County and experiences a substantial influx in population during the day because of the high school, government centers and tourism.

The District (hereafter Discharger) has made significant improvements to the treatment facilities in 1969 and in 1982, which were paid with public funds (Bonds) that are currently being repaid through monthly user fees and property taxes. Funds provided in a grant from the State Water Resources Control Board (SWRCB) in November 1992 were used for the rehabilitation of the headworks and the primary clarifier, and expansion of the trickling filter. These modifications were completed during the summer and fall of 1994. In 1994, grant funding from the State of California Small Community Grant Program was used to increase the WWTP's wet weather capacity. The Discharger's collection system was experiencing high inflow/infiltration during the wet weather in excess of the treatment plant capacity. State funding was used to construct bypass appurtenances above both the primary clarifier and trickling filter. Peak flows in excess of the treatment capacity of either treatment component may now be bypassed to an irrigation basin which was converted to a wet weather equalization holding basin. Excess wastewater is now stored during high flow events, and is pumped back to the headworks for treatment when excess influent flows subside.

The Discharger's collection system consists of approximately 18 miles of publicly owned sanitary sewer pipe ranging in size from 4 inches to 12 inches. The Discharger also maintains five lift stations. The current average dry weather flow to the treatment plant is approximately 0.3 million gallons per day (mgd). Actual peak influent flows have not exceeded 0.9 mgd since the Discharger completed various inflow/infiltration corrective actions in the 1990's. The Discharger has implemented a continuing sewer line preventative maintenance program, which includes video surveillance of the sewer lines and cleaning and repairs as necessary. The average dry weather flow capacity of the WWTP is currently 0.4 mgd. The design flow capacity of the main WWTP is 0.9 mgd. As currently configured, the design hydraulic capacity of the WWTP is 1.5 mgd (0.9 mgd in the main WWTP treatment train + 0.6 mgd in the peak flow treatment train).

Treatment Plant Description

The WWTP components include a grit removal chamber, mechanical screen (for solids removal) Parshall flume, flow metering, storm flow by-pass device for diverting excessive storm inflow to the high flow treatment system and storage reservoir, pre-aeration basin, primary clarifier, re-circulating trickling filter, secondary clarifier, sodium hypochlorite contact chamber, sodium bisulfite dechlorination unit, heated unmixed anaerobic digester, sludge drying beds, three post-secondary effluent polishing ponds, and a 6 million gallon storage reservoir. A diesel power generator is on site and used in the event of electrical power loss. The Plant lay out and wastewater flow diagram is shown in Attachment A, a part of this Order.

Dry Season Discharge (1 May – 31 October)
Disposal of treated wastewater is accomplished exclusively to land from 1 May through 31 October of each year. The Discharger owns approximately 180 acres of land for disposal, known as the Dedicated Land Disposal Area (DLDA). Presently, the Discharger uses about 70 of those acres, as the other 110 acres were recently purchased and are currently unimproved land. The treated wastewater is first held in the effluent storage reservoir, then pumped to on-site evaporation, transpiration and percolation ditches. The disposal ditches have a total length of approximately two miles, and vary in depth from about 1.5 to 3.0 feet and in width from about 2 to 4 feet. Storm water run off, or excess effluent from the trenches is returned to the storage reservoir via a return ditch. Vegetation control in the DLDA is accomplished through prescribed burns by the local public fire agency.

Wet Season Discharge (1 November – 30 April)
From 1 November through 30 April, secondary treated effluent is discharged to the DLDA to the extent feasible. Treated effluent that cannot be discharged to land is currently discharged to San Andreas Creek, a tributary to Murray Creek, a tributary of the North Fork of the Calaveras River. Using the effluent polishing ponds for storage, the WWTP is capable of discharging up to a maximum of 1.5 mgd of treated effluent depending upon receiving water flows and considering the minimum 20:1 dilution requirement. Discharge to surface waters is prohibited during the period of 1 May through 31 October of each year.

The discharge to San Andreas Creek is disinfected secondary treated wastewater, which requires that adequate dilution water be available in the creek at the time of discharge. Previous Order No. 5-01-118 required the Discharger to install a stream gauge monitor in Murray Creek to assure that when discharges occur, the stream flows of the creek would provide at least a 20:1 (receiving water:effluent) dilution ratio. The Department of Health Services has recommended that discharges of secondary treated domestic wastewater, when not diluted by receiving water flows of at least 20:1, be tertiary treated to reduce the concentration of human pathogens.

In previous Order No. 5-01-118, the Discharger proposed moving the point of effluent discharge from San Andreas Creek, to Murray Creek, where it was expected that a larger watershed would provide for higher sustained flows and a consistent minimum 20:1 dilution ratio. After installing a stream gauge monitor on Murray Creek, the Discharger determined that moving the effluent discharge point downstream from San Andreas Creek to Murray Creek might not result in a consistent minimum 20 to 1 dilution of receiving water to effluent recommended by the California Department of Health Services. The Discharger subsequently completed studies to evaluate all available effluent disposal options. In the February 2003 Effluent Disposal Options Assessment Report, the Discharger considered reclamation, land disposal, winter only surface water discharge, and year-round surface water discharge options. Results of this report indicate viable reclamation alternatives do not exist, and the complete containment of wastewater on land during typical wet winters is infeasible. Considering these findings, and the location of the WWTP in the rolling hills of the Sierra Foothills, this Report concluded that dry season land disposal, combined with maximizing winter land disposal supplemented with a winter surface water discharge was the superior option with regards to public health, the environment, and economics. For the wet season surface water discharge portion of this option, the Discharger determined that moving the point of effluent discharge downstream in the watershed, to the confluence of Murray Creek and the North Fork of the Calaveras River, would provide a consistent minimum dilution of 20 to 1 throughout the wet season period of discharge. The Discharger has proposed moving the discharge location from San Andreas Creek to the Calaveras River 1 November 2004. The Discharger has also proposed that the water will enter the Calaveras River via a 'cross river diffuser'.

A California Environmental Quality Act (CEQA) Mitigated Negative Declaration was prepared by the Discharger in support of the proposal to move the point of effluent discharge downstream to the Calaveras River. This Mitigated Negative Declaration was approved by the Lead Agency (the Discharger) on 19 March 2003. The Discharger has filed the Notice of Determination with the County Clerk and Office of Planning and Research.

Beneficial Uses

Calaveras River
The existing **beneficial uses** of the Calveras River, from its source to New Hogan Reservoir, as identified in Table II-1 of the Basin Plan include; body contact recreation, canoeing and rafting, (REC-1); and other non-body contact recreation (REC-2); warm freshwater aquatic habitat (WARM); cold freshwater aquatic habitat (COLD); migration of aquatic organisms (MIGR) in warm habitat, warm and cold habitat spawning, reproduction, and/or early development (SPWN); and wildlife habitat (WILD). Agricultural supply (AGR) including both irrigation and stock watering, is not identified in Table II-1 of the Basin Plan as an existing beneficial use of the Calaveras River. However, active water rights permits (stockwatering), have been identified downstream of the point of discharge along Murray Creek and the North Fork Calveras River. The Regional Board is required to apply the beneficial uses of municipal and domestic supply to the Calaveras River based on SWRCB Resolution No. 88-63 which was incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056. In addition, State Board Resolution No. 88-63, incorporated into the Basin Plan pursuant to Regional Board Resolution No. 89-056, provides that "*Where a a body of water is not currently designated as MUN* (municipal and domestic supply beneficial use) *but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation.* " Based upon ambient receiving water data collected by the Discharger, the North Fork Calveras River, from its source to New Hogan Reservoir, is suitable for MUN, therefore the MUN use is also designated as a beneficial use of this water body. Also, the State Water Resources Control Board (State Board) maintains an active water rights permit for domestic and irrigation supply use from New Hogan Reservoir, downstream of the discharge.

The Basin Plan on page II-1.00 states: "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning..." and with respect to disposal of wastewaters states that "... disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses."

San Andreas Creek/Murray Creek
The Basin Plan at page II-2.00 states that: "Existing and potential beneficial uses that currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams." The Basin Plan does not specifically identify beneficial uses for San Andreas or Murray Creek, but the Basin Plan does identify existing beneficial uses for the Calaveras River, as noted above, to which they are tributary.

In reviewing what existing beneficial uses that may apply to San Andreas Creek and Murray Creek, the Regional Board has considered the following facts:

a. *Domestic, Municipal, and Agricultural Irrigation Supply*

The Regional Board is required to apply the beneficial uses of municipal and domestic supply to San Andreas Creek and Murray Creek based on SWRCB Resolution No. 88-63 which was incorporated into the Basin Plan pursuant to Regional Board Resolution 89-056. The State Water Resources Control Board (SWRCB) has issued water rights permits to existing water users along Murray Creek and the Calaveras River downstream of the discharge for domestic and irrigation uses. Since San Andreas Creek and Murray Creek are ephemeral streams, the creeks likely provide groundwater recharge during periods of low flow. The groundwater is a source of drinking water. In addition to the existing water uses, growth in the area, downstream of the discharge is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in San Andreas Creek and Murray Creek.

b. *Groundwater Recharge*

In areas where groundwater elevations are below the stream bottoms, water from the streams will percolate to groundwater. Since San Andreas Creek and Murray Creek are at times almost dry, it is reasonable to assume that the stream water is lost by evaporation, flow downstream and percolation to groundwater thereby providing a source of domestic, municipal, and irrigation water supply.

c. *Freshwater Replenishment*

When water is present in San Andreas Creek and Murray Creek, there is hydraulic continuity between San Andreas Creek, Murray Creek and the Calaveras River. During periods of hydraulic continuity, San Andreas and Murray Creeks add to the water quantity and may impact the quality of water flowing downstream in the Calaveras River.

d. *Water Contact and Non-Contact Recreation and Esthetic Enjoyment*

The Regional Board finds that the discharge flows through areas where there is ready public access to San Andreas and Murray Creek. Exclusion of the public is unrealistic and contact recreational activities currently exist along the creeks. These uses are likely to increase as the population in the area grows.

e. *Preservation and Enhancement of Fish, Wildlife and Other Aquatic Resources.*

San Andreas Creek and Murray Creek flow to the Calaveras River. The California Department of Fish and Game (DFG) has verified that the fish species present in San Andreas and Murray Creeks and downstream waters are consistent with both cold and warm water fisheries, and that a cold water species has been found both upstream and downstream of the wastewater treatment plant. The Basin Plan (Table II-1) designates the Calaveras River source to New Hogan Reservoir, as being both a cold and warm freshwater habitat. Therefore, pursuant to the Basin Plan (Table II-1, Footnote (2)), the cold designation applies to San Andreas and Murray Creeks. The cold-water habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l. This approach recognizes that, if the naturally occurring in-stream dissolved oxygen concentration is below 7.0 mg/l, the Discharger is not required to improve the naturally occurring level.

Upon review of the flow conditions, habitat values, existing and potential beneficial uses of the Calaveras River, and the facts described above, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Calaveras River, from it's source to New Hogan Reservoir, are applicable to San Andreas Creek and Murray Creek. In addition, beneficial uses not specifically identified in the Basin Plan, as indicated above, exist or potentially exist in San Andreas Creek and Murray Creek and must be protected.

The Board also finds that based on the available information and on the Discharger's application, that San Andreas Creek and Murray Creek, absent the discharge, are at times ephemeral streams. At other times, natural flows within San Andreas Creek and Murray Creek help support the cold-water aquatic life. Both conditions may exist within a short time span, where the Creeks would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Calaveras River. Dry conditions occur primarily in the summer months, but dry conditions, and low flow conditions, may also occur throughout the year, particularly in low rainfall years. The lack of dilution results in more stringent effluent limitations to protect contact recreational uses, drinking water-related uses, agricultural water uses, and aquatic life. Significant dilution may occur during and immediately following high rainfall events.

New Information- CTR/NTR and Other Pollutants

On 10 September 2001 the Executive Officer of the Regional Board issued a letter pursuant to Section 13267 of the California Water Code (CWC) requiring all NPDES Dischargers to conduct effluent and receiving water monitoring and submit results of this monitoring in accordance with a time schedule provided in the letter. The Discharger conducted a study to determine whether levels of NTR, CTR, or other pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a numeric or narrative water quality standard, including Basin Plan numeric or narrative objectives. Results of this study were submitted in March 2003 with the new Report of Waste Discharge (RWD) that proposed moving the point of discharge to the Calaveras River.

Consideration of Effluent and Receiving Water Limitations

Evaluation of Dilution Credit

San Andreas Creek/Murray Creek
While the Discharger has proposed moving the point of effluent discharge downstream to the Calaveras River, extension of the pipeline and completion of the project will not be complete until at least November 2004. Until that time, the Discharger will continue to discharge treated effluent during the wet season at the historical location in San Andreas Creek. Only limited information regarding flows in San Andreas Creek or Murray Creek is available, and no information is available regarding critical flow conditions or flow conditions during extended dry periods. Limited flow data from Murray Creek indicates that a consistent 20:1 dilution ratio cannot be maintained during all flow conditions. Considering the limited watershed supporting San Andreas Creek and Murray Creek, it is likely that flows during a dry fall/winter period could be negligible. Considering these conditions, and given the new information on pollutant concentrations in the effluent, the reasonable potential analysis for pollutants in the effluent discharged to San Andreas Creek, and the development of associated effluent limitations, was accomplished considering no credit for dilution.

Previous Order No. 5-01-118 included a time schedule requiring tertiary treatment of any effluent discharged that does not receive 20:1 dilution by **1 April 2006**. This Order retains that time schedule.

Calaveras River
This Order requires a minimum dilution ratio of 20:1 (receiving water to effluent) for the discharge of treated secondary effluent to the Calaveras River. Development and consideration of dilution credits in establishing and determining compliance with water quality-based effluent limitations for priority pollutants is described in Section 1.4.2. of the SIP. Dilution credit, mixing zones and mixing zone analyses methods are also presented in Section 2 and Section 4 of the TSD. Considering minimum dilution ratio of 20:1 required by this Order, a maximum dilution credit of 20 has been used in accomplishing the reasonable potential analysis and developing effluent limitations where appropriate.

As the outfall and diffuser configuration and design have not been completed, the Discharger shall be required, prior to commencing the discharge, to conduct a *Dilution/Mixing Zone Study* to verify complete mixing of the discharge and characterize the extent of actual dilution. Points in the receiving water where the applicable criteria/objective shall be met must also be defined in this study. This Order may be reopened if the study indicates the discharge is not completely mixed, or if site specific conditions concerning the discharge and the receiving water indicate that a smaller dilution credit is necessary to protect beneficial uses and meet the conditions of the SIP. This study shall be completed prior to discharge from the new outfall to the Calaveras River.

Concerning mixing zones, the SIP provides that a mixing zone shall be as small as practicable, and "*The following conditions shall be met in allowing a mixing zone:*

A. A mixing zone shall not:

(1) compromise the integrity of the entire waterbody;

(2) *cause acutely toxic conditions to aquatic life passing through the mixing zone;*
(3) *restrict the passage of aquatic life*
(4) *adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws;*
(5) *produce undesirable or nuisance aquatic life;*
(6) *result in floating debris, oil, or scum;*
(7) *produce objectionable color, odor, taste, or turbidity;*
(8) *cause objectionable bottom deposits;*
(9) *cause nuisance;*
(10) *dominate the receiving water body or overlap a mixing zone from different outfalls; or*
(11) *be allowed at or near any drinking water intake.. "*

Considering these conditions, where applicable, maximum daily effluent limitations have been developed for discharge to the Calaveras River considering acute criteria, an acute waste load allocation, and no dilution credit, to prevent acutely toxic conditions at the point of discharge. Also where applicable, average monthly effluent limitations have been developed considering chronic criteria, a chronic wasteload allocation, and available dilution.

Consideration of Technology Based Effluent Limitations/Previous Permit Limits

Conventional Pollutants- Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS)
Technology-based treatment requirements under section 301(b) of the CWA represent the minimum level of control that must be imposed in a permit issued under section 402 of the CWA. Regulations promulgated at 40 CFR 122.44 (a) require technology-based effluent limitations to be placed in NPDES permits based on national effluent limitations guidelines and standards, best professional judgment (BPJ), or a combination of the two.

40 CFR Part 133 provides information on the level of effluent quality attainable through the application of secondary of equivalent treatment. 40 CFR Part 133.102 describes the minimum level of effluent quality attainable in terms of the parameters for biochemical oxygen demand (BOD), suspended solids (SS), and pH.

	BOD (mg/l)	Suspended Solids (mg/l)
30 Day Average	30	30
7 Day Average	45	45
30 Day Average % Removal	85%	85%

Effluent pH shall be maintained between 6.0 and 9.0

Results of monitoring indicate the Discharger is capable of meeting these limitations. Effluent limitations for these conventional pollutants using these levels of effluent quality established in 40 CFR Part 133.102 have been retained in the Order.

Disinfection
Previous Order No. 5-01-118 included an effluent limitation for total coliform, with a total coliform count not to exceed 23 MPN (Most Probable Number)/100 ml (milliliters) as a monthly median limitation, and 230 MPN/100ml as a daily maximum, with 20:1 dilution. These limitations were established considering recommendations from the California Department of Health Services. Beneficial uses of the Calaveras River, San Andreas Creek, and Murray Creek include body contact recreation (REC-1) and other non-contact recreation (REC-2), and public access is not restricted up or downstream in the vicinity of the discharge. Other beneficial uses include agricultural supply (AGR) and municipal and domestic supply (MUN). The limitations of Order No. 5-01-118 are retained in this new Order. As noted previously, limited flow information from San Andreas Creek and Murray Creek indicate there may be instances where the dilution ratio falls below 20:1. As noted previously, this Order includes a time schedule requiring tertiary treatment of any effluent discharged that does not receive 20:1 dilution by 1 April 2003.

Consideration of Water Quality-Based Effluent Limitations
Federal regulations, 40 CFR Part 122.44 (d)(1)(i), require that NPDES permit effluent limitations must control all pollutants which are or may be discharged at a level which will cause or have the reasonable potential to cause or contribute to an in-stream excursion above any State water quality standard, including any narrative criteria for water quality. Beneficial uses, together with their corresponding water quality objectives or promulgated water quality criteria, can be defined per federal regulations as water quality standards.

The Porter Cologne Water Quality Control Act defines water quality objectives as *"...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area"*. Water quality objectives designed to protect beneficial uses and prevent nuisances are found in the Basin Plan, and may be stated in either numerical or narrative form.

In determining whether a discharge has the reasonable potential to contribute to an in-stream excursion, the dilution of the effluent in the receiving water may be considered where areas of dilution are defined. The available dilution may also be used to calculate protective effluent limitations by applying water quality criteria at the edge of the defined mixing zone. These calculations include receiving water pollutant concentrations which are typically based on worst-case conditions for flow and concentration.

If limited or no dilution is available, effluent limitations are set equal to the applicable water quality objective or criteria which are applied at the point of discharge so the discharge will not cause the receiving stream to exceed water quality objectives or promulgated criteria established to protect the beneficial uses. In situations where receiving water flows are substantially greater than effluent flows, as is required for the discharge to the Calaveras River, dilution may be considered in establishing effluent limitations. However, when a receiving water is impaired by a particular pollutant or stressor, limited or no pollutant assimilative capacity may be available in spite of the available dilution. In these instances, and depending upon the nature of the pollutant, effluent limitations may be set equal to or less than the applicable water quality objectives or criteria which are applied at the point of discharge such that the discharge will not cause or contribute to the receiving stream excursion above water quality objectives or promulgated criteria established to protect the beneficial uses. At this time, the characteristics of the effluent and receiving water mixing zone in the Calaveras River have not been fully defined.

Priority Pollutants
Section 1.3 of the SIP requires a water quality based effluent limitation when the maximum effluent concentration (MEC) or observed maximum background concentration (B) of a priority pollutant exceeds an appropriate pollutant criterion. Based upon the study conducted by the Discharger, the MEC's of copper, zinc, dichlorobromomethane, and bis(2-ethylhexyl) phthalate have exceeded applicable pollutant criteria of the CTR/NTR. Therefore, water quality-based effluent limitations for these pollutants are required.

When required, Section 1.4 of the SIP provides four methods that may be used to develop effluent limitations. These four methods include: (1) assigning a loading allocation based upon a completed TMDL; (2) use of a steady state model; (3) use of a dynamic model; or, (4) establishing effluent limitations that consider intake water pollutants.

Water quality-based effluent limitations have been developed in this Order using the steady state model described in Section 1.4 of the SIP and the TSD. Since the discharge is permitted only under conditions of a minimum of 20:1 dilution, development of these limitations has, where applicable, considered dilution of the receiving water for pollutants with demonstrated assimilative capacity.

Data Adjustments
In most situations, USEPA's NPDES regulations require that limits for metals in permit's be stated as total recoverable. Since most water quality criteria are expressed in the dissolved form, it is necessary to translate between dissolved metal in ambient waters and total recoverable metal in effluent. USEPA guidance on the use of translators provides three options including, (1) assuming the translator equivalent to the criteria guidance conversion factor, (2) developing a translator directly as the ratio of dissolved to total recoverable metal, and/or, (3) developing a translator through the use of a partioning coefficient. Reasonable potential analysis for this permit was conducted using the first option, applying criteria guidance conversion factors. To assure that metals criteria are appropriate for the chemical conditions under which they are applied, USEPA also provides for adjustment of the criteria through application of the water-effect ratio (WER). The WER approach compares bioavailability and toxicity of a specific pollutant in receiving waters and in laboratory waters. For this permit, reasonable potential analysis was conducted using a WER default value of 1.

Effluent Limitations, CTR/NTR Aquatic Life Criteria

Copper
In studies conducted by the Discharger, the MEC for total copper was reported as 35 μg/L (ppb). The minimum hardness of the effluent was reported as 68 mg/L (ppm) hardness as CaCO3. This MEC exceeds the adjusted freshwater aquatic life water quality acute (Criterion Maximum Concentration, CMC) and chronic (Criterion Continuous Concentration, CCC) criteria for copper established in the USEPA's California Toxics Rule (9.7 μg/L (ppb) and 6.7 μg/L (ppb), respectively at 68 mg/L hardness

as CaCO3). As noted above, Section 1.3 of the SIP requires water quality-based effluent limitations when the maximum effluent concentration (MEC) or observed maximum background concentration (B) of a priority pollutant exceeds an appropriate pollutant criterion.

The maximum observed ambient background concentration (B) of total copper in the Calaveras River was reported as 1.8 µg/L (ppb), with a minimum observed ambient background hardness reported as 60 mg/L (as CaCO3). Considering the total copper adjusted freshwater aquatic life acute and chronic criteria at 60 mg/L hardness are 8.7 µg/L (ppb) and 6.0 µg/L (ppb) respectively, the data indicate that the Calaveras River does have assimilative capacity for copper.

To prevent acutely toxic conditions at the point of discharge to the Calaveras River and in the zone of initial dilution, a table expressing the maximum daily effluent limitation (MDEL) has been developed for copper considering the acute aquatic life criterion (CMC) without consideration of dilution. In accordance with Section 1.4 of the SIP, the acute effluent concentration allowance (ECA) shall be set equal to the CMC, adjusted using the observed corresponding effluent hardness. Effluent hardness is used in lieu of the receiving water hardness for the adjustment of the CMC since no credit was provided for dilution. As the number of data points for the calculation is less than 10, a default coefficient of variation (CV) of 0.6 shall be used in the calculation until sufficient data is collected. The MDEL shall be calculated using the CV and the multipliers in Tables 1 and 2 of the SIP as shown below:

WATER QUALITY -BASED MDEL- Calaveras River	
Copper (Total)	
ECA acute	CMC @ Observed Effluent Hardness as CaCO3
Coefficient of Variation (Default)	0.6
LTA (acute)	(ECA acute *Table 1 Acute Multiplier)
Sampling Frequency (n)	≤ 4
MDEL	(LTA*Table 2 MDEL Multiplier)

Attachment D provides an example of calculated MDEL's for copper based upon a range of effluent hardness values.

The average monthly effluent limitation (AMEL) has been developed considering the chronic aquatic life criterion (CCC) for copper and a dilution credit of 20. In accordance with Section 1.4 of the SIP, the C (priority pollutant criterion) shall be set equal to the CCC, adjusted using the observed ambient background, receiving water hardness. The ECA shall be calculated using the formula ECA = C + D(C – B) where C represents the adjusted chronic copper criterion, D represents the dilution credit, and B represents the maximum observed ambient background concentration. As the number of data points for the calculation is less than 10, a default CV of 0.6 shall be used until sufficient data is collected. The AMEL shall then be calculated using the CV and the multipliers in Tables 1 and 2 of the SIP as shown below:

WATER QUALITY -BASED AMEL- Calaveras River	
Copper (Total)	
C (chronic pollutant criterion)	CCC @ Observed Receiving Water Hardness as CaCO3
D	Dilution Credit = 20
B	Maximum observed background concentration
ECA chronic	C + D(C – B)
Coefficient of Variation (Default)	0.6
LTA (chronic)	(ECA chronic *Table 1 Chronic Multiplier)
Sampling Frequency (n)	≤ 4
AMEL	(LTA*Table 2 AMEL Multiplier)

Attachment D provides an example of calculated AMEL's for copper based upon a range of receiving water hardness values.

For discharge to San Andreas Creek, an AMEL and MDEL have been developed for copper considering the critical ECA, and no dilution credit. Since a site-specific translator has not been developed for copper as described in the SIP Section 1.4.1, the USEPA conversion factor was used in expressing the dissolved copper criterion as total recoverable. Acute and chronic effluent concentration allowance's (ECA's) shall be set equal to the adjusted acute and chronic copper criterion (criterion adjusted based upon observed receiving water hardness), and the most limiting long-term average (LTA) discharge condition for copper determined using Table 1 of the SIP, using a default CV of 0.6. The AMEL and MDEL shall then be calculated using a steady state model (with no dilution credit) this CV and the multipliers in Table 2 of the SIP as shown in the example below which uses an observed receiving water hardness of 60 mg/L (as CaCO3):

WATER QUALITY BASED MDEL and AMEL- San Andreas Creek	
Copper (Total)	
Number of Observations	3
Effluent Maximum	35
Dilution Credit	0
ECA acute (@ 60 mg/L (ppm) hardness as CaCO3)	8.7 µg/L
ECA chronic (@ 60 mg/L (ppm) hardness as CaCO3)	6.0 µg/L
Coefficient of Variation (Default)	0.6
LTA acute	2.8
LTA chronic	3.2
Limiting LTA (acute) = (ECA acute *Table 1 Acute Multiplier)	2.8
Sampling Frequency (n)	≤ 4/mo
AMEL (LTA*Table 2 AMEL Multiplier)	**4.3 µg/L (ppb)**
MDEL (LTA*Table 2 MDEL Multiplier)	**8.7 µg/L (ppb)**

Using these calculations, a final AMEL of 4.3 µg/L (ppb) and MDEL of 8.7 µg/L (ppb) for copper (total) would result at an observed receiving water hardness of 60 mg/L (as CaCO3) in accordance with Sections 1.3 and 1.4 of the SIP using the adjusted copper criteria. The final AMEL and MDEL in this Order are to be adjusted accordingly with results of corresponding receiving water monitoring for upstream receiving water hardness as shown in Attachment C.

The Discharger cannot currently meet these limitations, whether discharging to San Andreas Creek, or the Calaveras River. The Discharger has no processes specific to the removal of copper. Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" As the average monthly and maximum daily effluent limitations for copper are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP (Section 2.1). This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for copper become effective on **17 December 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Board. If a compliance schedule justification is completed and submitted by this date, the final water quality based effluent limitations for copper become effective **1 October 2008**, and this Order includes a Provision outlining studies and a time schedule for compliance with the new final effluent limitations for copper.

In accordance with the SIP, Sections 2.2.1 and 2.2.2, a numeric interim limitation for copper has been established in this Order based upon current facility performance. As shown below, this interim limitation consists of a projected monthly average effluent total copper concentration of 105 µg/L (ppb) derived using available effluent copper data (three data points), and applying the statistical methodologies for estimating maximum concentrations identified in Chapter 3 of USEPA's Technical Support Document for Water Quality-based Toxics Control (TSD, 1991). Derivation of this interim copper limitation is summarized below:

INTERIM EFFLUENT LIMITATION	
Copper (total)	
Number of Observations	3
Minimum (µg/L, ppb)	17
Observed Maximum (µg/L, ppb)	*35*
Coefficient of Variation (Default)	0.6
Multiplier[1]	3.0
Projected Monthly Average	**105 (µg/L, ppb)**

[1] From TSD Table 3-2

This Order includes new monitoring requirements for copper. The Order may be reopened to include a new interim effluent limitation for copper after additional effluent data have been collected.

Zinc

In studies conducted by the Discharger, the MEC for total zinc was reported as 170 µg/L (ppb). The minimum hardness of the effluent was reported as 68 mg/L (ppm) hardness as $CaCO_3$. This MEC exceeds the adjusted freshwater aquatic life water quality acute CMC and chronic CCC criteria for zinc established in the USEPA's CTR (86 µg/L (ppb) and 86 µg/L (ppb), respectively at 68 mg/L hardness as $CaCO_3$). As noted above, Section 1.3 of the SIP requires water quality-based effluent limitations when the MEC or observed maximum background concentration (B) of a priority pollutant exceeds an appropriate pollutant criterion.

The maximum observed ambient background concentration (B) of total zinc in the Calaveras River was reported as < 0.5 µg/L (ppb), with a minimum observed ambient background hardness reported as 60 mg/L (as CaCO3). Considering the total zinc adjusted freshwater aquatic life acute and chronic criteria at 60 mg/L hardness are 78 µg/L (ppb) and 78 µg/L (ppb) respectively, the data indicate that the Calaveras River does have assimilative capacity for zinc.

To prevent acutely toxic conditions at the point of discharge and in the zone of initial dilution, a table expressing the MDEL has been developed for zinc considering the acute aquatic life criterion (CMC) without consideration of dilution. In accordance with Section 1.4 of the SIP, the acute effluent concentration allowance (ECA) shall be set equal to the CMC, adjusted using the observed corresponding effluent hardness. Effluent hardness is used in lieu of the receiving water hardness for the adjustment of the CMC since no credit was provided for dilution. As the number of data points for the calculation is less than 10, a default coefficient of variation (CV) of 0.6 shall be used in the calculation until sufficient data is collected. The MDEL shall be calculated using the CV and the multipliers in Tables 1 and 2 of the SIP as shown below:

WATER QUALITY -BASED MDEL- Calaveras River	
Zinc (Total)	
ECA acute	CMC @ Observed Effluent Hardness as CaCO3
Coefficient of Variation (Default)	0.6
LTA (acute)	(ECA acute *Table 1 Acute Multiplier)
Sampling Frequency (n)	≤ 4
MDEL	(LTA*Table 2 MDEL Multiplier)

Attachment F provides an example of calculated MDEL's for zinc based upon a range of effluent hardness values.

The AMEL has been developed considering the chronic aquatic life criterion (CCC) for zinc and a dilution credit of 20. In accordance with Section 1.4 of the SIP, the C (priority pollutant criterion) shall be set equal to the CCC, adjusted using the observed ambient background, receiving water hardness. The ECA shall be calculated using the formula ECA = C + D(C – B) where C represents the adjusted chronic zinc criterion, D represents the dilution credit, and B represents the maximum observed ambient background concentration. As the number of data points for the calculation is less than 10, a default CV of 0.6 shall be used until sufficient data is collected. The AMEL shall then be calculated using the CV and the multipliers in Tables 1 and 2 of the SIP as shown below:

WATER QUALITY -BASED AMEL- Calaveras River	
Zinc (Total)	
C (chronic pollutant criterion)	CCC @ Observed Receiving Water Hardness as CaCO3
D	Dilution Credit = 20
B	Maximum observed background concentration
ECA chronic	C + D(C – B)
Coefficient of Variation (Default)	0.6
LTA (chronic)	(ECA chronic *Table 1 Chronic Multiplier)
Sampling Frequency (n)	≤ 4
AMEL	(LTA*Table 2 AMEL Multiplier)

Attachment F provides an example of calculated AMEL's for zinc based upon a range of receiving water hardness values.

For discharge to San Andreas Creek, an AMEL and MDEL have been developed for zinc considering the critical ECA, and no dilution credit. Acute and chronic effluent concentration allowance's (ECA's) shall be set equal to the adjusted acute and chronic zinc criterion (criterion adjusted based upon observed receiving water hardness), and the most limiting long-term average (LTA) discharge condition for zinc determined using Table 1 of the SIP, using a default CV of 0.6. The AMEL and MDEL shall then be calculated using a steady state model (with no dilution credit) this CV and the multipliers in Table 2 of the SIP as shown in the example below which uses an observed receiving water hardness of 60 mg/L (as CaCO3):

WATER QUALITY BASED MDEL and AMEL- San Andreas Creek	
Zinc (Total)	
Number of Observations	3
Effluent Maximum	170
Dilution Credit	0
ECA acute (@ 60 mg/L (ppm) hardness as CaCO3)	78 µg/L
ECA chronic (@ 60 mg/L (ppm) hardness as CaCO3)	78 µg/L
Coefficient of Variation (Default)	0.6
LTA acute	25
LTA chronic	41
Limiting LTA (acute) = (ECA acute *Table 1 Acute Multiplier)	25
Sampling Frequency (n)	≤ 4/mo
AMEL (LTA*Table 2 AMEL Multiplier)	**39 µg/L (ppb)**
MDEL (LTA*Table 2 MDEL Multiplier)	**78 µg/L (ppb)**

Using these calculations, a final AMEL of 39 µg/L (ppb) and MDEL of 78 µg/L (ppb) for zinc (total) would result at an observed receiving water hardness of 60 mg/L (as CaCO3) in accordance with Sections 1.3 and 1.4 of the SIP using the adjusted zinc criteria. These final limitations are to be adjusted accordingly with results of corresponding receiving water monitoring for upstream receiving water hardness as shown in Attachment E.

The Discharger cannot currently meet these limitations whether discharging to San Andreas Creek or the Calaveras River. The Discharger has no processes specific to the removal of zinc. Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" As the average monthly and maximum daily effluent limitations for zinc are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP (Section 2.1). This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for zinc become effective on **17 December 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Board. If a compliance schedule justification is completed and submitted by this date, the final water quality based effluent limitations for zinc become effective **1 October 2008**, and this

Order includes a Provision outlining studies and a time schedule for compliance with the new final effluent limitations for zinc.

In accordance with the SIP, Sections 2.2.1 and 2.2.2, a numeric interim limitation for zinc has been established in this Order based upon current facility performance. As shown below, this interim limitation consists of a projected monthly average effluent total zinc concentration of 510 µg/L (ppb) derived using available effluent zinc data (three data points), and applying the statistical methodologies for estimating maximum concentrations identified in Chapter 3 of USEPA's TSD. Derivation of this interim zinc limitation is summarized below:

INTERIM EFFLUENT LIMITATION	
Zinc (total)	
Number of Observations	3
Minimum (µg/L, ppb)	98
Observed Maximum (µg/L, ppb)	***170***
Coefficient of Variation (Default)	0.6
Multiplier[1]	3.0
Projected Monthly Average	**510 (µg/L, ppb)**

[1] From TSD Table 3-2

This Order includes new monitoring requirements for zinc. The Order may be reopened to include a new interim effluent limitation for zinc after additional effluent data have been collected.

Effluent Limitations, CTR/NTR Human Health Criteria
As noted in the Order findings, the MUN beneficial use applies to San Andreas Creek, Murray Creek, and the Calaveras River. Section 1.1 of the SIP states in part that "*Designated beneficial uses to which human health criteria/objectives would apply include… municipal and domestic supply (MUN) and water contact recreation (REC 1). Human health criteria/objectives are differentiated by whether organisms alone from the water body are consumed compared to whether both organisms and water from the water body are consumed. Where MUN is designated, the latter situation applies.*"

Dichlorobromomethane
A human health criterion for dichlorobromomethane of 0.56 µg/L (ppb), for consumption of both water and organisms, was established in the CTR. In studies conducted by the Discharger, the MEC for dichlorobromomethane was reported as 0.7 µg/L (ppb). This MEC exceeds the human health criterion for dichlorobromomethane established in the CTR. Section 1.3 of the SIP requires water quality-based effluent limitations when the MEC or observed maximum background concentration (B) of a priority pollutant exceeds an appropriate pollutant criterion.

The maximum observed ambient background concentration (B) of dichlorobromomethane in the Calaveras River was reported as < 0.46 µg/L (ppb). Considering this result assimilative capacity for dichlorobromomethane exists within the Calaveras River.

For discharge to the Calaveras River, an AMEL was developed considering the human health criterion for dichlorobromomethane and a dilution credit of 20 (minimum dilution ratio for discharge to the

Calaveras River). In accordance with Section 1.4 of the SIP, the C (priority pollutant criterion) was set equal to the human health criterion. The ECA was calculated using the formula ECA = C + D(C – B) where C represents the human health criterion, D represents the dilution credit, and B represents the ambient background arithmetic mean concentration (for pollutant criterion intended to protect human health from carcinogenic effects). Since the discharge to the Calaveras River occurs only under conditions of a minimum of 20 to 1 dilution (receiving water : effluent), a dilution credit of 20 was used in the ECA calculation. Concerning calculation of the arithmetic mean concentration (B), Section 1.4.3.2 of the SIP states: "*If all samples are below the reported detection limits, the ambient background concentration shall be set equal to the lowest of the individual reported detection limits*". Since results of both ambient background samples for dichlorbromomethane were less than detection limits, the lowest individual reported detection limit was used in the calculation (< 0.20 µg/L (ppb). In accordance with Section 1.4 of the SIP, the AMEL for dichlorbromomethane was then set equal to the calculated ECA. The MDEL for dichlorobromomethane was then calculated by multiplying the ECA by the ration of the MDEL multiplier to the AMEL multiplier using a default CV of 0.6, and a sampling frequency (n) of ≤ 4. These AMEL and MDEL calculations are summarized below:

WATER QUALITY -BASED AMEL and MDEL- Calaveras River	
Dichlorobromomethane	
C	Human health criterion (0.56 µg/L)
B	Arithmetic mean background concentration (0.20 µg/L)
D	Dilution Credit = 20
ECA = C + D(C – B)	ECA = 0.56 + 20(0.56 – 0.2) = 7.8 µg/L
AMEL = ECA	**7.8 µg/L**
Coefficient of Variation (Default)	0.6
Sampling Frequency (n)	≤ 4
MDEL = ECA (MDEL/AMEL multiplier)	7.8 (2.01) = **15.5 µg/L**

These water quality-based effluent limitations are substantially higher than the reported MEC of 0.7 µg/L (ppb). Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using the calculated AMEL and MDEL. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for dichlorobromomethane is needed prior to establishing a final effluent limitation for the discharge to the Calaveras River.

Concerning calculation of final effluent limitations for dichlorobromomethane, the SIP provides in Section 1.4 that "*If data are insufficient to calculate the effluent limitation, the RWQCB shall establish interim requirements in accordance with Section 2.2.2.*"

This Order includes a time schedule for the Discharger to collect sufficient information for the calculation of final effluent limitations prior to discharge to the Calaveras River. Pursuant to Section 2.2.1 of the SIP, the water quality to be achieved includes prevention of toxic conditions in the Calaveras River as a result of the discharge, and the maintenance of the highest quality water consistent with the maximum benefit to the people of the State. The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for dichlorobromomethane as enforceable limitations.

For discharge to San Andreas Creek, an AMEL was developed considering the human health criterion for dichlorobromomethane and no dilution credit. In accordance with Section 1.4 of the SIP, the ECA was set equal to the C (priority pollutant criterion), and the AMEL was then set equal to the ECA. The MDEL for dichlorobromomethane was calculated by multiplying the ECA by the ration of the MDEL multiplier to the AMEL multiplier using a default CV of 0.6, and a sampling frequency (n) of ≤ 4. These AMEL and MDEL calculations are summarized below:

WATER QUALITY -BASED AMEL and MDEL- San Andreas Creek	
Dichlorobromomethane	
C	Human health criterion (0.56 µg/L)
ECA = C	ECA = 0.56 µg/L
AMEL = ECA	**0.56 µg/L**
Coefficient of Variation (Default)	0.6
Sampling Frequency (n)	≤ 4
MDEL = ECA (MDEL/AMEL multiplier)	0.56 (2.01) = **1.1 µg/L**

The Discharger cannot currently meet these limitations when discharging to San Andreas Creek. The Discharger has no processes specific to the removal of dichlorobromomethane. Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" As the average monthly and maximum daily effluent limitations for dichlorobromomethane are new requirements in this Order, the Discharger has not been afforded an opportunity to submit the compliance schedule justification required by the SIP (Section 2.1). This Order requires the Discharger to provide this information. Implementation of the new water quality based effluent limitations for dichlorobromomethane become effective on **17 December 2003** if a compliance schedule justification is not completed and submitted by the Discharger to the Board. If a compliance schedule justification is completed and submitted by this date, the final water quality based effluent limitations for dichlorobromomethane become effective **1 October 2008**, and this Order includes a Provision outlining studies and a time schedule for compliance with the new final effluent limitations for dichlorobromomethane.

In accordance with the SIP, Sections 2.2.1 and 2.2.2, a numeric interim limitation for dichlorobromomethane has been established in this Order based upon current facility performance. As shown below, this interim limitation consists of a projected AMEL dichlorobromomethane concentration of 2.1 µg/L (ppb) derived using available effluent dichlorobromomethane data (three data points), and applying the statistical methodologies for estimating maximum concentrations identified in Chapter 3 of USEPA's Technical Support Document for Water Quality-based Toxics Control (TSD, 1991). Derivation of this interim dichlorobromomethane limitation is summarized below:

INTERIM EFFLUENT LIMITATION	
Dichlorobromomethane	
Number of Observations	3
Minimum (µg/L, ppb)	< 0.46
Observed Maximum (µg/L, ppb)	*0.7*
Coefficient of Variation (Default)	0.6
Multiplier[1]	3.0
Projected Monthly Average	**2.1 (µg/L, ppb)**

[1] From TSD Table 3-2

Bis(2-ethylhexyl) phthalate
A human health criterion for bis(2-ethylhexyl) phthalate of 1.8 µg/L (ppb), for consumption of both water and organisms, was established in the NTR. In studies conducted by the Discharger, the MEC for bis(2-ethylhexyl) phthalate was reported as 3.6 µg/L (ppb). This MEC exceeds the human health criterion for bis(2-ethylhexyl) phthalate established in the NTR. Section 1.3 of the SIP requires water quality-based effluent limitations when the MEC or observed maximum background concentration (B) of a priority pollutant exceeds an appropriate pollutant criterion.

The maximum observed ambient background concentration (B) of bis(2-ethylhexyl) phthalate in the Calaveras River was reported as < 2.0 µg/L (ppb). Considering this result, it is unknown if and how much assimilative capacity exists within the Calaveras River if any. No information is available regarding ambient background concentrations of bis(2-ethylhexyl) phthalate in San Andreas Creek or Murray Creek.

Concerning calculation of final effluent limitations for bis(2-ethylhexyl) phthalate for discharge to the Calaveras River, the SIP provides in Section 1.4 that "*If data are insufficient to calculate the effluent limitation, the RWQCB shall establish interim requirements in accordance with Section 2.2.2.*"

This Order includes a time schedule for the Discharger to collect sufficient information for the calculation of final effluent limitations prior to discharge to the Calaveras River. Pursuant to Section 2.2.1 of the SIP, the water quality to be achieved includes prevention of toxic conditions in the Calaveras River as a result of the discharge, and the maintenance of the highest quality water consistent with the maximum benefit to the people of the State. The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for bis(2-ethylhexyl) phthalate as enforceable limitations.

In accordance with the SIP, Sections 2.2.1 and 2.2.2, for discharge to the Calaveras River, a numeric interim limitation for bis(2-ethylhexyl) phthalate has been established in this Order based upon current facility performance. As shown below, this interim limitation consists of a projected AMEL bis(2-ethylhexyl) phthalate concentration of 13.7 µg/L (ppb) derived using available effluent bis(2-ethylhexyl) phthalate data (two data points), and applying the statistical methodologies for estimating maximum concentrations identified in Chapter 3 of USEPA's Technical Support Document for Water Quality-based Toxics Control (TSD, 1991). Derivation of this interim bis(2-ethylhexyl) phthalate limitation is summarized below:

INTERIM EFFLUENT LIMITATION	
Bis(2-ethylhexyl) phthalate	
Number of Observations	2
Minimum (µg/L, ppb)	< 2.0
Observed Maximum (µg/L, ppb)	***3.6***
Coefficient of Variation (Default)	0.6
Multiplier[1]	3.8
Projected Monthly Average	**13.7 (µg/L, ppb)**

[1] From TSD Table 3-2

For discharge to San Andreas Creek, an AMEL was developed considering the human health criterion for bis(2-ethylhexyl) phthalate and no dilution credit. In accordance with Section 1.4 of the SIP, the ECA was set equal to the C (priority pollutant criterion), and the AMEL was then set equal to the ECA. The MDEL for bis(2-ethylhexyl) phthalate was calculated by multiplying the ECA by the ration of the MDEL multiplier to the AMEL multiplier using a default CV of 0.6, and a sampling frequency (n) of ≤ 4. These AMEL and MDEL calculations are summarized below:

WATER QUALITY -BASED AMEL and MDEL- San Andreas Creek	
Bis(2-ethylhexyl) phthalate	
C	Human health criterion (1.8 µg/L)
ECA = C	ECA = 1.8 µg/L
AMEL = ECA	**1.8 µg/L**
Coefficient of Variation (Default)	0.6
Sampling Frequency (n)	≤ 4
MDEL = ECA (MDEL/AMEL multiplier)	1.8 (2.01) = **3.6 µg/L**

The Discharger cannot currently meet these limitations when discharging to San Andreas Creek. The Discharger has no processes specific to the removal of bis(2-ethylhexyl) phthalate. Compliance schedules described in Section 2.1 of the SIP exclude NTR pollutants, therefore this Order does not include a schedule of compliance with the final effluent limitation for bis(2-ethylhexyl) phthalate for discharge to San Andreas Creek.

Other Pollutants/Objectives

Narrative Toxicity
At p.III-8.00 the Basin Plan provides that relative to toxicity : "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" At page 1, the TSD provides that "*Where States have not developed chemical specific numeric criteria, States may interpret their narrative standards for specific chemicals by using EPA criteria updated with current quantitative risk values.*" The TSD further states on page 1 "*The integrated approach must include the control of toxics through implementation of the "no toxics" criterion and/or numeric criteria for the parameter of toxicity, the control of individual pollutants for which specific chemical water quality criteria exist in a state's standard, as well as the use of biological*

criteria. Reliance solely on the chemical specific numeric criteria or the narrative criterion or biological criteria would result in only a partially effective State toxics control program."

Under the CWA Section 304(a), USEPA has developed methodologies and specific criteria guidance to protect aquatic life and human health. These methodologies are intended to provide protection for all surface waters on a national basis. The methodologies have been subject to public review, as have the individual criteria guidance documents. Water quality criteria developed under Section 304(a) of the CWA are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. Section 304(a) criteria do not reflect consideration of economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water. Section 304(a) criteria provide guidance to States in adopting water quality standards that ultimately provide a basis for controlling discharges or releases of pollutants. Staff has used USEPA's ambient water quality criteria as a means of supplementing the integrated approach to toxics control, and in some cases deriving numeric limitations to protect receiving waters from toxicity as required in the Basin Plan's narrative objective of prohibiting toxic constituents in toxic amounts.

Aluminum

The Basin Plan does not provide a numeric water quality objective for aluminum. However, the USEPA has developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. The USEPA has recommended, as a freshwater ambient water quality criteria for aluminum, a chronic, four day average criterion continuous concentration (CCC) of 87 μg/L, and an acute, one-hour average criterion maximum concentration (CMC) of 750 μg/L expressed in terms of total recoverable metal in the water column. In establishing these criteria, USEPA notes that there are three major reasons why the use of a water-effect ratio (WER) may be appropriate in applying the aluminum criteria including the fact that the 87 μg/L CCC was based on a toxicity test with striped bass in water with low pH and low hardness.

Results of monitoring conducted by the Discharger indicate effluent aluminum concentrations ranged from 160 μg/L to 580 μg/L. The minimum pH of the effluent has been reported as 6.8 pH units, and the minimum hardness of the effluent has been reported as 68 mg/L as CaCO3. Results of monitoring of the Calaveras River indicate ambient background concentrations of aluminum ranged from 40 μg/L to 80 μg/L. The minimum pH of the Calaveras River has been reported as 7.8 pH Units during the period of discharge (one data point), and the minimum hardness of the Calaveras River has been reported as 60 mg/L as CaCO3. No information is available on aluminum concentrations in San Andreas or Murray Creek. Results of ambient background pH monitoring in San Andreas Creek during the period of discharge from December 2002 through April 2003 have ranged from 6.9 to 7.2 pH Units.

Considering results of monitoring indicate periods of relatively low hardness and neutral pH, the MEC for total aluminum is over 6 times greater than the CCC, the maximum ambient background concentration of aluminum in the Calaveras River has been reported as high as 80 μg/L, the aquatic life beneficial use, the narrative toxicity objective of the Basin Plan, and, the USEPA chronic criterion for aluminum, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

An AMEL and MDEL have been developed for aluminum considering the chronic aquatic life criteria, a chronic waste load allocation, and discharge to the Calaveras River and available dilution. A steady state model was used to develop an ECA using the example from the SIP where the ECA or waste load allocation (WLA) = C + D(C – B) where C represents the chronic aluminum criterion, D represents the dilution credit, and B represents the maximum observed ambient background concentration. The AMEL and MDEL were then calculated using procedures in Section 5.4 and Appendix E of the TSD. As the number of data points for the calculation is less than 10, a default CV of 0.6 was used in the development of these limitations shown below:

WATER QUALITY -BASED AMEL and MDEL- Calaveras River	
Total Aluminum	
C	Chronic Aquatic Life Criterion (87 µg/L)
B	Maximum observed background concentration (80 µg/L)
D	Dilution Credit = 20
WLA/ECA (chronic) = C + D(C – B)	WLA/ECA = 87 + 20(87 – 80) = 227 µg/L
Coefficient of Variation (Default)	0.6
LTA (chronic)	= WLA c * e $[0.5\sigma_4^2 - z\sigma_4]$ = 227 * 0.527 = 120
AMEL (95 Percentile, # samples = 2)	= LTA c * e $[z\sigma_n - 0.5\sigma_n^2]$ = 120 * 1.8 = **216 µg/L**
MDEL	= LTA c * e $[z\sigma - 0.5\sigma^2]$ = 120 * 3.11 = **373 µg/L**

For discharge to San Andreas Creek, an AMEL and MDEL have been developed for aluminum considering the chronic aquatic life criteria, a chronic waste load allocation, and no dilution credit. In this instance the WLA was set equal to the chronic aquatic life criterion, WLA = C. The AMEL and MDEL were then calculated using procedures in Section 5.4 and Appendix E of the TSD. As the number of data points for the calculation is less than 10, a default CV of 0.6 was used in the development of these limitations shown below:

WATER QUALITY -BASED AMEL and MDEL- San Andreas Creek	
Total Aluminum	
C	Chronic Aquatic Life Criterion (87 µg/L)
WLA(chronic) = C	WLA = 87 µg/L
Coefficient of Variation (Default)	0.6
LTA (chronic)	= WLA c * e $[0.5\sigma_4^2 - z\sigma_4]$ = 87 * 0.527 = 46
AMEL (95 Percentile, # samples = 2)	= LTA c * e $[z\sigma_n - 0.5\sigma_n^2]$ = 46 * 1.8 = **83 µg/L**
MDEL	= LTA c * e $[z\sigma - 0.5\sigma^2]$ = 46 * 3.11 = **143 µg/L**

Based upon the results of effluent monitoring, the Discharger cannot currently comply with these new effluent limitations for aluminum. At Page IV-16.00 the Basin Plan states "*In no event shall an NPDES permit include a schedule of compliance that allows more than ten years (from the date of adoption of the objective or criteria) for compliance with water quality objectives, criteria or effluent limitations based on the objectives or criteria. Schedules of compliance are authorized by this provision only for those water quality objectives or criteria adopted after the effective date of this provision [25 September 1995]*." The narrative toxicity objective is not a new objective, therefore a schedule of compliance for aluminum is not included in this Order. A separate Cease and Desist Order shall be proposed for compliance with the new aluminum effluent limitations.

Ammonia

In December 1999, the U.S EPA published an Update of Ambient Water Quality Criteria for Ammonia (1999 Ammonia Update). The 1999 Ammonia Update contains EPA's most recent freshwater aquatic life criteria for ammonia, superseding all previous EPA recommended freshwater criteria for ammonia. The new criteria in the 1999 Ammonia Update reflect recent research and data since 1984, and are a revision of several elements in the 1984 criteria, including the pH and temperature relationship of the acute and chronic criteria and the averaging period of the chronic criterion. As a result of these revisions, the acute criterion for ammonia is now dependent on pH and fish species present, and the chronic criterion is dependent on pH and temperature. At lower temperatures, the chronic criterion is also dependent on the presence or absence of early life stages of fish (ELS).

The other significant revision in the 1999 Ammonia Update is EPA's recommendation of 30 days as the averaging period for the ammonia chronic criterion. In addition, EPA recommends that within the 30-day averaging period, no 4-day average concentration should exceed 2.5 times the chronic criterion (Criterion Continuous Concentration (CCC)).

In natural waters ammonia exists in two forms, un-ionized ammonia (NH_3) and the ammonium ion (NH_4), with equilibrium controlled by temperature and pH. Whereas the 1984/1985 criteria were derived based on un-ionized ammonia, which required a relationship with temperature, the criteria used in the 1999 Update are expressed only as total (un-ionized plus ionized) ammonia.

The 1999 Update states in part that the available evidence indicates the toxicity of ammonia can depend on ionic composition, pH, and temperature. The 1999 Update further states that based upon available data for ammonia, evaluated using the procedures described in the "Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses", that, except possibly where an unusually sensitive species is important at a site, freshwater aquatic life should be protected if **both** of the following conditions are satisfied for the temperature, T, and pH of the waterbody:

1. The one-hour average concentration of total ammonia nitrogen (in mg N/L) does not exceed, more than once every three years on the average, the CMC (acute criterion) calculated using the following equations. Where salmonid fish are present:

$$CMC = \frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}}$$

Or where salmonid fish are not present:

$$CMC = \frac{0.411}{1 + 10^{7.204 - pH}} + \frac{58.4}{1 + 10^{pH - 7.204}}$$

2A. The thirty-day average concentration of total ammonia nitrogen (in mg N/L) does not exceed, more than once every three years on the average, the CCC (chronic criterion) calculated using the following equations.

When fish early life stages are present:

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \cdot MIN\left(2.85,\ 1.45 \cdot 10^{0.028 \cdot (25-T)}\right)$$

When fish early life stages are absent:

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \cdot 1.45 \cdot 10^{0.028 \cdot (25-MAX(T,7))}$$

2B. In addition, the highest four-day average within the 30-day period should not exceed 2.5 times the CCC.

Both the CMC and CCC for ammonia are expressed in milligrams ammonia nitrogen per liter (mg N/L).

The beneficial uses of the Calaveras River, from its source to New Hogan Reservoir, and San Andreas Creek include warm freshwater aquatic habitat (WARM), cold freshwater aquatic habitat (COLD), migration of aquatic organisms (MIGR) in warm habitat, warm and cold habitat spawning, and reproduction, and/or early development (SPWN). The early life stages of fish are likely present during the permitted period of discharge.

The reported MEC of total ammonia is 16 mg/L (as N), with an average daily concentration of effluent total ammonia reported as 2.2 mg/L (as N). The maximum effluent pH for the period of discharge from November 1999 through April 2003 was reported as 7.8 pH Units. Without regard to dilution, the discharge from the effluent has the reasonable potential to exceed the acute ambient water quality ammonia criteria for the protection of fresh water aquatic life at the point of discharge to the Calaveras River or San Andreas or Murray Creeks. The maximum total ammonia concentration reported in the Calaveras River was reported as 1.1 mg/L (as N), and the maximum pH was reported as 7.8 pH Units. Although simple steady state dilution calculations using the limited ambient data available indicate that assimilative capacity for chronic toxicity is available in the Calaveras River, sufficient information is not available to adequately determine mixing zone and dilution characteristics.

The Regional Board considered the level of ammonia in the effluent in light of the narrative toxicity objective in the Basin Plan. For determining whether there is reasonable potential for an excursion above this narrative objective, the Regional Board used the second method prescribed by 40 CFR 122.44(d)(vi) for determining reasonable potential, which relies on USEPA recommended criteria and other information. The Board chose this method because USEPA's recommended ambient water quality criteria for ammonia have been developed using methodologies that are subject to public review, as is the individual recommended criteria guidance document. Results of monitoring submitted by the Discharger indicate the effluent discharged to the Calaveras River has the reasonable potential to cause or contribute to an excursion above the acute ammonia criterion. Considering no dilution in San Andreas Creek, results of effluent monitoring submitted by the Discharger indicate the effluent discharged to San Andreas Creek has the reasonable potential to cause or contribute to an excursion above the acute and chronic ammonia criteria.

Accordingly, to prevent acutely toxic conditions at the point of discharge to the Calaveras River, a one hour maximum effluent limitation for total ammonia has been included in this Order based upon the EPA's ambient water quality acute toxicity criterion (Attachment H). Compliance with this limit will require recording of effluent pH at the time that the samples are collected for ammonia, and may require information regarding the presence or absence of salmonids in the Calaveras River. Because a minimum 20 to 1 dilution is required for discharge, acute toxicity is almost certainly the governing toxic criterion. The extent of the chronic toxicity mixing zone will be evaluated in the *Dilution/Mixing Zone Study.* Based upon the results on the *Dilution/Mixing Zone Study*, this Order may be reopened to include delineation of a chronic toxicity mixing zone and additional chronic effluent limitations for ammonia, if warranted.

To prevent chronic and acutely toxic conditions at the point of discharge to San Andreas Creek, a one hour maximum and AMEL for total ammonia have been included in this Order based upon the EPA's ambient water quality chronic and acute toxicity criteria (Attachment G and Attachment H). Compliance with these limits will require recording of effluent pH and temperature at the time that the samples are collected for ammonia, and may require information regarding the presence or absence of salmonids in San Andreas Creek.

Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for total ammonia. As noted previously, the narrative toxicity objective is not a new objective, therefore a schedule of compliance for ammonia is not included in this Order. A separate Cease and Desist Order shall be proposed for compliance with the new ammonia effluent limitations.

Chlorine

The Discharger uses chlorine for the disinfection of treated wastewater. The Basin Plan does not provide a numeric water quality objective for chlorine, but the Basin Plan does contain a narrative toxicity objective. For determining whether there is reasonable potential for an excursion above this narrative objective, the Regional Board used the second method prescribed by 40 CFR 122.44(d)(vi) for determining reasonable potential, which relies on USEPA criteria and other information. The Board chose this method because USEPA's recommended ambient water quality criteria for chlorine have been developed using methodologies that are subject to public review, as is the individual recommended criteria guidance document. USEPA's ambient water quality criteria for protection of aquatic life are 11 μg/L as a 4-day average (chronic) concentration, and 19 μg/L as a 1-hour average (acute) concentration for total residual chlorine. Continuous use of chlorine for the disinfection of the final effluent presents a reasonable potential for the discharge to cause or contribute to an excursion above the acute and chronic chlorine criteria. This Order includes new effluent limitations for chlorine based directly upon the USEPA's ambient water quality criteria. Based upon results of monitoring, and installation of the new dechlorination unit, the Discharger is capable of consistently meeting these limitations.

Chemical Constituents Objective

For Chemical Constituents at page III-3.00, the Basin Plan states '*At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations...*' Federal regulations at 40 CFR Section 122.44(d)(1)(vi)(A) allow the state to establish effluent limitations using an explicit state policy interpreting its narrative objectives. Use of MCL's is appropriate to implement the chemical constituent objective of the Basin Plan. The Calaveras River, San Andreas Creek, and Murray Creek are designated for use as domestic or municipal supply (MUN).

The Regional Board has considered the factors specified in California Water Code (CWC) Section 13263, including considering the provisions of CWC Section 13241 where appropriate. The Regional Board is not required to consider the factors in CWC Section 13241 in applying existing water quality objectives, including adopting new effluent limitations in this Order.

The Regional Board must implement the CWC consistent with the Clean Water Act (CWA). The CWA precludes the consideration of costs when developing effluent limitations for NPDES permits necessary to implement water quality standards (See Ackels v. EPA (9^{th} Cir. 1993) 7 F.3d 862, 865-66). The Regional Board may consider costs in developing compliance schedules. The Regional Board finds, on balance, that these requirements are necessary to protect the beneficial uses of the Calaveras River, San Andreas Creek, and Murray Creek.

Nitrate/Nitrite
The Basin Plan does not include a numeric objective for nitrate or nitrite. The USEPA has established a primary Maximum Contaminant Level (MCL) for nitrate of 10 mg/L (as nitrogen (N)), and a primary MCL for nitrite of 1 mg/L (as nitrogen (N)). USEPA has also established in the MCL a limit for total nitrate + nitrite of 10 mg/L. Additionally, USEPA's ambient water quality criteria for nitrate, protective of human health for consumption of water and organisms, is expressed also as a concentration of 10 mg/l (as N). In Title 22, Table 64431-A of the California Code of Regulations (CCR) the California DHS has established a primary MCL for nitrate + nitrite (sum as nitrogen) of 10 mg/L, and a primary MCL for nitrite (as nitrogen) of 1.0.

As reported by the Discharger, the MEC for nitrate + nitrite (as N) was 17.2 mg/L. Independently, the MEC for nitrate was reported as 17 mg/L (as N), and the MEC for nitrite was reported as 0.2 mg/L (as N). The average daily effluent concentration for nitrate + nitrite (as N) has been reported as 12.2 mg/L. These nitrate + nitrite effluent concentrations, without regard to dilution, exceed the California DHS primary MCL for nitrate + nitrite (as N). The maximum observed ambient background concentration of nitrate + nitrite (as N) in the Calaveras River was reported as 1.7 mg/L. Independently, the maximum observed ambient background concentration for nitrate was reported as 1.7 mg/L (as N), and the maximum observed ambient background concentration nitrite was reported as less than 0.03 mg/L (as N). The data indicate that the Calaveras River does have assimilative capacity for nitrate and nitrite. Dilution and/or assimilative capacity was not considered for discharge to San Andreas Creek.

Considering these effluent monitoring results, the MUN beneficial use, the chemical constituent objective of the Basin Plan, and the California DHS primary MCL for nitrate + nitrite, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

An AMEL and MDEL for discharge to the Calaveras River were considered for nitrate + nitrite (as N) developed using the USEPA recommendations for permitting for human health protection as described in Section 5.4.4 of the TSD. A steady state model was used to develop an ECA/WLA using the example from the SIP where the ECA or WLA = C + D(C – B) where C represents the nitrate + nitrite criterion, D represents the dilution credit, and B represents the arithmetic mean of the observed ambient background concentration. The AMEL was then set equal to the WLA. The MDEL was calculated using the multipliers in Table 5-3 of the TSD considering a default CV of 0.6 and the number of samples per month. Development of these limitations is shown below:

WATER QUALITY -BASED AMEL and MDEL- Calaveras River	
Nitrate + Nitrite	
C	Primary MCL (10 mg/L)
B	Arithmetic mean background concentration (1.0 mg/L)
D	Dilution Credit = 20
WLA/ECA (chronic) = C + D(C – B)	WLA/ECA = 10 + 20(10 – 1) = 190 mg/L
Coefficient of Variation (Default)	0.6
n (# of samples per month)	2
AMEL	**190 mg/L**
MDEL/AMEL ratio	Using 99^{th} percentile multiplier From TSD Table 5.3 = 1.31
MDEL	190 (1.31) = **249 mg/L**

These water quality-based effluent limitations are substantially higher than the reported MEC of 17.2 mg/L (ppm). Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using the calculated AMEL and MDEL. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for nitrate + nitrite is needed prior to establishing a final effluent limitation for the discharge to the Calaveras River.

The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations for discharge to the Calaveras River at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to reopen this Order and include final water quality-based effluent limitations for nitrate + nitrite as enforceable limitations.

For discharge to San Andreas Creek, where dilution credit was not considered, an AMEL was developed considering the USEPA recommendations for permitting for human health protection provided in Section 5.4.4 of the TSD. The AMEL was set equal to the WLA, or in this case, the nitrate + nitirite MCL (10 mg/L). Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for nitrate + nitrite. As the chemical constituent objective is not a new objective, a schedule of compliance for nitrate + nitrite is not included in this Order. A separate Cease and Desist Order shall be proposed for compliance with the new AMEL.

Iron

In Title 22, Table 64449-A of the CCR, the California DHS has established a secondary MCL for iron of 300 µg/L considering consumer acceptance limits.

Results of monitoring conducted by the Discharger indicate effluent concentrations of iron ranged from 210 µg/L to 450 µg/L . The MEC, without regard to dilution, exceeds California DHS secondary MCL for iron. The maximum observed ambient background concentration of iron in the Calaveras River was reported as 130 µg/L. The data indicate that the Calaveras River does have assimilative capacity for iron. Dilution and/or assimilative capacity was not considered for discharge to San Andreas Creek.

Considering the MEC, the MUN beneficial use, the chemical constituents objective of the Basin Plan, and the California DHS secondary MCL for iron, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

The criterion used to determine reasonable potential for iron is not related to aquatic toxicity or human health. Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using a calculated AMEL and MDEL based upon a human health WLA. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for iron is needed prior to establishing a final effluent limitation for the discharge to the Calaveras River.

The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for iron as enforceable limitations.

For discharge to San Andreas Creek, where dilution credit was not considered, an AMEL was set equal to the WLA, or in this case, the iron secondary MCL (300 µg/L). Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for iron. As the chemical constituents objective is not a new objective, a schedule of compliance for iron is not included in this Order. A separate Cease and Desist Order shall be proposed for compliance with the new AMEL.

Manganese

In Title 22, Table 64449-A of the CCR, the California DHS has established a secondary MCL for manganese of 50 µg/L considering consumer acceptance limits.

Results of monitoring conducted by the Discharger indicate effluent concentrations of manganese ranged from 25 µg/L to 82 µg/L. The MEC, without regard to dilution, exceeds California DHS secondary MCL's for manganese. The maximum observed ambient background concentration of manganese in the Calaveras River was reported as 12 µg/L. The data indicate that the Calaveras River does have assimilative capacity for manganese. Dilution and/or assimilative capacity was not considered for discharge to San Andreas Creek.

Considering the MEC, the MUN beneficial use, the chemical constituents objective of the Basin Plan, and the California DHS secondary MCL for manganese, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

The criterion used to determine reasonable potential for manganese is not related to aquatic toxicity or human health. Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using a calculated AMEL and MDEL based upon a human health WLA. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for manganese is needed prior to establishing a final effluent limitation for the discharge to the Calaveras River.

The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for manganese as enforceable limitations.

For discharge to San Andreas Creek, where dilution credit was not considered, an AMEL was set equal to the WLA, or in this case, the manganese secondary MCL (50 µg/L). Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for manganese. As the chemical constituent objective is not a new objective, a schedule of compliance for manganese is not included in this Order. A separate Cease and Desist Order shall be proposed for compliance with the new AMEL.

Methylene Blue Active Substances (MBAS)
In Title 22, Table 64449-A of the CCR, the California DHS has established a secondary MCL for MBAS of 500 µg/L considering consumer acceptance limits.

Results of monitoring conducted by the Discharger indicate effluent concentrations of MBAS ranged from 2,000 µg/L to 500 µg/L . The MEC, without regard to dilution, exceeds California DHS secondary MCL for MBAS. The maximum observed ambient background concentration of MBAS in the Calaveras River was reported as less than 50 µg/L. The data indicate that the Calaveras River does have assimilative capacity for MBAS. Dilution and/or assimilative capacity was not considered for discharge to San Andreas Creek.

Considering the MEC, the MUN beneficial use, the chemical constituents objective of the Basin Plan, and the California DHS secondary MCL for MBAS, the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

The criterion used to determine reasonable potential for MBAS is not related to aquatic toxicity or human health. Considering the existing performance of the plant, and SWRCB Resolution No. 68-16, a final limit based upon statistics and the MEC would be more appropriate than using a calculated AMEL and MDEL based upon a human health WLA. However, since only three effluent data points, and two receiving water data points are currently available, collection and evaluation of additional effluent and receiving water data for MBAS is needed prior to establishing a final effluent limitation for the discharge to the Calaveras River.

The reason that final water quality-based effluent limitations are not being incorporated into the permit as enforceable limitations at this time is because insufficient effluent and receiving water data exists for proper calculation of final limitations. When sufficient data are collected, it is the intent of the Regional Board to include final water quality-based effluent limitations for MBAS as enforceable limitations.

For discharge to San Andreas Creek, where dilution credit was not considered, an AMEL was set equal to the WLA, or in this case, the MBAS secondary MCL (500 µg/L). Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for MBAS. As the chemical constituents objective is not a new objective, a schedule of compliance for MBAS is not included in this Order. A separate Cease and Desist Order shall be proposed for compliance with the new AMEL.

Pesticides
The Basin Plan includes an objective for Pesticides, stating in part;

- *No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses*
- *Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses*
- *Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies*
- *Pesticide concentrations shall not exceed the lowest levels technically and economically achievable*

As noted previously, the Basin Plan also includes a narrative toxicity objective which states, in part, that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*"

Diazinon
Diazinon is used for the control of pests in both agricultural and urban settings. For inland surface waters within the Region, there are currently no adopted numeric objectives for diazinon.
For diazinon, the USEPA has published a tentative one-hour maximum acute criterion of 0.09 µg/L. The California Department of Fish and Game (DFG) criteria published in March 2000 include a one-hour average acute value of 0.08 µg/L and a four-day average chronic value of 0.05 µg/L.

Results of three effluent sampling events indicated one instance where diazinon was detected, at a concentration of 1.6 µg/L. Results of two ambient background monitoring events in the Calaveras River indicate concentrations of diazinon were less than 0.1 µg/L. This information is not sufficient to adequately assess whether the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard in the Calaveras River. This Order contains new monitoring requirements for diazinon, and may be reopened, and effluent limitations established for diazinon if appropriate, based upon additional data collection. Depending upon the nature of collected data, the Discharger may be required to implement a study and develop source control actions, and/or interim or final point of discharge effluent limitations may be established.

Considering the MEC, the aquatic life beneficial uses, the pesticide and narrative toxicity objectives of the Basin Plan, and the California DFG criteria for diazinon, the discharge to San Andreas Creek has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard.

An AMEL and MDEL have been developed for diazinon considering the most restrictive of a chronic or acute WLA. Since the limiting LTA is derived from consideration of a chronic WLA, the AMEL and MDEL have been developed for diazinon considering the chronic aquatic life criteria, a chronic waste load allocation, and no dilution credit. The AMEL and MDEL were then calculated using procedures in Section 5.4 and Appendix E of the TSD. A default CV of 0.6 was used in the development of these limitations shown below:

WATER QUALITY -BASED AMEL and MDEL- San Andreas Creek	
Diazinon	
WLA c = Cc	Chronic Aquatic Life Criterion (0.05 µg/L)
WLA a = Ca	Acute Aquatic Life Criterion (0.08 µg/L)
LTA c (99th Percentile)	= WLA c ∗ (.527) = 0.0263 µg/L
LTA a (99th Percentile)	= WLA a ∗ (.321) = 0.0257 µg/L
LTA min	= 0.0263 µg/L
Coefficient of Variation (Default)	0.6
MDEL (99th Percentile)	= LTA min (0.0263) ∗ (3.11) = 0.08 µg/L
AMEL (95 Percentile, # samples = 4)	= LTA min (0.0263) ∗ (1.55) = 0.04 µg/L

Based upon the results of effluent monitoring, the Discharger may not be able to consistently comply with these new limitations for diazinon. Additionally, based upon the use of current analytical methods, routine monitoring may be unable to determine compliance with these limitations. Analytical methods for compliance monitoring purposes will be specified in this Order. As the narrative toxicity and pesticide objectives are not new objectives, a schedule of compliance for diazinon is not included in this Order. A separate Cease and Desist Order shall be proposed for compliance with the new MDEL and AMEL.

Carbofuran

Carbofuran is a broad spectrum carbamate insecticide with applications for pest control in various food and feed crops. In Title 22, Table 64444-A of the CCR, the California DHS has established a primary MCL for carbofuran of 18 µg/L. The California Office of Environmental Health Hazard Assessment (OEHHA) has established a Public Health Goal for carbofuran in drinking water of 1.7 µg/L. In 1992, the California DFG published an interim criterion to protect freshwater aquatic life of 0.5 µg/L as an instantaneous maximum.

Results of three effluent sampling events indicated one instance where carbofuran was reported as greater than the analytical detection method limit, but less than the method reporting limit, at a detected, but not quantified (DNQ) concentration of 2.51 µg/L. Results from the two other rounds of effluent monitoring indicated carbofuran concentrations were less than 1.3 and less than 1.1 µg/L. Results of two ambient background monitoring events in the Calaveras River indicate concentrations of carbofuran were less than 0.5 µg/L and less than 1.1 µg/L. This information is not sufficient to adequately assess whether the discharge has the reasonable potential to cause or contribute to an in-stream excursion above a State water quality standard. This Order contains new monitoring requirements for carbofuran, and may be reopened, and effluent limitations established for carbofuran if appropriate, based upon additional data collection. Depending upon the nature of collected data, the Discharger may be required to implement a study and develop source control actions, and/or interim or final point of discharge effluent limitations may be established.

pH
The Basin Plan provides that the pH (of surface waters) shall not be depressed below 6.5 nor raised above 8.5 pH Units. The Basin Plan further provides that changes in normal ambient pH levels shall not exceed 0.5 pH Units in fresh waters with designated COLD or WARM beneficial uses. Although the discharge will occur under conditions of 20 to 1 dilution, pH can significantly affect the mobility of metals, and toxicity of ammonia, therefore the existing effluent limitation for pH has been retained in this Order. This Order also retains receiving water limitations and monitoring requirements for pH.

Dissolved Oxygen
At Page III-5.00, the Basin Pan provides surface water quality objectives for dissolved oxygen (DO), and states, in part: *For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75 percent of saturation. The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time:*

Waters designated WARM 5.0 mg/l
Waters designated COLD 7.0 mg/l
Waters designated SPWN 7.0 mg/l

This Order retains the limitation that the discharge shall not cause the DO of the receiving water to fall below 7.0 mg/l, in support of the COLD and SPWN beneficial uses and associated Basin Plan objective.

Temperature
Effluent and receiving water temperature affect numerous water quality conditions including ammonia toxicity (increasing with increasing temperature) and oxygen saturation (decreasing with increasing temperature). Additionally, warm waters may cause detrimental conditions of aquatic aversion or attraction. The Basin Plan states that: "*At no time shall the temperature of... WARM intrastate waters be increased more than 5°F above natural receiving water temperature*". Through the use of the pond system, effluent temperatures are buffered, and under conditions of 20:1 dilution, the potential for the

discharge to increase the temperature of the Calaveras River or San Andreas Creek appears unlikely. However, this Order contains receiving water limitations inclusive of the Basin Plan objectives.

Turbidity
Basin Plan states that: "*Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:*

- *Where natural turbidity is between 0 and 5 (NTUs), increases shall not exceed 1 NTU*
- *Where natural turbidity is between 5 and 50 NTU's, increases shall not exceed 20 percent*
- *Where natural turbidity is between 50 and 100 NTU's, increases shall not exceed 10 NTU's*
- *Where natural turbidity is greater than 100 NTU's, increases shall not exceed 10 percent"*

This Order includes effluent and receiving water monitoring requirements for turbidity, and retains receiving water limitations and monitoring requirements for turbidity.

Oil and Grease
The Basin Plan states that "*Waters shall not contain oils, greases, waxes, or other materials 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.*" This Order includes effluent monitoring requirements for Oil and Grease.

Treatment and Storage Ponds, Groundwater
The beneficial uses of the underlying ground water are municipal and domestic, industrial service, industrial process and agricultural supply. The WWTP processes include the use of three polishing ponds, the equalization basin, and the DLDA.

SWRCB Resolution 68-16 requires the Regional Board, in regulating the discharge of waste, to maintain high quality waters of the State (i.e. background water quality) until it is demonstrated that any change in quality will be consistent with the maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality les than that described in the Regional Board's policies (e.g. quality that exceeds objectives). Some degradation of groundwater beneath the WWTP and associated DLDA is consistent with Resolution 68-16 provided that:

a. the degradation is confined within a specified boundary;

b. The Discharger minimizes degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures;

c. The degradation is limited to waste constituents typically encountered in domestic wastewater as specified in the groundwater limitation in this Order; and,

d. The degradation does not result in water quality less than that prescribed in the Basin Plan.

Some degradation of groundwater by some of the typical waste constituents released with the discharge from a municipal wastewater utility, after effective source control, treatment, and control is consistent with the maximum benefit to the people of the State. The technology, energy, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impact on water quality will be substantially less. Degradation of groundwater by toxic pollutants other than those typically associated with a WWTP, and by pollutants that can be effectively removed by conventional treatment (e.g. total coliform bacteria) is prohibited. When allowed, the degree of degradation permitted depends upon many factors including; background water quality, the pollutant, the beneficial uses of groundwater and most stringent water quality objective, source control measures, and pollutant treatability. Economic prosperity of the local community is of maximum benefit to the people of the State, and therefore sufficient reason exists to accommodate growth and groundwater degradation around the WWTP, provided that the terms of the Basin Plan including SWRCB Resolution 68-16, are met.

As required by previous Order No. 5-01-118, the Discharger is currently installing a series of three wells to assess and monitor the impact of the discharge on groundwater, if any. This Order includes groundwater limitations that allow groundwater to be degraded when compared to background groundwater quality, but not to exceed water quality objectives. If groundwater quality has been degraded by the operation of the WWTP beyond the quality described above, this Order may be reopened, and specific numeric limitations imposed.

Sludge Disposal
The Discharger treats all primary and secondary sludge in a heated unmixed anaerobic digester. Drying of digested sludge is accomplished by using sand-drying beds. Dried sludge is then stored on site, characterized, then disposed of at the Calaveras County Landfill.

JME