(FINAL REPORT)

City of Calipatria

CYANIDE COMPLIANCE REPORT

March 2008

LEE & RO, Inc.

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1. INTRODUCTION

The City of Calipatria operates the publicly owned Wastewater Treatment Plant located at 106 Lindsey Road in the City of Calipatria, within Imperial County, California. The existing Calipatria Wastewater Treatment Plant (WWTP) services the City of Calipatria and the Calipatria State Prison. The total permitted design capacity is 1.73 million gallons per day (mgd). The treatment system consists of a manual bar screen at the prison, four facultative lagoons, and a hypochlorite/bisulfite chlorination/dechlorination system. The effluent is discharged into the "G" Drain, a tributary to the Alamo River, which drains into the Salton Sea. This facility is subject to the requirements set forth by the California Regional Water Quality Control Board (RWQCB), Colorado River Basin Region, within Order No. R7-2005-0085 (adopted and effective 06-29-2005; expires 06-29-2010) and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0105015.

1.1 Project Background

The Calipatria WWTP received Administrative Civil Liability (ACL) Complaint No. R7-2007-0024 from the California RWQCB, Colorado River Basin, on January 24, 2007. This complaint alleges violations of Waste Discharge Requirements (WDRs) in the exceedance of effluent limitations for waste discharge of Group II pollutants by 20% or more (for copper and free cyanide). This complaint assessed a mandatory minimum penalty of $18,000 to the City of Calipatria, who is entitled as a publicly owned treatment works (POTWs) to spend an amount of money equivalent to this penalty in the performance of an approved compliance project to correct the violations. The City of Calipatria opted to submit a settlement proposal in response to the complaint with a Proposed Compliance Project, dated February 7, 2007. The RWQCB determined that the compliance project proposal proposed by the City of Calipatria required further augmentation to meet the minimum requirements of the RWQCB Complaint. A detailed proposal was requested by the RWQCB to ensure regulatory compliance, a specific plan to eliminate identified pollutant sources, and proposed actions to prevent future occurrences of non-compliance. The City of Calipatria contracted with LEE & RO, Inc. on July 19, 2007 to prepare an Engineering Report for Cyanide Compliance for the Wastewater Treatment Plant. Table 1.1 presents the chronological events associated with the cyanide compliance projects.

Table 1.1 Chronological Events Associated with Cyanide Compliance Project

Date	Action Item
6/29/2005	Order No. R7-2005-0085 adopted by California RWQCB, Colorado River Basin
6/29/2005	Order No. R7-2005-0085 became effective
1/16/2006	Incomplete 2005 Annual M&R (Missing inorganic, pesticides and polychlorinated biphenols; incomplete priority pollutants data set)
4/5/2006	Exceeded Daily Maximum Limit of 30 µg/L for Free Cyanide; Reported value = 40 µg/L
4/30/2006	Exceeded Average Monthly Effluent Limit of 30 µg/L for Free Cyanide; Reported Value = 40 µg/L
9/13/2006	Exceeded Daily Maximum Limit of 14 µg/L for Copper; Reported Value = 19 µg/L
9/30/2006	Exceeded Average Monthly Effluent Limit of 14 µg/L for Copper; Reported Value = 37 µg/L
10/31/2006	Exceeded Daily Maximum Limit of 30 µg/L for Free Cyanide; Reported value = 37 µg/L

Date	Action Item
	µg/L
1/24/2007	RWQCB issues ACL Complaint No. R7-2007-0024 to City of Calipatria
2/22/2007	RWQCB Comments regarding the proposed Compliance Project by City of Calipatria
4/16/2007	City of Calipatria issues Request for Proposals to perform Engineering Services
5/10/2007	LEE & RO, Inc. submits Proposal to perform Engineering Services for City of Calipatria
7/19/2007	City of Calipatria contracts LEE & RO to perform an Engineering Report for Cyanide Compliance
8/20/2007	Notice to proceed for the Cyanide Compliance Report

1.2 Project Goal

The overall purpose of this investigation and engineering report is to satisfy the request of the RWQCB. The compliance project will identify project goals, costs, milestones, and completion dates required by the Administrative Civil Liability Complaint No. R7-2007-0024. The engineering report will focus on the validity of the laboratory data, the cyanide source identification, and recommendation for corrective action. The cyanide analysis procedures, protocols, and sample preservation by the commercial laboratory employed by the City of Calipatria will be reviewed. Additional sampling and analysis will be performed to further identify the source of cyanide and/or to investigate the validity of existing laboratory data. If the source is identified, the report will clearly propose Cyanide Compliance projects(s). The Compliance Project may be a simple identification source control/pollution minimization project and/or wastewater facility improvement project to ensure compliance.

1.3 Project Scope

This study presents a systematic approach to achieve the objectives discussed in the previous section. The project study includes the following elements:

1. Visit site and collect information on the wastewater plant, such as as-built facility drawings, monthly monitoring data, lab data, demography, prison and industry information, and other documents pertaining to the wastewater facilities and facility operations and maintenance.
2. Assess existing plant facilities, review NPDES permit, and evaluate existing plant performance.
3. Review the cyanide analysis methods (i.e., Standard method 4500-CN and EPA Method 335), and discuss possible interfering substances in the wastewater samples associated with these analyses methods.
4. Perform literature review to investigate cyanide source characterization, cyanide formation in wastewater treatment, previous cyanide pretreatment and pollution prevention activities, and false positive cyanide measurements in wastewater plant effluent.
5. Review quality assurance procedures of the cyanide sampling, sample preservation, and analysis used by the commercial laboratory employed by the City of Calipatria.
6. Take additional samples at the City Lift Station, the Calipatria State Prison Lift Station, secondary effluent prior to chlorination, and plant effluent after dechlorination, in order

to identify the source of cyanide (from an external source or onsite generation by chlorination). This task also involves the testing of the validity of existing laboratory data by splitting samples to several independent laboratories certified by the State of California.

7. If previous cyanide data provided by the contract laboratory is found to be invalid, the study report should present (i) the scientific background supporting the invalidity of the previous laboratory data, and (ii) the recommended quality assurance procedures of the cyanide sampling, sample preservation, and analysis.
8. Analyze potential cyanide source(s), if the cyanide is from unknown external source(s).
9. Once cyanide source is identified, develop a cyanide compliance plan either by source control/pollution minimization or by wastewater facility improvement to ensure compliance.

2. DESCRIPTION OF EXISTING FACILITIES

This section presents a brief overview of existing facilities and operations at the Calipatria WWTP. The existing plant facilities are presented in **Table 2.1**.

The Calipatria WWTP is a facultative lagoon secondary treatment plant, followed by chlorination and dechlorination. The treatment system consists of a manual bar screen at the prison, four square facultative lagoons, and a disinfection system. The total capacity of the wastewater treatment plant is 1.73 mgd. The treated effluent is discharged into the "G" Drain, a tributary of the Alamo River, which drains into the Salton Sea.

Ferric chloride is injected into the plant influent to enhance suspended solids removal. Sodium hypochlorite is injected into the secondary effluent for chlorination, and sodium metabisulfite is injected at the end of the chlorine contact basin for dechlorination.

The current plant power (three phase, 480 volt, three phase power) is served by the Imperial Irrigation District.

Table 2.1: Existing Calipatria Wastewater Plant Facility

Design Parameter	Value	Remarks
Lift Station (City)		
Pump Motors, each	3	40 hp, 460 volts, 3 phase
Pumps, each	3	1750 rpm, 700 gpm, 115 ft TDH
Bar screen (automatic), each	1	1 hp, 460 volts, 3 phase
Lift Station (Prison)		
Pump Motors, each	2	
Pumps, each	2	1750 rpm, 700 gpm, 115 ft TDH
Bar screen (manual), each	2	1 hp, 460 volts, 3 phase
Facultative Lagoon 1		
Approx dimension, L × W, feet	294 × 290 286 × 282 241 × 237	At grade At water surface At bottom
SWD, feet	11.25	
Volume, million gallons	5.8	Excluding volume for sludge at bottom
Aerator, each	1	40 hp, 460 volts, 3 phase
Facultative Lagoon 2		
Approx dimension, L × W, feet	294 × 290 285 × 281 241 × 237	At grade At water surface At bottom
SWD, feet	10.9	
Volume, million gallons	5.6	Excluding volume for sludge at bottom
Aerator, each	1	40 hp, 460 volts, 3 phase

Design Parameter	Value	Remarks
Facultative Lagoon 3		
Approx dimension, L × W, feet	294 × 290 284 × 280 241 × 237	At grade At water surface At bottom
SWD, feet	10.8	
Volume, million gallons	5.5	Excluding volume for sludge at bottom
Aerator, each	1	40 hp, 460 volts, 3 phase
Facultative Lagoon 4		
Approx dimension, L × W, feet	294 × 290 284 × 280 241 × 237	At grade At water surface At bottom
7SWD, feet	10.7	
Volume, million gallons	5.4	Excluding volume for sludge at bottom
Aerator, each	1	40 hp, 460 volts, 3 phase
Flowmeter Sampling Vault		
6-inch Magnetic Flowmeter, each	1	Range: 270-700 gpm
Composite samplers, each	2	
Sluice Gate, each	1	Heavy duty cast iron sluice gate
Chlorination Dechlorination Structure		
Sodium hypochlorite injection pump , each	1	
Flash Mixer, each	1	Located at downstream of sodium hypochlorite injection
Sodium metabisulfite injection pump, each	1	
Dimension, L × W × SWD		
Miscellaneous		
Ferric chloride storage tank, each	1	
Sodium Hypochlorite Storage tank, each	1	
Sodium metabisulfite, each	1	

3. EVALUATION OF WASTEWATER SOURCES

3.1 Service Area Characteristics

The City of Calipatria provides sewer service to approximately 529 single-family households and 140 multifamily residential units, three schools, the Calipatria State Prison, and 30 commercial and industrial businesses within its jurisdiction. **Table 3.1** is a list of users connected to the City's sewer collection system. The City's collection system service area consists of approximately 7,289 residents (899 households) as documented by the 2000 Census. At a wastewater production rate of 100 gallons/capita/day, the full time residents would generate 0.73 mgd.

Table 3.1: List of Users Connected to the City's Sewer Collection System

Type	Number
Schools	
High school (358 students/36 staff)	1
Middle school (323 students/25 staff)	1
Primary school (358 students30 staff	1
District office (32 staff)	1
State penitentiary (Approximately 5,000 inmates and 1,000 staff)	1
Single-family residential	481
Multi-family residential	150
Mobile Home/RV Park	1
Commercial	
Restaurants	5
Laundromats	1
Carwash	2
Tire repair	1
Grocery store	1
Convenience stores	3
Gas stations	3
Motel (40 rooms)	1
Dental office	1
Beauty salons	2
Auto repair offices	4
Bank	1
Auto parts offices	1
Bank	2
Auto Parts	13
Hardware store	1
Novelty Store	2
Industrial/Agricultural	13
Feed mill	1
Hay Compress	1
Apiary	1
Farm labor contractors	1
Onion packing shed	2
Citrus packing shed	1

3.2 Collection System

The City's collection system is antiquated dating back to the early years of the last century. The system is susceptible to breaks due to shallow clay sewer lines throughout the City of Calipatria. Clay sewer lines often break from the weight of heavy truck traffic on alleys. There are probably broken or cracked sewer lines in the system that could allow infiltration by groundwater and storm-water contaminated with hazardous materials. Several manholes within the system are below grade and are also potential sources of infiltration of the system following storm events.

All raw sewage in the City of Calipatria is collected at the Delta Lift-Station and pumped to the Calipatria WWTP through a 10-inch PVC force main with a distance of approximately 2 miles. The lift-station was built in the early 1970's, and is in poor condition now. The Calipatria State Prison is served by a 15-inch force main with a distance of approximately 2 ½ miles. The WWTP receives significant amounts of inert debris from the prison since the prison inmates dispose all trash into the sewer system. According to the records, wastewater flow from the Calipatria State Lift Station ranged from 0.73 mgd to 0.87 mgd, and the flow rate fluctuates seasonally. The wastewater flow from the City Lift Station and the Calipatria State Prison Lift Station were averaged at 0.26 mgd and 0.80 mgd, respectively.

4. REGULATORY REQUIREMENTS AND PLANT PERFORMANCE

This section is intended to evaluate the Calipatria WWTP discharge monitoring data for compliance with the NPDES permit requirements. This section may help identify potential areas of non-compliance and future planning needs to maintain NPDES Permit compliance.

4.1 Regulatory Requirements

The secondary effluent from the Calipatria WWTP is currently discharged from “Discharge Point 001” to the “G” Drain, a tributary to the Alamo River, which drains into the Salton Sea. This discharge from Calipatria WWTP is currently permitted by the California RWQCB, Colorado River Basin. The permit is authorized under Order No. R7-2005-0085; NPDES Permit No. CA0105015. The permit was effective on June 29, 2005 and will expire on June 29, 2010. The effluent limits specified in the permit for effluent discharge to the “G” Drain are summarized in **Table 4.1**. In addition, interim final effluent limitations have been established by the new permit and are presented in **Table 4.2**. The complete NPDES permit Order No. R7-2005-0085 is attached as **Appendix I**.

Table 4.1: NPDES Permit: Final Effluent Limitations

Parameter	Units	Final Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	mgd	1.73	-	-	-	-
BOD (5-day @ 20°C)	mg/L	45	65	-	-	-
	lbs/day	649	938	-	-	-
Total Suspended solids	mg/L	95	65	-	-	-
	lbs/day	1,371	938	-	-	-
Residual chlorine	mg/L	0.01	65	-	-	0.02
	lbs/day	0.14	938	-	-	0.29
pH	standard units	-	-	-	6.0	9.0
Copper	µg/L	2.9	-	5.8	-	-
	lbs/day	0.042	-	0.083	-	-
Free Cyanide	µg/L	4.3	-	8.5	-	-
	lbs/day	0.062	-	0.12	-	-
Selenium	µg/L	4.1	-	8.2	-	-
	lbs/day	0.059	-	0.12	-	-
Thallium	µg/L	6.3	-	13	-	-
	lbs/day	0.091	-	0.19	-	-

[a] The maximum daily TDS limitation = 4500 mg/L; Annual average TDS limitation = 4000 mg/L

[b] Escherichia coliform (E. coli) concentration in excess of a log mean of most probable number (MPN) of 126 per 100 mL (based on a minimum of not less than five samples for any 30-day period) nor shall any sample exceed 400 MPN per 100 mL.

[b] There shall be no acute or chronic toxicity in the treatment plant effluent nor shall the plant effluent cause any acute or chronic toxicity in the receiving water.

Table 4.2: NPDES Permit: Interim Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Copper	µg/L	14	-	14	-	-
	lbs/day	0.20	-	0.20	-	-
Free Cyanide	µg/L	30	-	30	-	-
	lbs/day	0.43	-	0.058	-	-
Selenium	µg/L	10	-	0.098	-	-
	lbs/day	0.14	-	0.00069	-	-
Thallium	µg/L	14	-	0.14	-	-
	lbs/day	0.20	-	0.00099	-	-

4.2 Plant Performance

4.2.1 Evaluation of Plant Influent Monitoring Data

To evaluate the Calipatria WWTP influent wastewater characteristics, the plant monitoring data between 2005 and 2007 was analyzed. **Figure 4.1** shows plant flow measured by the effluent meter. According to the records, wastewater flow ranged from 0.89 mgd to 1.16 mgd, and averaged 1.09 mgd for the last 3 years, which is about 63% of total treatment capacity (i.e., 1.73 mgd).

Figure 4.2 presents the plant influent biochemical oxygen demand (BOD_5) concentration profiles measured at the City Lift Station and the Prison Lift Station. The influent BOD_5 concentrations have varied between 34 to 400 mg/L, and were averaged 148 and 162 mg/L at the City Lift Station and the Prison Lift Station, respectively. The influent BOD_5 appears to be relatively low compared to typical municipal wastewater BOD_5 (i.e., ~200 mg/L).

Figure 4.3 presents the plant influent total suspended solids (TSS) concentration profiles measured at the two lift stations. TSS concentrations ranged from 43 to 1,894 mg/L, and were averaged 335 and 330 mg/L at the City Lift Station and the Prison Lift Station, respectively. The influent TSS appears to be relatively high compared to typical municipal wastewater TSS (i.e., ~200 mg/L).

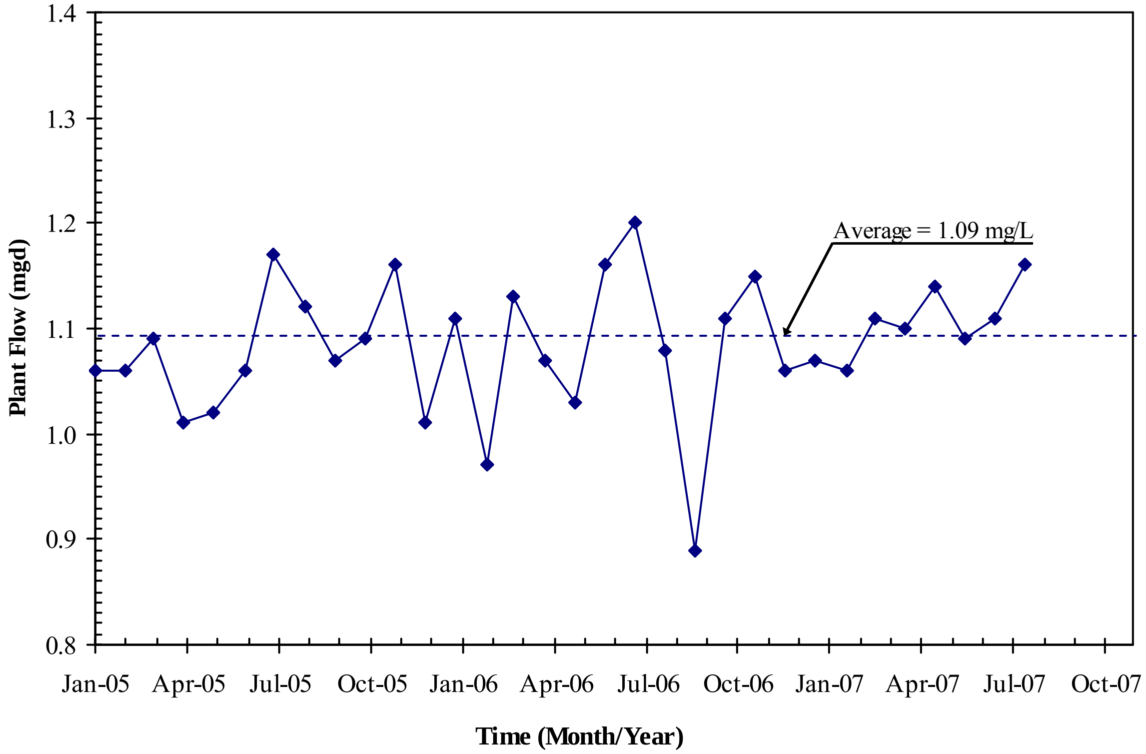

Figure 4.1: 2005-2007 Calipatria WWTP Secondary Effluent Flow Monitoring Data

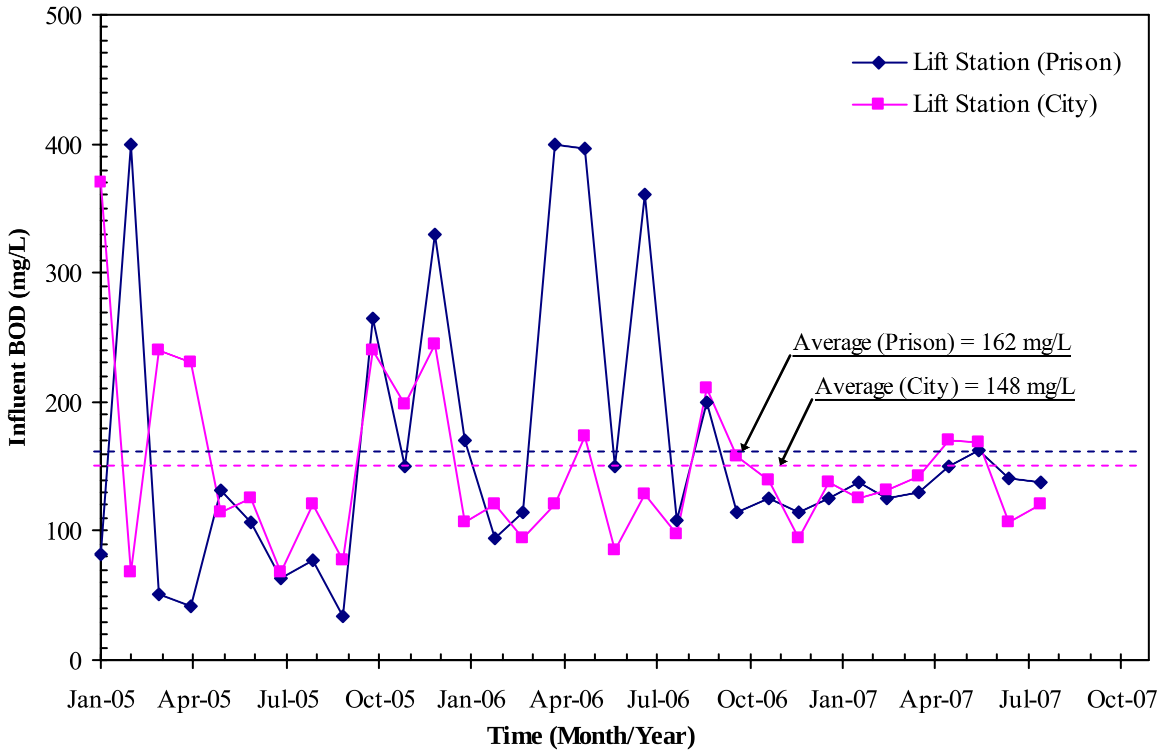

Figure 4.2: 2005-2007 the City and Calipatria State Prison Lift Stations BOD_5 Monitoring

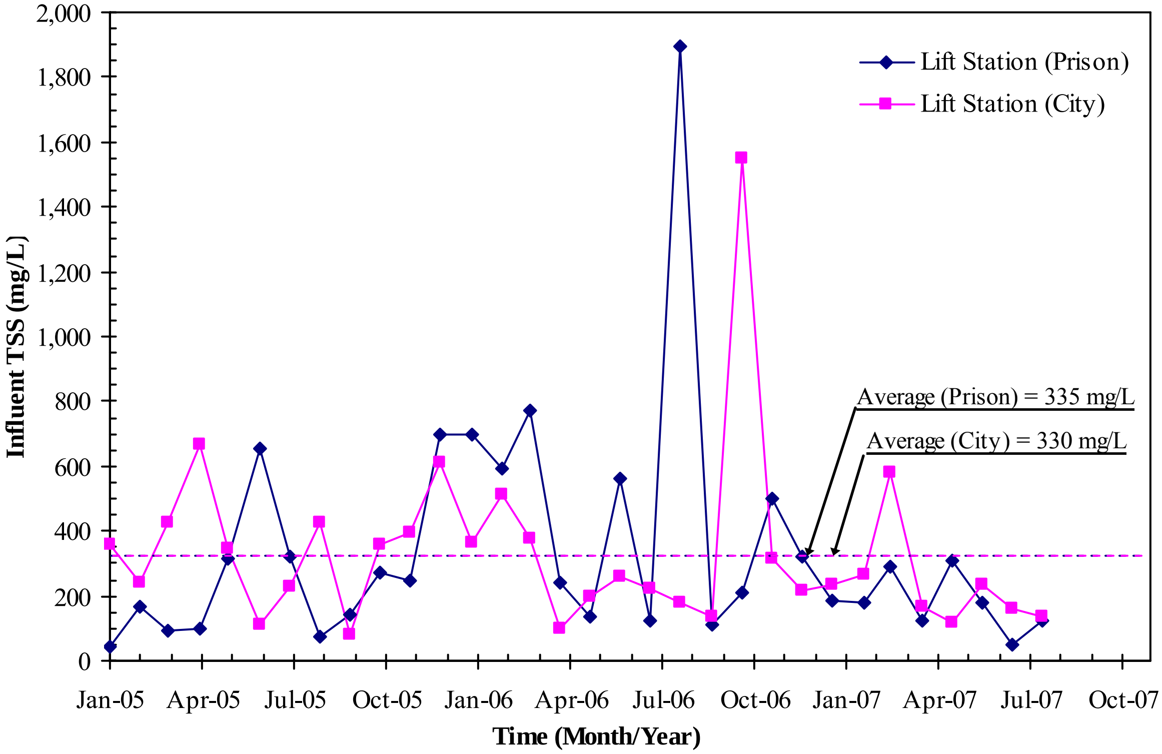

Figure 4.3: 2005-2007 the City and Calipatria State Prison Lift Stations BOD_5 Monitoring

4.2.2 Evaluation of Plant Effluent Monitoring Data

BOD_5 and TSS

Three years of secondary effluent monitoring data for January 2005 through August 2007 was analyzed to evaluate if the Calipatria WWTP complies with regulatory requirements. **Figure 4.4** presents the monthly average data for secondary effluent BOD_5 and TSS. Secondary effluent TSS averaged 21 mg/L for the last three years, while BOD_5 averaged 17 mg/L. The monthly average secondary effluent concentrations for both BOD_5 and TSS met the 45 mg/L discharge limit set by the California RWQCB, Colorado River Basin.

TDS and Hardness

Monthly average data for the secondary effluent total dissolved solids (TDS) and hardness are presented in **Figure 4.5**. The monthly average TDS concentrations for the last three years have varied from 900 to 1,900 mg/L, lower than the monthly average discharge limit (i.e., 4,000 mg/L). The secondary effluent TDS and hardness averaged 1,232 mg/L and 406 mg/L, respectively, for the last three years.

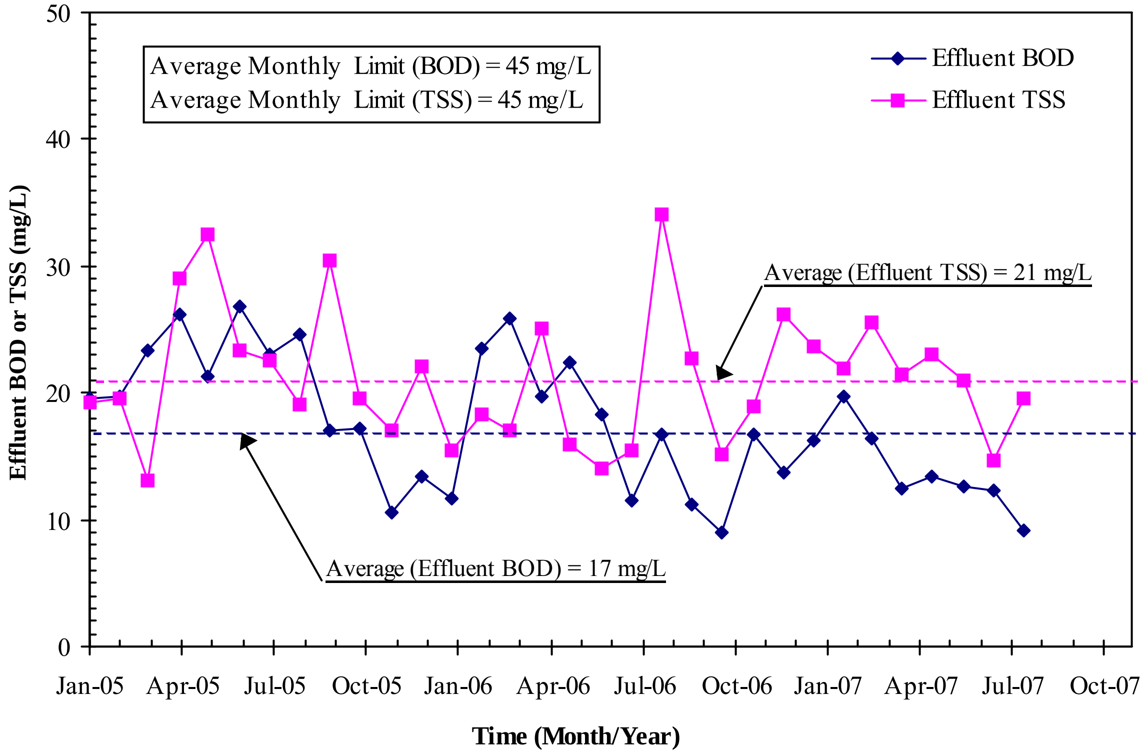

Figure 4.4: 2005-2007 Calipatria WWTP Effluent Monitoring for BOD$_5$ and TSS

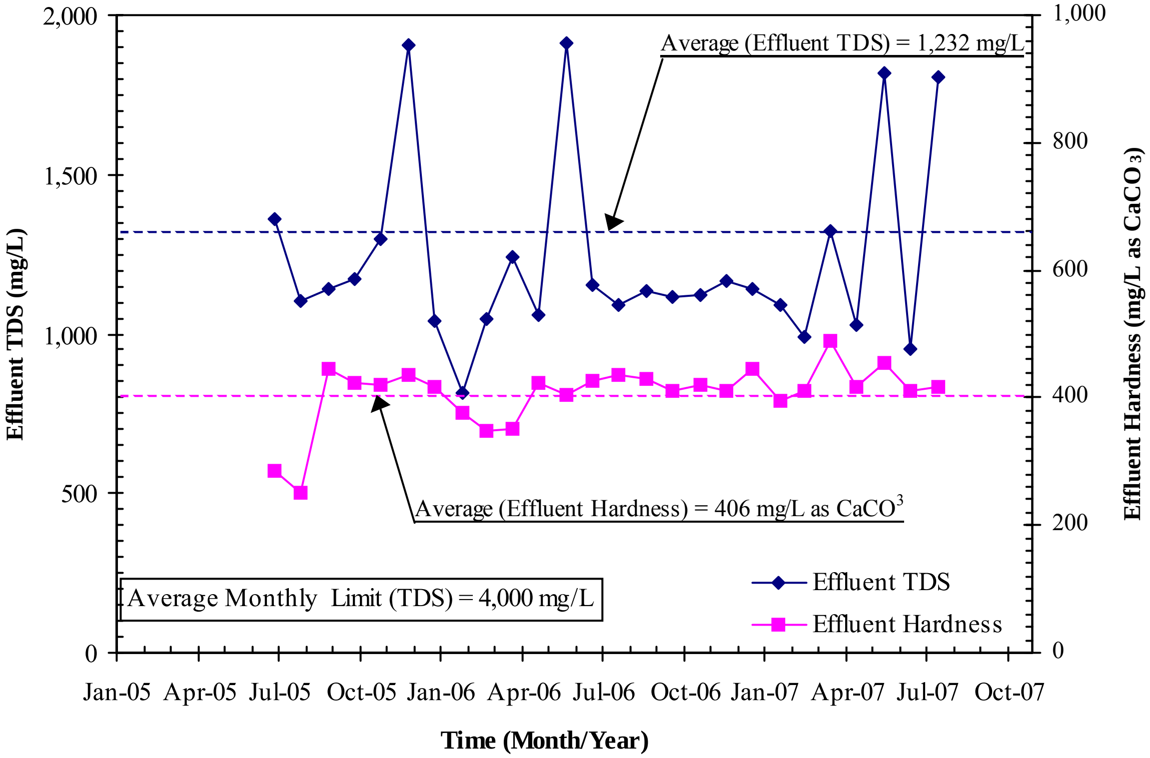

Figure 4.5: 2005-2007 Calipatria WWTP Effluent Monitoring for TDS and Hardness

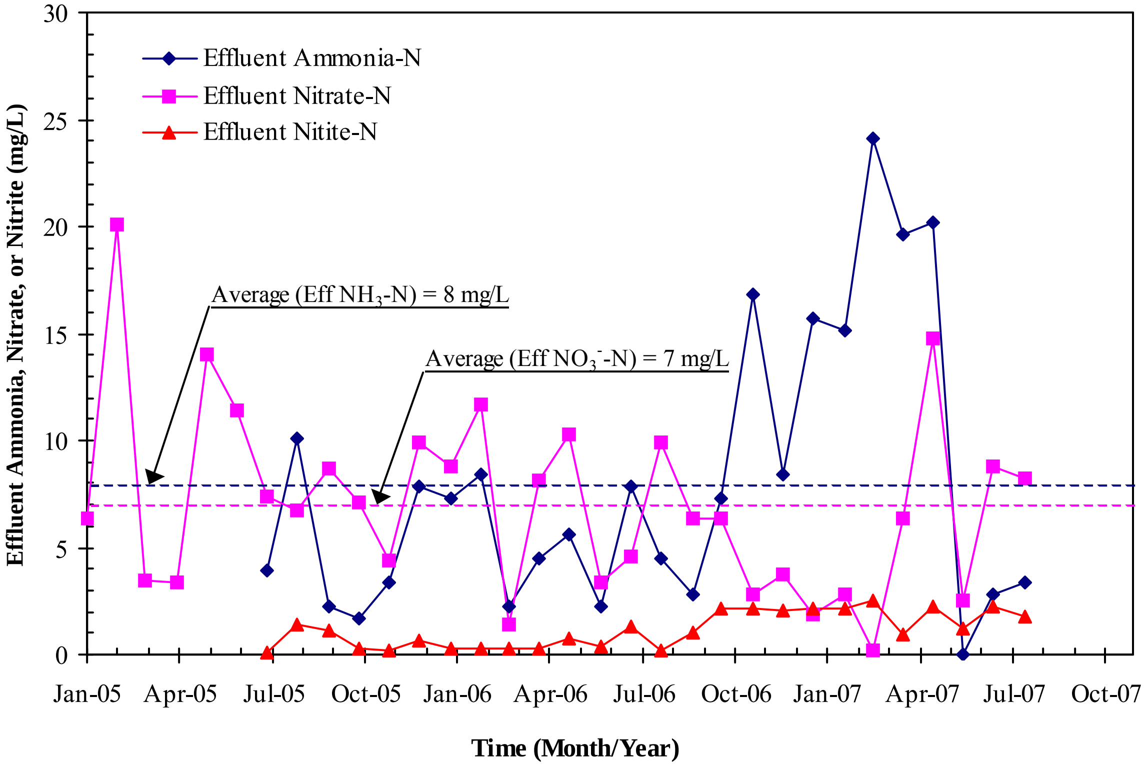

Figure 4.6: 2005-2007 Calipatria WWTP Effluent Monitoring for Ammonia, Nitrate, and Nitrite.

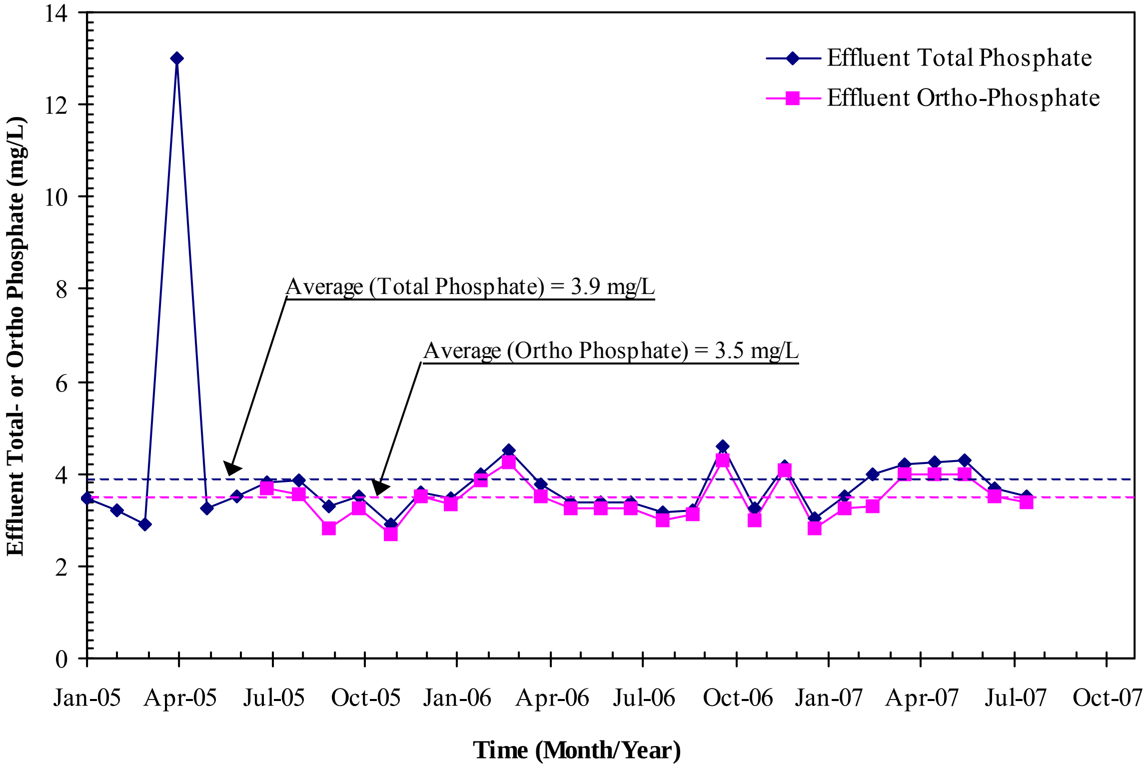

Figure 4.7: 2005-2007 Calipatria WWTP Effluent Monitoring for Phosphates

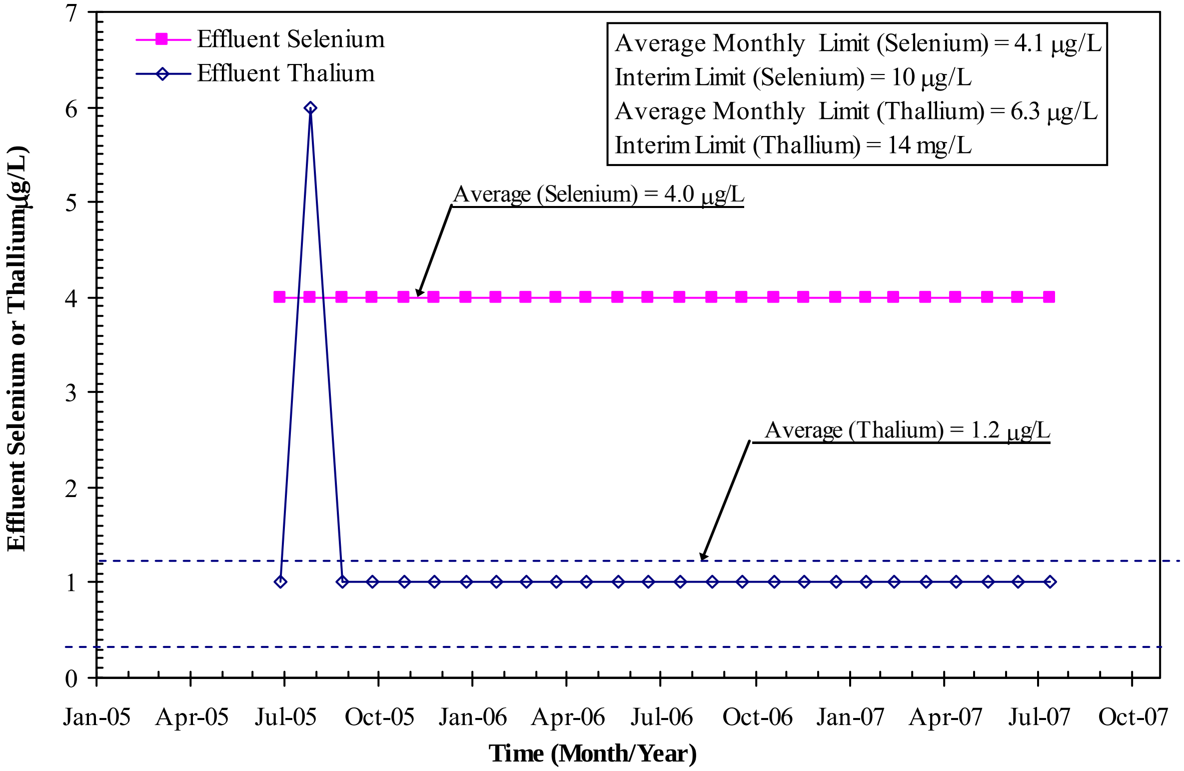

Figure 4.8: 2005-2007 Calipatria WWTP Effluent Monitoring for Selenium and Thallium

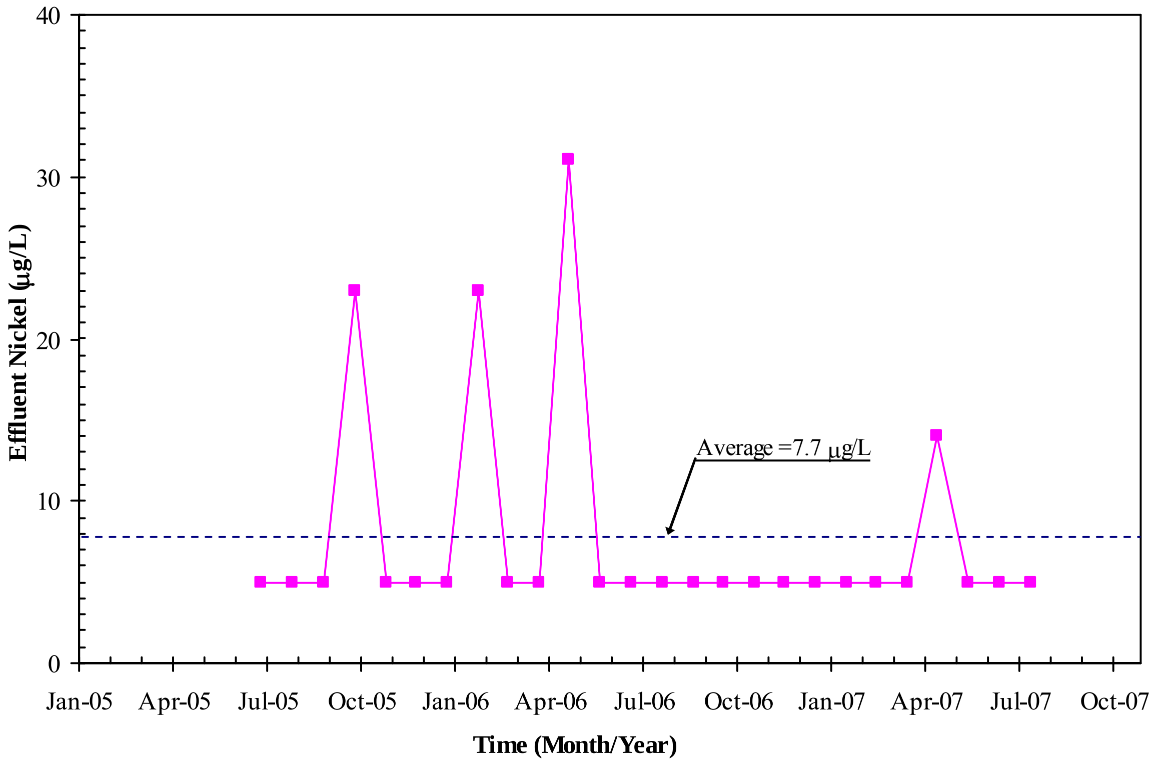

Figure 4.9: 2005-2007 Calipatria WWTP Effluent Monitoring for Nickel

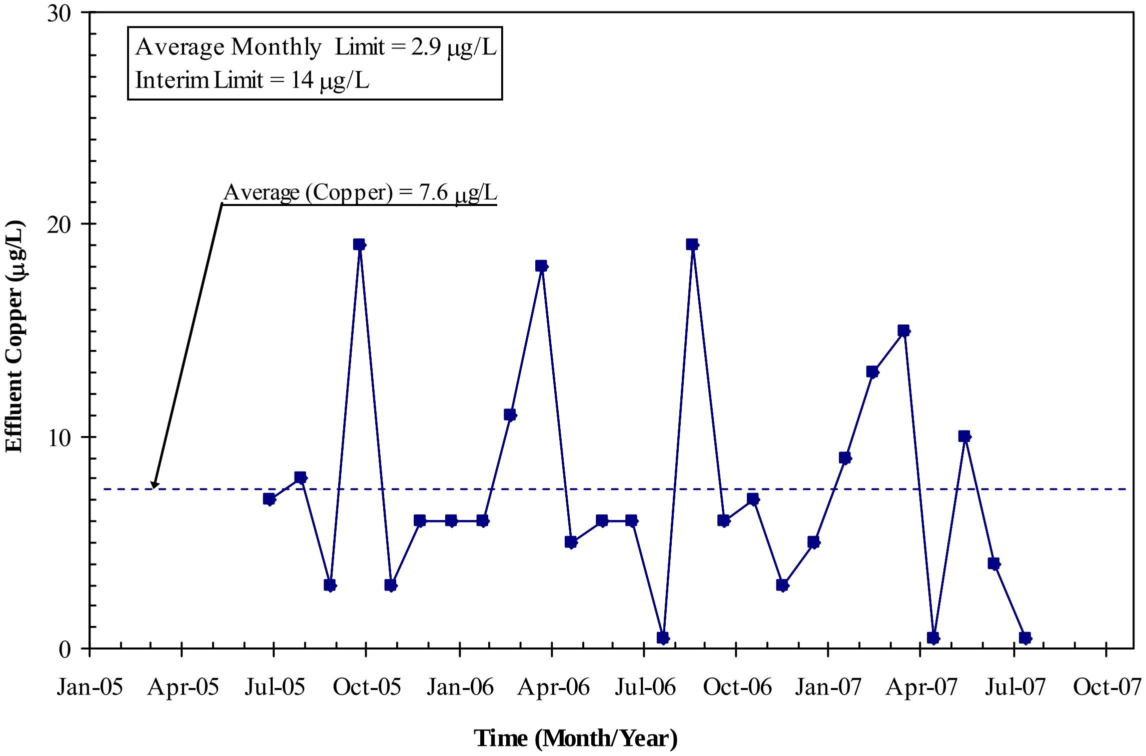

Figure 4.10: 2005-2007 Calipatria WWTP Effluent Monitoring for Copper

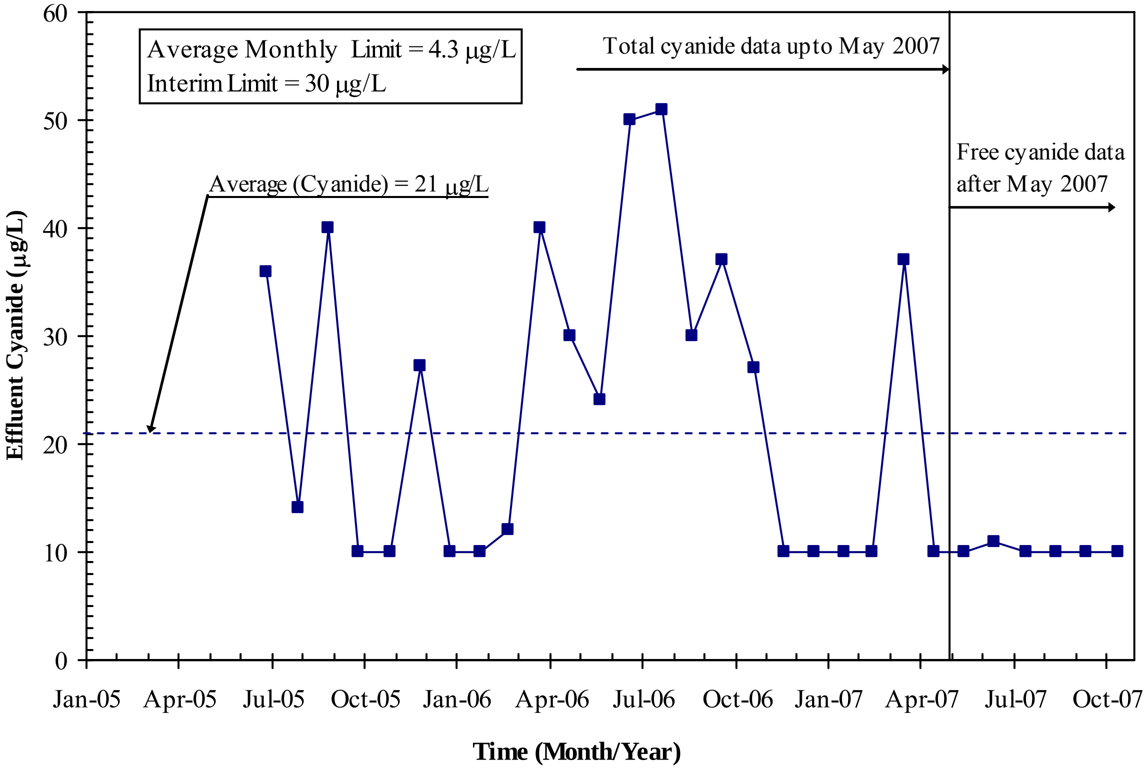

Figure 4.11: 2005-2007 Calipatria WWTP Effluent Monitoring for Cyanide

Ammonia, Nitrate, and Nitrite

Figure 4.6 presents monthly average secondary effluent concentration profiles for ammonia-N, nitrate-N, and nitrite-N. The data show that the secondary effluent ammonia-N concentration has varied from 2 to 24 mg/L (with an average of 8 mg/L) for the last 3 years. Given that facultative ponds are not very effective in oxidizing ammonia, the effluent ammonia concentration would be similar to the influent concentration. In this context, the ammonia-N concentration (~ 8mg/L) appears to be relatively low considering the fact that ammonia-N concentration in typical domestic wastewater ranges between 20 to 40 mg/L. Nitrate-N concentrations ranged from 1 to 20 mg/L, and averaged 7 mg/L. As shown in Figure 4.6, nitrate concentration tends to increase as ammonia concentration decreases. This suggests that some of ammonia has been oxidized to nitrate as temperature increased. Ammonia is not regulated by the current NPDES permit.

Phosphates

Monthly average data for the secondary effluent total phosphate and ortho-phosphate are presented in **Figure 4.7**. Secondary effluent total phosphate averaged 3.9 mg/L for the last three years, while ortho-phosphate averaged 3.5 mg/L. Total phosphorous concentration in typical domestic wastewater is about 7 mg/L as P (2 mg/L of organic-P and 5 mg/L of inorganic-P). The data presented in Figure 4.7 are within the range of typical secondary effluent phosphate concentrations. Phosphates are not regulated by the current NPDES permit.

Selenium and Thallium

The current NPDES permit specifies that the monthly average selenium and thallium concentration limits shall be 4.1 and 6.3 µg/L, respectively. The secondary effluent selenium and thallium data for the last three years is presented in **Figures 4.8.** Selenium was not detected in the secondary effluent for most of the time during the last three years. An interim effluent limitation of 10 µg/L was established for selenium based on the monthly monitoring data. Similarly, the secondary effluent thallium concentration on a monthly monitoring basis varied from non-detect (ND) to 6 µg/L (with an average of 1.2 µg/L), and an interim effluent limitation of 14 µg/L was established for selenium. The secondary effluent must meet these interim limits specified in the current NPDES permit from June 29, 2006 through June 29, 2010. The selenium and thallium data provided in Figure 4.8 demonstrates that the secondary effluent quality after June 2006 has met the interim effluent limitations.

Nickel and Copper

Figure 4.9 presents the secondary effluent nickel concentration. Since nickel was not detected in the secondary effluent for most of the time during the last three years, no limitation has been established for this parameter.

The current NPDES permit requires a monthly average copper concentration limit of 2.9 µg/L. The historic data shows that the secondary effluent copper concentration varied from ND to19 µg/L (with an average of 7.6 µg/L) for the last three years. An interim effluent limitation was established based on the highest observed levels in the effluent data. The secondary effluent must meet the copper interim limit specified in the current NPDES permit for the time period between June 2006 and June 2010. The interim discharge limitation is a monthly average of 14 µg/L. The ammonia data shown in **Figure 4.10** demonstrates that the reported copper concentrations for September 2006 (19 µg/L) and April 2007 (15 µg/L) exceeded the interim limit of 14 µg/L. The data values indicate that secondary effluent nickel concentration needs to be lowered to meet the current permit requirements upon the expiration of the interim limits, unless the NPDES permit for this parameter is changed in the upcoming regulation. It is anticipated that the method of reduction in these parameters shall be through reduced source emissions from the industrial waste streams feeding into the treatment plant (onsite source reduction at targeted industrial wastewater sources).

Cyanide

Data for total or free cyanide is presented in **Figure 4.11.** The secondary effluent cyanide concentration has varied from ND to 51 µg/L (with an average of 21 µg/L) for the last 3 years. The secondary effluent data for the year 2006 demonstrates that the reported cyanide concentrations for April (40 µg/L), July (50 µg/L), and October (37 µg/L) exceeded the interim limit of 30 µg/L. This year (2007), the monthly average secondary effluent cyanide values have met the interim discharge limit with the exception of only one exceedance in April. However, all of these violations up to May, 2007 were based on the "total cyanide" measurement. The commercial laboratory employed by the City of Calipatria measured "total cyanide" instead of "free cyanide". Furthermore, samples for cyanide measurement have been collected as 24-hour composite samples, and sample preservation using sodium hydroxide (to prevent the loss of free cyanide) was not carried out until August 2007. This suggests that the cyanides detected during this period were in the forms of metal-cyanide complexes, unless cyanide detection was a false positive bias during sample analysis.

Currently a strong hydroxide solution is added to a 24-hour composite sample at the time when samples are submitted to the commercial laboratory. However, sodium hydroxide solution needs to be added at the time of sampling, not at the time when samples are given to laboratory. Given that a 24-hour composite sample is a mixture of individual grab samples which are collected at regular intervals, each grab sample needs to be preserved with the preservation chemical to prevent the loss of free cyanide through volatilization.

The results of the accelerated testing for free cyanide will be discussed in more detail in later sections.

4.2.3 Summary of Plant Performance

Plant influent and effluent characteristics reviewed above and the effluent data are summarized in **Table 4.3** below.

Based on the analysis of the wastewater monitoring data, LEE & RO recommends that the City of Calipatria use the influent wastewater characteristics summarized in **Table 4.4** for the expansion or improvement of the existing plant in the future.

Table 4.3: Existing Plant Performance Data

Constituent	Average Values with 95% Confidence Interval[a]
Flow, Average, mgd	1.09 ± 0.06
Influent BOD_5 , mg/L	151 ± 52
Effluent BOD_5 , mg/L	17 ± 5
Influent TSS, mg/L	331 ± 207
Effluent TSS	21 ± 5
Effluent Ammonia, mg/L	8 ± 6
TDS, Daily, mg/L	1,232 ± 281
Effluent ammonia- Nitrogen, mg/L	19 ± 7
Effluent Copper, µg/L	7.5 ± 5.2
Effluent Cyanide, µg/L	18 ± 17

[a] average values with 95% confidence interval for the samples obtained every month for last 3 years

Table 4.4: Influent Wastewater Characteristics (Design Criteria for Plant Improvements)

Parameter	Average	Peak Factor	Peak Value
Design Flow, Average, mgd	1.09	1.8	2.00
Influent BOD_5, mg/L	151	1.7	250
TSS, mg/L	331	1.2	400
NH_3-N, mg/L	8	2.5	20

5. CYANIDE ANALYTICAL METHODS

Cyanide refers to all of the CN groups in cyanide compounds that can be determined as the cyanide ion (CN^-) by the methods used. The cyanide compounds in which cyanide can be obtained as cyanide ion are classed as simple and complex cyanides. In aqueous solution, the *simple cyanides* present as cyanide ion (CN^-) and hydrogen cyanide (HCN), the ratio depending on pH and the dissociation constant for hydrogen cyanide ($pK_a = 9.2$). *Complex cyanides* refer to weak and moderately strong metal-cyanide complexes of silver, cadmium, copper, mercury, nickel, and zinc, and the strong metal-cyanide complexes of iron. The toxicity of complex cyanides is primarily attributable to hydrogen cyanide released from the complex form. Analytical distinction between hydrogen cyanide and other cyanide species in solutions of complex cyanides is possible. The great toxicity of hydrogen cyanide is well known; it is formed in solutions of cyanides by hydrolytic reaction of cyanide ion with water. The toxicity of cyanide ion is less than that of hydrogen cyanide.

It is important to differentiate between *total cyanide* and *cyanides amenable to chlorination*. When total cyanide is determined, the almost non-dissociable cyanides, as well as cyanide bound in complexes of intermediate stability, are measured. Cyanide compounds that are amenable to chlorination include *free cyanide* (hydrogen cyanide and cyanide ion) as well as those complex cyanides that are potentially dissociable, almost wholly or in large degree, and therefore, potentially toxic at low concentrations, even in the dark. The chlorination test procedure is carried out under rigorous conditions appropriate for measurement of the more dissociable forms of cyanide. The free and potentially dissociable cyanides also may be estimated when using the *weak acid dissociable* procedure. These methods depend on a rigorous distillation, but the solution is only slightly acidified, and elimination of iron cyanides is insured by the earlier addition of precipitation chemicals to the distillation flask.

An important concern is the amount of free cyanide that is present in treated effluent, since free cyanide is the most toxic form to aquatic organisms. This is reflected in the NPDES permit where the discharge limits for free cyanide, not total cyanide. The distinction between total and free cyanide is important since the pollutants in treatment plant effluent are sometimes highly complexed. Currently, the best available analytical protocols and detection limits do not allow for direct measurement of free cyanide levels in treated effluent at levels that would provide answers to this question, so the RWQCB exercises a conservative assumption that all measured cyanide in effluent and in ambient waters is free cyanide.

5.1 Cyanide Analysis

Cyanide analysis is generally performed using the conventional acid distillation method. During the distillation step, hydrogen cyanide (HCN) gas is distilled and absorbed in sodium hydroxide solution. The absorption liquid is analyzed by a titrimetric (Method 4500-CN-D, Standard Methods 1995), colorimetric (Method 4500-CN-E, Standard Methods 1995), or cyanide ion selective electrode procedure (Method 4500-CN-F, Standard Methods 1995):

1. The titration method is suitable for cyanide concentration above 1 mg/L.
2. The colorimetric method is suitable for cyanide concentration to a lower limit of 5 to 20 µg/L.
3. The ion-selective electrode method is applicable in the concentration range of 0.05 to 10 mg/L.

Table 5.1 presents detection limits associated with different methodologies.

Table 5.1: Cyanide Detection Limits for Different Methodologies

Methodology	Detection Limit (μg/L)
Distillation, Spectrophotometric[1]	20
Distillation, Automated, Spectrophotometric[1]	5
Distillation, Amenable, Spectrophotometric[2]	20
Distillation, Selective Electrode[1,2]	50
UV, Distillation, Spectrophotometric[2]	0.5
Micro Distillation, Flow Injection Spectrophotometric[2]	0.6
Ligand Exchange with Amperometry[2]	0.5

[1] screening method for total cyanide
[2] measures free cyanide when distillation, digestion, or Ligand exchange is omitted.

5.1.1 Total Cyanide Analysis

Total cyanide analysis is generally performed using the conventional strong-acid distillation method (Method 4500-CN-C, Standard Methods 1995; EPA 335). After removal of interfering substances, the metal cyanide is converted to hydrogen cyanide gas, which is distilled and absorbed in sodium hydroxide solution. The absorption liquid is analyzed by a titrimetric, colorimetric, or cyanide ion selective electrode procedure.

5.1.2 Free Cyanide Analysis

Free cyanide analysis is generally performed using either (i) the cyanide amenable to chlorination (Method 4500-CN-G, Standard Methods 1995), (ii) weak acid dissociable cyanides (Method 4500-CN-I, Standard Methods 1995), or (iii) micro-diffusion in accordance with the American Society for Testing and Materials (ASTM, 1998).

Cyanide Amenable to Chlorination

Distillation of two samples is required, one that has been chlorinated to oxidize all amenable cyanide present and the other unchlorinated. Analyze absorption liquids from both tests for total cyanides. The observed difference equals cyanides amenable to chlorination.

Weak Acid Dissociable Cyanides

The weak acid dissociable (WAD) cyanides procedures also measure the cyanide amenable to chlorination by freeing HCN from the dissociable cyanide. Hydrogen cyanide is liberated from a slightly acidified (pH 4.5 to 6.0) sample under the prescribed distillation conditions. The method does not recover cyanide ion from tight complexes that would not amenable to oxidation by chlorine. After being collected in a sodium hydroxide absorption solution, cyanide ion may be determined by one of the three finishing procedures given for the total cyanide determination.

Micro-Diffusion Free Cyanide

Micro-diffusion free cyanide test methods (ASTM D4282-02) measure free cyanide in water and wastewater by micro-diffusion. Neither total cyanide nor WAD analytical methods provide specific information regarding the cyanide forms (e.g. free cyanide or metal-cyanide complexes) present in a sample. Both methods therefore overestimate, to an unknown degree, the toxic forms of cyanide by including relatively non-toxic iron-cyanide complexes and other less toxic metal-cyanide complexes.

5.1.3 Sample Handling and Preservation

Because most forms of cyanide are very reactive and unstable, it is necessary to analyze samples as soon as possible. If sample cannot be analyzed immediately, a strong caustic soda solution is added to raise pH to 12 to 12.5, and sample is stored in a closed, dark bottle in a cool place.

Oxidizing agents, such as chlorine, decompose most cyanide. The sample is tested for the presence of oxidizing agents with potassium iodide-starch test paper (KI-starch paper); a blue color indicates the need for sample pretreatment. Dechlorinating agent, such as ascorbic acid, sodium thiosulfate, sodium arsenite, is added a few crystals at a time until a drop of sample produces no color on the indicator paper. Then additional ascorbic acid, sodium arsenite, or sodium thiosulfate is added to quench residual chlorine.

Oxidized products of sulfide convert cyanide ion (CN^-) to thiocyanate (SCN^-) rapidly, especially at high pH. Lead acetate test paper previously moistened with acetic acid buffer solution, pH 4, is used to test for sulfide by placing a drop of sample on the test paper. Darkening of the paper indicates presence of sulfide. Lead sulfate is added and the test is repeated until a drop of treated sample no longer darkens the acidified lead acetate test paper. The sample is filtered before raising pH for stabilization. The sample is reconstituted by returning filtered particulates to the sample bottle after sulfide removal.

Aldehydes convert cyanide to cyanohydrin. Longer contact times between cyanide and the aldehydes and the higher ratios of aldehyde to cyanide both result in increasing losses of cyanide that are not reversible during analysis. If the presence of aldehydes is suspected, sample stabilization with caustic soda at time of collection is needed and 2 mL 3.5% ethylenediamine solution per 100 mL of sample is added.

5.1.4 Interferences

- ✓ Oxidizing agents, such as residual chlorine, monochloramine, and nitrate, can negatively bias results due to decomposition of cyanide.
- ✓ Sulfides adversely affect the colorimetric and titration procedures. Samples that contain hydrogen sulfide, metal sulfides or other compounds that may produce hydrogen sulfide, metal sulfides, or other compounds that may produce hydrogen sulfide during the distillation. The standard approach for its removal involves precipitation with lead carbonate and filtration. However, if the precipitated lead sulfide is not immediately removed from solution by filtration, it will catalyze the formation of thiocyanate.
- ✓ Fatty acids that distill and form soaps under alkaline titration conditions make the end point almost impossible to detect. Fatty acids are removed by extraction.
- ✓ Carbonate in high concentration may affect the distillation procedure by causing the violent release of carbon dioxide with excess foaming when acid is added before distillation and by

reducing pH of the absorption solution. Add calcium hydroxide to precipitate carbonate and decant supernatant for determining cyanide.

- ✓ Substances that might contribute color or turbidity may interfere with colorimetric determination of cyanide. In most cases, distillation will remove these substances.
- ✓ Aldehydes convert cyanide to cyanohydrin, which forms nitrile under the distillation conditions. Only direct titration without distillation can be used when aldehydes are present, which reveals only non-complex cyanides.
- ✓ Glucose and other sugars, especially at the pH of preservation, lead to cyanohydrin formation by reaction of cyanide with aldose. Cyanohydrin must be reduced to cyanide with ethylenediamine.
- ✓ Nitrite may form hydrogen cyanide during distillation by reacting with organic compounds. Also nitrate may reduce to nitrite. To avoid nitrite interference, add sulfamic acid to the sample before distillation. Nitrate also may interfere by reacting with SCN^-.
- ✓ Some sulfur compounds may decompose during distillation, releasing sulfide, hydrogen sulfide, or sulfur dioxide. Sulfur compounds may convert cyanide to thiocyanate and also may interfere with the analytical procedures for cyanide ion. To avoid this potential interference, add lead carbonate to the absorption solution before distillation. The sample needs to be filtered before proceeding with colorimetric or titrimetric determination.

It appears that nitrite, nitrate, and glucose can positively bias the results, whereas oxidizing agents, sulfides, aldehydes, and sulfur compounds may cause underestimation of the cyanide concentration.

5.2 Cyanogen Chloride

Cyanogen chloride ($CNCl$) is the first reaction product when cyanide compounds are chlorinated. It is a volatile gas, only slightly soluble in water, but highly toxic even in low concentrations. Because cyanogen chloride hydrolyzes to cyanate (CNO^-) at a pH of 12 or more, a sample for cyanogen chloride is collected separately in a closed container without sodium hydroxide. A quick test with a spot plate or comparator as soon as the sample is collected may be the only procedure for avoiding hydrolysis of cyanogen chloride due to time lapse between sampling and analysis.

5.3 Thiocyanate

When water containing thiocyanate (SCN^-) is chlorinated, highly toxic cyanogen chloride is formed. An acidic pH, ferric ion and thiocyanate form an intense red color suitable for colorimetric determination. Oxidative decomposition of thiocyanate using chlorine can also produce free cyanide, and cyanide formation from thiocyanate is dependant on chlorination levels. Cyanide ion can only be detected in thiocyanate solution after chlorination in which the chlorine dose or reaction time was not sufficient to destroy thiocyanate completely, thus ensuring no residual chlorine to destroy any cyanide produced.

6. CYANIDE SOURCE IDENTIFICATION

This section deals with the review of the City's action taken to determine the origins of the cyanide in their effluent, analysis of potential cyanide sources, and cyanide formation through the treatment process.

6.1 Cyanide in Municipal Influent

In an attempt to determine the origins of the cyanide in its effluent, the City of Calipatria conducted preliminary source identification studies. The City Lift Station and the Prison Lift Station were monitored over a 3-week period in March, 2007 **(Table 6.1)**. During that study, cyanide was never detected in the collection system above detection limits (i.e., 10 µg/L).

Table 6.1: Results of Cyanide Source Identification Studies

Sampling Date	Cyanide (µg/L) Plant Effluent	Cyanide (µg/L) City Lift Station	Cyanide (µg/L) Prison Lift Station	Cyanide (µg/L) Auto Body Shop
3/7/2007	12	ND	ND	ND
3/14/2007	6			
3/17/2007	12	ND	ND	
3/21/2007	0.03			

ND: Not detected (below the detection limit), Detection limit for cyanide: 10 µg/L

In general, cyanide may originate from industrial activities, such as metal plating, steel production, mining operations, or photographic finishing facilities. Other commercial or industrial operations that may utilize or discharge cyanide include metal finishing, electroplating, hospitals, manufacturing, chemical laboratories, and chemical manufacturing facilities. According to previous cyanide studies, nonetheless, these sources have been considered insignificant based on mass balance calculations that demonstrate their relative contributions to wastewater treatment plant influent. A study performed for the Sacramento Regional County Sanitation District detected cyanide in 5% of residential wastewater samples taken, suggesting that residential wastewater is a minor source of cyanide loading (Malcolm Pirnie 2003). Formation of cyanide in the collection system as a result of chemical treatments or maintenance activities is also a possible source of cyanide in influent.

Among the commercial or industrial users connected to the City's sewer connection system presented in Table 3.1, only one business (auto body shop) was suspected by the City of Calipatria as a potential cyanide source. However, additional monitoring of the auto body shop discharge into the sewer also resulted in no detected values of cyanide (Table 6.1). The detection of cyanide in plant effluent above detection limits can be suggestive of in-plant cyanide formation through municipal wastewater treatment processes, unless the cyanide detection was false positive bias during sample analysis by the commercial laboratory employed by the City of Calipatria.

6.2 Cyanide Formation in Wastewater Treatment

The result of cyanide accelerated testing as a means of cyanide source identification is presented in **Table 6.2**. Cyanide was never detected in the lift stations above detection limits; however, cyanide was detected in the samples taken at Pond 3, Pond 4, secondary effluent prior to sodium hypochlorite injection (i.e., prior to chlorination), and plant effluent (i.e., downstream of sodium metabisulfite injection). According to Table 6.2, it appears that cyanide is generated during wastewater treatment, unless significant interference produced false positive bias during sample analysis.

In general, cyanide, cyanide precursors, and cyanide complexes can undergo various transformations during the wastewater treatment process for municipal and industrial dischargers. Chlorination, UV disinfection, and incinerator scrubber return flows have been implicated as sources of cyanide formation during wastewater treatment and sources of cyanide detected in effluent (Zheng *et al.*, 2004a; Zheng *et al.*, 2004b; Malcolm Pirnie 2003). In-plant cyanide formation is not limited to POTWs; any discharger that disinfects or incinerates may produce cyanide in their effluent.

Table 6.2: Cyanide Accelerated Testing

Sampling Time	Cyanide Analysis	City Lift Station	Prison Lift Station	Pond 3	Pond 4	Prior to Chlorination	Plant Effluent
03/07/07	Total Cyanide Data (w/o NaOH preservation)	ND	ND				12
03/14/07							6
03/17/07		ND	ND				12
03/21/07							ND
03/24/07						**39**	
03/26/07						**30**	
03/28/07						**38**	**47**
04/04/07						ND	**45**
04/11/07					**40**	**42**	**30**
04/18/07							**37**
04/25/07					**70**	**56**	**68**
05/02/07							**52**
05/09/07		ND	ND			ND	**90**
05/16/07						**59**	**76**
05/18/07	Free Cyanide Data (w/o NaOH preservation)			19	22		
05/23/07				ND	ND		**38**
05/30/07					ND		ND
06/06/07				ND			ND
06/13/07		ND	ND				ND
06/20/07						ND	ND
06/28/07						ND	**42**
07/03/07						**41**	**47**
07/11/07						27	11
07/18/07						**47**	**65**
08/01/07						**51**	ND
08/08/07		ND	ND				ND
08/15/07							13
08/22/07						**51**	**35**

Sampling Time	Cyanide Analysis	City Lift Station	Prison Lift Station	Pond 3	Pond 4	Prior to Chlorination	Plant Effluent
08/29/07	Free Cyanide Data (w/ NaOH preservation)					ND	ND
09/05/07							ND
09/19/07		ND	ND			**53**	ND
09/26/07							ND
10/03/07							ND
10/10/07		ND	ND				ND
10/17/07							ND
10/24/07							ND
11/14/07							ND

ND: Not detected (below the detection limit), Detection limit for cyanide: 10 μg/L

6.2.1 Chlorination

Chlorination is the first process to be identified as causing formation of cyanide within treatment plants. Oxidative decomposition of thiocyanate using chlorine can produce free cyanide. Thiocyanate (SCN^-) is known to be used or generated in various industrial processes, including photo finishing, coke gasification, herbicide and insecticide production, ore mining processes, and dyeing and electroplating (Zheng *et al.*, 2004a). Zheng *et al.* (2004a; 2004c) showed cyanide formation from thiocyanate to be dependant on chlorination levels. Zheng *et al.*'s (2004a) results indicated that cyanide ion (CN^-) was detected in thiocyanate solution after chlorination in which the chlorine dose or reaction time was not sufficient to destroy thiocyanate completely, thus ensuring no residual chlorine to destroy any cyanide produced.

Although available information on cyanide formation by UV disinfection is very limited, previous studies have shown that switching from chlorination to UV could reduce cyanide effluent levels. However, the ability to provide reliable projections of effluent cyanide concentrations from UV disinfection is still uncertain, given the lack of full scale operating experience over a range of treatment facilities.

6.2.2 Nitrosation

Monthly monitoring data presented in Figure 4.6 shows that nitrite is consistently detected in the plant effluent. The data shows that the secondary effluent nitrite-N concentration has varied from 0.14 to 2.51 mg/L (with an average of 1.2 mg/L) for the last 3 years. Nitrosation of organic compounds, which involves the reaction with nitrite (NO_2^-) has been shown to produce cyanide under some conditions. The protonated form (HNO_2) has been shown to be the primary reactive species, with nitrite being almost non-reactive. This suggests that the potential for nitrosation to form cyanide in neutral to high pH wastewater effluent is negligible.

While nitrosation may not occur in the treatment process due to pH, the most commonly used total cyanide analytical method utilizes strong acidic conditions and high temperature, which greatly favors the nitrosation process. Procedures specified in Standard Methods (1995) accounts for this potential through the addition of sulfamic acid in the sample preparation to remove nitrite (Zheng *et al.*, 2004d). Reaction of nitrite species with organics to form cyanide may also occur during the distillation step of cyanide analysis. Sample pretreatment with sulfamic acid at the time of sampling, not at the time of analysis, has been recommended by Zheng *et al.* (2004d).

6.2.3 Nitrate as an Oxidizing Agent on Thiocyanate

Nitrate-N concentrations in the Calipatria WWTP effluent ranged from 1 to 20 mg/L, and averaged 7 mg/L (Figure 4.6). Incomplete nitrification (conversion of ammonia to nitrate) can result in excess nitrite in the wastewater effluent, leaving the potential for nitrosation to occur. It has been observed that cyanide formation occurs the most during the summer months when a plant is fully nitrifying (Zheng *et al.*, 2004b). Nitrate can also act as an oxidizing agent on thiocyanate, forming free cyanide.

7. ADDITIONAL CYANIDE SAMPLING AND ANALYSIS

This section discusses the results of additional sample analysis to further identify cyanide sources. The validity of the laboratory data is tested by splitting samples to several independent laboratories certified by the State of California.

7.1 Analysis of Cyanide Data

The results of accelerated cyanide sampling and analysis are presented in **Table 7.1**. The data from March 7 to May 16, 2007 is the results of total cyanide measurement without sample preservation with sodium hydroxide. As previously mentioned, strong sodium hydroxide solution needs to be added to raise sample pH to 12 to avoid the loss of hydrogen cyanide (HCN), unless the sample is analyzed within 15 minutes. Nonetheless, cyanide has been detected without sample preservation for the most of samples taken at the secondary effluent prior to chlorination and plant effluent during this period. This suggests that the detected cyanides were in the form of metal-cyanide complexes, unless the cyanide detection was a false positive bias during sample analysis. However, free cyanide was detected for the secondary effluent and plant effluent samples taken from May 18 to August 22, 2007 without sample preservation to raise the pH. This indicates that the cyanide detection was a false positive bias during sample analysis because it is impossible to detect free cyanide without sample preservation using a sodium hydroxide solution.

ATS Lab is the commercial laboratory employed by the City of Calipatria, and some of the samples given to ATS Lab are sent to D-Tek Analytical to analyze for cyanide. It is interesting to note that the cyanide was not detected (with only one exception for the sample taken on September 19) for the secondary and plant effluent samples taken from August 29 to November 15, 2007 with sample preservation to raise pH. Cyanide concentration, if present, is supposed to increase with sample preservation; however, cyanide was not detected with sample preservation using a strong sodium hydroxide solution. This result raised the necessity to test the validity of the cyanide data provided by D-Tek analytical. In this regard, the City of Calipatria started to split the samples to two independent laboratories, D-Tek Analytical and Sierra Analytical Labs, Inc. as of August 29, 2007 (Table 7.1). The results show that cyanide was not detected for any samples analyzed by Sierra Analytical Labs, Inc. This suggests that cyanide non-compliance problem may have been caused by inadequate testing procedures for cyanide analysis by D-Tek Analytical; there is a possibility that the presence of interferences as a result of inadequate sample handling, preservation and/or analytical methods produced false positives.

Cyanide measurements for both D-Tek Analytical and Sierra Analytical Labs, Inc. are based on either total cyanide or amenable cyanide measurements using Standard Methods 4500-CN or EPA Method 335. Standard operating procedures and protocols for cyanide analysis used by these laboratories are presented in **Appendix II**.

Table 7.1: Cyanide Analysis Results from D-Tek Analytical and Sierra Analytical Inc.

Date	Cyanide Analysis	City Lift Station		Prison Lift Station		Prior to Chlorination		Plant Effluent	
		D-Tek	Sierra	D-Tek	Sierra	D-Tek	Sierra	D-Tek	Sierra
03/07/07	Total Cyanide Data (w/o NaOH preservation)	ND		ND				12	
03/14/07								6	
03/17/07		ND		ND				12	
03/21/07								ND	
03/24/07						**39**			
03/26/07						**30**			
03/28/07						**38**		**47**	
04/04/07						ND		**45**	
04/11/07						**42**		**30**	
04/18/07								**37**	
04/25/07						**56**		**68**	
05/02/07								**52**	
05/09/07		ND		ND		ND		**90**	
05/16/07						**59**		**76**	
05/18/07	Free Cyanide Data (w/o NaOH preservation)								
05/23/07								**38**	
05/30/07								ND	
06/06/07								ND	
06/13/07		ND		ND				ND	
06/20/07						ND		ND	
06/28/07						ND		**42**	
07/03/07						**41**		**47**	
07/11/07						27		11	
07/18/07						**47**		**65**	
08/01/07						**51**		ND	
08/08/07		ND		ND				ND	
08/15/07								13	
08/22/07						**51**		**35**	
08/29/07	Free Cyanide Data (w/ NaOH preservation)					ND		ND	
09/05/07							ND	ND	
09/12/07							ND		ND
09/19/07		ND	ND	ND	ND	**53**	ND	ND	ND
09/26/07							ND	ND	ND
10/03/07								ND	ND
10/10/07		ND		ND				ND	ND
10/17/07								ND	ND
10/24/07								ND	
11/07/07								ND	
11/14/07								ND	
11/15/07			ND		ND		ND	ND	ND

ND: Not detected (below the detection limit), Detection limit for cyanide: 10 µg/L
D-Tek: D-Tek Analytical
Sierra: Sierra Analytical Laboratories, Inc.,

7.2 Analysis of Free Cyanide, Thiocyanate, and Cyanogen Chloride Data

In an attempt to further test the validity of experimental data provided by commercial laboratories, samples were split to four independent state approved laboratories including (i) D-Tek Analytical, (ii) Sierra Analytical Labs, Inc., (iii) Associated Laboratories, and (iv) Truesdail Laboratories, Inc. Samples were taken at the City Lift Station, the Prison Lift Stations, secondary effluent prior to chlorination, and plant effluent after dechlorination on September, 19 and November 15, 2007. Analysis results obtained from four different commercial laboratories are presented in **Table 7.3** and **Table 7.4**. The analyses of the laboratory data, as well as the validity of the existing data, are discussed in more detail in the following sections. Operating procedures and protocols used to analyze for free cyanide used by these commercial laboratories are presented in **Appendix II**.

Table 7.2: Analysis Results for the Samples Taken on 9/19/2007

Item	City Lift Station			Prison Lift Station			Prior to Chlorination			Plant Effluent		
	D-Tek	Sierra	Assoc	D-Tek	Sierra	Assoc	D-Tek	Sierra	Assoc	D-Tek	Sierra	Assoc
Cyanide	ND	ND	ND	ND	ND	ND	53	ND	ND	ND	ND	ND
SCN^-			ND			ND			ND			ND
CNCl			39			35			50			38

Detection limit for cyanide: 10 μg/L; Detection limit for SCN^-: 50 μg/L; Detection limit for CNCl: 20 μg/L
D-Tek: D-Tek Analytical
Sierra: Sierra Analytical Laboratories, Inc.,
Assoc: Associated Laboratories

Table 7.3: Analysis Results for the Samples Taken on 11/15/2007

Item	City Lift Station			Prison Lift Station			Prior to Chlorination			Plant Effluent		
	D-Tek	Sierra	Trues	D-Tek	Sierra	Trues	D-Tek	Sierra	Trues	D-Tek	Sierra	Trues
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SCN^-			90			ND			ND			ND
CNCl			ND			ND			ND			ND

Detection limit for cyanide: 10 μg/L; Detection limit for SCN^-: 50 μg/L; Detection limit for CNCl: 20 μg/L
D-Tek: D-Tek Analytical
Sierra: Sierra Analytical Laboratories, Inc.,
Trues: Truesdail Laboratories, Inc.

7.2.1 Free Cyanide

Free cyanide data for the samples taken at the lift stations and various points in the Calipatria WWTP are presented in Table 7.2 and Table 7.3. Free cyanide was never detected in influent and effluent above detection limits based on the analysis data provided by Sierra Analytical Labs, Inc., Associated Laboratories, and Truesdail Laboratories, Inc. However, data provided by D-Tek Analytical shows 53 μg/L of free cyanide for the samples taken at the secondary effluent prior to chlorination. This result further supports the false positive cyanide measurements performed by D-Tek Analytical. Given that identical sampling procedures have been used for all the samples split to different laboratories, the false positive measurements seems to have been caused by either sample preservation or analytical methods used by D-Tek Analytical.

Historical weekly monitoring data presented in Table 7.1 demonstrates that false positive cyanide measurements occur the most during the summer months when the Calipatria WWTP is nitrifying (Figure 4.6). This may suggest that cyanide has been formed through the reaction between nitrite species and organics (i.e., nitrosation) during the distillation step of cyanide analyses. Nitrate can also act as an oxidizing agent on thiocyanate (SCN^-), to form free cyanide. However, thiocyanate was not detected for that specific sample that exhibited false positive cyanide measurement, suggesting nitrosation might be a potential mechanism associated with the false positive cyanide measurements conducted by D-Tek Analytical.

Zheng *et al*. (2004) also have found that (i) thiocyanate in combination with nitrate and (ii) nitrite in combination with specific trace organic compounds (aromatics such as phenol and benzoic acid) can produce cyanide during total cyanide analysis that biases cyanide measurements upward. These researchers recommended sufficient addition of sulfamic acid at the time of sampling to avoid upward-biased cyanide results as a result of nitrite/organics reactions.

7.2.2 Thiocyanate

Thiocyanate, a linear, electronegative, polyatomic ion, is a cyanogen compound commonly encountered in municipal wastewater (Hung and Pavlostathis, 1997). Chlorination of thiocyanate can be an important mechanism for the formation of cyanide in wastewater treatment. Therefore, thiocyanate (SCN^-) present in the secondary effluent can be a potential precursor of cyanide in plant effluent according to the following chemical reactions.

$$SCN^- + Cl_2 \text{ (oxidizing agent)} \rightarrow \text{Free Cyanide } (HCN \text{ or } CN^-)$$

$$SCN^- + NO_3^- \text{ (oxidizing agent)} \rightarrow \text{Free Cyanide } (HCN \text{ or } CN^-)$$

In this study, thiocyanate (SCN^-) was also analyzed for all samples that were split to four independent commercial laboratories, in order to further investigate in-plant cyanide formation through wastewater treatment processes (i.e., oxidation of thiocyanate using chlorine or nitrate). The thiocyanate data presented in Table 7.2 and Table 7.3 shows thiocyanate was not detected beyond detection limit (i.e., 50 μg/L) for the all samples except for the one taken at City Lift Station on November 15, 2007. Nonetheless, no thiocyanate was detected for the samples taken at the secondary effluent prior to chlorination on the same date, thus suggesting that thiocyanate was biodegraded during the secondary processes. This is consistent with previous studies (Banerjee, 1996; Hung and Pavlostathis, 1997), wherein elevated levels of thiocyanate in raw wastewater were reduced significantly in the secondary process, indicating that thiocyanate is biodegradable.

In summary, the absence of thiocyanate in the secondary effluent further supports that there is no in-plant cyanide formation through wastewater treatment processes in the case of the Calipatria WWTP. This finding confirms that the detections of cyanide beyond detection limit were attributable to false positive cyanide measurement.

Approximately 1-6% of the thiocyanate is converted to cyanide during chlorination of the secondary effluent (Zheng *et al*., 2004a). Therefore, the presence of thiocyanate in the secondary effluent lower than detection limit (i.e., 50 μg/L) will not generate free cyanide (i.e., 3 μg/L based on maximum 6% conversion) large enough to exceed NPDES limitation (i.e., 4.3 μg/L).

7.2.3 Cyanogen Chloride

Cyanogen chloride (CNCl) is always the first-step product of the chlorination of cyanide, which occurs instantly at all pH values.

$$CN^- + Cl_2 \rightarrow CNCl + Cl^-$$

In alkaline solutions with pH > 10, cyanogen chloride may continuously undergo hydrolysis to form less toxic cyanate (CNO^-), which is unlikely to occur under typical wastewater pH conditions. Therefore, comparing cyanogen chloride concentration before and after chlorination will provide information on the amount of oxidized cyanide. In other words, increase in cyanogen chloride concentration after chlorination indicates the presence of cyanide in the secondary effluent.

The cyanogen chloride data presented in Table 7.2 shows a decrease in cyanogen chloride concentration after chlorination. Similarly, cyanogen chloride was never detected beyond the detection limit (20 μg/L) at various points in the Calipatria WWTP according to the data presented in Table 7.3. This result further supports the fact that there is no cyanide present in the secondary effluent. Cyanide generated in-plant through the municipal wastewater treatment process will eventually be converted to cyanogen chloride unless the chlorine dose or reaction time is not sufficient to oxidize thiocyanate to cyanogen chloride. Therefore, no cyanogen chloride present in the plant effluent further supports our finding in previous sections that there is no in-plant cyanide formation through treatment processes at the Calipatria WWTP.

7.3 Cyanide Formation During Sample Preservation

Some uncertainties have been identified regarding interferences that may affect the cyanide concentration data using Standard Methods. In its special study, the City of San Jose reported that the addition of sodium hydroxide as a preservative to bring de-chlorinated tertiary effluent samples up to pH 12 prior to cyanide analysis (in accordance with Standard Method 4500-CN-E) resulted in increased total cyanide measurements. In a controlled experiment by San Jose where flasks were sealed to prevent the loss of cyanide, samples with sodium hydroxide preservative added to pH 12 exhibited a 75 percent increase in measured cyanide concentration (2.1 μg/L versus 1.2 μg/L) as compared to unpreserved samples (City of San Jose, 2004). Similar results were observed by the County Sanitation Districts of Los Angeles County (Khoury *et al*, 2005), who found that unpreserved sample concentrations were less than a reporting limit of 5 μg/l in all samples, whereas samples preserved to pH 12 were above 5 μg/L in 18 percent of the samples where thiosulfate was used as a de-chlorinating agent and in 97 percent of the samples where arsenite was used to as the de-chlorinating agent. Others have found that use of ascorbic acid as a dechlorination compound has caused an upward bias in cyanide measurements.

Attempts were made to determine if the samples taken from the Calipatria WWTP contain the precursors that will undergo base catalyzed reactions to form cyanide. Duplicate samples bottles (with and without sodium hydroxide preservative) were prepared for each sample. The results (**Table 7.4**) shows all ND for the all samples regardless of sodium hydroxide addition as sample preservative. This suggests that samples from the Calipatria WWTP do not contain amino acids such as glycine to form cyanide under basic conditions.

Table 7.4: The Influence of Sodium Hydroxide Addition as Sample Preservative on Cyanide Measurement[a]

Sample ID	Free Cyanide without NaOH preservation	Free Cyanide with NaOH preservation
City Lift Station	ND	ND
Prison Lift Station	ND	ND
Prior to Chlorination	ND	ND
After Dechlorination	ND	ND

[a] Analyzed by Associated Laboratories

As mentioned in previous sections, cyanide formation through the reaction between nitrite species and organics (i.e., nitrosation) during the distillation step of cyanide analyses might be a potential cause of false positive cyanide measurement. In order to accounts for this potential, Standard Methods (1995) specifies the addition of sulfamic acid prior to the distillation step of cyanide analysis. On the other hand, Zheng *et al.* (2004d) recommended adding sulfamic acid at the time of sampling, not at the time of analysis. In this study, the influence of the time of sulfamic acid addition on the cyanide analysis was investigated (**Table 7.5**). The result shows all ND for all samples regardless of the time of sulfamic acid addition. Cyanide measurement of the samples taken at the Calipatria WWTP was not influenced by the time of sulfamic acid addition.

Table 7.5: The Influence of Time of Sulfamic Acid Addition on Cyanide Measurement

Sample ID	Addition of sulfamic acid at the time of sampling	Addition of sulfamic acid at the time before distillation	
	Assoc	Sierra	Trues.
City Lift Station	ND	ND	ND
Prison Lift Station	ND	ND	ND
Prior to Chlorination	ND	ND	ND
After Dechlorination	ND	ND	ND

Assoc: Associated Laboratories
Sierra: Sierra Analytical Laboratories, Inc.
Trues: Truesdail Laboratories, Inc.

8. SUMMARY AND RECOMMENDATION

This section summarizes the analysis of previous cyanide data and the results of additional sampling and analysis, and recommends the action to be taken by the City of Calipatria.

8.1 Summary

The cyanide compliance problem for Calipatria WWTP was investigated through a systematic approach of combining experimental data acquisitions with literature review. LEE & RO was not able to identify external cyanide source, and no in-plant cyanide formation was observed in the Calipatria WWTP. Based on the review of existing monitoring data and the results obtained from the additional sampling and analysis, the cyanide non-compliance problem seems to have been caused by inadequate and inappropriate testing procedures for cyanide analysis by the commercial laboratory employed by the City of Calipatria. The following findings further support the false positive cyanide measurements conducted by the contract laboratory.

- Free cyanide is regulated by the current NPDES permit. However, the City's cyanide monitoring data until 5/16/07 was based on total cyanide measurements. Furthermore, during this period, no sample preservation using sodium hydroxide has been carried out prior to the total cyanide analysis. This suggests that the detected cyanides were in the forms of metal-cyanide complexes, unless cyanide detection was a false positive bias during sample analysis by the commercial laboratory employed by the City of Calipatria.

- It is impossible to detect free cyanide without sample preservation with sodium hydroxide because hydrogen cyanide (HCN) volatilizes from the sample under typical wastewater pH condition. However, the City's historical data showed free cyanide detection without sample preservation. This clearly demonstrates that the cyanide detection was a false positive bias during sample analysis by the commercial laboratory employed by the City of Calipatria.

- Samples taken at the influent and effluent of the Calipatria WWTP were split to four independent laboratories including the commercial laboratory employed by the City of Calipatria. The results showed that only the contract laboratory showed positive cyanide measurements (53 μg/L), whereas the results from the other three laboratories were all non-detect.

- The absence of thiocyanate in the secondary effluent further supports the fact that there is no in-plant cyanide formation through treatment processes in the Calipatria WWTP. This finding also confirms that the detections of cyanide in the plant effluent were attributable to false positive cyanide measurement.

- Cyanogen chloride analysis at various points in the Calipatria WWTP further supports the fact that there is no cyanide (either from external source or on-site generated) in the secondary effluent.

- Free cyanide analyses of duplicate samples with and without the addition of sodium hydroxide preservative demonstrates that samples from the Calipatria WWTP do not contain amino acids such as glycine to form cyanide under basic conditions.

8.2 Recommendation

Since the cyanide compliance problem appeared to be caused by inadequate laboratory procedures, LEE & RO recommends the City of Calipatria to employ a state approved laboratory with appropriate quality assurance procedures for the sample preservation and free cyanide analysis. It is important to ensure that the commercial laboratory measures free cyanide rather than total cyanide. The test for cyanide amenable to chlorination, Standard Methods 4500-CN-G, is most commonly used method by commercial laboratories, and is recommended.

It is also recommended to use appropriate sampling procedures. The sample for cyanide measurement shall be collected as a 24-hour composite sample, which is a mixture of individual grab samples collected at regular intervals. Each grab sample shall be immediately checked for chlorine residual and shall be dechlorinated with sodium thiosulfate. Each grab sample shall be preserved by adding sodium hydroxide until a pH >12 is attained to prevent the loss of hydrogen cyanide. Cyanide samples shall be kept in the dark and refrigerated at 4 ^{o}C until the samples are submitted to the contract laboratory. It is required to record the time and date of sample collection, pH, and the name of the person(s) collecting/preserving the samples.

Due to the presence of nitrite and sulfide in the Calipatria wastewater sample, it is important to ensure that the commercial laboratory uses appropriate sample pretreatment procedures. Nitrosation seemed to be successfully avoided by adding sulfamic acid, and the time of sulfamic acid addition did not influence the free cyanide results, presumably due to relatively low nitrite concentration. Nonetheless, sample pretreatment with sulfamic acid at the time of sampling, not at the time of analysis, is recommended considering the potential increase in nitrite concentrations in the secondary effluent as a result of plant improvements in the future.

The approximate detection limit for cyanide analysis at most commercial laboratories is currently around 10 μg/L. The interim permit limit for cyanide is 30 μg/L, which is comfortably above the laboratory detection limits. However, the interim permit limits will expire, and the final discharge limitation for free cyanide will be lowered to 4.3 μg/L on June 2010. This creates a problem with the laboratory analyses because the final discharge limit is less than the current detection limit (10 μg/L). One possible method to improve the detection limit is to use a spectrophotometer cell with a light path that is larger than the 1 centimeter (cm) cell currently being used. For example, the use of a spectrophotometer cell with a light path of 5 cm would improve the detection limit by five orders of magnitude. This approach would provide a new detection limit of 2 μg/L. This lower detection limit would be less than the 4.3 μg/L final discharge limit requirement.

If cyanide compliance problems occur again, LEE & RO recommends implementing accelerated testing not only for free cyanide, but also for thiocyanate (as a potential precursor of cyanide) and cyanogen chloride (as a product of cyanide oxidation by chlorine). Given that samples for cyanide measurement need to be collected as 24-hour composite samples, each grab sample shall be preserved with appropriate preservation chemicals (i.e., sodium hydroxide for free cyanide, nitric acid for thiocyanate, and no preservation for cyanogen chloride in accordance with Standard Methods 4500-CN).

LEE & RO also recommends that the City of Calipatria complete implementation of an industrial pretreatment ordinance to control cyanide from the industrial users. If external cyanide sources are identified in the future, the primary method of cyanide control shall be through reduced source emissions from the industrial waste streams feeding into the Calipatria WWTP (onsite source reduction at targeted industrial wastewater sources).

9. REFERENCES

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APPENDICES

APPENDIX I: CITY OF CALIPATRIA NPDES PERMIT (JUNE 29, 2005)

APPENDIX II: LABORATORY PROCEDURES FOR CYANIDE ANALYSIS

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APPENDIX IV: CALIPATRIA MONTHLY MONITORING DATA

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APPENDIX VI: CHAIN OF CUSTODY RECORD

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APPENDIX I

CITY OF CALIPATRIA NPDES PERMIT

(June 29, 2005)

Alan C. Lloyd, Ph.D.
Agency Secretary

California Regional Water Quality Control Board

Colorado River Basin Region

73-720 Fred Waring Drive, Suite 100, Palm Desert, CA 92260
Phone (760) 346-7491 • Fax (760) 341-6820
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Arnold Schwarzenegger
Governor

ORDER NO. R7-2005-0085
NPDES NO. CA0105015

The following Discharger is authorized to discharge in accordance with the conditions set forth in this Order:

Discharger	**City of Calipatria**
Name of Facility	**Calipatria Wastewater Treatment Plant**
Facility Address	**106 Lindsey Road**
	Calipatria, CA 92233
	Imperial County

The Discharger is authorized to discharge from the following discharge points as set forth below:

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Treated Wastewater	33°, 8', 50.9" N	115 °, 33', 10.02" W	"G" Drain

This Order was adopted by the Regional Water Board on:	June 29, 2005
This Order shall become effective on:	June 29, 2005
This Order shall expire on:	June 29, 2010
The U.S. Environmental Protection Agency (U.S. EPA) and the Regional Water Board have classified this discharge as a major discharge.	
The Discharger shall file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, not later than 180 days in advance of the Order expiration date as application for issuance of new waste discharge requirements.	

IT IS HEREBY ORDERED, that Order No. 00-002 is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in Division 7 of the California Water Code (CWC) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA), and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, Robert E. Perdue, Executive Officer, do hereby certify the following is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Colorado River Basin Region, on June 29, 2005.

Robert E Perdue

Robert E. Perdue, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
REGION 7, COLORADO RIVER BASIN REGION

ORDER NO. R7-2005-0085
NPDES NO. CA0105015

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I. FACILITY INFORMATION

The following Discharger is authorized to discharge in accordance with the conditions set forth in this Order:

Discharger	**City of Calipatria**
Name of Facility	**Calipatria Wastewater Treatment Plant**
Facility Address	**106 Lindsey Road**
	Calipatria, CA 92233
	Imperial County
Facility Contact, Title, and Phone	**Romualdo Medina, City Manager, (760) 348-4141**
Mailing Address	**125 North Park Avenue** **Calipatria, CA 92233**
Type of Facility	**Publicly Owned Treatment Works**
Facility Design Flow	**1.73 (in million gallons per day)**

II. FINDINGS

The California Regional Water Quality Control Board, Colorado River Basin Region (hereinafter Regional Water Board), finds:

A. **Background.** The City of Calipatria submitted a Report of Waste Discharge, dated February 9, 2005 and applied for a National Pollutant Discharge Elimination System (NPDES) permit renewal to discharge up to 1.73 million gallons per day (mgd) of treated wastewater from the Calipatria Wastewater Treatment Plant. The application was deemed complete on April 8, 2005.

B. **Facility Description.** The Discharger owns and operates the wastewater treatment plant, which services the City and the Calipatria State Prison. . The total design capacity of the wastewater treatment plant is 1.73 mgd. The treatment system consists of a manual bar screen at the prison, four square aeration ponds, and a disinfection system. Wastewater is discharged from Discharge 001 (see table on cover page) to the "G" Drain, a water of the United States and a tributary to the Alamo River. Attachment B is a map of the area around the facility. Attachment C is a wastewater flow schematic of the facility. Attachments B and C are hereby incorporated into this Order.

C. **Legal Authorities.** This Order is issued pursuant to section 402 of the Federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and Chapter 5.5, Division 7 of the California Water Code (CWC). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4 of the CWC for discharges that are not subject to regulation under CWA section 402.

D. **Background and Rationale for Requirements**. The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and through special studies. Attachments A through F, which contain background information and rationale for Order requirements, are hereby incorporated into this Order and, thus, constitute part of the Findings for this Order.

E. **California Environmental Quality Act (CEQA).** This action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21100, et seq.) in accordance with Section 13389 of the CWC.

F. **Technology-based Effluent Limitations.** The Code of Federal Regulations (CFR) at 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards. This Order includes technology-based effluent limitations based on equivalent to secondary treatment standards for POTWs. The Regional Board has considered the factors listed in CWC § 13241 in establishing these requirements. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet (Attachment F).

G. **Water Quality-based Effluent Limitations.** Section 122.44(d) of 40 CFR requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Where numeric water quality objectives have not been established, 40 CFR §122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA section 304(a), proposed State criteria or a State policy interpreting narrative criteria supplemented with other relevant information, or an indicator parameter. USEPA approved the State's 2002 303(d) list of impaired water bodies on July 25, 2003. According to the 2002 303(d) list, the Imperial Valley Drains are impaired for sediment/silt, pesticides, and selenium. A sedimentation/siltation total daily maximum load (TMDL) for the Alamo River, to which "G" Drain flows, was approved by the USEPA in June 2002. This Order implements the waste load allocations required by the sedimentation/siltation TMDL.

H. **No More Stringent than Federal Law.** This Order contains restrictions on individual pollutants that are no more stringent than required by the federal Clean Water Act. Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. The technology-based effluent limitations are discussed in detail in the Fact Sheet (Attachment F). Restrictions on technology-based effluent limits are specified in federal regulations as stated in Findings F. Technology-based Effluent Limitations. and detailed in the Fact Sheet, and the permit's technology-based pollutant restrictions are no more stringent than required by the Clean Water Act. Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the California Toxics Rule, the California Toxics Rule is the applicable standard pursuant to 40 C.F.R. 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on May 1, 2001. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the [Clean Water] Act" pursuant to 40 C.F.R. 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the Clean Water Act and the applicable water quality standards for purposes of the Clean Water Act.

I. **Water Quality Control Plans.** The Regional Water Board adopted a Water Quality Control Plan for the Colorado River Basin Region (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, State Water Resources Control Board (State Water Board) Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. Beneficial uses applicable to the Imperial Valley Drains are as follows:

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	"G" Drain	Existing: Freshwater replenishment (FRESH), contact (REC-1)[12] and non-contact (REC-2)[1] water recreation Warm freshwater habitat (WARM); wildlife habitat (WILD), preservation or rare, threatened or endangered species (RARE)[3].

J. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, which was amended on May 4, 1995 and November 9, 1999, and the CTR on May 18, 2000, which was amended on February 13, 2001. These rules include water quality criteria for priority pollutants and are applicable to this discharge.

K. **State Implementation Policy.** On March 2, 2000, State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Boards in their basin plans, with the exception of the provision on alternate test procedures for individual discharges that have been approved by USEPA Regional Administrator. The alternate test procedures provision was effective on May 22, 2000. The SIP became effective on May 18, 2000. The SIP includes procedures for determining the need for and calculating WQBELs and requires dischargers to submit data sufficient to do so.

L. **Alaska Rule.** On March 30, 2000, U.S. EPA revised its regulation that specifies when new and revised State and Tribal water quality standards (WQS) become effective for Clean Water Act (CWA) purposes (40 CFR 131.21, 65 FR 24641, April 27, 2000). Under U.S. EPA's new regulation (also known as the Alaska rule), new and revised standards submitted to U.S. EPA after May 30, 2000, must be approved before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to U.S. EPA by May 30, 2000, may be used for CWA purposes, whether or not approved by EPA.

M. **Compliance Schedules and Interim Requirements.** Section 2.1 of the SIP provides that, based on a discharger's request and demonstration that it is infeasible for an existing discharger to achieve immediate compliance with an effluent limitation derived from a CTR criterion, compliance schedules may be allowed in an NPDES permit. Unless an exception has been granted under Section 5.3 of the SIP, a compliance schedule may not exceed 5 years from the date that the permit is issued or reissued, nor may it extend beyond 10 years from the effective date of the SIP (or May 18, 2010) to establish and comply with CTR criterion-based effluent limitations. Where a compliance schedule for a final effluent limitation exceeds 1 year, the Order must include interim numeric limitations for that constituent or parameter. Where allowed by the Colorado River Basin Plan, compliance schedules and interim effluent limitations or discharge specifications may also be granted to allow time to implement a new or revised water quality

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[1] Unauthorized use.

[2] The only REC 1 usage that is known to occur is from infrequent fishing activity.

[3] Rare, endangered, or threatened wildlife exists in or utilizes some of these waterway(s). If the RARE beneficial use may be affected by a water quality control decision, responsibility for substantiation of the existence of rare, endangered, or threatened species on a case-by-case basis is upon the California Department of Fish and Game on its own initiative and/or at the request of the Regional Board; and such substantiation must be provided within a reasonable time frame as approved by the Regional Board.

objective. This Order does include compliance schedules and interim effluent limitations and discharge specifications. A detailed discussion of the basis for the compliance schedule(s) and interim effluent limitation(s) and/or discharge specifications is included in the Fact Sheet (Attachment F).

N. **Antidegradation Policy.** Section 131.12 of 40 CFR requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16, which incorporates the requirements of the federal antidegradation policy. Resolution 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. As discussed in detail in the Fact Sheet (Attachment F) the permitted discharge is consistent with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution 68-16.

O. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR § 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order.

P. **Monitoring and Reporting.** Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. This Monitoring and Reporting Program is provided in Attachment E.

Q. **Standard and Special Provisions.** Standard Provisions, which in accordance with 40 CFR §§122.41and 122.42, apply to all NPDES discharges and must be included in every NPDES permit, are provided in Attachment D. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet (Attachment F).

R. **Notification of Interested Parties.** The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet (Attachment F) of this Order.

S. **Consideration of Public Comment.** The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet (Attachment F) of this Order.

III.DISCHARGE PROHIBITIONS

A. Bypass, overflow, discharge or spill of untreated or partially treated waste is prohibited.

B. The discharge of waste to land not owned or controlled by the discharger is prohibited.

C. Discharge of treated wastewater at a location or in a manner different from that described in Finding No. IIB, above, is prohibited.

D. The bypass or overflow of untreated wastewater or wastes to the "G" Drain is prohibited, except as allowed in the Standard Provision No. 13, as contained in the Standard Provisions for National Pollutant Discharge Elimination System Permit (hereinafter Standard Provisions), dated October, 1990.

E. The discharger shall not accept waste in excess of the design treatment capacity of the disposal system.

F. The discharge shall not cause degradation of any water supply.

G. The treatment or disposal of wastes from the facility shall not cause pollution or nuisance as defined in Section 13050(I) and 13050(m) of Division 7 of the California Water Code.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point 001

1. Final Effluent Limitations – Discharge Point 001

a. The discharge of treated wastewater shall maintain compliance with the following effluent limitations at Discharge Point 001 with compliance measured at Monitoring Location M-001 as described in the attached Monitoring and Reporting Program (Attachment E):

Parameter	**Units**	**Effluent Limitations**				
		Average Monthly	**Average Weekly**	**Maximum Daily**	**Instantaneous Minimum**	**Instantaneous Maximum**
Flow	mgd	1.73				
Biochemical Oxygen Demand 5-day @ 20°C	mg/L	45	65			
	lbs/day	649	938			
Total Suspended Solids	mg/L	95				
	lbs/day	1,371				
Residual Chlorine	mg/L	0.01				0.02
	lbs/day	0.14				0.29
pH	standard units				6.0	9.0
Copper	µg/L	2.9		5.8		
	lbs/day	0.042		0.083		
Free Cyanide	µg/L	4.3		8.5		
	lbs/day	0.062		0.12		
Selenium	µg/L	4.1		8.2		
	lbs/day	0.059		0.12		
Thallium	µg/L	6.3		13		
	lbs/day	0.091		0.19		

b. **Percent Removal:** The average monthly percent removal of BOD 5-day 20°C shall not be less than 65 percent.

c. The maximum daily concentration of total dissolved solids (TDS) in the discharge of wastewater shall be limited to 4,500 mg/L. Further, the annual average concentration of total dissolved solids (TDS) in the discharge of wastewater shall be limited to 4,000 mg/L.

d. Wastewater effluent discharged to "G" Drain shall not have a Escherichia coli (E. coli) concentration in excess of a log mean of Most Probable Number (MPN) of 126 MPN per 100 milliliters (based on a minimum of not less than five samples for any 30-day period) nor shall any sample exceed 400 MPN per 100 milliliters.

e. There shall be no acute or chronic toxicity in the treatment plant effluent nor shall the treatment plant effluent cause any acute or chronic toxicity in the receiving water, as defined in the Monitoring and Reporting Program (Attachment E). All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, or bioassays of appropriate duration or other appropriate methods specified by the Regional Board.

2. Interim Effluent Limitations

a. During the period beginning June 29, 2005 and ending before May 18, 2010, the discharge of treated wastewater shall maintain compliance with the following limitations at 001, with compliance measured at Monitoring Location M-001 as described in the attached Monitoring and Reporting Program (Attachment E). These interim effluent limitations shall apply in lieu of the corresponding final effluent limitations specified for the same parameters during the time period indicated in this provision.

Constituent	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Copper	µg/L	14	14
	lbs/day	0.20	0.20
Free Cyanide	µg/L	30	30
	lbs/day	0.43	0.43
Selenium	µg/L	10	10
	lbs/day	0.14	0.14
Thallium	µg/L	14	14
	lbs/day	0.20	0.20

Land Discharge Specifications – Not Applicable

B. Reclamation Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based on water quality objectives contained in the Basin Plan and are a required part of this Order. The discharge shall not cause the following in "G" Drain:

1. Depress the concentration of dissolved oxygen to fall below 5.0 mg/L. When dissolved oxygen in the receiving water is already below 5.0 mg/L, the discharge shall not cause any further depression.
2. The presence of oil, grease, floating material (liquids, solids, foam and scum) or suspended material in amounts that create a nuisance or adversely affect beneficial uses.
3. Result in the deposition of pesticides or combination of pesticides to be detected in concentrations that adversely affect beneficial uses.
4. Discoloration in the receiving water that adversely affects beneficial uses.
5. Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses
6. Increase turbidity that results in affecting beneficial uses.
7. The normal ambient pH to fall below 6.0 or exceed 9.0 units.
8. The natural receiving water temperature of surface waters shall not be altered by discharges of wastewater unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses.
9. Result in the deposition of material that causes nuisance or adversely affects beneficial uses.
10. No individual chemical or combination of chemicals shall be present in concentrations that adversely affect beneficial uses.
11. Toxic pollutants to be present in the water column, sediments or biota in concentrations that adversely affect beneficial uses or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
12. Taste or odor-producing substances that affect beneficial uses.

This discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the State Water Resources Control Board as required by the Federal Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act or amendments thereto, the Regional Board will revise and modify this Permit in accordance with such more stringent standards.

B. Groundwater Limitations

1. The discharge shall not cause the underlying groundwater to be degraded, to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.

VI. PROVISIONS

A. Standard Provisions

1. **Federal Standard Provisions.** The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. **Regional Water Board Standard Provisions.** The Discharger shall comply with the following provisions:

    a. The Calipatria Wastewater Treatment Plant shall be protected from any washout or erosion of wastes or covering material, and from any inundation, which could occur as a result of floods having a predicted frequency of once in 100 years.

    b. The discharger shall comply with all conditions of this Board Order. Noncompliance constitutes a violation of the Federal Clean Water Act and Porter-Cologne Water Quality Control Act, and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification of waste discharge requirements; or denial of a Permit renewal application.

    c. The discharger shall ensure that all site-operating personnel are familiar with the content of this Board Order, and shall maintain a copy of this Board Order at the site.

    d. The discharger's wastewater treatment plant shall be supervised and operated by persons possessing certification of appropriate grade pursuant to Section 3680, Chapter 26, Division 3, Title 23 of the California Code of Regulations. The discharger shall ensure that all operating personnel are familiar with the contents of this Board Order.

    e. The discharger shall report any noncompliance that may endanger human health or the environment. The discharger shall immediately report orally information of the noncompliance as soon as (1) the discharger has knowledge of the discharge, (2) notification is possible, and (3) notification can be provided without substantially impeding cleanup or other emergency measures, to the Regional Board office and the Office of Emergency Services. During non-business hours, the discharger shall leave a message on the Regional Board office voice recorder. A written report shall also be provided within five (5) business days of the time the discharger becomes aware of the incident. The written report shall contain a description of the noncompliance and its cause, the period of noncompliance, the anticipated time to achieve full compliance, and the steps taken or planned, to reduce, eliminate, and prevent recurrence of the noncompliance. The discharger shall report all intentional or unintentional spills in excess of one thousand (1,000) gallons occurring within the facility or collection system to the Regional Board office in accordance with the above time limits.

f. The discharger shall provide a report to the Regional Board when it determines that the treatment plant's average dry weather flow rate for any month exceeds 80 percent of the design treatment capacity specified in Findings No. II.B above. The report should indicate what steps, if any, the discharger intends to take to provide for the expected wastewater treatment capacity necessary when the plant reaches design capacity.

g. Prior to any change in ownership or management of this operation, the discharger shall transmit a copy of this Board Order to the succeeding owner/operator, and forward a copy of the transmittal letter to the Regional Board.

h. Prior to any modifications in this facility, which would result in material change in the quality or, quantity of wastewater treated or discharged, or any material change in the location of discharge, the discharger shall report all pertinent information in writing to the Regional Board and obtain revised requirements before any modifications are implemented.

i. The discharger shall provide adequate notice to the Regional Board's Executive Officer of the following:

    1. Any new introduction of pollutants into any of the treatment facilities described in the Findings of this Board Order from an indirect discharger which would be subject to Section 301 or 306 of the Clean Water Act, if it were directly discharging the pollutants.

    2. Any substantial change in the volume or character of pollutants being introduced into any of the treatment facilities described in the Findings of this Board Order by an existing or new source.

    3. Any planned physical alterations or additions to the facilities described in this Board Order, or changes planned in the discharger's sludge use or disposal practice, where such alterations, additions, or changes may justify the application of Board Order conditions that are different from or absent in the existing Board Order, including notification of additional disposal sites not reported during the Board Order application process, or not reported pursuant to an approved land application plan.

    4. Adequate notice shall include information on the quality and quantity of effluent introduced, and any anticipated impact of the change on the quantity or quality of the Discharger's effluent and/or sludge.

j. Adequate measures shall be taken to assure that flood or surface drainage waters do not erode or otherwise render portions of the discharge facilities inoperable.

k. This Board Order does not authorize violation of any federal, state, or local laws or regulations.

l. This Board Order does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

B. Monitoring and Reporting Program Requirements

The discharger shall comply with the Monitoring and Reporting Program, and future revisions thereto, in Attachment E of this Order.

C. Special Provisions

1. Reopener Provisions

a. The discharger shall submit data sufficient to determine if a water quality–based effluent limitation is required in the discharge permit as required under the SIP. It is the discharger's responsibility to provide all information requested by the Regional Board for use in the analysis. The permit shall be reopened to establish water quality-based effluent limitations, if necessary.

b. The permit shall be reopened and modified or revoked and reissued as a result of the detection of a reportable priority pollutant identified by special conditions' monitoring data, included in this permit. These special conditions in the permit may be, but are not limited to, fish tissue sampling, whole effluent toxicity tests, monitoring requirements on internal waste stream(s), and monitoring for surrogate parameters. Additional requirements may be included in the permit as a result of the special condition monitoring data.

c. This Board Order may be modified, rescinded and reissued, for cause. The filing of a request by the discharger for a Board Order modification, rescission and reissuance, or a notification of planned changes or anticipated noncompliance does not stay any Board Order condition. Causes for modification include the promulgation of new regulations, modification of land application plans, or modification in sludge use or disposal practices, or adoption of new regulations by the State Board or the Regional Board, including revisions to the Basin Plan.

d. TMDLs for pesticides and selenium are to be developed by the Regional Board. The permit may be reopened and modified in future to include appropriate requirements necessary to fully implement the approved TMDL if needed.

e. This Order may be reopened and the Whole Effluent Toxicity (WET) Testing Requirements contained in the Attachment E, Monitoring and Reporting Program, Section V modified to address changes to USEPA or State Water Board policies or guidance regarding the testing or reporting requirements for WET testing.

f. This Order may be reopened and the Whole Effluent Toxicity (WET) Testing Requirements contained in the Attachment E, Monitoring and Reporting Program, Section V modified to address changes to USEPA or State Water Board policies or guidance regarding the testing or reporting requirements for WET testing

2. Special Studies, Technical Reports and Additional Monitoring Requirements

b. **Toxicity Identification Evaluations or Toxicity Reduction Evaluations.** The discharger shall submit to the Regional Board a toxicity reduction evaluation (TRE) workplan (1-2 pages) within 90 days of the effective date of this permit. This plan shall describe the steps the permittee intends to follow in the event that toxicity is detected, and should include at a minimum:

1. A description of the investigation and evaluation techniques that will be used to identify potential causes/sources of toxicity, effluent variability, and treatment system efficiency;
2. A description of the facility's method of maximizing in-house treatment efficiency and good housekeeping practices, and a list of all chemicals used in operation of the facility;
3. If a toxicity identification evaluation (TIE) is necessary, who will conduct it (i.e., in-house or outside consultant).

c. **Translator Study**. In addition, should the discharger request to use a translator for metals and selenium different than the U.S. EPA conversion factor, it shall complete a translator study within two years from the date of the issuance of this permit as stated in the SIP. In the event a translator study is not completed within the specified time, the U.S. EPA conversion factor-based effluent limitation as specified in the CTR shall be effective as a default limitation.

d. **Pollutant Minimization Study.** In accordance with Section 2.4.5 of the SIP the Discharger shall conduct a Pollutant Minimization Program as specified in Special Provision VI.C.4.c of this Order when there is evidence that the priority pollutant is present in the effluent above an effluent limitation and either:

1. A sample result is reported as DNQ and the effluent limitation is less than the reported ML; or
2. A sample is reported as ND and the effluent limitation is less than the MDL

Evidence that a priority pollutant may be present includes, but is not limited to, sample results reported DNQ, when the effluent limitation is less than the MDL, sample results from analytical methods more sensitive than those methods included in this Order in accordance with the SIP, presence of whole effluent toxicity, health advisories for fish consumption, and results of benthic or aquatic organism tissue sampling.

e. **Total Dissolved Solids Study**. The Discharger shall perform a study to evaluate whether a 400 mg/L incremental increase in salinity above the source water is practical and if not, what incremental increase is practical for their discharge. This report shall be submitted to the Regional Board's Executive Officer prior to the filing date for re-application. The following items describe the purpose and description of the minimum requirements for the report:

1. The permitting authority may permit a discharge in excess of the 400 mg/L incremental increase at the time of issuance or reissuance of a NPDES discharge permit, upon satisfactory demonstration by the permittee that it is not practicable to attain the 400 mg/L limit.

2. Demonstration by the applicant must include information on the following factors relating to the potential discharge:

    a. Description of the municipal entity and facilities

    b. Description of the quantity and salinity of domestic water sources contributing to discharge.

    c. Description of significant salt sources of the municipal wastewater collection system, and identification of entities responsible for each source, if available.

    d. Description of water rights, including diversions and consumptive use quantities.

    e. Description of the wastewater discharge, receiving waters, quantity, salt load, and salinity.

    f. Alternative plans for minimizing salt contribution from the municipal discharge. Alternative plans should include:

        1. Description of system salt sources and alternative means of control; and

        2. Cost of alternative plans in dollars per ton, of salt removed from discharge

    g. Such other information pertinent to demonstration of non-practicability as the permitting authority may deem necessary.

3. In determining what permit conditions shall be required, the permit issuing authority shall consider the following criteria including, but not limited to:

    a. The practicability of achieving the 400 mg/L incremental increase.

    b. Where the 400 mg/L incremental increase is not determined to be practicable, the discharger shall provide the following:

1. The impact of the proposed salt input of each alternative on the beneficial uses of the surface water in terms of tons per year and concentration;
2. Costs per ton of salt removed from discharge of each alternative plan;
3. Capability of minimizing the salt discharge;
4. A proposed value for the practical incremental increase; and
5. A justification for the proposed practical incremental increased value.

3. Best Management Practices and Pollution Prevention – Not Applicable

4. Compliance Schedules

a. **Compliance Plan**. The discharger developed a compliance plan (CP) for priority pollutants that was submitted to the Regional Board on April 8, 2005. The CP identified the measures that will be taken to reduce the concentrations of copper, free cyanide, selenium and thallium in their discharge. The plan will evaluate options to achieve compliance with the permit limitations specified in Final Effluent Limitations of this Order. The Compliance Plan milestones are as follows:

Milestone	Completion Date	Milestone Description
1	June 29, 2006	Develop and implement pretreatment program – collect and analyze data for copper, free cyanide, selenium and thallium. Begin addition of coagulants to pond No. 1.
		Submit report detailing pretreatment program status, and coagulant addition.
2	June 29, 2007	Evaluate effectiveness of pretreatment program and coagulation treatment. Identify and evaluate additional treatment options if necessary
		Submit report-detailing effectiveness of measures to date and proposed additional treatment measures.
3	June 29, 2008	Design changes to existing plant or if necessary, design new WWTP with secondary treatment capable of treating copper, free cyanide, selenium and thallium to required levels
		Submit report detailing proposed plant changes and status of construction

Milestone	Completion Date	Milestone Description
4	June 29, 2009	Begin construction of additional treatment systems if necessary.
		Submit report detailing construction progress.
5	May 18, 2010	Complete construction and commence operation of new WWTP
		Submit report and verification of compliance with CTR

b. **Pollutant Minimization Plan.** When required to develop a Pollutant Minimization Program (PMP) in accordance with Special Provision VI.C.2.c of this Order, the Discharger shall develop a PMP in accordance with Section 2.4.5.1 of the SIP as described below:

The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality based effluent limitations specified in Sections IV.A.1, and IV.a.2. of this Order. The PMP shall include, but not be limited to, the following actions and submittals acceptable to the Regional Board:

1. An annual review and semi-annual monitoring of potential sources of the reportable priority pollutant(s), which may include fish tissue monitoring and other bio-uptake sampling;
2. Quarterly monitoring for the reportable priority pollutant(s) in the influent to the wastewater treatment system;"
3. Implementation of appropriate cost-effective control measures consistent with the control strategy;
4. An annual status report that shall be sent to the Regional Board at the same time the annual summary report is submitted in accordance with Attachment E, Reporting Requirements, and include:
    a. All PMP monitoring results for the previous year
    b. A list of potential sources of copper, free cyanide, selenium and thallium
    c. A summary of all actions undertaken pursuant to the control strategy
    d. A description of actions to be taken in the following year.

5. Construction, Operation and Maintenance Specifications

a. Disposal to Ponds

1. A minimum depth of freeboard of two (2) feet shall be maintained at all times in aeration ponds.

2. Aeration ponds shall be managed to control breeding of mosquitoes, 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 through control of water depth, harvesting, or herbicides.

    c. Dead algae, vegetation, and debris shall not accumulate on the water surface.

3. The oxidation basins and evaporative/storage basins shall be maintained so they will be kept in aerobic conditions.

4. On-site wastes, including windblown spray from recycled water application, shall be strictly confined to the lands specifically designated for the disposal operation, and on-site irrigation practices shall be managed so there is no runoff of effluent from irrigated areas.

5. Ponds shall have sufficient capacity to accommodate allowable wastewater flow, design seasonal precipitation, ancillary inflow, and infiltration during the non-irrigation season. 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.

6. Public contact with undisinfected water or wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.

b. Spill Response Plan

1. The Discharger shall review its current Spill Response Plan (SRP) developed under previous Order 00-002 and revise if needed within 60 days after the effective date of this Order. Revised plans shall be submitted for Regional Board staff review. Thereafter, the plan shall be updated annually, and shall be available for staff review during Regional Board inspections. The Discharger shall ensure that all operating personnel are familiar with the contents of the SRP. A copy of the SRP shall be maintained at the site and shall be accessible to all operating personnel.

c. Facility and Treatment Operation

1. The discharger shall, at all times, properly operate and maintain all systems and components of collection, treatment and control which are installed or used by the discharger to achieve compliance with the conditions of this Board Order. Proper operation and maintenance includes effective performance, adequate process controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of this Board Order. All systems both in service and reserved, shall be inspected and maintained on a regular basis. Records shall be kept of the inspection results and maintenance performed and made available to the Regional Board upon demand.

2. Facilities shall be available to keep the plant in operation in the event of commercial power failure.

6. Special Provisions for Municipal Facilities (POTWs Only)

A. Sludge Disposal Requirements

1. The discharger shall provide a plan as to the method, treatment, handling and disposal of sludge that is consistent with all State and Federal laws and regulations and obtain prior written approval from the Regional Board specifying location and method of disposal, before disposing of treated or untreated sludge, or similar solid waste materials using an alternative method.

2. The discharger shall maintain a permanent log of all solids hauled away from the treatment facility for use/disposal elsewhere and shall provide a summary of the volume, type (screenings, grit, raw sludge, digested sludge), use (agricultural, composting, etc.), and the destination in accordance with the Monitoring and Reporting Program of this Board Order. The sludge that is stockpiled at the treatment facility shall be sampled and analyzed for those constituents listed in the sludge monitoring section of the Monitoring and Reporting Program of this Board Order and as required by Title 40, Code of Federal Regulations, Part 503. The results of the analyses should be submitted to the Regional Board as part of the Monitoring and Reporting Program.

3. All sludge generated at the wastewater treatment plant will be disposed, treated, or applied to land in accordance with Federal Regulations 40 CFR 503.

4. Collected screenings, sludge, and other solids removed from liquid wastes shall be disposed of in a manner that is consistent with State Water Resources Control Board and Integrated Waste Management Board's joint regulations (Title 27) of the California Code of Regulations and approved by the Regional Board's Executive Officer.

B. Pretreatment Program

1. The discharger reports that there are no known industrial wastes subject to regulation under the NPDES Pretreatment Program being discharged to the wastewater treatment plant.

2. In the event that the Regional Board or its Executive Officer determines that circumstances warrant pretreatment requirements in order to prevent Interference [40 CFR 403.3(j)] with the wastewater treatment facility or Pass Through [40 CFR 403.3(n)], then:

   a. The discharger shall notify the Regional Board within 30 days after there are discharges that trigger the pretreatment requirements.

   b. The discharger shall submit a revised Report of Waste Discharge and the pretreatment program for the Regional Board's review and approval as soon as possible but not more than one year after discharger's notification to Regional Board of pretreatment requirements.

   c. The discharger shall enforce the federal categorical pretreatment standards on all Categorical Industrial Users (CIUs).

   d. The discharger shall notify the CIU of its discharge effluent limits. The limits must be as stringent as the pretreatment standards contained in the applicable federal category (40 CFR Part 400 – 699). The discharger may develop more stringent, technology based local limit if it can show cause.

   e. The discharger shall notify the RWQCB if the CIU violates its discharge effluent limits.

3. The discharger shall provide the Regional Board with an annual report describing the pretreatment program activities over the previous 12-month period. The report shall be transmitted to the Regional Board office no later than January 15 of each year and include:

   a. A summary of actions taken by the discharger, which ensures industrial-user compliance;

   b. An updated list of industrial users (by SIC categories) which were issued permits, and/or enforcement orders, and a status of compliance for each user; and

   c. The name and address of each user that received a revised discharge limit.

4. The Regional Board retains the right to take legal action against an industrial user and/or the discharger where a user fails to meet the approved applicable pretreatment standards.

C. Combined Sewer Overflows (CSOs) – Not Applicable

D. Sanitary Sewer Overflows/Collection Systems – Not Applicable

7. Other Special Provisions

a. This discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Regional board or the State Water Resources Control Board as required by the Federal Clean Water Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act or amendments thereto, the Regional Water Board will revise and modify this Board Order in accordance with such more stringent standards.

b. The Discharger may be required to submit technical reports as directed by the Regional Board's Executive Officer.

c. The Discharger shall exclude from the wastewater treatment plant any liquid or solid waste that could adversely affect the plant operation or effluent quality. The excluded liquid or solid waste shall be disposed of in accordance with applicable regulations.

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in Section IV of this Order will be determined as specified below:

A. Average Monthly Effluent Limitation (AMEL).
If the average of daily discharges over a calendar month exceeds the AMEL for a given parameter, an alleged violation will be flagged and the discharger will be considered out of compliance for each day of that month for that parameter (e.g., resulting in 31 days of non-compliance in a 31-day month). The average of daily discharges over the calendar month that exceeds the AMEL for a parameter will be considered out of compliance for that month only. If only a single sample is taken during the calendar month and the analytical result for that sample exceeds the AMEL, the discharger will be considered out of compliance for that calendar month. For any one calendar month during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar month.

B. Average Weekly Effluent Limitation (AWEL).
If the average of daily discharges over a calendar week exceeds the AWEL for a given parameter, an alleged violation will be flagged and the discharger will be considered out of compliance for each day of that week for that parameter, resulting in 7 days of non-compliance. The average of daily discharges over the calendar week that exceeds the AWEL for a parameter will be considered out of compliance for that week only. If only a single sample is taken during the calendar week and the analytical result for that sample exceeds the AWEL, the discharger will be considered out of compliance for that calendar week. For any one calendar week during which no sample (daily discharge) is taken, no compliance determination can be made for that calendar week.

C. Maximum Daily Effluent Limitation (MDEL).
If a daily discharge exceeds the MDEL for a given parameter, an alleged violation will be flagged and the discharger will be considered out of compliance for that parameter for that 1 day only within the reporting period. For any 1 day during which no sample is taken, no compliance determination can be made for that day.

D. Instantaneous Minimum Effluent Limitation.
If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, a violation will be flagged and the discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation).

E. Instantaneous Maximum Effluent Limitation.
If the analytical result of a single grab sample is higher than the instantaneous maximum effluent limitation for a parameter, a violation will be flagged and the discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both exceed the instantaneous maximum effluent limitation would result in two instances of non-compliance with the instantaneous maximum effluent limitation).

F. Water Quality-Based Effluent Limitations

1. In accordance with Section 2.4.5 of the SIP, compliance with water quality-based effluent limitations shall be determined as follows:

a. Dischargers shall be deemed out of compliance with an effluent limitation if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum Level (ML).

b. When determining compliance with an average monthly effluent limitation and more than one sample result is available in a month, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or ND. In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

   1) The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

   2) The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

If a sample result, or the arithmetic mean or median of multiple sample results, is below the reported ML, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the Discharger conducts a PMP, the Discharger shall not be deemed out of compliance."

ATTACHMENT A – DEFINITIONS

Average Monthly Effluent Limitation (AMEL): 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 Effluent Limitation (AWEL): the highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Daily Discharge: Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Log Mean of Most Probable Number (MPN): the geometric mean of E. Coli bacteria data (measured as MPN per 100 milliliters), based on a minimum of not less than five samples during the calendar month. The geometric mean is equal to the antilog of the average of log-transformed data.

Maximum Daily Effluent Limitation (MDEL): the highest allowable daily discharge of a pollutant.

Six-month Median Effluent Limitation: the highest allowable moving median of all daily discharges for any 180-day period.

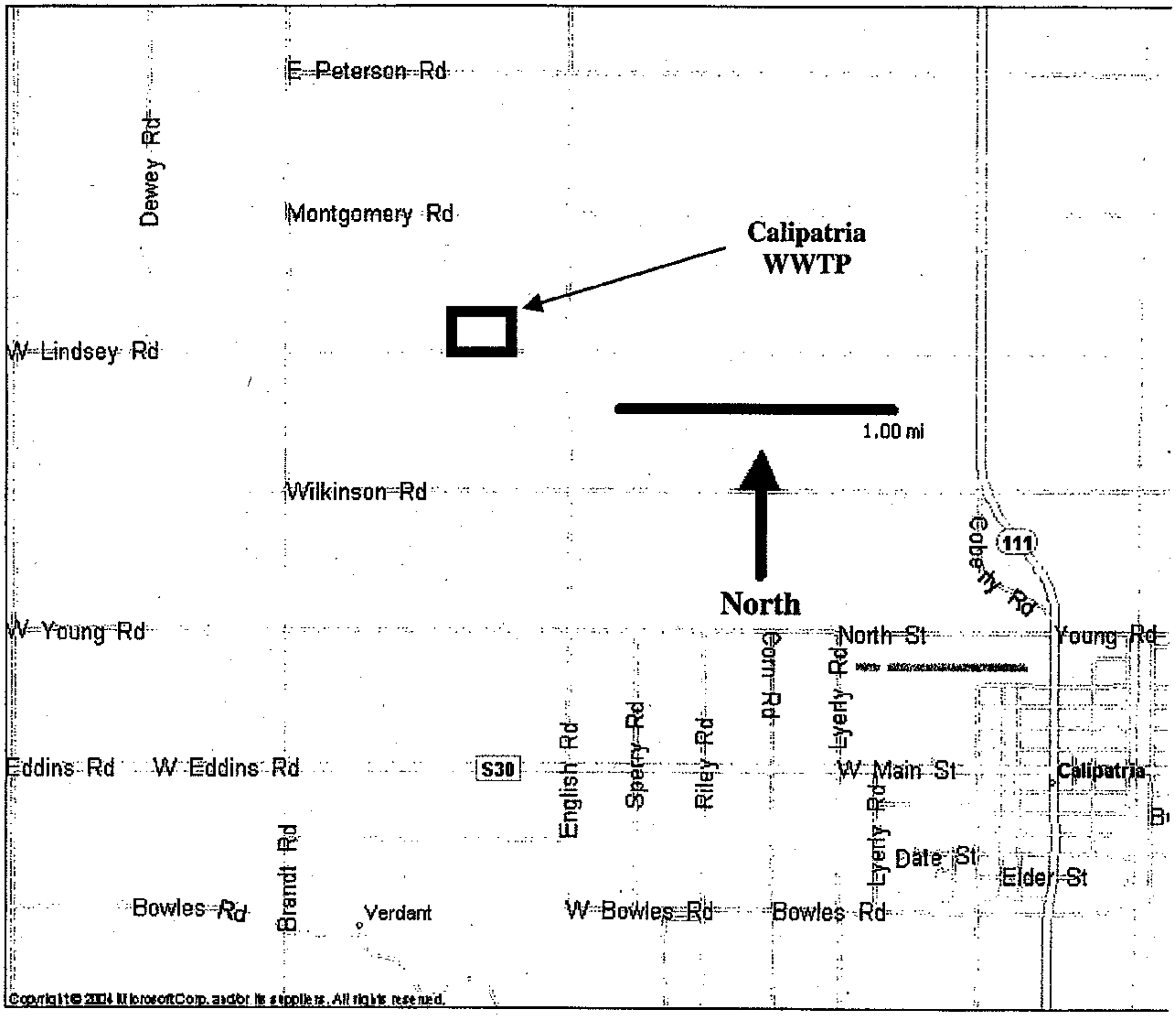
mg/L: milligrams per Liter.

µg/L: micrograms per Liter.

MGD: million gallons per day

CITY OF CALIPATRIA
CALIPATRIA WASTEWATER TREATMENT PLANT
ORDER NO. R7-2005-0085
NPDES NO. CA0105015

ATTACHMENT B – SITE MAP



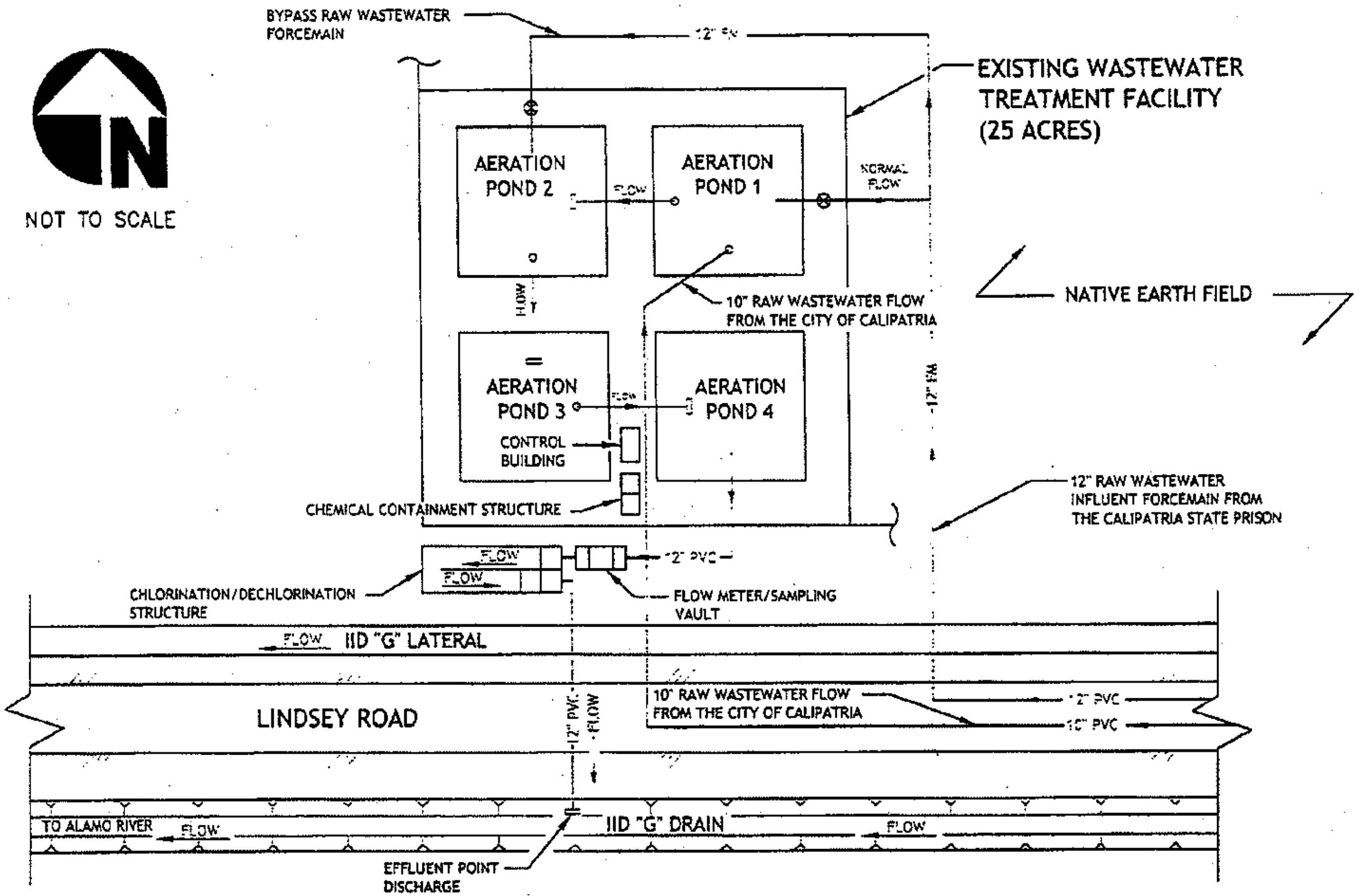
SITE MAP

CITY OF CALIPATRIA
MUNICIPAL WASTEWATER TREATMENT PLAN
Calipatria - Imperial County

DISCHARGE LOCATION - 33 °, 8', 50.9" N LATITUDE AND 115 °, 33', 8.4" W LONGITUDE

Board Order No. R7-2005-0085

ATTACHMENT C – FLOW SCHEMATIC



CITY OF CALIPATRIA
WASTEWATER TREATMENT
FACILITY ANALYSIS
SEPTEMBER 2004

FIGURE 2
WASTEWATER
TREATMENT FACILITY
SITE PLAN

The Holt Group
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ATTACHMENT D – FEDERAL STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (CWC) and is grounds for enforcement action, for permit termination, revocation and reissuance, or denial of a permit renewal application [*40 CFR §122.41(a)*].

2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not been modified to incorporate the requirement [*40 CFR §122.41(a)(1)*].

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order [*40 CFR §122.41(c)*].

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment [*40 CFR §122.41(d)*].

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order [*40 CFR §122.41(e)*].

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges [*40 CFR §122.41(g)*].

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations [*40 CFR §122.5(c)*].

F. Inspection and Entry

The Discharger shall allow the Regional Water Quality Control Board (RWQCB), State Water Resources Control Board (SWRCB), United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to [*40 CFR §122.41(i)*] [*CWC 13383(c)*]:

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order [*40 CFR §122.41(i)(1)*];

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order [*40 CFR §122.41(i)(2)*];

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order [*40 CFR §122.41(i)(3)*];

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location [*40 CFR §122.41(i)(4)*].

G. Bypass

1. Definitions

    a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility [*40 CFR §122.41(m)(1)(i)*].

    b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production [*40 CFR §122.41(m)(1)(ii)*].

2. Bypass not exceeding limitations – The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3 and I.G.5 below [*40 CFR §122.41(m)(2)*].

3. Prohibition of bypass – Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless [*40 CFR §122.41(m)(4)(i)*]:

    a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage [*40 CFR §122.41(m)(4)(A)*];

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance [*40 CFR §122.41(m)(4)(B)*]; and

c. The Discharger submitted notice to the Regional Water Board as required under Standard Provision – Permit Compliance I.G.5 below [*40 CFR §122.41(m)(4)(C)*].

4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above [*40 CFR §122.41(m)(4)(ii)*].

5. Notice

   a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass [*40 CFR §122.41(m)(3)(i)*].

   b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below [*40 CFR §122.41(m)(3)(ii)*].

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation [*40 CFR §122.41(n)(1)*].

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph H.2 of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review [*40 CFR §122.41(n)(2)*].

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that [*40 CFR §122.41(n)(3)*]:

   a. An upset occurred and that the Discharger can identify the cause(s) of the upset [*40 CFR §122.41(n)(3)(i)*];

   b. The permitted facility was, at the time, being properly operated [*40 CFR §122.41(n)(3)(i)*];

c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b [*40 CFR §122.41(n)(3)(iii)*]; and

d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above [*40 CFR §122.41(n)(3)(iv)*].

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof [*40 CFR §122.41(n)(4)*].

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition [*40 CFR §122.41(f)*].

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit [*40 CFR §122.41(b)*].

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the CWC [*40 CFR §122.41(l)(3)*] [*40 CFR §122.61*].

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [*40 CFR §122.41(j)(1)*].

B. Monitoring results must be conducted according to test procedures under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503 unless other test procedures have been specified in this Order [*40 CFR §122.41(j)(4)*] [*40 CFR §122.44(i)(1)(iv)*].

IV. STANDARD PROVISIONS – RECORDS

A. Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this

Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time [*40 CFR §122.41(j)(2)*].

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements [*40 CFR §122.41(j)(3)(i)*];
2. The individual(s) who performed the sampling or measurements [*40 CFR §122.41(j)(3)(ii)*];
3. The date(s) analyses were performed [*40 CFR §122.41(j)(3)(iii)*];
4. The individual(s) who performed the analyses [*40 CFR §122.41(j)(3)(iv)*];
5. The analytical techniques or methods used [*40 CFR §122.41(j)(3)(v)*]; and
6. The results of such analyses [*40 CFR §122.41(j)(3)(vi)*].

C. Claims of confidentiality for the following information will be denied [*40 CFR §122.7(b)*]:

1. The name and address of any permit applicant or Discharger [*40 CFR §122.7(b)(1)*]; and
2. Permit applications and attachments, permits and effluent data [*40 CFR §122.7(b)(2)*].

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, SWRCB, or USEPA within a reasonable time, any information which the Regional Water Board, SWRCB, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, SWRCB, or USEPA copies of records required to be kept by this Order [*40 CFR §122.41(h)*] [*CWC 13267*].

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, SWRCB, and/or USEPA shall be signed and certified in accordance with paragraph (2.) and (3.) of this provision [*40 CFR §122.41(k)*].

2. All permit applications shall be signed as follows:

   a. For a corporation: By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures [*40 CFR §122.22(a)(1)*];

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively [*40 CFR §122.22(a)(2)*]; or

c. For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA) [*40 CFR §122.22(a)(3)*].

3. All reports required by this Order and other information requested by the Regional Water Board, SWRCB, or USEPA shall be signed by a person described in paragraph (b) of this provision, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in paragraph (2.) of this provision [*40 CFR §122.22(b)(1)*];

   b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position) [*40 CFR §122.22(b)(2)*]; and

   c. The written authorization is submitted to the Regional Water Board, SWRCB, or USEPA [*40 CFR §122.22(b)(3)*].

4. If an authorization under paragraph (3.) of this provision is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (3.) of this provision must be submitted to the Regional Water Board, SWRCB or USEPA prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR §122.22(c)].

5. Any person signing a document under paragraph (2.) or (3.) of this provision shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations" [*40 CFR §122.22(d)*].

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program in this Order [*40 CFR §122.41(l)(4)*].

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or SWRCB for reporting results of monitoring of sludge use or disposal practices [*40 CFR §122.41(l)(4)(i)*].

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board [*40 CFR §122.41(l)(4)(ii)*].

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order [*40 CFR §122.41(l)(4)(iii)*].

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date [*40 CFR §122.41(l)(5)*].

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance [*40 CFR §122.41(l)(6)(i)*].

2. The following shall be included as information that must be reported within 24 hours under this paragraph [*40 CFR §122.41(l)(6)(ii)*]:

   a. Any unanticipated bypass that exceeds any effluent limitation in this Order [*40 CFR §122.41(l)(6)(ii)(A)*].

   b. Any upset that exceeds any effluent limitation in this Order [*40 CFR §122.41(l)(6)(ii)(B)*].

c. Violation of a maximum daily discharge limitation for any of the pollutants listed in this Order to be reported within 24 hours [*40 CFR §122.41(l)(6)(ii)(C)*].

3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours [*40 CFR §122.41(l)(6)(iii)*].

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when [*40 CFR §122.41(l)(1)*]:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b) [*40 CFR §122.41(l)(1)(i)*]; or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in this Order nor to notification requirements under 40 CFR Part 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1) [*40 CFR §122.41(l)(1)(ii)*].

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan [*40 CFR §122.41(l)(1)(iii)*].

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board or SWRCB of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements [*40 CFR §122.41(l)(2)]*.

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting E.3, E.4, and E.5 at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E [*40 CFR §122.41(l)(7)*].

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, SWRCB, or USEPA, the Discharger shall promptly submit such facts or information [*40 CFR §122.41(l)(8)*].

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The CWA provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed $25,000 per day for each violation. The CWA provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than one (1) year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than two (2) years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than three (3) years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than six (6) years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the Clean Water Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions [*40 CFR §122.41(a)(2)*] [*CWC 13385 and 13387*].

B. Any person may be assessed an administrative penalty by the Regional Water Board for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed $10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $25,000. Penalties for Class II violations are not to exceed $10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $125,000 [*40 CFR §122.41(a)(3)*].

C. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both [*40 CFR §122.41(j)(5)*].

D. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this Order, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both [*40 CFR §122.41(k)(2)*].

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural dischargers shall notify the Regional Water Board as soon as they know or have reason to believe [*40 CFR §122.42(a)*]:

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" [*40 CFR §122.42(a)(1)*]:
    a. 100 micrograms per liter (µg/L) [*40 CFR §122.42(a)(1)(i)*];
    b. 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony [*40 CFR §122.42(a)(1)(ii)*];
    c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge [*40 CFR §122.42(a)(1)(iii)*]; or
    d. The level established by the Regional Water Board in accordance with 40 CFR §122.44(f) [*40 CFR §122.42(a)(1)(iv)*].
2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" [*40 CFR §122.42(a)(2)*]:
    a. 500 micrograms per liter (µg/L) [*40 CFR §122.42(a)(2)(i)*];
    b. 1 milligram per liter (mg/L) for antimony [*40 CFR §122.42(a)(2)(ii)*];
    c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge [*40 CFR §122.42(a)(2)(iii)*]; or

d. The level established by the Regional Water Board in accordance with 40 CFR §122.44(f) [*40 CFR §122.42(a)(2)(iv)*].

B. Publicly-Owned Treatment Works (POTWs)

All POTWs shall provide adequate notice to the Regional Water Board of the following [*40 CFR §122.42(b)*]:

1. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to Sections 301 or 306 of the CWA if it were directly discharging those pollutants [*40 CFR §122.42(b)(1)*]; and
2. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order [*40 CFR §122.42(b)(2)*].

Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW [*40 CFR §122.42(b)(3)*].

Attachment E – Monitoring and Reporting Program – Table of Contents

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (CFR) at 40 CFR §122.48 requires that all NPDES permits specify monitoring and reporting requirements. CWC sections 13267 and 13383 also authorize the Regional Water Quality Control Board (RWQCB) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

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

B. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ±10 percent from true discharge rates throughout the range of expected discharge volumes. Guidance in selection, installation, calibration and operation of acceptable flow measurement devices can be obtained from the following references:

1. "A Guide to Methods and Standards for the Measurement of Water Flow," U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 421, May 1975, 96 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by SD Catalog No. C13.10:421.)

2. "Water Measurement Manual," U.S. Department of Interior, Bureau of Reclamation, Second Edition, Revised Reprint, 1974, 327 pp. (Available from the U.S. Government Printing Office, Washington D.C. 20402. Order by Catalog No. 172.19/2:W29/2, Stock No. S/N 24003-0027.)

3. "Flow Measurement in Open Channels and Closed Conduits," U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 484, October 1977, 982 pp. (Available in paper copy or microfiche from National Technical Information Services (NTIS) Springfield, VA 22151. Order by NTIS No. PB-273 535/5ST.)

4. "NPDES Compliance Sampling Manual," U.S. Environmental Protection Agency, Office of Water Enforcement, Publication MCD-51, 1977, 140 pp. (Available from the General Services Administration (8FFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, CO 80225.)

C. Unless otherwise approved by the Regional Board's Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants", promulgated by the United States Environmental Protection Agency.

D. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

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

F. The collection, preservation and holding times of all samples shall be in accordance with United States Environmental Protection Agency (USEPA) approved procedures. Unless otherwise approved by the Regional Board's Executive Officer, all analyses shall be conducted by a laboratory certified by the State Department of Health Services. All analyses shall be conducted in accordance with the latest edition of the "Guidelines Establishing Test Procedures for Analysis of Pollutants" (40 CFR Part 136), promulgated by the USEPA.

G. If the facility is not in operation, or there is no discharge during a required reporting period, the Discharger shall forward a letter to the Regional Board indicating that there has been no activity during the required reporting period.

II. MONITORING LOCATIONS

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

Discharge Point Name	Monitoring Location Name	Monitoring Location Description (include Latitude and Longitude when available)
--	M-INF-1	Wastewater influent to the treatment facilities from Calipatria State Prison
	M-INF-2	Wastewater influent to the treatment facilities from the City of Calipatria
001	M-001	Representative sample from the effluent flow prior to discharge from Discharge Point 001; 33°, 8', 50.94" N Latitude and 115°, 33' 10.02" W Longitude
--	R-001	Receiving water-monitoring location not to exceed 100 feet upstream from the point of discharge.
--	R-002	Receiving water-monitoring location not to exceed 200 feet downstream of the discharge pipe outlet at a point where the plume would be expected

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Locations

1. The Discharger shall monitor influent to the facility at M-INF-1 and M-INF-2 as follows:

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
20°C BOD_5	mg/L	24-Hr. Composite	1x/Month	[1]
Suspended Solids	mg/L	24-Hr. Composite	1x/Month	[1]

[1] Pollutants shall be analyzed using the analytical methods described in 40 CFR sections 136; for priority pollutants the methods must meet the lowest minimum levels (MLs) specified in Attachment 4 of the SIP, where no methods are specified for a given pollutant, by methods approved by this Regional Board or the State Board.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location M-001

1. The Discharger shall monitor the treated wastewater at M-001 as follows:

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Daily Effluent Discharge	mgd	Flow Meter Reading	1x/Day	[2]
20°C BOD_5	mg/L	24-Hr. Composite	1x/Week	[1]
Total Suspended Solids	mg/L	24-Hr. Composite	1x/Week	[1]
Residual Chlorine	mg/L	Grab	1x/Day	
pH	pH units	Grab	1x/Day	[1]
Escherichia Coli (E. Coli)	Number/ 100 ml	Grab	5x/Month	[3]
Nitrates as Nitrogen (N)	mg/L	24-Hr. Composite	1x/Month	[1]
Nitrites as N	mg/L	24-Hr. Composite	1x/Month	[1]
Ammonia Nitrogen as N	mg/L	24-Hr. Composite	1x/Month	[1]
Total Nitrogen as N	mg/L	24-Hr. Composite	1x/Month	[1]
Total Phosphate as Phosphorus (P)	mg/L	24-Hr. Composite	1x/Month	[1]
Ortho-Phosphate as P	mg/L	24-Hr. Composite	1x/Month	[1]
Total Dissolved Solids[5]	mg/L	24-Hr. Composite	1x/Month	[1]
Oil and Grease	mg/L	24-Hr. Composite	1x/Year	[1]
Temperature	°F	Grab	1x/Week	[1]
Hardness (as $CaCO_3$)	mg/L	Grab	1x/Month	[1]
Copper	µg/L	24-Hr. Composite	1x/Month	[1]
Free Cyanide	µg/L	24-Hr. Composite	1x/Month	[1]
Lead	µg/L	24-Hr. Composite	1x/Month	[1]
Nickel	µg/L	24-Hr. Composite	1x/Month	[1]
Selenium	µg/L	24-Hr. Composite	1x/Month	[1]
Thallium	µg/L	24-Hr. Composite	1x/Month	[1]
Priority Pollutants [4]	µg/L	Grab	1x/Year	[1]

1 Pollutants shall be analyzed using the analytical methods described in 40 CFR sections 136; for priority pollutants the methods must meet the lowest minimum levels (MLs) specified in Attachment 4 of the SIP, where no methods are specified for a given pollutant, by methods approved by this Regional Board or the State Board.

2 Report total daily flow and monthly average daily flow.

3 The Discharger may monitor for E. coli using analytical methods, Standard Method 9221.F or 9223, (APHA. 1998, 1995, 1992. Standard Methods for the Examination of Water and Wastewater. American Public Health Association, 20th, 19th and 18th Editions. Amer. Publ. Hlth. Assoc., Washington, D.C.)

4 Priority Pollutants as defined by the California Toxics Rule (CTR) defined in Finding II.I of the Limitations and Discharge Requirements of this Order, and included as Attachment H.

5 Reported as daily maximum and annual average.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Monitoring Requirements

1. Bioassays shall be performed to evaluate the toxicity of the discharged wastewater in accordance with the following procedures unless otherwise specified by the Regional Board's Executive Officer or his designee:

   a. Bioassays shall be conducted on a sensitive fish species and an invertebrate species as approved by the Regional Board's Executive Officer. Pimephales promelas (fathead minnow) and Ceriodaphnia dubia (water flea) are suggested test species that may be utilized. The bioassays shall be conducted in accordance with the protocol given in EPA/821-R-02-013 – Short Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms, 4th Edition, and EPA/821-R-02-012 – Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters for Freshwater and Marine Organisms, 5th Edition, or subsequent editions.

2. The Discharger shall conduct chronic and acute toxicity testing on the final effluent discharged to "G" Drain at monitoring point M-001 as follows:

Test	Units	Sample Type	Minimum Sampling Frequency
Chronic Toxicity	TU_c	24-hr Composite	1x/Quarter
Acute Toxicity[1]	TU_a[2]	24-hr. composite	1x/Quarter

[1] Acute Bioassay results can be calculated from chronic bioassay test for Pimephales promelas

[2] Discharger can provide % Survival or Pass/Fail when using a t-test

3. Both test species given below shall be used to measure chronic and acute toxicity:

Species	Effect	Test Duration (days)	Reference[1, 2]
Fathead Minnow (Pimephales promelas)	Larval Survival and Growth	7	EPA/821-R-02-013 (Chronic) EPA/821-R-02-012 (Acute)
Water Flea (Ceriodaphnia dubia)	Survival and Reproduction	7	EPA/821-R-02-013 (Chronic) EPA/821-R-02-012 (Acute)

[1] Additional references listed in Section V.A.4

[2] Acute Bioassay results can be calculated from chronic bioassay tests.

4. Toxicity Test References for Conducting Toxicity Tests

   a. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA/821-R-02-012, October, 2002 or subsequent editions.

b. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water for Freshwater Organisms, Fourth Edition, EPA/821-R-02-013, October, 2002 or subsequent editions.

B. Quality Assurance

1. Dilution and control waters may be obtained from an unaffected area of receiving waters. Synthetic (standard) dilution is an option and may be used if the above source is suspected to have toxicity greater than 1.0 TU_c
2. A series of at least five dilutions and a control shall be tested for chronic toxicity testing and may be used for acute toxicity testing. The series shall include the following concentrations: 12.5, 25, 50, 75, and 100 percent effluent.
3. For the acute toxicity testing using a t-test, two dilutions shall be used, i.e., 100 percent effluent and a control (when a t-test is used instead of an LC50).
4. If organisms are not cultured in-house, concurrent testing with a referenced toxicant shall be conducted. Where organisms are cultured in-house, monthly reference toxicant testing is sufficient. Reference toxicant tests also shall be conducted using the same test conditions as the effluent toxicity tests (e.g., same test duration, etc.).
5. If either the reference toxicant test or effluent test does not meet all test acceptability criteria (TAC) as specified in the toxicity test references, then the permittee must re-sample and retest within 15 working days or as soon as possible. The retesting period begins when the Discharger receives the test results that indicate retesting is needed and ends when the discharger collects the first sample required to complete the test."
6. The reference toxicant and effluent tests must meet the upper and lower bounds on test sensitivity as determined by calculating the percent minimum significant difference (PSMD) for each test result. The test sensitivity bound is specified for each test method in the respective methods manuals.

C. Accelerated Monitoring Requirements

The Discharger shall implement an accelerated monitoring frequency consisting of performing three toxicity tests in a nine-week period beginning from the date the Discharger receives the results indicating an initial exceedance of the chronic or acute toxicity triggers described below:

Any chronic toxicity test that exceeds 2 chronic toxicity units (TU_c) or a three (3)-sample median[1] (consecutive samples) that exceeds 1 TU_c shall trigger an accelerated monitoring frequency. In addition, any acute toxicity test results showing high toxicity shall trigger an accelerated monitoring frequency. High acute toxicity is defined as follows:

a. Less than 80% survival when acute toxicity is calculated from results of the chronic toxicity test (only for *Pimephales promelas*), or

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[1] 3-Sample median is defined as follows: The middle value of 3 consecutive samples arranged from the low value to the high value

b. Less than 90% survival when acute toxicity is calculated from the results of the acute toxicity test, or

c. Results of acute toxicity t-test for 100 percent effluent concentration that is reported as failed.

Accelerated monitoring frequency shall consist of performing three (3) toxicity tests in a nine (9)-week period beginning from the date the Discharger receives the results indicating an initial exceedance of the chronic or acute toxicity triggers. The scope of accelerated monitoring shall be limited to the species and analytical method that failed the test."

If implementation of the generic TRE workplan indicates the source of the exceedance of the toxicity trigger (for instance, a temporary plant upset), then only one additional test is necessary. If exceedance of the toxicity trigger is detected in this test, the discharger will continue with accelerated monitoring requirements or implement the Toxicity Identification and Toxicity Reduction Evaluations.

If none of the three tests indicated exceedance of the toxicity trigger, then the permittee may return to the normal bioassay testing frequency.

D. Conducting Toxicity Identification Evaluations and Toxicity Reduction Evaluations

1. A Toxicity Identification Evaluation (TIE) shall be triggered if testing from the accelerated monitoring frequency indicates any of the following:

    a. Two of the three accelerated chronic toxicity tests are reported as failed tests meeting any of the conditions specified in Attachment E, Section V.C; or

    b. Two of the three acute toxicity tests are reported as failed tests meeting any of the conditions specified in Attachment E, Section V.C.

    c. The TIE shall be initiated within 15 days following failure of the second accelerated monitoring test.

    d. If a TIE is triggered prior to the completion of the accelerated testing, the accelerated testing schedule may be terminated, or used as necessary in performing the TIE.

2. The TIE shall be conducted to identify and evaluate toxicity in accordance with procedures recommended by the United States Environmental Protection Agency (USEPA) which include the following:

    a. Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I, (USEPA, 1992a);

    b. Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures, Second Edition (USEPA, 1991a);

   c. Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Sampling Exhibiting Acute and Chronic Toxicity (USEPA, 1993a);

   d. Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity (USEPA, 1993b);

3. As part of the TIE investigation, the Discharger shall be required to implement its Toxicity Reduction Evaluation (TRE) workplan. The Discharger shall take all reasonable steps to control toxicity once the source of the toxicity is identified. A failure to conduct required toxicity tests or a TRE within a designated period shall result in the establishment of numerical effluent limitations for chronic toxicity in a permit or appropriate enforcement action. Recommended guidance in conducting a TRE include the following:

   a. Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants, August 1999, EPA/833B-99/002;

   b. Clarifications Regarding Toxicity Reduction and Identification Evaluations in the National Pollutant Discharge Elimination System Program dated March 27, 2001, USEPA Office of Wastewater Management, Office of Regulatory Enforcement.

E. Definition of Toxicity

1. Chronic toxicity measures sublethal effect (e.g., reduced growth, reproduction) to experimental test organisms exposed to an effluent or ambient waters compared to that of the control organisms.

2. Chronic toxicity shall be measured in TU_c, where $TU_c = 100/NOEC$. The no observed effect concentration (NOEC) is the highest concentration of toxicant to which organisms are exposed in a chronic test that causes no observable adverse effect on the test organisms (e.g., the highest concentration of toxicant to which the values for the observed responses are not statistically significantly different from the controls).

3. Acute toxicity is a measure of primarily lethal effects that occur over a ninety-six (96) hour period. Acute toxicity for Pimephales promelas can be calculated from the results of the chronic toxicity test for Pimephales promelas and reported along with the results of each chronic test. Acute toxicity for Ceriodaphnia dubia cannot be calculated from the results of the chronic toxicity test for Ceriodaphnia dubia because the test design is not amenable to calculation of a lethal concentration (LC50) value as needed for the acute requirement.

4. Acute toxicity shall be measured in Tu_a, where $Tu_a = 100/LC50$ or as pass/fail using a t-test. LC50 is the toxicant concentration that would cause death in 50 percent of the test organisms.

F. Reporting

1. "The Discharger shall submit the analysis and results of the toxicity test, including any accelerated testing in toxicity units with the discharge monitoring reports for the month in which the last test is conducted.

2. If a Toxicity Identification Evaluation (TIE) is conducted the Discharger shall submit the results of the TIE with the discharge monitoring reports for the month in which the final report is completed.

3. If the Toxicity Reduction Evaluation (TRE) Workplan has been initiated, the Discharger shall report on the progress of the actions being taken and include this information with each monthly monitoring report.

VI. LAND DISCHARGE MONITORING REQUIREMENTS - NOT APPLICABLE

VII. RECLAMATION MONITORING REQUIREMENTS - NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

A. Monitoring Location R-001

1. The Discharger shall monitor the "G" Drain at R-001 as follows:

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Temperature	°F	Grab	1x/Quarter	1
Dissolved Oxygen	mg/L	Grab	1x/Quarter	1
pH	pH units	Grab	1x/Quarter	1
Hardness (as CaCO3)	mg/L	Grab	1x/Quarter	1

1 Pollutants shall be analyzed using the analytical methods described in 40 CFR sections 136; for priority pollutants the methods must meet the lowest minimum levels (MLs) specified in Attachment 4 of the SIP, where no methods are specified for a given pollutant, by methods approved by this Regional Board or the State Board.

B. Monitoring Location R-002

1. The Discharger shall monitor "G" Drain at R-002 as follows:

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Temperature	°F	Grab	1x/Quarter	1
Dissolved Oxygen	mg/L	Grab	1x/Quarter	1
pH	pH units	Grab	1x/Quarter	1
Hardness (as $CaCO_3$)	mg/L	Grab	1x/Quarter	1

1 Pollutants shall be analyzed using the analytical methods described in 40 CFR sections 136; for priority pollutants the methods must meet the lowest minimum levels (MLs) specified in Attachment 4 of the SIP, where no methods are specified for a given pollutant, by methods approved by this Regional Board or the State Board.

C. Visual Monitoring Upstream and Downstream Receiving Water Sampling Points

1. In conducting the receiving water sampling, a log shall be kept of the receiving water conditions at Stations R-001 and R-002. In the event that no receiving water is present, no receiving water monitoring data is required for station R-001 or R-002. 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. Aquatic life (including plants, fish, shellfish, birds)
   d. Visible film, sheen or coating
   e. Fungi, slime, or objectionable growths
   f. Potential nuisance conditions

IX. OTHER MONITORING REQUIREMENTS

A. Water Supply Monitoring

The Discharger is required to obtain or acquire source water data, quarterly, either through monitoring or obtaining the data from the drinking water purveyor.

B. Monitoring Location S-001 Sludge Monitoring

a. Sludge that is generated at the treatment facility shall be sampled and analyzed for the following prior to disposal:

Constituent	Units	Sample Type	Minimum Sampling Frequency	Required Test Method
Arsenic	mg/kg	Grab	Annually	1
Cadmium	mg/kg	Grab	Annually	1
Copper	mg/kg	Grab	Annually	1
Lead	mg/kg	Grab	Annually	1

Constituent	Units	Sample Type	Minimum Sampling Frequency	Required Test Method
Mercury	mg/kg	Grab	Annually	1
Molybdenum	mg/kg	Grab	Annually	1
Nickel	mg/kg	Grab	Annually	1
Selenium	mg/kg	Grab	Annually	1
Zinc	mg/kg	Grab	Annually	1
Fecal Coliform	MPN/gram	Grab	Annually	1

[1] Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 503.

b. The Discharger shall maintain a permanent log of all solids hauled away from the treatment facility for use/disposal elsewhere and shall provide a quarterly summary of the volume, type (screenings, grit, raw sludge, digested sludge), use (agricultural, composting, etc.), and the destination.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. The Discharger shall report the results of acute and chronic toxicity testing, TRE and TIE as required in Attachment E, Whole Effluent Toxicity Testing Requirements, Section V.F.

3. The results of any analysis take, more frequently than required at the locations specified in this Monitoring and Reporting Program shall be reported to the Regional Board.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit self-monitoring reports. Until such notification is given, the Discharger shall submit self-monitoring reports in accordance with the requirements described below.

2. The Discharger shall submit monthly, quarterly, and annual Self Monitoring Reports including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. Monthly reports shall be due on the 1st day of the second month following the end of each calendar month; Quarterly reports shall be due on May 1, August 1, November 1, and February 1 following each calendar quarter; Annual reports shall be due on February 1 following each calendar year.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	June 30, 2005	All	First day of second calendar month following month of sampling
X / hour	June 30, 2005	Hourly	First day of second calendar month following month of sampling
X / day	June 30, 2005	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	First day of second calendar month following month of sampling
X / week	July 1 following June 29, 2005	Sunday through Saturday	First day of second calendar month following month of sampling
X / month	July 1 following June 29, 2005	1st day of calendar month through last day of calendar month	First day of second calendar month following month of sampling
X / quarter	July 1 following June 29, 2005	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	May 1 August 1 November 1 February 1
X / year	July 1 following June 29, 2005	January 1 through December 31	February 1

1 On February 1, 2006, the Discharger will report the data collected for the period between June 29, 2005 and January 1, 2006.

4. The Discharger shall report with each sample result the applicable Minimum Level (ML) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136.

5. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations.

6. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

7. SMRs must be submitted to the Regional Water Board, signed and certified as required by the standard provisions (Attachment D), to the address listed below:

Submit monitoring reports to:
California Regional Water Quality Control Board Colorado River Basin Region 73-720 Fred Waring, Suite 100 Palm Desert, CA 92260

C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the discharger to electronically submit self-monitoring reports. Until such notification is given, the Discharger shall submit discharge monitoring reports (DMRs) in accordance with the requirements described below.

2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original DMR and one copy of the DMR to the address listed below:

Submit monitoring reports to:
State Water Resources Control Board Discharge Monitoring Report Processing Center Post Office Box 671 Sacramento, CA 95812

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated or modified cannot be accepted.

D. Other Reports

a. Annual Operation and Maintenance Report

The Discharger shall report the following:

Activity	**Reporting Frequency**
To inspect and document any operation/maintenance problems by inspecting each unit process. In addition, calibration of flow meters, cleaning of disinfection system and mechanical equipment shall be performed in a timely manner and documented.	Annually
The amount of any chemicals used (i.e., chlorine , etc.,)shall be monitored daily and reported monthly. Measured in pounds per day.	Monthly

Attachment F – Fact Sheet – Table of Contents

ATTACHMENT F – FACT SHEET

As described in Section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

WDID	**7A130102041**
Discharger	**City of Calipatria**
Name of Facility	**Calipatria Wastewater Treatment Plant**
Facility Address	**106 Lindsey Road**
	Calipatria, CA 92233
	Imperial County
Facility Contact, Title and Phone	**Romualdo Medina, City Manager, (760) 348-4141**
Authorized Person to Sign and Submit Reports	**Ruben Mireles, Plant Operator, (760) 355-4256**
Mailing Address	**125 North Park Ave, Calipatria, CA 92233**
Billing Address	**SAME**
Type of Facility	**POTW**
Major or Minor Facility	**Major**
Threat to Water Quality	**2**
Complexity	**A**
Pretreatment Program	**N**
Reclamation Requirements	**None**
Facility Permitted Flow	**1.73 mgd**
Facility Design Flow	**1.73 mgd**
Watershed	**West Colorado River Basin**
Receiving Water	**G Drain**
Receiving Water Type	**Drain**

A. The City of Calipatria is the operator of the Calipatria Wastewater Treatment Plant; a publicly owned treatment works facility. The City of Calipatria owns the property at 106 Lindsey Road, Calipatria, CA 92233 on which the facility is located. Together the City of Calipatria and the Calipatria Wastewater Treatment Plant are hereinafter referred to as Discharger.

B. The Facility discharges wastewater to "G" Drain, a water of the United States and is currently regulated by Order No. 00-002 which was adopted on April 12, 2000 and expires on April 12, 2005.

C. The Discharger filed a report of waste discharge and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on February 10, 2005.

II. FACILITY DESCRIPTION

A. Description of Wastewater and Biosolids Treatment or Controls

1. The City of Calipatria owns and operates the wastewater collection, treatment and disposal system (hereinafter referred to as facility) and provides sewerage service to the City of Calipatria and the Calipatria State Prison. The current wastewater treatment plant has a treatment capacity of 1.73 million gallons-per-day (MGD) and is located in Section 6, T12S, R14E, SBB&M.

2. The wastewater treatment plant consists of a four square aeration ponds operated in series, and a disinfection system. The disinfection system chlorinates using sodium hypochlorite, and dechlorinates with sodium metabisulfite prior to discharge. Domestic wastewater from Calipatria State Prison passes through a manual bar screen at the prison prior to being pumped to the City's wastewater treatment plant. Wastewater is discharged from Discharge 001 to the "G" Drain, a water of the United States.

3. The Discharger owns and operates the wastewater collection system which provides conveyance of raw wastewater to the treatment facility. The collection system flows by gravity to two lift stations. One lift station serves the City of Calipatria and the other lift station serves Calipatria State Prison and is located at the prison. Both lift stations pump via force main to the treatment plant. The collection system is a separate sanitary sewer system, and the facility experiences negligible inflow and/or infiltration into its system.

B. Discharge Points and Receiving Waters

1. The final effluent is discharged to the "G" Drain. The "G" Drain conveys the effluent to the Salton Sea via the Alamo River. The permitted maximum daily flow limitation is equal to the facility's current design capacity of the wastewater treatment plant as 1.73 mgd.

2. The discharge consists of "equivalent to secondary" treated domestic wastewater.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

1. Effluent limitations contained in the previous Order 00-002 for discharges from the aerated ponds treatment system, Discharge Point 001 (Monitoring Location M-001) and representative monitoring data from the term of the previous Order are as follows:

Parameter (units)	Effluent Limitation			Monitoring Data (From May 2000 – To February 2005)		
	Average Monthly	**Average Weekly**	**Maximum Daily**	**Maximum Average Monthly Discharge**	**Maximum Average Weekly Discharge**	**Maximum Daily Discharge**
Discharge Flow (mgd)	--	--	1.70	1.17	--	1.84
BOD (mg/L)	45	65	--	64	118.	118
TSS (mg/L)	95	--	--	74	--	130

Parameter (units)	Effluent Limitation			Monitoring Data (From May 2000 – To February 2005)		
	Average Monthly	**Average Weekly**	**Maximum Daily**	**Maximum Average Monthly Discharge**	**Maximum Average Weekly Discharge**	**Maximum Daily Discharge**
Settleable Matter (ml/L)	0.3	0.5	--	0.1	0.2	.02
E. Coli (MPN)	126[1]		400	264.2	--	2,400
Chlorine (mg/L)	0.01	--	0.02	0.04	--	0.17
pH (ph units)	--	--	6.0 – 9.0[2]	--	--	8.2
Percent Removal, BOD, (%)	65	--	--	50[3]	--	--
Percent Removal, SS, (%)	65	--	--	35.5[3]	--	--

[1] Calculated as the log mean of not less than 5 samples in any 30-day period
[2] This represents the range of reported values of pH.
[3] These values represent the lowest reported value of the minimum percent removal of the pollutant. For BOD and SS, the Discharger violated the minimum percent removal requirement 2 times for each.

2. The National Pollutant Elimination System Permit application described the effluent characteristics as follows

Constituent	Treatment System
pH Maximum Daily (Minimum)	6.9 pH Units
pH Maximum Daily (Maximum)	8.2 pH Units
Flow Rate Maximum Daily	1.16 mgd
Flow Rate Average Daily	1.04 mgd
BOD Maximum Daily	68.0 mg/L
BOD Average Daily	29.5 mg/L
Total Suspended Solids Maximum Daily	55.6 mg/L
Total Suspended Solids Average Daily	23.8 mg/L
Temperature Maximum Daily (Winter/Summer)	67.2°F / 84.9°F
Temperature Average Daily (Winter/Summer)	55°F / 78°F
Fecal Coliform Maximum Daily	95 MPN
Fecal Coliform Average Daily	41.3 MPN

D. Compliance Summary

Based on a review of effluent monitoring data submitted by the Discharger for the period from May 2000 through February 2005, the wastewater discharged from the wastewater treatment facility was in chronic violation of effluent limitations for biochemical oxygen demand, and escherichia coli established in Order No. 00-002 for the treatment system. The Regional Board issued an Administrative Civil Liability (ACL), No. R7-2003-0023, on May 22, 2003.

On May 22, 2003, the Regional Board issued an Administrative Civil Liability Complaint (ACLC) No. R7-2003-0023 proposing the Discharger pay $60,000 in civil liability for effluent violations. The above referenced ACLC was rescinded on June 10, 2003 to allow the Discharger to propose an acceptable Compliance Project (CP). On October 3, 2003, the Discharger proposed upgrading the chemical injection system including replacement of storage tanks, developing operations and monitoring procedures to reduce equipment failures, installing flow channels between aeration ponds, upgrading the effluent chamber, and purchasing additional lab equipment to aid in operational control of the plant in order to bring the discharge into compliance with effluent limitations. This CP was incorporated into ACL No. R7-2004-0014.

E. Planned Changes – Not Applicable

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in the proposed Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order is issued pursuant to section 402 of the Federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and Chapter 5.5, Division 7 of the California Water Code (CWC). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4 of the CWC for discharges that are not subject to regulation under CWA section 402.

B. California Environmental Quality Act (CEQA)

This action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (Public Resources Code Section 21100, et seq.) in accordance with Section 13389 of the CWC.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. Beneficial uses applicable to "G" Drain, a part of the Imperial Valley Drains, are as follows:

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	"G" Drain (Imperial Valley Drains)	Existing: Freshwater replenishment (FRESH), Water Contact Recreation (REC I)[1,2], Non-contact water recreation (REC-2)[1], Warm freshwater habitat (WARM); Wildlife habitat (WILD), Preservation of Rare, Threatened or Endangered Species (RARE)[3].

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[1] Unauthorized Use.

[2] The only REC1 usage that is known to occur is from infrequent fishing activity.

[3] Rare, endangered, or threatened wildlife exists in or utilizes some of these waterway(s). If the RARE beneficial use may be affected by a water quality control decision, responsibility for substantiation of the existence of rare, endangered, or threatened species on a case-by-case basis is upon the California Department of Fish and Game on its own initiative and/or at the request of the Regional Board; and such substantiation must be provided within a reasonable time frame as approved by the Regional Board.

2. **Thermal Plan. The Thermal Plan does not apply to the "G" Drain**

3. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, which was amended on May 4, 1995 and November 9, 1999, and the CTR on May 18, 2000, which was amended on February 13, 2001. These rules include water quality criteria for priority pollutants and are applicable to this discharge.

4. **State Implementation Policy.** On March 2, 2000, State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Boards in their basin plans, with the exception of the provision on alternate test procedures for individual discharges that have been approved by USEPA Regional Administrator. The alternate test procedures provision was effective on May 22, 2000. The SIP became effective on May 18, 2000. The SIP includes procedures for determining the need for and calculating water quality-based effluent limitations (WQBELs), and requires Dischargers to submit data sufficient to do so.

5. **Antidegradation Policy.** Section 131.12 of 40 CFR requires that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution 68-16, which incorporates the requirements of the federal antidegradation policy. Resolution 68-16 requires that existing water quality is maintained unless degradation is justified based on specific findings. As discussed in detail in this Fact Sheet, the permitted discharge is consistent with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution 68-16.

6. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and 40 CFR §122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. All effluent limitations in the Order are at least as stringent as the effluent limitations in the previous Order.

7. **Monitoring and Reporting Requirements.** Section 122.48 of 40 CFR requires that all NPDES permits specify requirements for recording and reporting monitoring results. Sections 13267 and 13383 of the CWC authorize the Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements to implement federal and State requirements. This MRP is provided in Attachment E.

8. **Storm Water Requirements**

   a. Federal regulations for storm water discharges were promulgated by the United States Environmental Protection Agency (USEPA) (40 CFR Parts 122, 123, and 124). The regulations require specific categories of facilities which discharge storm water associated with industrial activity to obtain National Pollutant Discharge Elimination System (NPDES) permits and to implement Best Conventional Pollutant Technology (BCT)) and Best Available Technology Economically Achievable (BAT) to reduce or eliminate industrial storm water pollution.

b. The State Water Resources Control Board (SWRCB) adopted Order No. 97-03-DWQ (General Permit No. CAS000001), specifying waste discharge requirements for discharges of storm water associated with industrial activities, excluding construction activities, and requiring submittal of a Notice of Intent by industries to be covered under the Permit. Coverage under the General Permit is not required because there are no storm water flows from the facility.

D. Impaired Water Bodies on CWA 303(d) List

Section 303(d) of the CWA requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. For all 303(d)-listed water bodies and pollutants, the Regional Board plans to develop and adopt total maximum daily loads (TMDLs) that will specify waste load allocations (WLAs) for point sources and load allocations (LAs) for non-point sources, as appropriate. USEPA approved the State's 2002 303(d) list of impaired water bodies on July 25, 2003.

The final effluent from the facility is discharged through Discharge Point 001 to "G" Drain, which is a part of Imperial Valley Drains and drains into the Alamo River and ultimately the Salton Sea. The Imperial Valley Drains has been classified as impaired on the 2002 303(d) list and has been scheduled for TMDL development. According to the 2002 303(d) list, the Imperial Valley Drains are impaired for sedimentation/silt pesticides, and selenium. A TMDL for sedimentation/siltation was approved by USEPA in June 2002. To date no TMDL has been completed for pesticides or selenium.

The sedimentation/siltation TMDL establishes a numeric target of an annual average in-stream TSS concentration of 200 mg/L. In assigning the waste load allocation (WLA), the TDML assigned a WLA to the City of Calipatria of 491.9 tons per year of suspended solids based on a TSS effluent limit equal to double the TSS effluent limits contained in the City's NPDES permit. The TSS effluent limits equal to the equivalent to secondary effluent standards as specified in 40 CFR 133 for TSS of 95 mg/L as a monthly average is applied to this discharge. If the Discharger were to discharge at its maximum design flow rate of 1.73 mgd every day for a year at a concentration equal to the maximum weekly limit, the facility would not exceed the WLA of 491.9 tons per year of sediment. The limits established in this Order adequately implement the requirements of the TMDL.

E. Other Plans, Polices and Regulations – Not Applicable

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source discharges to control the amount of conventional, nonconventional, and toxic pollutants that are discharged into the waters of the United States. The control of the discharge of pollutants is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations. Section 122.44(a) of 40 CFR requires that permits include applicable technology-based limitations and standards. Section 122.44(d) of 40 CFR requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Where numeric water quality objectives have not been established, 40 CFR §122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA section 304(a); proposed State criteria or a State policy interpreting narrative criteria supplemented with other relevant information; or an indicator parameter.

Effluent and receiving water limitations in this Board Order are based on the Federal Clean Water Act, Basin Plan, State Water Resources Control Board's plans and policies, U. S. Environmental Protection Agency guidance and regulations, and best practicable waste treatment technology. While developing effluent limitations and receiving water limitations, monitoring requirements, and special conditions for the draft permit, the following information sources were used:

1. EPA NPDES Application Forms 1 and 2A dated February 9, 2005.
2. Code of Federal Regulations – Title 40
3. Water Quality Control Plan (Colorado River Basin – Region 7) as amended to date.
4. Regional Board files related to Calipatria WWTP NPDES permit CA0105015.

A. Discharge Prohibitions

The discharge prohibitions are based on the requirements of the Basin Plan, CWC, and previous permit provisions, and are consistent with the requirements set for other discharges regulated by NPDES permit to the Imperial Valley Drains.

B. Technology-Based Effluent Limitations

1. Scope and Authority

a. Secondary Treatment Standards. Regulations promulgated in 40 CFR §125.3(a)(1) require technology-based effluent limitations for municipal dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTWs [defined in Section 304(d)(1)].

Section 301(b)(1)(B) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the USEPA Administrator.

Based on this statutory requirement, USEPA developed secondary treatment regulations, which are specified in 40 CFR 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

Equivalent Secondary Treatment Standards. Following publication of the secondary treatment regulations, legislative history indicates that Congress was concerned that USEPA had not "sanctioned" the use of certain biological treatment techniques that were effective in achieving significant reductions in BOD_5 and TSS for secondary treatment. Therefore to prevent unnecessary construction of costly new facilities, Congress included language in the 1981 amendment to the Construction Grants statues [Section 23 of Pub. L. 97-147] that required USEPA to provide allowance for alternative biological treatment technologies such as trickling filters or waste stabilization ponds. In response to this requirement, definition of secondary treatment was modified on September 20, 1984 and June 3, 1985, and published in the revised secondary treatment regulations contained in 40 CFR §133.105. These regulations allow alternative limitations for facilities using trickling filters and waste stabilization ponds that meet the requirements for "equivalent to secondary treatment." These "equivalent to secondary treatment" limitations are *up to* 45 mg/L (monthly average) and *up to* 65 mg/L (weekly average) for BOD_5 and TSS. Therefore, POTWs that use waste stabilization ponds, identified in 40 CFR §133.103, as the principal process for secondary treatment and whose operation and maintenance data indicate that the TSS values specified in the equivalent-to-secondary regulations cannot be achieved, can qualify to have their minimum TSS levels adjusted upwards.

Furthermore, in order to address the variations in facility performance due to geographic, climatic, or seasonal conditions in different States, the Alternative State Requirements (ASR) provision contained in 40 CFR §133.105(d) was written. ASR allows States the flexibility to set permit limitations above the maximum levels of 45 mg/L (monthly average) and 65 mg/L (weekly average) for TSS from lagoons. However, before ASR limitations for suspended solids can be set, the effluent must meet the BOD limitations as prescribed by 40 CFR §133.102(a). Presently, the maximum TSS value set by the State of California for lagoon effluent is 95 mg/L. This value corresponds to a 30-day consecutive average or an average over duration of less than 30 days.

In order to be eligible for equivalent-to-secondary limitations, a POTW must meet all of the following criteria [40 CFR §133.101(g)]:

1. The principal treatment process must be either a trickling filter or waste stabilization pond.
2. The effluent quality consistently achieved, despite proper operations and maintenance, is in excess of 30 mg/L BOD_5 and TSS.

3. Water quality is not adversely affected by the discharge.

4. The treatment works as a whole provides significant biological treatment such that a minimum 65 percent reduction of BOD_5 is consistently attained (30-day average).

2. Applicable Technology-Based Effluent Limitations

1. This facility meets the technology-based regulations for the minimum level of effluent quality attainable by equivalent to secondary treatment in terms of biochemical oxygen demand (BOD_5), SS, and pH as summarized in Table F-1 for the oxidation ponds system. These effluent limitations have been carried over from the previous Order with some modifications as discussed below:

2. This facility meets the technology-based regulations for the minimum level of effluent quality attainable by equivalent to secondary treatment with Alternative State Requirements in terms of biochemical oxygen demand (BOD_5), SS, and pH as summarized in Table F-3 for the oxidation ponds and wetlands treatment systems.

3. Effluent limits for settleable solids are not included in the proposed Order. Both TSS and settleable solids provide a measure of solids in the wastewater. This Order establishes an effluent limitation based on plant performance using BPJ for TSS (see discussion below). Since TSS is regulated in the proposed permit, effluent limitations for settleable solids are redundant and are not necessary; therefore, this Order does not include a limit for settleable solids.

4. Basis for Limitations:

Constituents	**Basis for Limitations**
Biochemical Oxygen Demand (BOD)	Discharges to waters that support aquatic life, that is dependent on oxygen. Organic matter in the discharge may consume oxygen as it breaks down.
Total Suspended Solids (TSS)	High levels of suspended solids can adversely impact aquatic habitat. Untreated or improperly treated wastewater can contain high amounts of suspended solids.
Hydrogen Ion (pH)	Hydrogen Ion (pH) is a measure of Hydrogen Ion concentration in the water. A range specified between 6 to 9 ensures suitability of biological life. This limitation has been adopted in the Basin Plan of the Region.
Total Dissolved Solids	High levels of TDS can adversely impact aquatic life. The TDS limit is from the Basin Plan of the Region.
Flow	The design capacity of the treatment plant is 1.73 mgd.

Table F-1
Summary of Technology-based Effluent Limitations Oxidation Pond Treatment System Equivalent to Secondary Treatment Standards with Alternative State Requirements for TSS
Discharge Point 001 at Monitoring Location M-001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	mgd	1.73				
Biochemical Oxygen Demand 5-day @ 20°C	mg/L	45	65	--	--	--
	lbs/day	649	938	--	--	--
Total Suspended Solids	mg/L	95	--	--	--	--
	lbs/day	1,371	--	--	--	--
pH	standard units	--	--	--	6.0	9.0

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

a. Effluent discharged from this facility could contain pollutants in sufficient quantities to affect receiving water quality. Pursuant to Section 13263, Article 4, Chapter 4 of the Porter Cologne Water Quality Control Act, the Regional Boards are required to issue Waste Discharge Requirements for discharges that could affect the quality of the State's waters. Furthermore, Federal Regulation 40 CFR 122.1 requires the issuance of NPDES permits for pollutants discharged from a point source to the waters of the United States.

b. The U.S. Environmental Protection Agency published the adopted California Toxics Rule (CTR) (40 CFR §131.38). The CTR promulgates new criteria for both human health protection and protection of aquatic life. New numeric aquatic life criteria for 23 priority toxic pollutants and numeric human health criteria for 57 priority toxic pollutants are listed. In addition, the CTR contains a compliance schedule provision, which authorizes the State to issue schedules of compliance for new or revised NPDES permit limits based on the federal criteria when certain conditions are met.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

Table F-2 summarizes the applicable water quality criteria/objective for priority pollutants reported in detectable concentrations in the effluent or receiving water. These criteria were used in conducting the Reasonable Potential Analysis for this Order.

Table F-2
Table F-2 Water Quality Criteria
"G" Drain

			CTR/NTR Water Quality Criteria					
			Freshwater		Saltwater		Human Health for Consumption of:	
		Selected Criteria	Acute	Chronic	Acute	Chronic	Water & Organisms	Organisms only
CTR No.	Constituent	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
6	Copper	3.735	51.68	30.5	5.783	3.735	--	--
7	Lead	8.517	476.8	18.58	220.8	8.517	--	--
9	Nickel	8.2	470	52	74	8.2	610	4,600
10	Selenium	5	20	5	290.58	71.14	--	--
12	Thallium	6.3	--	--	--	--	--	6.3
14	Free Cyanide	5.2	22	5.2	--	--	--	220,000
108	4,4 DDT	0.00059	1.1	0.001	0.13	0.001	--	0.00059
109	4,4 DDE	0.00059						0.00059

3. Determining the Need for WQBELs

In accordance with Section 1.3 of the SIP, the Regional Board conducted a reasonable potential analysis (RPA) for each priority pollutant with an applicable criterion or objective to determine if a WQBEL is required in the Order. The Regional Board analyzed effluent and receiving water data to determine if a pollutant in a discharge has the reasonable potential to cause or contribute to an excursion above a state water quality standard. For all parameters that have the reasonable potential to cause or contribute to an excursion above a water quality standard, numeric WQBELs are required. The RPA considers criteria from the CTR and NTR, and when applicable, water quality objectives specified in the Basin Plan. To conduct the RPA, the Regional Board identified the maximum observed concentration influent to the pond (MEC) and maximum background concentration (B) in the receiving water for each constituent, based on data provided by the Discharger.

Section 1.3 of the SIP provides the procedures for determining reasonable potential to exceed applicable water quality criteria and objectives. The SIP specifies three triggers to complete a RPA:

1. Trigger 1 – If the MEC is greater than or equal to the CTR water quality criteria or applicable objective (C), a limit is needed.
2. Trigger 2 – If MEC<C and background water quality (B) > C, a limit is needed.
3. Trigger 3 – If other related information such as CWA 303(d) listing for a pollutant, discharge type, compliance history, etc. indicates that a WQBEL is required.

Sufficient data are needed to conduct a complete RPA. If data are not sufficient, the Discharger will be required to gather the appropriate data for the Regional Board to conduct the RPA. Upon review of the data, and if the Regional Board determines that WQBELs are needed to protect the beneficial uses, the permit will be reopened for appropriate modification.

The RPA was performed for the priority pollutants for which effluent data were available. These data were used in the RPA and are summarized in Table F-3.

Table F-3
Summary Reasonable Potential Analysis

CTR No.	Priority Pollutant Name	Applicable Water Quality Criteria (C) µg/L	Maximum Effluent Concentration (MEC) µg/L	Maximum Receiving Water Concentration (B) µg/L	RPA Result – Need Limit?	Reason
6	Copper	3.735	14	17	YES	MEC and B > C
7	Lead	8.517	ND	9.8	NO	MEC = ND
9	Nickel	8.2	ND	9.2	NO	MEC = ND
10	Selenium	5	10	8.8	YES	MEC and B > C
12	Thallium	6.3	14	ND	YES	MEC > C
14	Free Cyanide	5.2	30	ND	YES	MEC > C
108	4,4 DDT	0.00059	ND	0.012	NO	MEC = ND
109	4,4 DDE	0.00059	ND	0.075	NO	MEC = ND

4. WQBEL Calculations

a. Water quality based effluent limits (final) are based on monitoring results and following the calculation process outlined in Section 1.4 of the California Toxic Rule and the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California. Table F-4 summarizes the final WQBELs for this Order using the process described below.

b. WQBELS Calculation Example

Using selenium as an example, the following demonstrates how water quality based effluent limits were established for this Order. The process for developing these limits is in accordance with Section 1.4 of the SIP. Attachment G summarizes the development and calculation of all water quality-based effluent limitations for this Order using the process described below.

Step 1: For each constituent requiring an effluent limit, identify the applicable water quality criteria or objective. For each criterion determine the effluent concentration allowance (ECA) using the following steady state equation:

$ECA = C + D(C-B)$ when $C>B$, and
$ECA = C$ When C# B,

Where C = The priority pollutant criterion/objective, adjusted if necessary for hardness, pH and translators. In this Order a hardness value of 400 mg/L (as $CaCO_3$) was used for development of hardness-dependant criteria, and a pH of 7.2 was used for pH-dependant criteria.
D = The dilution credit, and
B = The ambient background concentration

As discussed below, for this Order, dilution was not allowed; therefore:

ECA = C

For selenium the applicable water quality criteria are (reference Table F-2):

$ECA_{acute}=$ 20.00 µg/L
$ECA_{chronic}=$ 5.00 µg/L
$ECA_{human\ health}=$ Narrative

Step 2: For each ECA based on aquatic life criterion/objective, determine the long-term average discharge condition (LTA) by multiplying the ECA by a factor (multiplier). The multiplier is a statistically based factor that adjusts the ECA to account for effluent variability. The value of the multiplier varies depending on the coefficient of variation (CV) of the data set and whether it is an acute or chronic criterion/objective. Table 1 of the SIP provides pre-calculated values for the multipliers based on the value of the CV. Equations to develop the multipliers in place of using values in the tables are provided in Section 1.4, Step 3 of the SIP and will not be repeated here.

$LTA_{acute} = ECA_{acute} \times Multiplier_{acute}$

$LTA_{chronic} = ECA_{chronic} \times Multiplier_{chronic}$

The CV for the data set must be determined before the multipliers can be selected and will vary depending on the number of samples and the standard deviation of a data set. If the data set is less than 10 samples, or at least 80% of the samples in the data set are reported as non-detect, the CV shall be set equal to 0.6.

For selenium, the following data was used to develop the acute and chronic LTA using Table 1 of the SIP:

No. of Samples	CV	$Multiplier_{acute}$	$Multiplier_{chronic}$
2	0.6	0.321	0.527

$LTA_{acute} = 20.00$ µg/L x 0.321 = 6.42 µg/L

$LTA_{chronic} = 5.00$ µg/L x 0.527 = 2.64 µg/L

Step 3: Select the most limiting (lowest) of the LTA.

LTA = most limiting of LTA_{acute} or $LTA_{chronic}$

For selenium, the most limiting LTA was the $LTA_{chronic}$

LTA = 2.64 µg/L

Step 4: Calculate the water quality based effluent limits by multiplying the LTA by a factor (multiplier). Water quality-based effluent limits are expressed as Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitation (MDEL). The multiplier is a statistically based factor that adjusts the LTA for the averaging periods and exceedance frequencies of the criteria/objectives and the effluent limitations. The value of the multiplier varies depending on the probability basis, the coefficient of variation (CV) of the data set, the number of samples (for AMEL) and whether it is monthly or daily limit. Table 2 of the SIP provides pre-calculated values for the multipliers based on the value of the CV and the number of samples. Equations to develop the multipliers in place of using values in the tables are provided in Section 1.4, Step 5 of the SIP and will not be repeated here.

$\text{AMEL}_{\text{aquatic life}} = \text{LTA} \times \text{AMEL}_{\text{multiplier}}$

$\text{MDEL}_{\text{aquatic life}} = \text{LTA} \times \text{MDEL}_{\text{multiplier}}$

AMEL multipliers are based on a 95th percentile occurrence probability, and the MDEL multipliers are based on the 99th percentile occurrence probability. If the number of samples is less than four (4), the default number of samples to be used is four (4).

For selenium, the following data was used to develop the AMEL and MDEL for aquatic life using Table 2 of the SIP:

No. of Samples	CV	$\text{Multiplier}_{\text{MDEL}}$	$\text{Multiplier}_{\text{AMEL}}$
2	0.6	3.11	1.55

$\text{AMEL}_{\text{aquatic life}} = 2.64 \times 1.55 = 4.1\ \mu\text{g/L}$

$\text{MDEL}_{\text{aquatic life}} = 2.64 \times 3.11 = 8.2\ \mu\text{g/L}$

Step 5: For the ECA based on human health, set the AMEL equal to the $\text{ECA}_{\text{human health}}$ - Note: The following approach is not applicable for selenium but it was used for calculating the WQBEL for thallium

$\text{AMEL}_{\text{human health}} = \text{ECA}_{\text{human health}}$

Step 6: Calculate the MDEL for human health by multiplying the AMEL by the ratio of the $\text{Multiplier}_{\text{MDEL}}$ to the $\text{Multiplier}_{\text{AMEL}}$. Table 2 of the SIP provides pre-calculated ratios to be used in this calculation based on the CV and the number of samples.

$\text{MDEL}_{\text{human health}} = \text{AMEL}_{\text{human health}} \times (\text{Multiplier}_{\text{MDEL}} / \text{Multiplier}_{\text{AMEL}})$

No. of Samples	CV	$\text{Multiplier}_{\text{MDEL}}$	$\text{Multiplier}_{\text{AMEL}}$	Ratio
2	0.60	3.11	1.55	2.01

$\text{MDEL}_{\text{human health}}$ = Criteria x 2.01

Step 7: Select the lower of the AMEL and MDEL based on aquatic life and human health as the water-quality based effluent limit for the Order.

For selenium:

$\text{AMEL}_{\text{aquatic life}}$	$\text{MDEL}_{\text{aquatic life}}$	$\text{AMEL}_{\text{human health}}$	$\text{MDEL}_{\text{human health}}$
4.1 µg/L	8.2 µg/L	NA	NA

The lowest (most restrictive) effluent limits are based on aquatic toxicity and were incorporated into this Order. These limits will be protective of aquatic life.

5. WQBEL Based on Basin Plan Objectives

The Basin Plan states that any discharge to a waterbody with a REC1 designated use shall not have an Escherichia coli (E. coli) concentration in excess of a log mean of Most Probable Number (MPN) of 126 MPN per 100 milliliters (based on a minimum of not less than five samples for any 30-day period) nor shall any sample exceed 400 MPN per 100 milliliters. Effluent limitations for E.coli are incorporated in this Order. In addition, the Basin Plan contains receiving water limitations for enterococci and fecal coliform. E.coli is an indicator parameter for enterococci and fecal coliform. Therefore, effluent limitations for enterococci and fecal coliform are not included in the Order.

The Basin Plan requires all waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, 96-hour bioassay or bioassays of appropriate duration or other appropriate methods as specified by the Regional Board. This Order establishes narrative toxicity limitations to comply with this requirement.

In addition, the Basin Plan states that any discharge to Imperial Valley Drains have a total dissolved solids (TDS) daily maximum limit of 4,500 mg/L and an annual average TDS limit of 4,000 mg/L. Effluent limits for TDS are included in this Order.

6. Final WQBELs

Summaries of the water quality effluent limitations required by this Order are described in Table F-4 below.

Table F-4
Summary of Water Quality-based Effluent Limitations

Constituent	Units	Effluent Limitations	
		Average Monthly	Maximum Daily
Copper	µg/L	2.9	5.8
Selenium	µg/L	4.1	8.2
Thallium	µg/L	6.3	13
Free Cyanide	µg/L	4.3	8.5

Wastewater effluent discharged to "G" Drain shall not have a Escherichia coli (E.coli) concentration in excess of a log mean of Most Probable Number (MPN) of 126 MPN per 100 milliliters (based on a minimum of not less than five samples for any 30-day period) nor shall any sample exceed 400 MPN per 100 milliliters.

Wastewater effluent discharged to "G" Drain shall not have a daily maximum TDS concentration in excess of 4,500 mg/L and an annual average concentration in excess of 4,000 mg/L.

There shall be no acute or chronic toxicity in the treatment plant effluent nor shall the treatment plant effluent cause any acute or chronic toxicity in the receiving water. All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, or bioassays of appropriate duration or other appropriate methods specified by the Regional Board.

7. Whole Effluent Toxicity (WET)

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach allows for protection of the narrative "no toxics in toxic amounts" criterion while implementing numeric criteria for toxicity. There are two types of WET tests: acute and chronic. An acute toxicity test is conducted over a shorter time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth.

The Basin Plan specifies a narrative objective for toxicity, requiring that all waters be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental response on aquatic organisms. Detrimental response includes but is not limited to decreased growth rate, decreased reproductive success of resident or indicator species, and/or significant alterations in population, community ecology, or receiving water biota.

In addition to the Basin Plan requirements, Section 4 of the SIP states that a chronic toxicity effluent limitation is required in permits for all discharges that will cause, have the reasonable potential to cause, or contribute to chronic toxicity in receiving waters.

Therefore, in accordance with the SIP, this Order requires the Discharger to conduct chronic toxicity testing for discharges to "G" Drain. In addition, the Order establishes thresholds that when exceeded requires the Discharger to conduct accelerated toxicity testing and/or conduct toxicity identification evaluation (TIE) studies.

D. Final Effluent Limitations

Summaries of the water quality effluent limitations required by this Order are described in Table F-5 and the text below.

Proposed effluent limitations are based on equivalent to secondary treatment standards, CTR, Basin Plan, and effluent limitations established in the previous Order

Table F-5
Summary of Final Effluent Limitations
Discharge Point 001 at Monitoring Location M-001

Parameter	Units	Effluent Limitations					Basis
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Flow	mgd	1.73					
Biochemical Oxygen Demand 5-day @ 20°C	mg/L	45	65	--	--	--	40 CFR §133.103
	lbs/day	649	938	--	--	--	
Total Suspended Solids	mg/L	95		--	--	--	40 CFR §133.103
	lbs/day	1,371		--	--	--	
BOD Percent Removal	%	>/= 65	--	--	--	--	40 CFR §133.103
TSS Percent Removal	%	>/= 65	--	--	--	--	40 CFR §133.103
pH	standard units	--	--	--	6.0	9.0	Basin Plan
Copper	µg/L	2.9		5.8			CTR, SIP
	lbs/day	0.042		0.083			
Free Cyanide	µg/L	4.3		8.5			CTR, SIP
	lbs/day	0.062		0.12			
Selenium	µg/L	4.1	--	8.2	--	--	CTR, SIP
	lbs/day	0.059	--	0.12	--	--	
Thallium	µg/L	6.3	--	13	--	--	CTR, SIP
	lbs/day	0.091	--	0.19	--	--	

[1] Limitations are applicable after June 29, 2009. The interim limitations establish in Section IV.A.2 are applicable from June 29, 2005 through May 16, 2009.

1. The annual average concentration of total dissolved solids (TDS) in the discharge of wastewater shall be limited to 4,000 mg/L.

2. Wastewater effluent discharged to "G" Drain shall not have a Escherichia coli (E. coli) concentration in excess of a log mean of Most Probable Number (MPN) of 126 MPN per 100 milliliters (based on a minimum of not less than five samples for any calendar month) nor shall any sample exceed 400 MPN per 100 milliliters

3. There shall be no acute or chronic toxicity in the treatment plant effluent nor shall the treatment plant effluent cause any acute or chronic toxicity in the receiving water, as defined in the Monitoring and Reporting Program (Attachment E). All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, or bioassays of appropriate duration or other appropriate methods specified by the Regional Board.

E. Interim Effluent Limitations

The Discharger may not be able to consistently comply with the new effluent limitations for selenium and thallium. Therefore, interim limits have been set as follows:

1. The governing Water Quality Criteria (WQC) for copper is 3.735 µg/L, the saltwater aquatic life criteria contained in the CTR. Copper has reasonable potential to exceed water quality objectives, and final WQBELs are required. The WQBELs calculated pursuant to SIP procedures are 2.9 µg/L average monthly and 5.8 µg/L maximum daily. The Discharger indicated in its April 8, 2005 Feasibility Study that it is infeasible to comply immediately with the WQBELs. Therefore, pursuant to the provisions of the SIP, interim effluent limits for selenium are required. The previous permit did not contain an effluent limit for copper, and it is not possible to statistically determine current plant performance based on the limited number of data points. Therefore, the interim effluent limit is the Maximum Effluent Concentration (MEC), 14 µg/L for both the monthly average and daily maximum interim limit. These interim effluent limits are based on the best professional judgment of Regional Board staff.

2. The governing Water Quality Criteria (WQC) for selenium is 5 µg/L, the freshwater aquatic life criteria contained in the CTR. Selenium has reasonable potential to exceed water quality objectives, and final WQBELs are required. The WQBELs calculated pursuant to SIP procedures are 4.1 µg/L average monthly and 8.2 µg/L maximum daily. The Discharger indicated in its April 8, 2005 Feasibility Study that it is infeasible to comply immediately with the WQBELs. Therefore, pursuant to the provisions of the SIP, interim effluent limits for selenium are required. The previous permit did not contain an effluent limit for selenium, and it is not possible to statistically determine current plant performance based on the limited number of data points. Therefore, the interim effluent limit is the Maximum Effluent Concentration (MEC), 10 µg/L for both the monthly average and daily maximum interim limit. These interim effluent limits are based on the best professional judgment of Regional Board staff.

3. The governing WQC for thallium is 6.3 μg/L, the human health criteria for the consumption of organisms contained in the CTR Thallium has reasonable potential to exceed water quality objectives, and final WQBELs are required. The WQBELs calculated pursuant to SIP procedures are 6.3 μg/L and 13 μg/L maximum daily. The Discharger indicated in its April 8, 2005 Feasibility Study that it is infeasible to comply immediately with the WQBELs. Therefore, pursuant to the provisions of the SIP, interim effluent limits for thallium are required. The previous permit did not contain an effluent limit for thallium, and it is not possible to statistically determine current plant performance based on the limited number of data points. Therefore, the interim effluent limit is the MEC, 14 μg/L for both the monthly average and daily maximum interim limit. These interim effluent limits are based on the best professional judgment of Regional Board staff

4. The governing Water Quality Criteria (WQC) for free cyanide is 5.2 μg/L, the freshwater aquatic life criteria contained in the CTR. Free cyanide has reasonable potential to exceed water quality objectives, and final WQBELs are required. The WQBELs calculated pursuant to SIP procedures are 4.3 μg/L average monthly and 8.5 μg/L maximum daily. The Discharger indicated in its April 8, 2005 Feasibility Study that it is infeasible to comply immediately with the WQBELs. Therefore, pursuant to the provisions of the SIP, interim effluent limits for selenium are required. The previous permit did not contain an effluent limit for free cyanide, and it is not possible to statistically determine current plant performance based on the limited number of data points. Therefore, the interim effluent limit is the Maximum Effluent Concentration (MEC), 30 μg/L for both the monthly average and daily maximum interim limit. These interim effluent limits are based on the best professional judgment of Regional Board staff.

Table F-6
Summary of New Interim and Final Effluent Limitations
Discharge Point 001 at Monitoring Location M-001

Constituents	Unit	Date Effluent Limit Becomes Effective	Average Monthly Effluent Limit	Maximum Daily Effluent Limit
Copper (interim)	µg/L	June 29, 2005	14	14
Copper (final)	µg/L	May 18, 2010	2.9	5.8
Selenium (interim)	µg/L	June 29, 2005	10	10
Selenium (final)	µg/L	May 18, 2010	4.1	8.2
Thallium (interim)	µg/L	June 29, 2005	14	14
Thallium (final)	µg/L	May 18, 2010	6.3	13
Free Cyanide (interim)	µg/L	June 29, 2005	30	30
Free Cyanide (final)	µg/L	May 18, 2010	4.3	8.5

F. Land Discharge Specifications (Not Applicable)

G. Reclamation Specifications (Not Applicable)

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

The surface water receiving water limitations in the proposed Order are based upon the water quality objectives contained in the Basin Plan. As such, they are a required part of the proposed Order.

B. Groundwater

The groundwater receiving water limitations in the proposed Order are based upon the water quality objectives contained in the Basin Plan. As such, they are a required part of the proposed Order.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 of 40 CFR requires all NPDES permits to specify recording and reporting of monitoring results. Sections 13267 and 13383 of the California Water Code authorize the Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program, Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the Monitoring and Reporting Program for this facility.

A. Influent Monitoring

This Order carries forward the treatment plant influent monitoring requirements without change.

B. Effluent Monitoring

Monitoring for those pollutants expected to be present in the discharge from the treatment system, M-001, will be required as shown on the proposed monitoring and reporting program (Attachment E) and as required in the "*Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*" adopted March 2, 2000.

The Discharger is required to conduct monitoring of the permitted discharges in order to evaluate compliance with permit conditions. Monitoring requirements are given in the proposed monitoring and reporting program (Attachment E). This provision requires compliance with the monitoring and reporting program, and is based on 40 CFR 122.44(i), 122.62, 122.63 and 124.5. The SMP is a standard requirement in almost all NPDES permits (including the proposed Order) issued by the Regional Board. In addition to containing definitions of terms, it specifies general sampling/analytical protocols and the requirements of reporting of spills, violations, and routine monitoring data in accordance with NPDES regulations, the California Water Code, and Regional Board's policies. The monitoring and reporting program also contains sampling program specific for the Discharger's wastewater treatment plant. It defines the sampling stations and frequency, pollutants to be monitored, and additional reporting requirements. Pollutants to be monitored include all pollutants for which effluent limitations are specified. Further, in accordance with Section 1.3 of the SIP, periodic monitoring is required for all priority pollutants defined by the CTR, for which criteria apply and for which no effluent limitations have been established, to evaluate reasonable potential to cause or contribute to an excursion above a water quality standard.

C. Whole Effluent Toxicity Testing Requirements

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth.

This requirement establishes conditions and protocol by which compliance with the Basin Plan narrative water quality objective for toxicity will be demonstrated and in accordance with Section 4.0 of the SIP. Conditions include required monitoring and evaluation of the effluent for acute and chronic toxicity and numerical values for chronic toxicity evaluation to be used as 'triggers' for initiating accelerated monitoring and toxicity reduction evaluation(s).

The Whole Effluent Toxicity (WET) Testing Requirements contained in the Attachment E, Monitoring and Reporting Program, Section V were developed based on the Draft National Whole Effluent Toxicity Implementation Guidance Under the NPDES Program developed by USEPA (Docket ID. No. OW-2004-0037). This is the most current guidance available to the Regional Board. This Order includes a reopener to allow the requirements of this section to be revised pending the issuance of final guidance or policies developed by either the USEPA or State Water Board.

D. Receiving Water Monitoring

1. Surface Water

Receiving water monitoring is required to determine compliance with receiving water limitations and to characterize the water quality of the receiving water. Requirements are based on the Basin Plan

2. Groundwater – Not Applicable

E. Other Monitoring Requirements

The Discharger shall maintain a permanent log of all solids hauled away from the treatment facility for use/disposal elsewhere and shall provide a summary of the volume, type (screenings, grit, raw sludge, digested sludge), use (agricultural, composting, etc.), and the destination in accordance with the Monitoring and Reporting Program of this Board Order. The sludge that is stockpiled at the treatment facility shall be sampled and analyzed for those constituents listed in the sludge monitoring section of the Monitoring and Reporting Program of this Board Order and as required by Title 40, Code of Federal Regulations, Part 503. The results of the analyses should be submitted to the Regional Board as part of the Monitoring and Reporting Program.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

1. Federal Standard Provisions

Federal Standard Provisions, which in accordance with 40 CFR sections 122.41and 122.42, apply to all NPDES discharges and must be included in every NPDES permit, are provided in Attachment D to the Order.

2. Regional Board Provisions

Regional Board Standard Provisions are based on the Clean Water Act, U.S. EPA regulations, and the California Water Code.

B. Special Provisions

1. Reopener Provisions

This provision is based on 40 CFR Part 123. The Regional Board may reopen the permit to modify permit conditions and requirements. Causes for modifications include the promulgation of new regulations, modification in sludge use or disposal practices, or adoption of new regulations by the State Board or Regional Board, including revisions to the Basin Plan.

2. Special Studies and Additional Monitoring Requirements

a. **Toxicity Identification Evaluations or Toxicity Reduction Evaluations.** This provision is based on the SIP, Section 4, Toxicity Control Provisions.

b. **Translator Study.** This provision is based on the SIP that allows the use of a translator for metals and selenium different than the U.S. EPA conversion factor, provided the Discharger requests this action and completes a translator study within two years from the date of the issuance of this permit as stated in the SIP.

c. **Pollutant Minimization Study.** This provision is based on the SIP, Section 2.1, Compliance Schedules.

d. **Total Dissolved Solids (TDS) Study.** The purpose of this section is to provide more detailed information on the Regional Board's development of salinity standards pursuant to Section 303 and through the NPDES permitting authority in the regulation of municipal and industrial sources. (See Section 402 of the Federal Water Pollution Control Act.)

As part of the Regional Board's development of salinity standards, the Regional Board is requiring a study to determine what is a reasonable increase in salinity for municipal discharges to surface waters and its impact on the beneficial uses of waters of the United States.

As part of the 1996 Review of the Water Quality Standards for Salinity of the Colorado River System dated June 1996, the study proposed that an incremental increase in salinity shall be 400 mg/L or less, which is considered to be a reasonable incremental increase above the flow weighted average salinity of the source water supply.

As part of this permit, the discharger is required to perform a study to evaluate whether a 400 mg/L incremental increase in salinity above the source water is practical and if not, what incremental increase is practical for their discharge. This report shall be submitted to the Regional Board's Executive Officer prior to the filing date for re-application.

The following items describe the purpose and description of the minimum requirements for the report.

1) The permitting authority may permit a discharge in excess of the 400 mg/L incremental increase at the time of issuance or reissuance of a NPDES discharge permit, upon satisfactory demonstration by the permittee that it is not practicable to attain the 400 mg/L limit.

2) Demonstration by the applicant must include information on the following factors relating to the potential discharge:

    (a) Description of the municipal entity and facilities.

    (b) Description of the quantity and salinity of domestic water sources contributing to discharge.

    (c) Description of significant salt sources of the municipal wastewater collection system, and identification of entities responsible for each source, if available.

    (d) Description of water rights, including diversions and consumptive use quantities.

    (e) Description of the wastewater discharge, covering location, receiving waters, quantity, salt load, and salinity.

    (f) Alternative plans for minimizing salt contribution from the municipal discharge. Alternative plans should include:

        a. Description of system salt sources and alternative means of control; and

        b. Cost of alternative plans in dollars per ton, of salt removed from discharge

(g) Such other information pertinent to demonstration of non-practicability as the permitting authority may deem necessary.

3) In determining what permit conditions shall be required, the permit issuing authority shall consider the following criteria including, but not limited to:

(a) The practicability of achieving the 400 mg/L incremental increase.

(b) Where the 400 mg/L incremental increase is not determined to be practicable, the discharger shall provide the following:

c. The impact of the proposed salt input of each alternative on the beneficial uses of the surface water in terms of tons per year and concentration;

d. Costs per ton of salt removed from discharge of each alternative plan;

e. Capability of minimizing the salt discharge;

f. A proposed value for the practical incremental increase; and

g. A justification for the proposed practical incremental increased value.

3. Best Management Practices and Pollution Prevention - Not Applicable

4. Compliance Schedules

a. This Order establishes final effluent limitations for copper, free cyanide, selenium and thallium that are new limits for the facility. This Order also contains interim effluent limitations and a compliance schedule that provides the Discharge time to bring their facility into compliance with the newly established final limits. In accordance with Section 2.1 of the SIP, interim limits and compliance schedules can only be provided by the Board after the Discharger has submitted a report that demonstrates and justifies that it is infeasible for the Discharger to achieve immediate compliance with newly established final effluent limitations. Infeasible means not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.

The provision for compliance schedule is based on Section 2.1 (Compliance Schedules) of the SIP. The proposed permit allows the Discharger up to 4 years from the date of issue of the proposed permit to be in compliance with the final effluent limitations for selenium and thallium. Based on Regional Board's BPJ, 4 years is sufficient for the Discharger to achieve the final effluent limitations for the pollutants. The Discharger is required to develop a compliance and a pollution minimization plan to ensure that the Discharger achieves compliance with the final limitations within a time specified in this Order. Quarterly reporting is required to inform the Regional Board about the progress made by the Discharger to achieve compliance with the final limitations within the specified time. During the interim period, the Discharger is required to meet the interim limitations derived from facility performance data.

5. Construction, Operation, and Maintenance Specifications

These provisions are based on the requirements of 40 CFR 122.41(e) and the previous Order.

6. Special Provisions for Municipal Facilities (POTWs Only)

a. **Sludge Disposal Requirements.** Requirements are based on the previous Order and 40 CFR Part 503.

b. **Pretreatment Program Requirements.** Requirements are based on the previous Order and 40 CFR Part 403.

7. Other Special Provisions

Provisions VI.C.7.a through VI.C.7.g, are included to ensure the compliance with requirements established in the Order, are based on the previous Order, the Clean Water Act, U.S. EPA regulations, California Water Code, and Regional Board plans and policies.

VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, Colorado River Basin Region (Regional Water Board) is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for City of Imperial District Wastewater Treatment Plant. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was published in the following newspapers: Desert Sun, Imperial Valley Press, and Salton Seafarer. In addition, copies of proposed permit were sent to interested agencies and persons.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments should be submitted either in person or by mail to the Executive Office at the Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by 5:00 p.m. on May 25, 2005.

C. Public Hearing

The Regional Water Board will hold a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: June 29, 2005
Time: 10:00 a.m.
Location: City Council Chambers
City of La Quinta
780495 Calle Tampico
La Quinta, CA 92253

Interested persons are invited to attend. At the public hearing, the Regional Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our web address is **http://www.waterboards.ca.gov/coloradoriver/** where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Regional Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

E. Information and Copying

The Report of Waste Discharge (RWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (760) 341-6820

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Jon Rokke at (760) 776-8959.

Attachment G – Summary Water Quality-Based Effluent Limit Calculations

The water quality-based effluent limits developed for this Order are summarized below and were calculated as described in the methodology summarized in Attachment F, Fact Sheet Section IV.C.4 of this Order.

Priority Pollutant	Human Health Calculations			Aquatic Life Calculations											Selected Limits	
	Human Health			Saltwater / Freshwater												
	AMEL = ECA = C hh	MDEL/AMEL multiplier	MDEL hh	ECA acute = C acute	ECA acute multiplier	LTA acute	ECA chronic = C chronic	ECA chronic multiplier	LTA chronic	Lowest LTA	AMEL multiplier 95	AMEL aquatic life	MDEL multiplier 99	MDEL aquatic life	AMEL	MDEL
	ug/L		ug/L	ug/L		ug/L	ug/L		ug/L	ug/L					ug/L	ug/L
Copper	n/a	n/a	n/a	5.78	0.32	1.86	3.7	0.53	1.97	1.86	1.55	2.88	3.11	5.78	2.88	5.78
Selenium	n/a	n/a	n/a	20	0.32	6.42	5	0.53	2.64	2.64	1.55	4.09	3.11	8.21	4.09	8.21
Thallium	6.30	2.01	12.663	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.30	12.6
Free Cyanide	220,000	2.01	441,362	1.00	0.32	0.32	1.00	0.53	0.53	0.32	1.55	0.5	3.11	1.00	0.5	1.0

Notes:

C = Water Quality Criteria
hh = human health
AMEL = Average monthly effluent limitation
MDEL = Maximum daily effluent limitation
ECA = Effluent concentration allowance
LTA = Long-term average concentration

ATTACHMENT H – LIST OF PRIORITY POLLUTANTS

CTR Number	Parameter	CAS Number	Suggested Analytical Methods
1	Antimony	7440360	EPA 6020/200.8
2	Arsenic	7440382	EPA 1632
3	Beryllium	7440417	EPA 6020/200.8
4	Cadmium	7440439	EPA 1638/200.8
5a	Chromium (III)	16065831	EPA 6020/200.8
5a	Chromium (VI)	18540299	EPA 7199/1636
6	Copper	7440508	EPA 6020/200.8
7	Lead	7439921	EPA 1638
8	Mercury	7439976	EPA 1669/1631
9	Nickel	7440020	EPA 6020/200.8
10	Selenium	7782492	EPA 6020/200.8
11	Silver	7440224	EPA 6020/200.8
12	Thallium	7440280	EPA 6020/200.8
13	Zinc	7440666	EPA 6020/200.8
14	Free Cyanide	57125	EPA 9012A
15	Asbestos	1332214	EPA/600/R-93/116(PCM)
16	2,3,7,8-TCDD	1746016	EPA 8290 (HRGC) MS
17	Acrolein	107028	EPA 8260B
18	Acrylonitrile	107131	EPA 8260B
19	Benzene	71432	EPA 8260B
20	Bromoform	75252	EPA 8260B
21	Carbon Tetrachloride	56235	EPA 8260B
22	Chlorobenzene	108907	EPA 8260B
23	Chlorodibromomethane	124481	EPA 8260B
24	Chloroethane	75003	EPA 8260B
25	2-Chloroethylvinyl Ether	110758	EPA 8260B
26	Chloroform	67663	EPA 8260B
27	Dichlorobromomethane	75274	EPA 8260B
28	1,1-Dichloroethane	75343	EPA 8260B
29	1,2-Dichloroethane	107062	EPA 8260B

CTR Number	Parameter	CAS Number	Suggested Analytical Methods
30	1,1-Dichloroethylene	75354	EPA 8260B
31	1,2-Dichloropropane	78875	EPA 8260B
32	1,3-Dichloropropylene	542756	EPA 8260B
33	Ethylbenzene	100414	EPA 8260B
34	Methyl Bromide	74839	EPA 8260B
35	Methyl Chloride	74873	EPA 8260B
36	Methylene Chloride	75092	EPA 8260B
37	1,1,2,2-Tetrachloroethane	79345	EPA 8260B
38	Tetrachloroethylene	127184	EPA 8260B
39	Toluene	108883	EPA 8260B
40	1,2-Trans-Dichloroethylene	156605	EPA 8260B
41	1,1,1-Trichloroethane	71556	EPA 8260B
42	1,12-Trichloroethane	79005	EPA 8260B
43	Trichloroethylene	79016	EPA 8260B
44	Vinyl Chloride	75014	EPA 8260B
45	2-Chlorophenol	95578	EPA 8270C
46	2,4-Dichlorophenol	120832	EPA 8270C
47	2,4-Dimethylphenol	105679	EPA 8270C
48	2-Methyl-4,6-Dinitrophenol	534521	EPA 8270C
49	2,4-Dinitrophenol	51285	EPA 8270C
50	2-Nitrophenol	88755	EPA 8270C
51	4-Nitrophenol	100027	EPA 8270C
52	3-Methyl-4-Chlorophenol	59507	EPA 8270C
53	Pentachlorophenol	87865	EPA 8270C
54	Phenol	108952	EPA 8270C
55	2,4,6-Trichlorophenol	88062	EPA 8270C
56	Acenaphthene	83329	EPA 8270C
57	Acenaphthylene	208968	EPA 8270C
58	Anthracene	120127	EPA 8270C
59	Benzidine	92875	EPA 8270C
60	Benzo(a)Anthracene	56553	EPA 8270C
61	Benzo(a)Pyrene	50328	EPA 8270C
62	Benzo(b)Fluoranthene	205992	EPA 8270C
63	Benzo(ghi)Perylene	191242	EPA 8270C
64	Benzo(k)Fluoranthene	207089	EPA 8270C
65	Bis(2-Chloroethoxy)Methane	111911	EPA 8270C
66	Bis(2-Chloroethyl)Ether	111444	EPA 8270C

CTR Number	Parameter	CAS Number	Suggested Analytical Methods
67	Bis(2-Chloroisopropyl)Ether	108601	EPA 8270C
68	Bis(2-Ethylhexyl)Phthalate	117817	EPA 8270C
69	4-Bromophenyl Phenyl Ether	101553	EPA 8270C
70	Butylbenzyl Phthalate	85687	EPA 8270C
71	2-Chloronaphthalene	91587	EPA 8270C
72	4-Chlorophenyl Phenyl Ether	7005723	EPA 8270C
73	Chrysene	218019	EPA 8270C
74	Dibenzo(a,h)Anthracene	53703	EPA 8270C
75	1,2-Dichlorobenzene	95501	EPA 8260B
76	1,3-Dichlorobenzene	541731	EPA 8260B
77	1,4-Dichlorobenzene	106467	EPA 8260B
78	3,3'-Dichlorobenzidine	91941	EPA 8270C
79	Diethyl Phthalate	84662	EPA 8270C
80	Dimethyl Phthalate	131113	EPA 8270C
81	Di-n-Butyl Phthalate	84742	EPA 8270C
82	2,4-Dinitrotoluene	121142	EPA 8270C
83	2,6-Dinitrotoluene	606202	EPA 8270C
84	Di-n-Octyl Phthalate	117840	EPA 8270C
85	1,2-Diphenylhydrazine	122667	EPA 8270C
86	Fluoranthene	206440	EPA 8270C
87	Fluorene	86737	EPA 8270C
88	Hexachlorobenzene	118741	EPA 8260B
89	Hexachlorobutadiene	87863	EPA 8260B
90	Hexachlorocyclopentadiene	77474	EPA 8270C
91	Hexachloroethane	67721	EPA 8260B
92	Indeno(1,2,3-cd)Pyrene	193395	EPA 8270C
93	Isophorone	78591	EPA 8270C
94	Naphthalene	91203	EPA 8260B
95	Nitrobenzene	98953	EPA 8270C
96	N-Nitrosodimethylamine	62759	EPA 8270C
97	N-Nitrosodi-n-Propylamine	621647	EPA 8270C
98	N-Nitrosodiphenylamine	86306	EPA 8270C
99	Phenanthrene	85018	EPA 8270C
100	Pyrene	129000	EPA 8270C
101	1,2,4-Trichlorobenzene	120821	EPA 8260B
102	Aldrin	309002	EPA 8081A
103	alpha-BHC	319846	EPA 8081A

CTR Number	Parameter	CAS Number	Suggested Analytical Methods
104	beta-BHC	319857	EPA 8081A
105	gamma-BHC	58899	EPA 8081A
106	delta-BHC	319868	EPA 8081A
107	Chlordane	57749	EPA 8081A
108	4,4'-DDT	50293	EPA 8081A
109	4,4'-DDE	72559	EPA 8081A
110	4,4'-DDD	72548	EPA 8081A
111	Dieldrin	60571	EPA 8081A
112	alpha-Endosulfan	959988	EPA 8081A
113	beta-Endosulfan	33213659	EPA 8081A
114	Endosulfan Sulfate	1031078	EPA 8081A
115	Endrin	72208	EPA 8081A
116	Endrin Aldehyde	7421934	EPA 8081A
117	Heptachlor	76448	EPA 8081A
118	Heptachlor Epoxide	1024573	EPA 8081A
119	PCB-1016	12674112	EPA 8082
120	PCB-1221	11104282	EPA 8082
121	PCB-1232	11141165	EPA 8082
122	PCB-1242	53469219	EPA 8082
123	PCB-1248	12672296	EPA 8082
124	PCB-1254	11097691	EPA 8082
125	PCB-1260	11096825	EPA 8082
126	Toxaphene	8001352	EPA 8081A

APPENDIX II

LABORATORY PROCEDURES FOR CYANIDE ANALYSIS

APPENDIX II-1

SIERRA ANALYTICAL INC. –CYANIDE

METHOD #: 335.2 Approved for NPDES (Technical Revision 1980)

TITLE: Cyanide, Total (Titrimetric; Spectrophotometric)

ANALYTE: CN Cyanide

INSTRUMENTATION: Spectrophotometer

STORET No. 00720

1.0 Scope and Application

1.1 This method is applicable to the determination of cyanide in drinking, surface and saline waters, domestic and industrial wastes.

1.2 The titration procedure using silver nitrate with p-dimethylamino-benzal-rhodanine indicator is used for measuring concentrations of cyanide exceeding 1 mg/L (0.25 mg/250 mL of absorbing liquid).

1.3 The colorimetric procedure is used for concentrations below 1 mg/L of cyanide and is sensitive to about 0.02 mg/L.

2.0 Summary of Method

2.1 The cyanide as hydrocyanic acid (HCN) is released from cyanide complexes by means of, a reflux-distillation operation and absorbed in a scrubber containing sodium hydroxide solution. The cyanide ion in the absorbing solution is then determined by volumetric titration or colorimetrically.

2.2 In the colorimetric measurement the cyanide is converted to cyanogen chloride, CNCl, by reaction with chloramine-T at a pH less than 8 without hydrolyzing to the cyanate. After the reaction is complete, color is formed on the addition of pyridine-pyrazolone or pyridine-barbituric acid reagent. The absorbance is read at 620 nm when using pyridine-pyrazolone or 578 nm for pyridine-barbituric acid. To obtain colors of comparable intensity, it is essential to have the same salt content in both the sample and the standards.

2.3 The titrimetric measurement uses standard solution of silver nitrate to titrate cyanide in the presence of a silver sensitive indicator.

3.0 Definitions

3.1 Cyanide is defined as cyanide ion and complex cyanides converted to hydrocyanic acid (HCN) by reaction in a reflux system of a mineral acid in the presence of magnesium ion.

4.0 Sample Handling and Preservation

4.1 The sample should be collected in plastic or glass bottles of 1 liter or larger size. All bottles must be thoroughly cleansed and thoroughly rinsed to remove soluble material from containers.

4.2 Oxidizing agents such as chlorine decompose most of the cyanides. Test a drop of the sample with potassium iodide-starch test paper (KI-starch paper); a blue color indicates the need for treatment. Add ascorbic acid, a few crystals at a time, until a drop of sample produces no color on the indicator paper. Then add an additional 0.06 g of ascorbic acid for each liter of sample volume.

4.3 Samples must be preserved with 2 mL of 10 N sodium hydroxide per liter of sample (pH 2 > or = 12) at the time of collection.

4.4 Samples should be analyzed as rapidly as possible after collection. If storage is required, the samples should be stored in a refrigerator or in an ice chest filled with water and ice to maintain temperature at 4°C.

5.0 Interferences

5.1 Interferences are eliminated or reduced by using the distillation procedure described in Procedure 8.1, 8.2 and 8.3.

5.2 Sulfides adversely affect the colorimetric and titration procedures. Samples that contain hydrogen sulfide, metal sulfides or other compounds that may produce hydrogen sulfide during the distillation should be distilled by the optional procedure described in Procedure 8.2. The apparatus for this procedure is shown in Figure 3.

5.3 Fatty acids will distill and form soaps under the alkaline titration conditions, making the end point almost impossible to detect.

5.3.1 Acidify the sample with acetic acid (1 + 9) to pH 6.0 to 7.0.

Caution: This operation must be performed in the hood and the sample left there until it can be made alkaline again after the extraction has been performed.

5.3.2 Extract with iso-octane, hexane, or chloroform (preference in order named) with a solvent volume equal to 20% of the sample volume. One extraction is usually adequate to reduce the fatty acids below the interference level. Avoid multiple extractions or a long contact time at low pH in order to keep the loss of HCN at a minimum. When the extraction is completed, immediately raise the pH of the sample to above 12 with NaOH solution.

5.4 High results may be obtained for samples that contain nitrate and/or nitrite. During the distillation nitrate and nitrite will form nitrous acid which will react with some organic compounds to form oximes. These compounds formed will decompose under test conditions to generate HCN. The interference of nitrate and nitrite is eliminated by pretreatment with sulfamic acid.

6.0 Apparatus

6.1 Reflux distillation apparatus such as shown in Figure 1 or Figure 2. The boiling flask should be of 1 liter size with inlet tube and provision for condenser. The gas absorber may be a Fisher-Milligan scrubber.

6.2 Microburet, 5.0 mL (for titration).

6.3 Spectrophotometer suitable for measurements at 578 nm or 620 nm with a 1.0 cm cell or larger.

6.4 Reflux distillation apparatus for sulfide removal as shown in Figure 3. The boiling flask same as 6. 1. The sulfide scrubber may be a Wheaton Bubber #709682 with 29/42 joints, size 100 mL. The air inlet tube should not be fritted.

The cyanide absorption vessel should be the same as the sulfide scrubber. The air inlet tube should be fritted.

6.5 Flow meter, such as Lab Crest with stainless steel float (Fisher 11-164-50).

7.0 Reagents

7.1 Sodium hydroxide solution, 1.25N: Dissolve 50 g of NaOH in distilledwater, and dilute to 1 liter with distilled water.

7.2 Lead acetate: Dissolve 30 g of Pb $(C_2H_3O_2)\cdot3H_2O$ in 950 mL of distilled water. Adjust the pH to 4.5 with acetic acid. Dilute to 1 liter.

7.5 Sulfuric acid; 18N: Slowly add 500 mL of concentrated H_2SO_4 to 500 mL of distilled water.

7.6 Sodium dihydrogenphosphate, 1 M: Dissolve 138 g of NaH2PO4*H2O in 1 liter of distilled water. Refrigerate this solution.

7.7 Stock cyanide solution: Dissolve 2.51 g of KCN and 2 g KOH in 900 mL of distilled water. Standardize it with 0.0192 N AgNO3. Dilute to appropriate concentration so that 1 mL = 1 mg CN.

7.8 Standard cyanide solution, intermediate: Dilute 100.0 mL of stock (1 mL = 1 mg CN) to 1000 mL with distilled water (1 mL = 100.0 ug).

7.9 Working standard cyanide solution: Prepare fresh daily by diluting 100.0 mL of intermediate cyanide solution to 1000 mL with distilled water and store in a glass stoppered bottle. 1 mL = 10.0 ug CN.

7.10 Standard silver nitrate solution, 0.0192 N: Prepare by crushing approximately 5 g AgNO3 crystals and drying to constant weight at 40°C. Weigh out 3.2647 g of dried $AgNO_3$, dissolve in distilled water, and dilute to 1000 mL (1 mL = 1 mg CN).

7.11 Rhodanine indicator: Dissolve 20 mg of p-dimethyl-amino-benzalrhodanine in 100 mL of acetone.

7.12 Chloramine T solution: Dissolve 1.0 g of white, water soluble Chloramine T in 100 mL of distilled water and refrigerate until ready to use. Prepare fresh daily.

7.13 Color Reagent--One of the following may be used:

  7.13.1 Pyridine-Barbituric Acid Reagent: Place 15 g of barbituric acid in a 250 mL volumetric flask and add just enough distilled water to wash the sides of the flask and wet the barbituric acid. Add 75 mL of pyridine and mix. Add 15 mL of conc. HCl, mix, and cool to room temperature. Dilute to 250 mL with distilled water and mix. This reagent is stable for approximately six months if stored in a cool, dark place.

  7.13.2 Pyridine-pyrazolone solution:

    7.13.2.1 3-Methyl-1-phenyl-2-pyrazolin-5-one reagent, saturated solution: Add 0.25 g of 3-methyl-1-phenyl-2-pyrazolin-5-one to 50 mL of distilled water, heat to 60°C with stirring. Cool to room temperature.

    7.13.2.2 3,3'Dimethyl-1, 1'-diphenyl-[4,4'-bi-2 pyrazoline] -5,5'dione (bispyrazolone): Dissolve 0.01 g of bispyrazolone in 10 mL of pyridine.

    7.13.2.3 Pour solution (7.13.2.1) through non-acid-washed filter paper. Collect the filtrate. Through the same filter paper pour solution (7.13.2.2) collecting the filtrate in the same container as filtrate from (7.13.2.1). Mix until the filtrates are homogeneous. The mixed reagent develops a pink color but this does not affect the color production with cyanide if used within 24 hours of preparation.

7.14 Magnesium chloride solution: Weight 510 g of $MgCl_2 \cdot 6H_2O$ into a 1000 mL flask, dissolve and dilute to 1 liter with distilled water.

7.15 Sulfamic acid.

8.0 Procedure

8.1 For samples without sulfide.

8.1.1 Place 500 mL of sample, or an aliquot diluted to 500 mL in the 1 liter boiling flask. Pipet 50 mL of sodium hydroxide (7.1) into the absorbing tube. If the . apparatus in Figure 1 is used, add distilled water until the spiral is covered. Connect the boiling flask, condenser, absorber and trap in the train. (Figure 1 or 2).

8.1.2 Start a slow stream of air entering the boiling flask by adjusting the vacuum source. Adjust the vacuum so that approximately two bubbles of air per second enters the boiling flask through the air inlet tube. Proceed to 8.4.

8.2 For samples that contain sulfide.

8.2.1 Place 500 mL of sample, or an aliquot diluted to 500 mL in the 1 liter boiling flask. Pipet 50 mL of sodium hydroxide (7.1) to the absorbing tube. Add 25 mL of lead acetate (7.2) to the sulfide scrubber.Connect the boiling flask, condenser, scrubber and absorber in the train. (Figure 3) The flow meter is connected to the outlet tube of the cyanide absorber.

8.2.2 Start a stream of air entering the boiling flask by adjusting the vacuum source. Adjust the vacuum so that approximately 1.5 liters per minute enters the boiling flask through the air inlet tube. The bubble rate may not remain constant while heat is being applied to the flask. It may be necessary to readjust the air rate occasionally. Proceed to 8.4.

8.3 If samples contain NO_3, and or NO_2 add 2 g of sulfamic acid solution (7.15) after the air rate is set through the air inlet tube. Mix for 3 minutes prior to addition of H_2SO_4.

8.4 Slowly add 50 mL 18N sulfuric acid (7.5) through the air inlet tube. Rinse the tube with distilled water and allow the airflow to mix the flask contents for 3 min. Pour 20 mL of magnesium chloride (7.14) into the air inlet and wash down with a stream of water.

8.5 Heat the solution to boiling. Reflux for one hour. Turn off heat and continue the airflow for at least 15 minutes. After cooling,the boiling flask, disconnect absorber and close off the vacuum source.

8.6 Drain the solution from the absorber into a 250 mL volumetric flask. Wash the absorber with distilled water and add the washings to the flask. Dilute to the mark with distilled water.

8.7 Withdraw 50 mL or less of the solution from the flask and transfer to a 100 mL volumetric flask. If less than 50 mL is taken, dilute to 50 mL with 0.25N sodium hydroxide solution (7.4). Add 15.0 mL of sodium phosphate solution (7.6) and mix.

8.7.1 Pyridine-barbituric acid method: Add 2 mL of chloramine T (7.12) and mix. See Note 1. After 1 to 2 minutes, add 5 mL of pyridine-barbituric acid solution (7.13.1) and mix. Dilute to mark with distilled water and mix again. Allow 8 minutes for color development then read absorbance at 578 nm in a 1 cm cell within 15 minutes.

8.7.2 Pyridine-pyrazolene method: Add 0.5 mL of chloramine T (7.12) and mix. See Note 1 and 2. After 1 to 2 minutes add 5 mL of pyridine-pyrazolone solution (7.13.1) and mix. Dilute to mark with distilled water and mix again. After 40 minutes read absorbance at 620 nm in a 1 cm cell.

NOTE 1: Some distillates may contain compounds that have a chlorine demand. One minute after the addition of chloramine T, test for residual chlorine with KI-starch paper. If the test is negative, add an additional 0.5 mL of chlorine T. After one minute, recheck the sample.

NOTE 2: More than 05. mL of chloramine T will prevent the color from developing with pyridine-pyrazolone.

8.8 Standard curve for samples without sulfide.

8.8.1 Prepare a series of standards by pipeting suitable volumes of standard solution (7.9) into 250 mL volumetric flasks. To each standard add 50 mL of 1.25 N sodium hydroxide and dilute to 250 mL with distilled water. Prepare as follows:

ML of Working Standard Solution (1 mL = 10 μg CN)	Conc. μg CN per 250 mL
0	BLANK
1.0	10
2.0	20
5.0	50
10.0	100
15.0	150
20.0	200

8.8.2 It is not imperative that all standards be distilled in the same manner as the samples. It is recommended that at least two standards (a high and low) be distilled and compared to similar values on the curve to insure that the distillation technique is reliable. If distilled standards do not agree within ±10% of the undistilled standards the analyst should find the cause of the apparent error before proceeding.

8.8.3 Prepare a standard curve by plotting absorbance of standard vs. cyanide concentrations.

8.8.4 To check the efficiency of the sample distillation, add an increment of cyanide from either the intermediate standard (7.8) or the working standard (7.9) to 500 mL of sample to insure a level of 20 μg/L. Proceed with the analysis as in Procedure (8.1.1).

8.9 Standard curve for samples with sulfide.

8.9.1 It is imperative that all standards be distilled in the same manner as the samples. Standards distilled by this method will give a linear curve, but as the concentration increases, the recovery decreases. It is recommended that at least 3 standards be distilled.

8.9.2 Prepare a standard curve by plotting absorbance of standard vs.

cyanide concentrations.

8.10 Titrimetric method.

8.10.1 If the sample contains more than 1 mg/L of CN, transfer the distillate or a suitable aliquot diluted to 250ml, to a 500 mL Erlenmeyer flask. Add 10-12 drops of the benzalrhodanine indicator.

8.10.2 Titrate with standard silver nitrate to the first change in color from yellow to brownish-pink. Titrate a distilled water blank using the same amount of sodium hydroxide and indicator as in the sample.

8.10.3 The analyst should familiarize himself with the end point of the titration and the amount of indicator to be used before actually titrating the samples.

9.0 Calculation

9.1 If the colorimetric procedure is used, calculate the cyanide, in µg/L, in the original sample as follows:

$$CN,\ \mu g/L = \frac{A \times 1{,}000}{B} \times \frac{50}{C}$$

where:

A = µg CN read from standard curve
B = mL of original sample for distillation
C = mL taken for colorimetric analysis

9.2 Using the titrimetric procedure, calculate concentration of CN as follows:

$$CN,\ mg/L = \frac{(A - B)1{,}000}{mL\ orig.\ sample} \times \frac{250}{mL\ of\ aliquot\ titrated}$$

where:

A = volume of $AgNO_3$ for titration of sample.
B = volume of $AgNO_3$ for titration of blank.

10.0 Precision and Accuracy

10.1 In a single laboratory (EMSL), using mixed industrial and domestic waste samples at concentrations of 0.06, 0.13, 0.28 and 0.62 mg/L CN, the standard deviations were ±0.005, ±0.007, ±0.031 and ±0.094, respectively.

10.2 In a single laboratory (EMSL), using mixed industrial and domestic waste samples at concentrations of 0.28 and 0.62 mg/L CN, recoveries were 85% and 102%, respectively.

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APPENDIX II-2

TRUESDAIL LABORATORIES, INC. – CYANIDE

Total Cyanide by SM 4500-E

1. APPARATUS

- Reflux distillation apparatus. The boiling flask should be of 1 liter size with inlet tube and provision for condenser. The gas absorber may be a Fisher-Milligan scrubber.
- Spectrophotometer suitable for measurements at 578nm with a 1.0cm cell

2. REAGENTS

- **Sodium hydroxide solution, 1N**: Dissolve 40g of NaOH in distilled water, and dilute to 1 liter with distilled water.
- **Sulfuric acid, 18N**: Slowly add 500ml of concentrated H_2SO_4 to 500ml of distilled water. Refrigerate this solution.
- **Stock cyanide solution**: 1000ppm
- **Magnesium chloride solution**: Weigh 510g of $MgCl_2 \cdot 6H_2O$ into a 1000ml flask, dissolve and dilute to 1 liter with deionized water
- **Acetate buffer**: Dissolve 410g sodium acetate trihydrate, $NaC_2H_3O_2 \cdot 3H_2O$ in 500ml of deionized water. Add glacial acetic acid to adjust to a pH of 4.5, approx. 500ml
- **Sodium hydroxide dilution solution**: Dissolve 1.6g NaOH in 1 liter distilled water
- **Chloramine-T solution**: Dissolve 1.0g of white, water-soluble Chloramine T in 100ml of distilled water and refrigerate until ready to use. Prepare fresh weekly
- **Pyridine-barbituric acid reagent**: Place 15g of barbituric acid in a 250ml volumetric flask and add just enough distilled water to wash the sides of the flask and wet the barbituric acid. Add 75ml of pyridine and mix. Add 15ml of concentrated HCl, mix, and cool to room temperature. Dilute to 250ml with distilled water and mix. This reagent is stable for approximately six months if stored in a cool, dark place
- **Calcium hypochlorite solution**: Dissolve 5g of calcium hypochloride [$Ca(OCl)_2$] in 100ml of distilled water
- Lead carbonate, $PbCO_3$, powdered
- Lead Acetate paper
- Starch-Iodide (KI) test paper
- Ascorbic acid
- Sulfamic acid, NH_2SO_3H
- **Zinc acetate solution, 100g/L**: Dissolve 120g $Zn(C_2H_3O_2)2 \cdot 2H_2O$ in 500ml water. Dilute to 1 liter
- Phenolphthalein indicator
- **MBTH indicator solution**: Dissolve 0.05g 3-methyl,2-benzothiazolone hydrazone hydrochloride in 100 ml water. Filter if necessary.
- **Ferric Chloride oxidizing solution**: Dissolve 1.6g sulfamic acid and 1 g $FeCl_3.6H_2O$ in 100 ml water
- **Ethylenediamine**, 3.5%. Dilute 3.5g $NH_2CH_2CH_2NH_2$ to 100ml water

3. Procedure

A. Preliminary Treatment of Samples

1. Sulfide (S^{-2}) Test

a. Place lead acetate test paper in a porcelain spot plate.
b. Moistened with acetate buffer.
c. Add 1 drop of sample.
d. Darkening indicates presence of sulfide.
e. Add powdered lead carbonate, filter, and repeat sulfide test.

2. **Chlorine test**
    a. Place Potassium Iodide-Starch paper in a porcelain spot plate
    b. Moistened with acetate buffer.
    c. Add 1 drop of sample.
    d. If bluish discoloration is noted, chlorine is present. Add ascorbic acid on the sample and repeat the test until chlorine is no longer present.

3. **Aldehyde Test**
    a. To 10 ml sample, add 1+1 H_2SO_4 to adjust pH to less than 8.
    b. Place 1 drop sample and 1 drop blank to a separate cavity in a porcelain spot plate.
    c. Add 1 drop MBTH solution and then 1 drop $FeCl_3$ solution to each spot.
    d. If color changed from faint green-yellow to deep green, aldehydes are presnt. Add 2 ml of 3.5% ethylenediamine solution/100ml sample and repeat the test until aldehydes are no longer present.

B. Preparation of calibration standard

1. Primary Standard, 100 ppm: Pipet 10 ml of 1000 ppm cyanide standard into 100 ml volumetric flask and bring to volume with deionized water.
2. Working Standard, 1 ppm: Pipet 1 ml of 100 ppm primary standard into 100 ml volumetric flask and bring to volume with deionized water.
3. Prepare series of working standard by pipeting the required volume of 1 ppm working standards into 50 ml graduated cylinder. Then dilute to 40ml with NaOH dilution solution. Refer to Standards preparation logbook for details.
4. Add 1ml acetate buffer. Add 2ml chloramines-T. Dilute to 45 mL with dilution solution. Add 5ml pyridine-barbituric acid. Mix and let stand form 8 minutes. Read absorbance at 578nm
5. It is not imperative that all standards be distilled in the same manner as the samples. It is recommended that at least two standards (a high and a low) be distilled and compared to similar values on the curve to insure that the distillation technique is reliable.

b) Pretreatment for Cyanides Amenable to Chlorination

1. Three sample aliquots are required to determine cyanides amenable to chlorination. To one 500ml aliquot or a volume (ex. 300ml) diluted to 500ml, add calcium hypochlorite solution dropwise while agitating and maintaining the pH between 11 and 12 with sodium hydroxide solution.

    Caution: The initial reaction produce of alkaline chlorination is the very toxic gas cyanogen chloride; therefore it is recommended that this reaction be performed in the hood. For convenience, the sample may be agitated in a 1 liter beaker by means of a magnetic stirring device. Wrap the beaker in foil and cover the beaker with a foil covered watch glass.

2. Test for residual chlorine with KI-starch paper and maintain this excess for one hour, continuing agitation. A distinct blue color on the test paper indicated a sufficient chlorine level. If necessary, add additional hypochlorite solution.

3. After one hour, add 0.5g of ascorbic acid until KI-starch paper shows no residual chlorine. Add an additional 0.5g of ascorbic acid to ensure the presence of excess reducing agent.

4. Test for total cyanide in both the chlorinated and unchlorinated aliquots. (The difference between the unchlorinated and chlorinated aliquots is the cyanide amenable to chlorination, or free cyanide). Proceed to distillation and color

development.

B. Distillation and color development

1. Place 500 ml of sample, or an aliquot diluted to 500ml in the 1 liter boiling flask. Pipet 50ml of sodium hydroxide solution into the absorbing tube. Connect the boiling flask, condenser, absorber, and trap in the train.

2. Start a slow stream of air entering the boiling flask by adjusting the vacuum source. Adjust the vacuum so that approximately two bubbles of air per second enter the boiling flask through the air inlet tube.

3. Add 2g of sulfamic acid solution after the air rate is set through the air inlet tube. Mix for 3 minutes prior to addition of H_2SO_4.

4. Slowly add 50ml 18N sulfuric acid through the air inlet tube. Rinse the tube with distilled water and allow the airflow to mix the flask contents for 3 minutes. Pour 20ml of magnesium chloride into the air inlet and wash down with a stream of water.

5. Heat the solution to boiling. Reflux for one hour. Turn off heat and continue the airflow for at least 30 minutes. After cooling the boiling flask, disconnect absorber and close off the vacuum source. For best results continue airflow for 1 hour.

6. Transfer the solution from the absorber into a 250ml volumetric flask. Wash the absorber with distilled water and add the washings to the flask. Dilute to the mark with distilled water.

7. Colorimetric Method: Pipet 25ml or less of the solution from the flask and transfer to a 50ml graduated cylinder. Dilute to 40ml with NaOH dilution solution.

8. Add 1ml acetate buffer. Add 2ml chloramines-T. Invert twice to mix, wait 2 minutes. Add 5ml pyridine-barbituric acid. Dilute to 50ml with dilution solution. Let stand 8 minutes. Read absorbance at 578nm using 1cm cell.

APPENDIX II-3

TRUESDAIL LABORATORIES, INC. – THIOCYANATE

Thiocyanate by SM 4500-M

1. APPARATUS

- Spectrometer suitable for measurements at 578nm with a 1.0cm cell
- Glass Adsorption Column: Use 50ml buret with glass wool plug and pack with macroreticular resin approximately 40 cm high.

2. REAGENTS

- Ferric Nitrate solution: Dissolve 404g $Fe(NO_3)_3.9H_20$ in about 800 ml distilled water. Add 80 ml conc HNO_3 and dilute to 1L.
- Stock thiocyanate solution, 1000ppm: Dissolve 1.673g potassium thiocyante in distilled water and dilute to 1L.
- Sodium hydroxide solution, 0.1N: Dissolve 4g NaOH in 1L distilled water
- Nitric Acid solution, 0.1N: Mix 6.4ml conc HNO_3 and dilute to 1L.
- Macroreticular resin (Amberlite XAD-7 HP)
- Hexane
- Acetone
- methanol

3. Procedure

a. Purifying the resin

1. Place sufficient resin in a beaker.
2. Add 5x the resin volume of acetone. Stir for 1 hr. Pour off fines and acetone from settled resin.
3. Add 5x the resin volume of hexane. Stir for 1 hr. Pour off fines and hexane.
4. Add 5x the resin volume of methanol. Stir for 15 min. Pour off methanol.
5. Add 3x the resin volume of 0.1N NaOH. Stir for 15 min. Pour off NaOH.
6. Add 3x the resin volume of 0.1N HNO3. Stir for 15 min. Pour off HNO3
   Add 3x the resin volume of DI. Drain and fill the column. Store excess resin in DI in a closed jar.

b. Regenerate column between samples

1. Rinse with 100 ml 0.1N NaOH; 50 ml 0.1N HNO3, and 100ml DI
2. Insure that the water rinsed empty glass section of the buret.
3. After 10 samples rinse with 100 ml methanol for complete regeneration, then do step #1.
4. Leave the column covered with the last rinse water for storage

* note: refer to (e3) when passing solution through column

c. Standard Preparation

1. Potassium thiocyanate standard, 1000ppm: Dissolve 1.673g potassium thiocyanate (KSCN) in distilled water and dilute to 1L.
2. Prepare the 5-point calibration standards using 200ml volumetric flask. Refer to Standards preparation logbook.
3. Proceed to steps (e1).

d. Preliminary Treatment of Samples

1. Sulfide (S^{-2}) Test
    - a. Place lead acetate test paper in a porcelain spot plate.
    - b. Moistened with acetate buffer.
    - c. Add 1 drop of sample.
    - d. Darkening indicates presence of sulfide.
    - e. Add powdered lead carbonate, filter, and repeat sulfide test.

2. Chlorine test
    - d. Place Potassium Iodide-Starch paper in a porcelain spot plate
    - e. Moistened with acetate buffer.
    - f. Add 1 drop of sample. If bluish discoloration is noted, chlorine is present. Add ascorbic acid on the sample and repeat the test until chlorine is no longer present.

e. Procedure

1. Acidify 150ml sample or a dilution to pH 2 by adding conc. HNO3 dropwise while stirring.
2. Flow rate of sample passing through the column is ≤20ml/min. Do not let liquid level drop below the adsorbent in the column.
3. Measure 90 ml solution (standard, samples and blank) in a graduated cylinder. Use a separate 5x of 5ml addition through the column. Then pour the remaining 65ml through the column. Add the rest of sample (60ml) and collect the eluate.
4. Transfer 50ml of eluate in a 50ml graduated cylinder
5. Add 2.5 ml ferric nitrate solution and mix. Measure absorbance @460 after 2 min using 5cm cell.

APPENDIX II-4

TRUESDAIL LABORATORIES, INC. – CYANOGEN CHLORIDE

Cyanogens Chloride by SM 4500-J

1. APPARATUS

- Spectrophotometer suitable for measurements at 578nm with a 1.0cm cell

2. REAGENTS

- **Sodium hydroxide dilution solution**: Dissolve 1.6g NaOH in 1 liter distilled water
- **Acetate buffer**: Dissolve 410g sodium acetate trihydrate, $NaC_2H_3O_2 \cdot 3H_2O$ in 500ml of deionized water. Add glacial acetic acid to adjust to a pH of 4.5, approx. 500ml
- **Chloramine-T solution**: Dissolve 1.0g of white, water-soluble Chloramine-T in 100ml of distilled water and refrigerate until ready to use. Prepare fresh weekly
- **Phosphate buffer**: Dissolve 138g sodium dihydrogen phosphate monohydrate, $NaH_2PO_4.H_2O$, in water and dilute to 1L. Refrigerate
- **Pyridine-barbituric acid reagent**: Place 15g of barbituric acid in a 250ml volumetric flask and add just enough distilled water to wash the sides of the flask and wet the barbituric acid. Add 75ml of pyridine and mix. Add 15ml of concentrated HCl, mix, and cool to room temperature. Dilute to 250ml with distilled water and mix. This reagent is stable for approximately six months if stored in a cool, dark place
- Lead carbonate, $PbCO_3$, powdered
- Lead Acetate paper
- Starch-Iodide (KI) Test paper
- Ascorbic acid

3. Procedure

A. Calibration Standard

1. Pipet series of standards into 50ml volumetric flasks.
2. Dilute to 20ml with NaOH dilution solution.
3. Add 2ml Chloramine-T and 4ml phosphate buffer. Stopper and mix by inversion 2x.
4. Add 5ml pyridine-barbituric acid, dilute to volume with water and mix
5. After 8 minutes read absorbance @578nm using 1-cm cell

B. Preliminary Treatment of Samples

1. Sulfide (S^{-2}) Test
   a. Place lead acetate test paper in a porcelain spot plate.
   b. Moistened with acetate buffer.
   c. Add 1 drop of sample.
   d. Darkening indicates presence of sulfide.
   e. Add powdered lead carbonate, filter, and repeat sulfide test.
2. Chlorine test
   a. Place Potassium Iodide-Starch paper in a porcelain spot plate
   b. Moistened with acetate buffer. Add 1 drop of sample
   c. If bluish discoloration is noted, chlorine is present. Add ascorbic acid on the sample and repeat the test until chlorine is no longer present.

C. Sample measurement

1. If sample ph>8, reduce it to 8.0-8.5 by careful addition of phosphate buffer.
2. Measure 20 ml sample into 50ml volumetric flask.
3. Add 1ml phosphate buffer. Stopper and mix by inversion one time. Wait for 2 min
4. Add 5ml pyridine-barb acid. Stopper and mix by inversion one time. Let color develop 3 minutes, dilute to volume with water, mix and wait additional 5 minutes. Read absorbance at 578nm using 1cm cell

APPENDIX III

ANALYSIS RESULTS

APPENDIX III-1 ANALYTICAL RESULTS:

D-TEK ANALYTICAL (ATS LABORATORIES)

ATS
LABORATORIES

Lab no: 7469

Reported : 3-8-07

City of Calipatria

Received: 2-14-07

Wastewater

Effluent

	Results	Units	DL	Date Analyzed	Analyst	Method	MDL
Copper	9	ug/l	0.5	2-22-07	OJ	3113B	NA
Lead	ND	ug/l	4	2-21-07	JV	3113B	5
Nickel	ND	ug/l	1	2-23-07	JV	3120B	5
Selenium	ND	ug/l	5	2-23-07	JV	3113B	4
Thallium	ND	ug/l	4	2-23-07	JV	279.2	1
Cyanide	ND	ug/l	5	2-22-07	OJ	4500CN CE	

Analysis by D Tek Analytical, copy of report enclosed

Linda L Webster

Linda L. Webster, Lab supervisor

APPENDIX III-2 ANALYTICAL RESULTS

SIERRA ANALYTICAL INC. (IVE ENVIRONMENTAL LABORATORY)

Imperial Valley Environmental Laboratory
501 E. Third Street
Calexico CA, 92231
(Tel) 760-357-8764
(Fax) 760-357-8765
ELAP Certification # 2524

Client: Calipatria WWTP

Contact : Ruben M.

Log Number: 1627
Sample ID: Pre Chlorination (1627-2)

Date Reported: 09-13-07
Date Sampled: 09-05-07
Date Received: 09-05-07
Sample Type: Water

Analytical Results

Analysis	Effluent	Units	Method	DLR	Analysis Date
Cyanide (Free)	ND	ug/L	EPA 335.2	10.0	09-06-07

*Portion of analysis done by Sierra Analytical Inc. #2320.

Miguel E. Ortega, Laboratory Director

APPENDIX III-3 ANALYTICAL RESULTS

Associated Laboratories

ASSOCIATED LABORATORIES
806 North Batavia - Orange, California 92868 - 714/771-6900 **FAX 714/538-1209**

CLIENT	Enviro-Chem Laboratories, Inc.	(7420)	LAB REQUEST	197899
	ATTN: Curtis Desilets			
	1214 E. Lexington Avenue		REPORTED	10/04/2007
	Pomona, CA 91766		RECEIVED	09/20/2007

SUBMITTER Client

COMMENTS

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods as indicated on the report. This cover letter is an integral part of the final report.

Order No.	Client Sample Identification
833824	070919-58
833825	070919-61
833826	070919-64
833827	070919-67
833828	070919-56
833829	070919-57
833830	070919-59
833831	070919-60
833832	070919-62
833833	070919-63
833834	070919-65
833835	070919-66
833836	Laboratory Method Blank

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

ASSOCIATED LABORATORIES by,

for/ Edward S. Behare, Ph.D.
Vice President

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from date reported.

TESTING & CONSULTING
Chemical
Microbiological
Environmental

Order #: 833824 **Client Sample ID:** 070919-58
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst
4500-CN-J Cyanogen Chloride (CNCl)				
Cyanogen Chloride	0.039	0.02	mg/L	10/03/07 TP
4500-CN-M Thiocyanate				
Thiocyanate	ND	0.5	mg/L	09/25/07 HK

Order #: 833825 **Client Sample ID:** 070919-61
Matrix: WATER
Date Sampled: 09/19/2007

Analyte	Result	DLR	Units	Date/Analyst
4500-CN-J Cyanogen Chloride (CNCl)				
Cyanogen Chloride	0.035	0.02	mg/L	10/03/07 TP
4500-CN-M Thiocyanate				
Thiocyanate	ND	0.5	mg/L	09/25/07 HK

Order #: 833826 **Client Sample ID:** 070919-64
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst
4500-CN-J Cyanogen Chloride (CNCl)				
Cyanogen Chloride	0.050	0.02	mg/L	10/03/07 TP
4500-CN-M Thiocyanate				
Thiocyanate	ND	0.5	mg/L	09/25/07 HK

DLR = Detection limit for reporting purposes, ND = Not Detected below indicated detection limit

Order #: 833827 **Client Sample ID:** 070919-67
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst	
4500-CN-J Cyanogen Chloride (CNCl)					
Cyanogen Chloride	0.038	0.02	mg/L	10/03/07	TP
4500-CN-M Thiocyanate					
Thiocyanate	ND	0.5	mg/L	09/25/07	HK

Order #: 833828 **Client Sample ID:** 070919-56
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst	
4500-CN G Cyanide, Amenable to Chlorination					
Cyanide, Amenable	ND	0.01	mg/L	09/24/07	TP

Order #: 833829 **Client Sample ID:** 070919-57
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst	
4500-CN G Cyanide, Amenable to Chlorination					
Cyanide, Amenable	ND	0.01	mg/L	09/24/07	TP

Order #: 833830 **Client Sample ID:** 070919-59
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst	
4500-CN G Cyanide, Amenable to Chlorination					
Cyanide, Amenable	ND	0.01	mg/L	09/24/07	TP

DLR = Detection limit for reporting purposes, ND = Not Detected below indicated detection limit

Order #: 833831 **Client Sample ID:** 070919-60
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst
4500-CN G Cyanide, Amenable to Chlorination				
Cyanide, Amenable	ND	0.01	mg/L	09/24/07 TP

Order #: 833832 **Client Sample ID:** 070919-62
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst
4500-CN G Cyanide, Amenable to Chlorination				
Cyanide, Amenable	ND	0.01	mg/L	09/24/07 TP

Order #: 833833 **Client Sample ID:** 070919-63
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst
4500-CN G Cyanide, Amenable to Chlorination				
Cyanide, Amenable	ND	0.01	mg/L	09/24/07 TP

Order #: 833834 **Client Sample ID:** 070919-65
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst
4500-CN G Cyanide, Amenable to Chlorination				
Cyanide, Amenable	ND	0.01	mg/L	09/24/07 TP

DLR = Detection limit for reporting purposes, ND = Not Detected below indicated detection limit

Order #: 833835 **Client Sample ID:** 070919-66
Matrix: WATER
Date Sampled: 09/21/2007

Analyte	Result	DLR	Units	Date/Analyst	
4500-CN G Cyanide, Amenable to Chlorination					
Cyanide, Amenable	ND	0.01	mg/L	09/24/07	TP

Order #: 833836 **Client Sample ID:** Laboratory Method Blank
Matrix: WATER

Analyte	Result	DLR	Units	Date/Analyst	
4500-CN G Cyanide, Amenable to Chlorination					
Cyanide, Amenable	ND	0.01	mg/L	09/24/07	TP
4500-CN-J Cyanogen Chloride (CNCl)					
Cyanogen Chloride	ND	0.02	mg/L	10/03/07	TP
4500-CN-M Thiocyanate					
Thiocyanate	ND	0.5	mg/L	09/25/07	HK

DLR = Detection limit for reporting purposes, ND = Not Detected below indicated detection limit

ASSOCIATED LABORATORIES
QA REPORT FORM

QC Sample: 197956-834098

Matrix: WATER

Prep. Date: September 24, 2007

Analysis Date: September 25, 2007

ID#'s in Batch: 197956, 197899

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RESULT

Reporting Units = mg/L

Test	Method	Sample Result	Spike Added	Matrix Spike	Matrix Spike Dup	%Rec MS	%Rec MSD	RPD
CN	335.4 / 4500-CN	ND	0.50	0.415	0.423	83	85	2

ND = Not Detected
RPD = Relative Percent Difference of Matrix Spike and Matrix Spike Duplicate
%REC-MS & MSD = Percent Recovery of Matrix Spike & Matrix Spike Duplicate

%REC LIMITS = 80-120	
RPD LIMITS = 20	

PREPARATION BLANK / LAB CONTROL SAMPLE RESULTS

PREP BLK	LCS				
Value	Result	True	%Rec	L.Limit	H.Limit
ND	0.100	0.10	100	90%	110%

Value = Preparation Blank Value
LCS Result = Lab Control Sample Result
True = True Value of LCS
L.Limit / H.Limit = LCS Control Limits

APPENDIX III-4 ANALYTICAL RESULTS

TRUESDAIL LABORATORIES, INC.

TRUESDAIL LABORATORIES, INC.
INDEPENDENT TESTING, FORENSIC SCIENCE, AND ENVIRONMENTAL ANALYSES
Established 1931
14201 FRANKLIN AVENUE · TUSTIN, CALIFORNIA 92780-7008
(714) 730-6239 · FAX (714) 730-6462 · www.truesdail.com

Client: LEE & RO Inc.
1199 S. Fullerton Road
City of Industry
Attention: Warner Song

Laboratory No.: 971156
Report Date: 11/29/07
Date Received: 11/15/07

Project Name: Cyanide Compliance Project

P.O. No.: Warner Song

Analytical Results Summary

Lab I.D.	Sample I.D.	Sample Time	EPA 150.1 *pH*	SM 4500-CN C,G,E *Cyanide*	SM 4500-J *Cyanogen Chloride*	SM 4500-M *Thiocyanate*
			pH Units	*mg/L*	*mg/L*	*mg/L*
971156-1	City Lift Station	11:50	7.38	ND	ND	0.0902
971156-2	Prison Lift Station	12:00	7.50	ND	ND	ND
971156-3	Prior to Cl2	11:30	7.45	ND	ND	ND
971156-4	Plant Effluent	11:30	7.61	ND	ND	ND

ND: Non Detected (below reporting limit)
mg/L: Milligrams per liter.

Note: The following "Significant Figures" rule has been applied to all results:
Results below 0.01ppm will have two (2) significant figures.
Result above or equal to 0.01ppm will have three (3) significant figures.
Quality Control data will always have three (3) significant figures.

TRUESDAIL LABORATORIES, INC.

EXCELLENCE IN INDEPENDENT TESTING

Established 1931

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TUSTIN, CALIFORNIA 92780-7008
(714) 730-6239 · FAX (714) 730-6462
www.truesdail.com

REPORT

Client: LEE & RO Inc.
1199 S. Fullerton Road
City of Industry
Attention: Warner Song

Laboratory No.: 971156

Date: November 29, 2007
Collected: November 15, 2007
Received: November 15, 2007
Prep/ Analyzed: November 16, 2007
Analytical Batch: 11PH07Q

Project Name: Cyanide Compliance Project

P.O. No.: Warner Song

Investigation: **pH by EPA 150.1**

Analytical Results pH

TLI I.D.	Sample I.D.	Sample Time	Run Time	Units	RL	Results
971156-1	City Lift Station	11:50	10:55	pH Units	2.00	7.38
971156-2	Prison Lift Station	12:00	10:59	pH Units	2.00	7.50
971156-3	Prior to Cl2	11:30	11:03	pH Units	2.00	7.45
971156-4	Plant Effluent	11:30	11:08	pH Units	2.00	7.61

QA/QC Summary

QC STD I.D.	Laboratory Number	Concentration	Duplicate Concentration	Difference (Units)	Acceptance limits	QC Within Control
Duplicate	971170	8.64	8.64	0.00	± 0.100 Units	Yes

QC Std I.D.	Measured Concentration	Theoretical Concentration	Difference (Units)	Acceptance Limits	QC Within Control
LCS	7.05	7.00	0.05	± 0.100 Units	Yes

ND: Below the reporting limit (Not Detected).
RL: Reporting Limit.

Respectfully submitted,
TRUESDAIL LABORATORIES, INC.

Mona Nassimi, Manager

Analytical Services

TRUESDAIL LABORATORIES, INC.
EXCELLENCE IN INDEPENDENT TESTING

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TUSTIN, CALIFORNIA 92780-7008
(714) 730-6239 · FAX (714) 730-6462
www.truesdail.com

REPORT

Client: LEE & RO Inc.
1199 S. Fullerton Road
City of Industry
Attention: Warner Song

Project Name: Cyanide Compliance Project

P.O. No.: Warner Song

Laboratory No.: 971156
Date: November 29, 2007
Collected: November 15, 2007
Received: November 15, 2007
Prep/ Analyzed: November 19, 2007
Analytical Batch: 11CN07I

Investigation: **Cyanide by SM 4500-CN C,G,E**

Analytical Results Cyanide

TLI I.D.	Field I.D.	Units	Method	DF	RL	Results
971156-1	City Lift Station	mg/L	SM 4500-CN C,G,E	1.00	0.01	ND
971156-2	Prison Lift Station	mg/L	SM 4500-CN C,G,E	1.00	0.01	ND
971156-3	Prior to Cl2	mg/L	SM 4500-CN C,G,E	1.00	0.01	ND
971156-4	Plant Effluent	mg/L	SM 4500-CN C,G,E	1.00	0.01	ND

QA/QC Summary

QC Std I.D.	Measured Concentration	Theoretical Concentration	Percent Recovery	Acceptance Limits	QC Within Control
LCS	0.191	0.200	95.5%	90% - 110%	Yes
LCSD	0.190	0.200	95.0%	90% - 110%	Yes

Respectfully submitted,
TRUESDAIL LABORATORIES, INC.

Mona Nassimi, Manager
Analytical Services

TRUESDAIL LABORATORIES, INC.
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TUSTIN, CALIFORNIA 92780-7008
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REPORT

Client: LEE & RO Inc.
1199 S. Fullerton Road
City of Industry
Attention: Warner Song

Project Name: Cyanide Compliance Project

P.O. No.: Warner Song

Laboratory No.: 971156
Date: November 29, 2007
Collected: November 15, 2007
Received: November 15, 2007
Prep/ Analyzed: November 15, 2007
Analytical Batch: 11CNCl07A

Investigation: **Cyanogen Chloride by SM 4500-J**

Analytical Results Cyanogen Chloride

TLI I.D.	Field I.D.	Units	Method	DF	RL	Results
971156-1	City Lift Station	mg/L	SM 4500-J	1.00	0.02	ND
971156-2	Prison Lift Station	mg/L	SM 4500-J	1.00	0.02	ND
971156-3	Prior to Cl2	mg/L	SM 4500-J	1.00	0.02	ND
971156-4	Plant Effluent	mg/L	SM 4500-J	1.00	0.02	ND

QA/QC Summary

QC STD I.D.	Laboratory Number	Concentration	Duplicate Concentration	Relative Percent Difference	Acceptance limits	QC Within Control
Duplicate	971156-4	ND	ND	0.00	≤ 10%	Yes

QC Std I.D.	Measured Concentration	Theoretical Concentration	Percent Recovery	Acceptance Limits	QC Within Control
LCS	0.0584	0.0600	97.3%	90% - 110%	Yes

Respectfully submitted,
TRUESDAIL LABORATORIES, INC.

Mona Nassimi, Manager
Analytical Services

TRUESDAIL LABORATORIES, INC.
EXCELLENCE IN INDEPENDENT TESTING

Established 1931

14201 FRANKLIN AVENUE
TUSTIN, CALIFORNIA 92780-7008
(714) 730-6239 · FAX (714) 730-6462
www.truesdail.com

REPORT

Client: LEE & RO Inc.
1199 S. Fullerton Road
City of Industry
Attention: Warner Song

Project Name: Cyanide Compliance Project

P.O. No.: Warner Song

Laboratory No.: 971156
Date: November 29, 2007
Collected: November 15, 2007
Received: November 15, 2007
Prep/ Analyzed: November 26, 2007
Analytical Batch: 11SCN07A

Investigation: **Thiocyanate by SM 4500-M**

Analytical Results Thiocyanate

TLI I.D.	Field I.D.	Units	Method	DF	RL	Results
971156-1	City Lift Station	mg/L	SM 4500-J	1.00	0.05	0.0902
971156-2	Prison Lift Station	mg/L	SM 4500-J	1.00	0.05	ND
971156-3	Prior to Cl2	mg/L	SM 4500-J	1.00	0.05	ND
971156-4	Plant Effluent	mg/L	SM 4500-J	1.00	0.05	ND

QA/QC Summary

QC STD I.D.	Laboratory Number	Concentration	Duplicate Concentration	Relative Percent Difference	Acceptance limits	QC Within Control
Duplicate	971156-4	ND	ND	0.00	≤ 10%	Yes

QC Std I.D.	Measured Concentration	Theoretical Concentration	Percent Recovery	Acceptance Limits	QC Within Control
LCS	0.163	0.150	109%	90% - 110%	Yes

Respectfully submitted,
TRUESDAIL LABORATORIES, INC.

Mona Nassimi, Manager
Analytical Services

APPENDIX IV

CALIPATRIA MONTHLY MONITORING DATA

	Influent from Prison		Influent from City		Effluent																	
	BOD	TSS	BOD	TSS	Flow	BOD	TSS	TDS	Nitrate-N	Nitrite-N	Ammonia-N	Total-N	T-Phosphate	Ortho-Phosphate	Temp	Copper	Free Cyanide	Selenium	Thalium	Lead	Nickel	Hardness
	mg/L	mg/L	mg/L	mg/L	mgd	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L as $CaCO_3$
1/1/2005	81.40	43.50	370.00	356.50	1.06	19.63	19.25		6.35				3.46									428
2/1/2005	400.00	167.50	68.00	239.00	1.06	19.75	19.50		20.10				3.20									
3/1/2005	51.00	93.00	240.00	429.00	1.09	23.40	13.10		3.44				2.90									
4/1/2005	42.00	100.50	230.00	668.50	1.01	26.25	29.00		3.41				13.00									
5/1/2005	132.00	316.00	114.00	343.00	1.02	21.25	32.50		14.00				3.25									
6/1/2005	107.00	653.00	126.00	113.00	1.06	26.80	23.40		11.40				3.50									
7/1/2005	64.00	324.00	68.00	230.00	1.17	23.00	22.50	1,358	7.40	0.14	3.92	17.06	3.80	3.70	87.50	7	36.00	ND	ND	117	ND	284
8/1/2005	78.00	77.00	120.00	423.00	1.12	24.60	19.10	1,102	6.76	1.38	10.08	21.02	3.86	3.55	86.24	8	14.00	ND	6	281	ND	252
9/1/2005	34.00	142.00	77.00	81.00	1.07	17.00	30.50	1,140	8.70	1.12	2.24	14.86	3.30	2.80	78.00	3	40.00	ND	ND	ND	ND	444
10/1/2005	264.00	270.50	240.00	357.50	1.09	17.25	19.63	1,173	7.14	0.27	1.68	11.33	3.50	3.25	70.70	19	0.025	ND	ND	131	23	424
11/1/2005	150.00	244.50	198.00	394.50	1.16	10.60	17.10	1,300	4.42	0.17	3.36	9.07	2.89	2.70	64.40	3	0.32	4	1	5	5	420
12/1/2005	330.00	695.50	244.00	612.00	1.01	13.40	22.13	1,905	9.93	0.65	7.84	18.98	3.60	3.50	52.78	6	27.30	ND	ND	ND	ND	436
1/1/2006	170.00	695.50	107.00	365.00	1.11	11.75	15.50	1,041	8.75	0.25	7.28	19.64	3.47	3.34	53.60	6	4.00	ND	ND	ND	ND	418
2/1/2006	94.00	590.00	120.00	510.50	0.97	23.50	18.25	818	11.70	0.24	8.40	23.70	3.98	3.86	58.02	6	0.04	ND	ND	12	23	376
3/1/2006	115.00	771.00	94.00	375.00	1.13	25.82	17.00	1,048	1.42	0.27	2.24	11.77	4.50	4.25	59.38	11	12.00	ND	ND	ND	ND	348
4/1/2006	400.00	238.50	120.00	101.50	1.07	19.70	25.13	1,244	8.13	0.26	4.48	14.77	3.75	3.50	64.13	18	40.00	ND	ND	12	ND	352
5/1/2006	396.00	137.50	174.00	199.50	1.03	22.32	15.90	1,060	10.30	0.79	5.60	20.61	3.39	3.26	76.88	5	30.00	4	1	37	31	424
6/1/2006	150.00	564.00	85.00	258.00	1.16	18.30	14.00	1,914	3.36	0.39	2.24	14.95	3.38	3.23	81.46	6	24.00	ND	ND	21	ND	404
7/1/2006	360.00	122.00	128.00	221.50	1.20	11.58	15.48	1,153	4.55	1.35	7.84	16.54	3..38	3.24	86.10	6	50.00	ND	ND	531	ND	427
8/1/2006	108.00	1,894.00	97.00	181.80	1.08	16.66	34.10	1,092	9.95	0.19	4.48	20.22	3.15	3.00	85.56	ND	51.00	ND	ND	ND	ND	436
9/1/2006	200.00	111.00	210.00	134.50	0.89	11.15	22.75	1,135	6.40	1.06	2.80	12.50	3.20	3.12	79.54	19	30.00	ND	ND	22	ND	428
10/1/2006	115.00	207.50	158.00	1,551.50	1.11	9.03	15.13	1,117	6.36	2.11	7.28	20.79	4.60	4.31	73.25	6	37.00	ND	ND	ND	ND	412
11/1/2006	126.00	497.50	140.00	315.50	1.15	16.78	19.00	1,124	2.80	2.11	16.84	25.07	3.27	2.99	62.60	7	27.00	ND	ND	ND	ND	419
12/1/2006	115.00	320.00	94.00	214.00	1.06	13.68	26.13	1,165	3.78	2.06	8.40	15.90	4.18	4.06	52.50	3	ND	ND	ND	ND	ND	412
1/1/2007	126.00	184.00	138.00	236.00	1.07	16.20	23.60	1,140	1.88	2.15	15.68	24.19	3.05	2.81	51.25	5	ND	ND	ND	ND	ND	444
2/1/2007	138.00	178.00	126.00	263.00	1.06	19.65	22.00	1,090	2.80	2.12	15.12	25.64	3.50	3.25	56.00	9	ND	ND	ND	ND	ND	396
3/1/2007	126.00	290.00	132.00	577.50	1.11	16.43	25.50	988	0.22	2.51	24.08	24.01	4.00	3.30	64.40	13	6.00	ND	ND	ND	ND	412
4/1/2007	130.00	121.00	142.00	168.00	1.10	12.53	21.38	1,322	6.34	0.94	19.60	30.24	4.21	3.98	68.75	15	37.00	ND	ND	ND	ND	490
5/1/2007	150.00	306.50	170.00	116.00	1.14	13.34	23.00	1,027	14.80	2.23	20.16	40.55	4.25	4.00	75.60	ND	ND	ND	ND	ND	14	416
6/1/2007	162.00	182.00	168.00	236.00	1.09	12.68	21.00	1,817	2.50	1.23	ND	7.65	4.27	4.00	77.50	10	ND	ND	ND	ND	ND	456
7/1/2007	141.00	47.00	107.00	158.00	1.11	12.30	14.63	954	8.78	2.21	2.80	16.03	3.70	3.50	84.75	4	11.00	ND	ND	ND	ND	412
8/1/2007	138.00	122.00	120.00	137.00	1.16	9.12	19.60	1,804	8.20	1.81	3.36	12.25	3.50	3.38	84.20	ND	ND	ND	ND	6	ND	416
9/1/2007																	ND					
10/1/2007																	ND					
11/1/2007																	ND					
12/1/2007																						
Average	162.29	334.56	147.66	330.21	1.09	17.36	21.15	1,232	7.06	1.15	8.31	18.82	3.92	3.46	70.58	8.48	23.83	4.00	2.67	106.82	19.20	406.89

APPENDIX V

INVOICES FOR SAMPLE ANALYSIS

Truesdail Laboratories, Inc.

14201 Franklin Avenue
Tustin, CA 92780

www.truesdail.com

Phone: 714 730-6239 Fax: 714 730-6462

Invoice

Laboratory **00971156**
Date: 11/15/07

Bill To:

Lee & Ro
Attn: Warner Song
11995 S. Fullerton Road
City of Industry, CA 91748-1232

Ship To:

Lee & Ro
Attn: Warner Song
11995 S. Fullerton Road
City of Industry, CA 91748-1232

Project Manager	Your No.	Ship Via	Date Collected	Terms	Page
David Santos	Warner Song	S10c	11/15/07	C.O.D.	1

QTY.	TEST or SERVICE	DESCRIPTION X	PRICE EACH	DISC %	EXTENDED PRICE
	Received	11/15/07			
	Matrix	W/4			
	Date Collected	11/15/07			
	Sample ID	1) City Lift Station; 2) Prison Lift Station; 3) Prior to Cl2; 4) Plant EFF			
4	41-CN Free	Free (Amenable) Cyanide (CN-F) by EPA 335.1/2	$80.00		$320.00
4	41-Testing	CNCl - Cyanogen Chloride	$100.00		$400.00
4	41-Testing	SCN - Thiocyanate	$120.00		$480.00
1	51-Fld Serv	Field Services	$65.00		$65.00

Sale Amount	$1,265.00
Sales Tax	$0.00
Total Amount	**$1,265.00**
Paid	$0.00
Balance Due	$1,265.00

154886

ASSOCIATED LABORATORIES
806 North Batavia • Orange, California 92868 • 714/771-6900
AX 714/538-1209

TESTING & CONSULTING
Chemical •
Microbiological •
Environmental •

— INVOICE —

USTOMER:

Lee & Ro
Warner (Wonho) Song, Ph.D., P.E.
1199 S. Fullerton Rd.

City of Industry, CA 91748

Client ID: 5890

Inv. Date: 11/14/2007

Invoice # 357665

Lab Req. # 197899

TERMS: NET 30 DAYS

Qty	Item	Item	Item Total
4	4500-CN-J Cyanogen Chloride (CNCl)	45.00	$180.00
8	Cyanide, Amenable	45.00	$360.00
4	Thiocyanate	90.00	$360.00

Total Balance Due $900.00

46501

11/30/07

To insure proper credit, please be sure to enclose invoice number with your remittance. Thank you.

APPENDIX VI

CHAIN OF CUSTODY RECORD

APPENDIX VI-1 CHAIN OF CUSTODY RECORD

D-TEK ANALYTICAL (ATS LABORATORIES)

ATS LABORATORIES
104 S 8TH ST
BRAWLEY, CA 92227
TEL: (760)344-2532
FAX: (760-344-3459)

CHAIN OF CUSTODY

LAB NO:	8257
DATE:	9-19-07

CLIENT: CITY OF CALIPATRIA	
ADDRESS:	**PHONE:**
	FAX:

SAMPLE INFORMATION

SAMPLE NO	IDENTIFICATION	LIQ	SOL	PRES	ANALYSIS
	1. PLANT EFFLUENT				
	2. PRIOR TO CHLORINATION				
	3. LIFT STATION				
	4. PRISON				
	FREE CYANIDE				
	~~PH TO 12/NAOH~~				

RELINQUISHED BY: JESSE SORIANO	
RECEIVED BY: JB	
DATE COLLECTED: 9/19/07	**TIME COLLECTED:** 12-12:45pm
DATE RECEIVED: 9-19-07	**TIME RECEIVED:** 230PM 31o

APPENDIX VI-2 CHAIN OF CUSTODY RECORD

SIERRA ANALYTICAL INC. (IVE ENVIRONMENTAL LABORATORY)

CHAIN OF CUSTODY

Imperial Valley Environmental Laboratory
501 E. Third Street, Calexico, CA 92231
(760) 357-8764 Fax (760) 357-8765
E.L.A.P Cert. # 2524

Date: 9/19/07

Temperature:

Lab ID # 1650

Client: City of Calipatria

Contact Name: Ruben M / Jesse S.

Phone: ( ) Fax: ( )

Project# /

Project name:

Shipped Via: [ ]Walk in [ ]Courier [ ]Fed-Ex [ ]UPS

ANALYSIS REQUESTED

	Sample ID	Matrix	Date / Time	Lab ID	Cyanide (Free)	Chronic Bioassay C. Dubia	Chronic Bioassay F. Minnow	Acute Bioassay C. Dubia	Acute Bioassay F. Minnow
3X	1 Lift Station	water	9/19/07 12:30p		K				
3X	2 Plant Effluent	"	12:04p		R				
3X	3 Prison Imperial	"	12:45p		K				
3X	4 Prior to Chlorination	"	12:15p		K				
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12 Lee & Ro Inc.								

Samplers Name: Warner Jong Date: 9/19/07 Time: above

Notes:

1) Relinquished By: JESSE SORIANO	Date/Time 9/19/07 2:45pm	2) Relinquished By:	Date/Time	3) Relinquished By:	Date/Time
1) Received By: Jorge G	Date/Time 9/19/07 3:45p	2) Received By:	Date/Time	3) Received By:	Date/Time

LAB USE ONLY Received in Lab By:

Signature Printed Name: Jorge G Date / Time

Revise 11/20/03

APPENDIX VI-3 CHAIN OF CUSTODY RECORD

Associated Laboratories

Enviro-Chem, Inc. Laboratories
1214 E. Lexington Avenue,
Pomona, CA 91766
Tel: (909) 590-5905 Fax: (909) 590-5907
CA-DHS ELAP CERTIFICATE # 1555

Turnaround Time
○ Same Day
○ 24 Hours
○ 48 Hours
○ 72 Hours
[✓ ● 1 Week (Standard)]
Other:

Misc. ★ 197844
SM-4500-CN-M

SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	No. OF CONTAINERS	TEMPERATURE	PRESERVATION	THIOCYANATE ★	(By SM-4500-CN-M		Free Cyanide	CNA						COMMENTS
070919-58		9/19/2007		H_2O	1			X				X						
-61					1			X				X						SEE BARBARA
-64								X				X						FOR DETAILS
-67								X				X						
070919-56				H_2O							X							
-57											X							
-59											X							
-60											X							
-62											X							
-63											X							
-65											X							
-66											X							

Company Name: Enviro-Chem, Inc
Address: 1214 E. Lexington Avenue
City/State/Zip: Pomona, CA 91766
Project Contact: Curtis Desilets
Tel: 909-590-5905
Fax: 909-590-5907
Sampler's Signature:
Project Name/ID:

Relinquished by: (CURTIS DESILETS)	Received by: EDDIE HERNANDEZ	Date & Time: 09/20/07 14:50
Relinquished by: EDDIE HERNANDEZ	Received by:	Date & Time: 09/20/07 19:00
Relinquished by:	Received by:	Date & Time:

Instructions for Sample Storage After Analysis:
○ Dispose of ○ Return to Client [✓ ○ Store (30 Days)]
○ Other:

CHAIN OF CUSTODY RECORD

9-21-07 11:45

Date: 9/17/07 09/20/07

WHITE WITH SAMPLE - YELLOW TO CLIENT

Page 1 of 1

nviro-Chem, Inc. Laboratories
214 E. Lexington Avenue,
omona, CA 91766
: (909) 590-5905 Fax: (909) 590-5907
A-DHS ELAP CERTIFICATE #1555

Turnaround Time
○ Same Day
○ 24 Hours
○ 48 Hours
○ 72 Hours
[✓ ○ 1 Week (Standard)]
○ Other:

Misc.

SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	No. OF CONTAINERS	TEMPERATURE	PRESERVATION	Free Cyanide	CNCl	Cyanate SCN							COMMENTS
ity Lift Station	W/ NaOH	9/19/07		H_2O	1x			X									070919-56
ity Lift Station	W/o NaOH	↓		↓	↓			X									↓ -57
ity Lift Station									X	X							-58
ison Lift Station	W/ 〃							X									-59
〃	W/o 〃							X									-60
〃									X	X							-61
rior to Cl_2	W/ 〃							X									-62
〃	W/o 〃							X									-63
〃									X	X							-64
Cont Eff.	W/ 〃							X									-65
〃	W/o 〃							X									-66
〃									X	X							-67

Analysis Required

mpany Name: LEE & RO, Inc

Project Contact: Warner Song

Sampler's Signature:

dress: 1199 S. Fullerton Rd. ~~City of Ind~~.

Tel: (626) 912-3391 x208

Fax:

/State/Zip: City of Industry CA 91748

Project Name/ID: Cyanide compliance Project

inquished by:	Received by:	Date & Time: 9/19/07 12:00PM
inquished by:	Received by:	Date & Time:
inquished by:	Received by:	Date & Time:

Instructions for Sample Storage After Analysis:
○ Dispose of ○ Return to Client ○ Store (30 Days)
○ Other:

9/19/2007

CHAIN OF CUSTODY RECORD

WHITE WITH SAMPLE · YELLOW TO CLIENT

APPENDIX VI-4 CHAIN OF CUSTODY RECORD

TRUESDAIL LABORATORIES, INC.

TRUESDAIL LABORATORIES, INC.
14201 FRANKLIN AVENUE · TUSTIN, CA 92780-7008
(714) 730-6239 · FAX (714) 730-6462
www.truesdail.com

CHAIN OF CUSTODY RECORD

971156

☐ TURNAROUND TIME
DATE 11/15/07 PAGE 1 OF 1

COMPANY LEE & RO Inc.
PROJECT NAME Cyanide Compliance Proj.
PHONE (626) 912-3391 FAX
ADDRESS 1199 S. Fullerton Rd.
City of Industry CA 91763
P.O. NUMBER
SAMPLERS (SIGNATURE)

METHODS

	SAMPLE I.D.	DATE	TIME	DESCRIPTION	Total Cyanide	Cyanide Amenable	Thiocyanate	CNCl	NUMBER OF CONTAINERS	COMMENTS
-1	City Lift station	11/15	~~[illegible]~~ 11:50 W.S.		X	X	X	X	4	
-2	Prison Lift station	11/15	~~B~~ 12:00 pm		X	X	X	X	4	
-3	Prior to Cl₂	11/15	11:30 AM		X	X	X	X	4	
-4	Plant eff.	11/15	11:30 A		X	X	X	X	4	

NEW CLIENT

[redacted]

16 TOTAL NUMBER OF CONTAINERS

CHAIN OF CUSTODY SIGNATURE RECORD

Signature (Relinquished)		Printed Name	WONHO SONG	Company/ Agency	LEE&RO, Inc.	Date/ Time	11/15 4:20 pm
Signature (Received)	Rafael Davila	Printed Name	Rafael	Company/ Agency	T.L.I.	Date/ Time	11-15-07 4:20
Signature (Relinquished)		Printed Name	Hashemi	Company/ Agency	T.L.I	Date/ Time	11-15-07 17:30
Signature (Received)		Printed Name		Company/ Agency		Date/ Time	
Signature (Relinquished)		Printed Name		Company/ Agency		Date/ Time	
Signature (Received)		Printed Name		Company/ Agency		Date/ Time	
Signature (Relinquished)		Printed Name		Company/ Agency		Date/ Time	
Signature (Received)		Printed Name		Company/ Agency		Date/ Time	

For Sample Conditions
See Form Attached

Rec'd 11/15/07
s10d 971156

SAMPLE CONDITIONS
RECEIVED COOL ☐ WARM ☐ ____ °F
CUSTODY SEALED YES ☐ NO ☐
SPECIAL REQUIREMENTS: