CHAPTER 2

EFFLUENT QUALITY

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INTRODUCTION

The goal of the Terminal Island Treatment Plant (TITP) effluent monitoring program is to characterize the physical and chemical properties of treated wastewater discharged to the Outer Los Angeles Harbor. The effluent data, in conjunction with the receiving water monitoring data, are used to assess the impact of the effluent discharge on the Los Angeles Harbor.

TITP has a dry weather design capacity of 30 million gallons per day (MGD) and receives wastewater from San Pedro and neighboring cities (CLA, EMD 1994). Approximately 60% of the wastewater is from the industrial and commercial sector, while the remaining 40% is domestic. Domestic sewage sources include the cities of Wilmington, San Pedro, and Harbor City. Major industrial sources include the seafood processing, petroleum, and metal finishing industries. Other non-domestic sources include docking and storage facilities around the Los Angeles Harbor and the United States Coast Guard facility.

TITP became a full secondary treatment facility with biosolids handling capability in 1977. Biosolids produced during wastewater treatment at TITP are anaerobically digested and dewatered. The resultant biosolids are 100% beneficially reused. In December 1996, the plant was upgraded to include a sand filtration system. Since 1997, essentially all TITP effluent discharged to the Harbor has been tertiary-treated wastewater. The plant has also been upgraded to include an Advanced Wastewater Treatment Facility (AWTF) that began operation in 2002. The AWTF treatment process consists of microfiltration, reverse osmosis (RO), lime stabilization, chlorination, and dechlorination. The AWTF is designed to generate advanced tertiary effluent that will be used by the City's Harbor Water Recycling Project (HWRP) for nonpotable applications (e.g. industrial, irrigational, and recreational purposes), and for ground water recharge in the Dominguez Gap Barrier Project. The AWTF began delivery of water to the Dominguez Gap Barrier Project in March 2006. From January 2004 to December 2005, TITP discharged an average of 15.8 MGD of tertiary-treated wastewater into the Outer Los Angeles Harbor at the TITP Outfall (see Figure 1-1).

This chapter reports the concentrations of the TITP effluent constituents from January 2004 through December 2005 and summarizes trends in effluent quality from 1995 to 2005. TITP was issued a new NPDES permit in May 2005 and updated the monitoring program. Table 2-1a lists the constituents measured in the effluent under the previous TITP NPDES effluent monitoring program, and Table 2-1b lists the constituents measured in the effluent under the current TITP NPDES effluent monitoring program.

The California State Water Resources Control Board adopted two water quality control plans in April 1991: the Inland Surface Water Plan and the Enclosed Bays and Estuaries Plan. These two statewide plans included numeric water quality criteria for priority toxic pollutants. However, these plans were rescinded when a lawsuit brought by several dischargers successfully challenged how the plans were adopted. Since 1994, California has been without water quality standards for most priority pollutants for inland surface waters, enclosed bays and estuaries as required by Section 303(c)(2)(B) of the Clean Water Act (CWA).

The California Toxics Rule (CTR), which became effective on May 18, 2000, was promulgated by the EPA to establish numeric water quality criteria to replace the criteria that were rescinded by the California state court. The CTR established ambient aquatic life criteria for 23 priority toxics, ambient human health criteria for 57 priority toxics, and 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. The State must use the CTR together with the State's existing water quality standards when controlling pollution in inland waters and enclosed bays and estuaries. The numeric water quality criteria contained in the final rule are identical to EPA's recommended Clean Water Act section 304(a) criteria.

The California State Water Resources Control Board also adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (also known as the State Implementation Plan or SIP) on March 2, 2000. The SIP incorporated the May 16, 1974 *Enclosed Bays and Estuaries Policy*, which contains narrative and numerical water quality objectives for the protection of beneficial uses. The SIP applies to discharges of toxic pollutants in the inland surface waters, enclosed bays, and estuaries of California which are subject to regulation under the State's Porter-Cologne Water Quality Control Act and the Federal Clean Water Act . This SIP also establishes the following:

- Implementation provisions for priority pollutant criteria promulgated by USEPA through the CTR and for priority pollutant objectives established by Regional Boards in their Basin Plans
- Monitoring requirements for priority pollutants with insufficient data to determine reasonable potential
- Monitoring requirements for 2, 3, 7, 8 – TCDD equivalents
- Chronic toxicity control provisions

Toxic substances are regulated in the current TITP NPDES permit by water quality based effluent limitations derived from the 1994 Basin Plan, the CTR, and/or best professional judgment (BPJ) pursuant to 40 CFR Part 122.44. If a discharge causes, has a reasonable potential to cause, or contributes to a receiving water excursion above a narrative or numeric objective within a State water quality standard, federal law and regulations, as specified in 40 CFR 122.44(d)(1)(i), and in part, the SIP, the establishment of Water Quality Based Effluent Limits (WQBELs) that will protect water quality is required.

Regional Board staff used tertiary-treated effluent data collected at TITP between July 1997 and June 2004 and the most conservative dilution credit of 61 (approved by the State Board on September 3, 2004) in the Reasonable Potential Analysis. Reasonable potential was not triggered for most of the 126 priority pollutants and final numerical limits were not established. TITP is required to gather the appropriate data on an annual basis and submit it to the Regional Board who will determine if additional final effluent limits need to be established. The City of Los Angeles' Bureau of Sanitation Regulatory Affairs Division will provide the necessary data. If additional final effluent limits are needed, the current NPDES permit will be reopened, and the limits will be included in the permit.

Table 2-1a. Constituents measured in the effluent monitoring program from January 2004 to May 2005.

Constituent	Units of Analysis	Frequency of Analysis	Sample Type	Method
Total Waste Flow	MGD	continuous		recorder/totalizer
Total chlorine residual	mg/L	continuous	--	
Turbidity	NTU	continuous	--	
pH	pH units	weekly	grab	SM 4600-H+ B
Temperature	˚F	weekly	grab	
Settleable solids	ml/L	weekly	grab	SM 2540F
Suspended solids	mg/L	weekly	24-hr composite	SM 2540D
BOD5 @20 C	mg/L	weekly	24 hr composite	SM 5210B
Oil & Grease	mg/L	weekly	grab	EPA 1664
Copper	µg/L	weekly	24 hour composite	SM 3030H, 3120B
Mercury	ng/L	weekly	24 hour composite	SM 3030G, 3112B
Silver	µg/L	weekly	24 hour composite	SM 3030H, 3113B
Zinc	µg/L	weekly	24 hour composite	SM 3030H, 3120B
Ammonia Nitrogen	mg/L	weekly	24 hr composite	SM 4500 NH3 C
Toxicity (acute)	TUa	monthly	grab	*
Toxicity (chronic)	TUc	monthly	24-hr composite	*
Cyanide	µg/L	monthly	grab	EPA 335.2
Arsenic	µg/L	monthly	24 hour composite	SM 3030G, 3114B
Cadmium	µg/L	quarterly	24 hour composite	SM 3030H, 3120B
Chlordane	pg/L	quarterly	24-hour composite	EPA 608
Chloroform	µg/L	quarterly	24-hour composite	EPA 624
Chromium (hexavalent)	µg/L	quarterly	24 hour composite	SM 3500 Cr D
Lead	µg/L	quarterly	24 hour composite	SM 3030H, 3113B
Nickel	µg/L	quarterly	24 hour composite	SM 3030H, 3120B
Selenium	µg/L	quarterly	24 hour composite	SM 3030G, 3114B
Aldrin	pg/L	quarterly	24 hour composite	EPA 608
Benzene	µg/L	quarterly	24-hour composite	EPA 625
DDT's	pg/L	quarterly	24 hour composite	EPA 608
1,2-dichlorobenzene	mg/L	quarterly	24-hour composite	EPA 625
1,3-dichlorobenzene	µg/L	quarterly	24-hour composite	EPA 625
1,4-dichlorobenzene	µg/L	quarterly	24-hour composite	EPA 625
Dichloromethane	µg/L	quarterly	24-hour composite	EPA 625
Dieldrin	pg/L	quarterly	24-hour composite	EPA 608
Endosulfan	ng/L	quarterly	24-hour composite	EPA 608
Endrin	ng/L	quarterly	24 hour composite	EPA 608
Fluoranthene	µg/L	quarterly	24-hour composite	EPA 625
Halomethanes	µg/L	quarterly	24-hour composite	EPA 625
Heptachlor	ng/L	quarterly	24-hour composite	EPA 608
Heptachlor epoxide	ng/L	quarterly	24-hour composite	EPA 608
Hexachlorobenzene	pg/L	quarterly	24-hour composite	EPA 625
HCH - Alpha	pg/L	quarterly	24-hour composite	EPA 608
HCH - Beta	ng/L	quarterly	24 hour composite	EPA 608
HCH - Gamma	ng/L	quarterly	24 hour composite	EPA 608
PAH's	pg/L	quarterly	24-hour composite	EPA 625
PCB's	g/L	quarterly	24 hour composite	EPA 608
Pentachlorophenol	g/L	quarterly	24 hour composite	EPA 625
TCDD equivalents	ng/L	quarterly	24 hour composite	EPA 8280A
Toluene	ng/L	quarterly	24 hour composite	EPA 625
Toxaphene	ng/L	quarterly	24 hour composite	EPA 608
Tributyltin	ng/L	quarterly	24 hour composite	**
2,4,6-trichlorophenol	ng/L	quarterly	24 hour composite	EPA 625
Radioactivity	pCi/L	semi-annually	24 hour composite	EPA 900

SM = Standard Methods, 20th Edition, 1998 (APHA, 1998)
EPA = U.S. Environmental Protection Agency test method
* Acute toxicity is measured as described under EPA (2002) using Method 2006. Chronic toxicity is measured using EPA methods 600/4 87/028 (Weber et al., 1988) and Marine Bioassay Project, 90 10WQ (Anderson et al., 1990).
** Tributyltin was analyzed by CRG Marine Lab, Torrance, CA using a method by Krone et al. for Organotins by GCMS.

MATERIALS AND METHODS

SAMPLE COLLECTION

Representative TITP effluent samples were collected from the effluent pumping plant wet-well. Raw sewage influent to the plant comes from the Fries Avenue, Terminal Way, San Pedro, and Navy forcemains. Representative raw influent samples were collected after a convergence point of the four forcemains. Bi-hourly samples of raw influent and wet-well effluent were collected using automatic samplers and composited by laboratory

Table 2-1b. Constituents measured in the effluent monitoring program from May 2005 to December 2005.

Constituent	Units of Analysis	Frequency of Analysis	Sample Type	Method
Total Waste Flow	MGD	continuous	recorder/totalizer	
Total chlorine residual	mg/L	continuous	recorder	
Turbidity	NTU	continuous	recorder	
pH	pH units	weekly	grab	SM 4600-H+ B
Temperature	°F	weekly	grab	
Settleable solids	ml/L	weekly	grab	SM 2540F
Suspended solids	mg/L	weekly	24-hr composite	SM 2540D
BOD_5 @20°C	mg/L	weekly	24-hr composite	SM 5210B
Oil & Grease	mg/L	weekly	grab	EPA 1664
Dissolved Oxygen	mg/L	weekly	grab	SM 4500-O G
Ammonia-Nitrogen	mg/L	monthly	24-hr composite	SM 4500-NH3
Bis(2-ethylhexyl)phthalate	µg/L	monthly	24-hour composite	EPA 625
Copper	µg/L	monthly	24-hour composite	SM 3030H, 312
Cyanide	µg/L	monthly	grab	EPA 335.2
Dieldrin	µg/L	monthly	24-hour composite	EPA 608
Lead	µg/L	monthly	24-hour composite	SM 3030H, 311
Mercury	ng/L	monthly	24-hour composite	SM 3030G, 311
Nickel	µg/L	monthly	24-hour composite	SM 3030H, 312
Nitrate+Nitrite Nitrogen	mg/L	monthly	24-hour composite	EPA 300
Organic Nitrogen	mg/L	monthly	24-hour composite	SM 4500-NOR
Surfactants (MBAS)	mg/L	monthly	24-hour composite	SM 5540 C
Surfactants (CTAS)	mg/L	monthly	24-hour composite	SM 5540 D
Toxicity (acute)	TUa	monthly	24-hour composite	*
Toxicity (chronic)	TU_c	monthly	24-hour composite	*
Arsenic	µg/L	quarterly	24-hour composite	SM 3030G, 311
Cadmium	µg/L	quarterly	24-hour composite	SM 3030H, 312
Chlordane	pg/L	quarterly	24-hour composite	EPA 608
Chloroform	µg/L	quarterly	24-hour composite	EPA 624
Chromium (hexavalent)	µg/L	quarterly	24-hour composite	SM 3500-Cr D
Selenium	µg/L	quarterly	24-hour composite	SM 3030G, 311
Silver	µg/L	quarterly	24-hour composite	SM 3030H, 311
Zinc	µg/L	quarterly	24-hour composite	SM 3030H, 312
Aldrin	pg/L	quarterly	24-hour composite	EPA 608
Benzene	µg/L	quarterly	24-hour composite	EPA 625
DDT's	pg/L	quarterly	24-hour composite	EPA 608
1,2-dichlorobenzene	mg/L	quarterly	24-hour composite	EPA 625
1,3-dichlorobenzene	µg/L	quarterly	24-hour composite	EPA 625
1,4-dichlorobenzene	µg/L	quarterly	24-hour composite	EPA 625
Dichloromethane	µg/L	quarterly	24-hour composite	EPA 625
Endosulfan	ng/L	quarterly	24-hour composite	EPA 608
Endrin	ng/L	quarterly	24-hour composite	EPA 608
Fluoranthene	µg/L	quarterly	24-hour composite	EPA 625
Halomethanes	µg/L	quarterly	24-hour composite	EPA 625
Heptachlor	ng/L	quarterly	24-hour composite	EPA 608
Heptachlor epoxide	ng/L	quarterly	24-hour composite	EPA 608
Hexachlorobenzene	pg/L	quarterly	24-hour composite	EPA 625
HCH - Alpha	pg/L	quarterly	24-hour composite	EPA 608
HCH - Beta	ng/L	quarterly	24-hour composite	EPA 608
HCH - Gamma	ng/L	quarterly	24-hour composite	EPA 608
PAH's	pg/L	quarterly	24-hour composite	EPA 625
PCB's	g/L	quarterly	24-hour composite	EPA 608
Pentachlorophenol	g/L	semi-annually	24-hour composite	EPA 625
TCDD equivalents	ng/L	semi-annually	24-hour composite	EPA 8280A
Toluene	ng/L	semi-annually	24-hour composite	EPA 625
Toxaphene	ng/L	semi-annually	24-hour composite	EPA 608
Tributyltin	ng/L	semi-annually	24-hour composite	**
2,4,6-trichlorophenol	ng/L	semi-annually	24-hour composite	EPA 625
2,3,7,8-Dioxin	ng/L	semi-annually	24-hour composite	EPA 8290
Radioactivity	pCi/L	semi-annually	24-hour composite	EPA 900

SM = Standard Methods, 20th Edition, 1998 (APHA, 1998)
EPA = U.S. Environmental Protection Agency test method
* Acute toxicity is measured as described under EPA (1985). Chronic toxicity is measured using EPA methods 600/4-87/028 (Weber et al., 1988) and Marine Bioassay Project, 90-10WQ (Anderson et al., 1990).
** Tributyltin was analyzed by Battelle-Duxburry Operations, MA using a method by Unger et al., 1986 until October 2003 at which point the analysis was conducted by CRG Marine Lab, Torrance, CA using a method by Krone et al. for Organotins by GCMS.

personnel based on the flow on the sampling date. Grab samples were collected manually by plant operators or laboratory technicians for analysis (see Table 2-1a,b). These samples were taken during the expected peak flow.

Samples for oil and grease and organic analyses were collected in glass bottles. The grab samples for VOCs were collected with no headspace in amber glass vials with Teflon-coated screw caps. All other samples were collected in plastic bottles. Samples were preserved and stored as detailed in Standard Methods (APHA 1998).

LABORATORY ANALYSIS

All samples were analyzed according to Environmental Laboratory Accreditation Program (ELAP) approved procedures. Specific methods used for individual analyte measurements are listed in Table 2-1a and Table 2-1b.

To control discharge of toxic chemicals to the environment, the Federal Clean Water Act mandates a national policy that "the discharge of toxic pollutants in toxic amounts be prohibited". The EPA, as authorized by the Clean Water Act, implements this policy through the use of "whole effluent testing" for toxicity using the sensitive life stage of aquatic organisms exposed to wastewater effluent. Acute toxicity tests were performed using fathead minnows (*Pimephales*) from April 2004 through May 2005. Acute toxicity testing was waived for January 2004, February 2004, and March 2004 due to participation of TITP in the Bight 2003 resource exchange. Beginning in June 2005, due to a new NPDES permit, the acute toxicity testing was done on mysid shrimp (*Mysidopsis bahia)* and topsmelt (*Atherinops affinis)* for a period of three months to determine the most sensitive species. The mysid shrimp *(Mysidopsis bahia)* was the most sensitive and the acute toxicity testing was continued on the mysid shrimp from September 2005 through December 2005.

Chronic toxicity tests were conducted using the most sensitive species, which is determined by biennial screening tests of three species: sporophytes of the giant kelp (*Macrocystis*), larvae of the red abalone (*Haliotis*), and larvae of the topsmelt (*Atherinops*). The most sensitive species determined for TITP in 2003 was the red abalone (*Haliotis*). The annual screenings in April 2004 and May 2005 resulted in the continued use of the red abalone larvae through December 2005.

DATA ANALYSIS

For the purpose of compliance reporting, analytical data was reported following specific protocols. A discharger does not report the actual measured analytical results that are below the Minimum Level (ML) due to the statistical uncertainty of the result. The ML represents the lowest quantifiable concentration in a sample based on the proper application of all method based analytical procedures and the absence of any matrix interference. The ML also represents the lowest standard used in the calibration curve for a specific analytical method. The ML is adjusted to compensate for any dilution or concentration factors to calculate the Reporting Minimum Level (RML). The Method Detection Limit (MDL) is the lowest concentration at which an analyte can be detected in a sample and can be distinguished from a blank sample with 99% certainty. The ML is typically about 3 to 5 times the MDL but is dependent on the analytical method used.

When the result of an analysis for a constituent was greater than the RML of the constituent, the measured chemical concentration in the samples was reported. When the result of an analysis for a constituent was less than the RML but greater than the MDL of the constituent, the result was reported as "Detected, but Not Quantified". Sample results that were less than the MDL were reported as "Not Detected" or ND.

For the purpose of calculating annual averages of individual constituents, the measured result was used if the sample was greater than or equal to the MDL. If the result was less than the MDL, zero was used in the calculation of the average. If the final calculated average was less than the MDL, the annual average was reported as ND. If the final calculated average was less than the RML, then the annual average was reported as DNQ with the estimated value in parenthesis.

RESULTS AND DISCUSSION

CONVENTIONAL CONSTITUENTS AND NUTRIENTS

The main objectives in the treatment of wastewater are the removal of suspended and floatable materials and the treatment of biodegradable organics (Metcalf and Eddy 1979). The discharge of materials with high total suspended solids (TSS), biochemical oxygen demand (BOD), and oil and grease (O&G) can cause degradation of the receiving environment through eutrophication and introduction of toxic materials (Morel and Schiff 1983).

TITP's 2004 and 2005 effluent discharge limits for major wastewater constituents, as well as the 2004 and 2005 effluent averages and the number of permit exceedances are listed in Table 2-2a and Table 2-2b. The 2004 and 2005 averages for all the major wastewater constituents were much lower than the discharge permit limits. For example, during 2004, the 30-day average concentration and mass emission limits for BOD were 15 mg/L and 3750 lbs/day, respectively, while the 2004 effluent quality averages were < 2 mg/L and < 261 lbs/day, respectively. Similarly, the 30-day average discharge limits for suspended solids, O&G, ammonia, and settleable solids are 15 mg/L, 10 mg/L, 15 mg/L, and 0.1 ml/L, while the 2004 effluent concentrations of these constituents were 1 mg/L, <3.0 mg/L, 0.2 mg/L, and <0.03 ml/L, respectively.

During 2005, the 30-day average concentration and mass emission limits for BOD were 15 mg/L and 3750 lbs/day, respectively, while the 2005 effluent quality averages were < 2 mg/L and < 268 lbs/day, respectively. Similarly, the 30-day average discharge limits for suspended solids, O&G, ammonia, and settleable solids were 15 mg/L, 10 mg/L, 7.4 mg/L, and 0.1 ml/L, while the 2005 effluent concentrations of these constituents were 1 mg/L, <3.0 mg/L, 0.4 mg/L, and <0.03 ml/L, respectively.

Table 2-3a and Table 2-3b list the 2004 and 2005 monthly averages and annual removal efficiencies for most of the major wastewater constituents. The 2005 average percent removals ranged from 92% for oil and grease, 98% for ammonia, 99% for BOD to greater than 99% removal of both suspended and settleable solids. The 2004 average percent removals ranged from 92% for oil and grease, 97% for ammonia, 99% for BOD to greater than 99% removal of both suspended and settleable solids.

Table 2-4 lists the annual averages from 1995 to 2005 for major wastewater constituents. Prior to 1994, most of the exceedances at TITP were associated with a high level of settleable solids caused by occasional bulking in the aeration tanks. At that time, after excessive bulking occurred, there were several successive days of high settleable solids before the biological aeration process could be brought under control. Since then, improved process control has led to fewer process upsets.

TITP's filtration system started operating in December 1996, and since 1997 the entire flow of treated effluent has received sand filtration. This additional treatment has further improved and stabilized the quality of the effluent. Since 1997, with the exception of chronic toxicity, there have only been two permit violations, one each for turbidity and acute toxicity.

Table 2-2a. The NPDES effluent limits and annual averages of major effluent constituents in 2004.

CONSTITUENT	UNITS	LIMITS 30-DAY AVERAGE	7-DAY AVERAGE	DAILY MAXIMUM	2005 ANNUAL AVERAGE	# of EXCEEDANCES
BOD-5	mg/L	15	30	40	<2	0
	lbs/day	3750	7500	10000	<261	0
Suspended Solids	mg/L	15	30	40	1	0
	lbs/day	3750	7500	10000	130	0
Oil and Grease	mg/L	10	---	15	<3	0
	lbs/day	2500	---	3750	<390	0
Settleable Solids	ml/L	0.1	---	0.3	<0.03	0
Residual Chlorine	mg/L	---	---	0.1	<0.05	0
Ammonia-N	mg/L	15	---	45	0.2	0
	lbs/day	3750	---	11250	26	0
pH	pH units	6 - 9			7.4	0
Temperature	°F			100	80	0
Turbidity	NTU			2* 5NTU**	0.36	0

* Daily average

**Turbidity shall not exceed 5 NTU for more than 5% of the time (72 minutes) during any 24-hour period.

Table 2-2b. The NPDES effluent limits and annual averages of major effluent constituents in 2005.

CONSTITUENT	UNITS	LIMITS 30-DAY AVERAGE	7-DAY AVERAGE	DAILY MAXIMUM	2005 ANNUAL AVERAGE	# of EXCEEDANCES
BOD-5	mg/L	15	30	40	<2	0
	lbs/day	3750	7500	10000	<268	0
			---	---	---	---
Suspended Solids	mg/L	15	30	40	1	0
	lbs/day	3750	7500	10000	134	0
Oil and Grease	mg/L	10	---	15	<3	0
	lbs/day	2500	---	3800	<400	0
Settleable Solids	ml/L	0.1	---	0.3	<0.03	0
Residual Chlorine	mg/L	---	---	0.1	<0.05	0
Ammonia-N	mg/L	7.4[a]	---	20 [a]	0.4	0
	lbs/day	1850	---	5000	54	0
pH	pH units	6 - 9			7.4	0
Temperature	°F			100	79	0
Turbidity	NTU			2* 5NTU**	0.34	0

* Daily average

**Turbidity shall not exceed 5 NTU for more than 5% of the time (72 minutes) during any 24-hour period.

[a] New permit limit effective in May 2005

Table 2-3a. 2004 monthly averages for major wastewater constituents.

	FLOW	TEMP.	TURB.	pH		TSS		5-d BOD		OIL & GREASE		SETT. SOLIDS		AMMONIA-N	
	INF	EFF	EFF	INF	EFF	INF	EFF	INF	EFF	INF	EFF	INF	EFF	INF	EFF
2004	MGD	°F	NTU			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
JAN	17.1	73	0.3	7.6	7.3	162	1	212	2	38	<3.0	12.8	<0.04	23.6	0.2
FEB	17.3	75	0.3	7.6	7.2	181	1	217	<2	38	<3.0	12.5	<0.03	22.9	0.3
MAR	15.7	80	0.2	7.8	7.3	176	1	224	<2	40	<3.0	12.0	<0.03	26.2	0.1
APR	14.7	77	0.4	7.7	7.4	204	1	223	<2	37	<3.0	12.7	<0.04	24.2	0.1
MAY	15.3	81	0.4	7.6	7.5	184	1	215	<2	40	<3.0	13.9	<0.03	23.7	0.2
JUN	15.0	83	0.4	7.6	7.4	154	1	196	<2	38	<3.0	13.6	<0.03	23.7	0.3
JUL	15.0	84	0.5	7.4	7.4	170	1	224	3	34	<3.0	13.6	<0.03	22.7	0.2
AUG	15.0	85	0.4	7.3	7.4	169	1	220	3	35	<3.0	13.4	<0.03	22.3	0.1
SEP	15.2	85	0.2	7.3	7.4	189	<1	233	2	35	<3.0	14.7	<0.03	22.4	0.2
OCT	15.8	83	0.3	7.4	7.4	195	1	236	<2	37	<3.0	17.1	<0.03	21.5	0.1
NOV	14.2	79	0.4	7.3	7.4	195	1	265	<2	46	<3.0	14.4	<0.03	25.5	0.3
DEC	16.6	76	0.4	7.3	7.4	184	1	277	<2	34	<3.0	13.7	<0.03	26.2	0.4
*MAX	24.8	90	0.8	8.5	7.9	570	6	390	5	89	4.0	81	0.20	34.4	0.7
*MIN	10.4	69	0.1	6.6	7.0	92	<1	114	<2	25	<1	0.4	<0.03	15.1	<0.1
MEAN	15.6	80	0.4	7.5	7.4	180	1	228	<2	38	<3	13.1	<0.03	23.7	0.2
% REMOVAL							99.4		99.1		92		100		97

* Daily maximum and minimum results for 2004

Table 2-3b. 2005 monthly averages for major wastewater constituents.

	FLOW	TEMP.	TURB.	pH		TSS		5-d BOD		OIL & GREASE		SETT. SOLIDS		AMMONIA-N	
	INF	EFF	EFF	INF	EFF	INF	EFF	INF	EFF	INF	EFF	INF	EFF	INF	EFF
2005	MGD	°F	NTU			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
JAN	18.4	74	0.4	7.4	7.3	158	1	226	<2	29	<3.0	11.1	<0.03	21.5	0.3
FEB	17.8	74	0.4	7.4	7.2	167	1	239	<2	32	<3.0	15.2	<0.03	22.8	0.4
MAR	15.6	76	0.4	7.5	7.3	308	1	292	<2	42	<3.0	13.7	<0.03	27.6	0.3
APR	15.0	77	0.3	7.7	7.3	174	1	240	<2	39	<3.0	11.4	<0.03	25.6	0.4
MAY	15.2	79	0.4	7.7	7.4	131	1	207	<2	40	<3.0	11.7	<0.03	24.4	0.3
JUN	15.2	81	0.3	7.6	7.5	140	1	206	<2	43	<3.0	12.0	<0.03	23.4	0.2
JUL	15.1	82	0.3	7.5	7.5	171	1	250	<2	30	<3.0	12.7	<0.03	23.5	0.4
AUG	16.1	83	0.4	7.4	7.5	159	1	234	<2	33	<3.0	12.8	<0.03	23.4	0.1
SEP	16.0	83	0.2	7.5	7.5	144	1	215	<2	36	<3.0	11.4	<0.03	23.7	0.3
OCT	15.8	82	0.4	7.6	7.4	152	1	243	2	45	<3.0	12.3	<0.03	24.2	0.6
NOV	15.9	80	0.3	7.4	7.5	156	1	251	<2	43	<3.0	14.0	<0.03	24.1	0.3
DEC	15.5	78	0.4	7.6	7.3	172	1	289	2	34	<3.0	13.2	<0.03	24.4	0.4
*MAX	26.9	86	2.0	9.1	7.7	1020	4	580	7	94	<3.0	140	0.05	49.3	0.7
*MIN	10.0	70	0.2	6.5	7.0	62	<1	110	<2	10	<3.0	2.0	<0.03	13.7	0.1
MEAN	16.0	79	0.3	7.5	7.4	170	1	241	<2	37	<3.0	12.6	<0.03	24.1	0.4
% REMOVAL							99.4		99.2		92		100		98

* Daily maximum and minimum results for 2005

PRIORITY POLLUTANT INORGANICS

Tables 2-5a and 2-5b list the effluent discharge limits, the 2004 and 2005 annual effluent averages, as well as the maximum and minimum analytical results detected during the year for priority pollutant inorganics. Pollutants under these groups include heavy metals, cyanide and tributyltin. All inorganic constituents were detected in 2004, except hexavalent chromium, cyanide and tributyltin. Several of the annual maximum values were detected but below the reporting limit (DNQ). In these cases, an estimated value was calculated applying the method described in Materials and Methods. There were no permit exceedances for these constituents.

The removal efficiency of metals through the treatment processes is related to the chemical and physical characteristics of the individual metal. In

Table 2-4. Annual average of major wastewater constituents from 1995 to 2005.

	FLOW	TURB.	pH		Suspended Solids		BOD-5		Oil & Grease		Settleable Solids		Ammonia-N	
Year	INF MGD	EFF NTU	INF	EFF	INF mg/L	EFF mg/L	INF mg/L	EFF mg/L	INF mg/L	EFF mg/L	INF ml/L	EFF ml/L	INF mg/L	EFF mg/L
1995	16.9	2.5	7.6	7.3	195	6	194	3	48	3.3	14.1	<0.03	28.5	<0.3
1996	15.9	1.2	7.6	7.2	187	5	201	3	49	2.2	12.6	0.03	28.5	0.4
1997	16.3	1.0	7.6	7.4	185	2	193	2	48	2.0	12.5	<0.03	28.5	1.8
1998	16.6	1.0	7.4	7.3	195	1	192	4	43	1.0	43	<0.03	29.7	6.2
1999	15.1	<0.5	7.5	7.4	234	2	251	3	41	1.0	41	<0.03	32.6	3.4
2000	15.9	0.5	7.5	7.3	227	1	237	2	40	2.0	40	<0.03	33.7	1.6
2001	15.2	0.5	7.4	7.3	216	1	251	<2	39	1.2	1.2	<0.03	30.6	0.6
2002	15.1	0.5	7.5	7.4	193	1	233	<2	42	3.2*	12.1	<0.03	24.9	0.3
2003	15.3	0.5	7.5	7.4	195	1	224	2	36	<3	13.1	<0.03	23.8	0.6
2004	15.6	0.4	7.5	7.4	180	1	229	<2	38	<3	13.7	<0.03	23.7	0.2
2005	16.0	0.3	7.5	7.4	170	1	241	<2	37	<3	12.6	<0.03	24.1	0.4

*MDL changed in 2002

general, higher removal efficiencies are found in metals that are less soluble in wastewater and have greater tendencies to associate with particles in the wastewater (Chen et al., 1974). This group of less soluble metals includes chromium, mercury, lead, copper, silver, and zinc. Arsenic and selenium are more soluble in wastewater and are not easily removed.

The average concentrations of eight detected priority pollutant metals are shown in Table 2-6. Consistent with the above findings, the levels of chromium, mercury, copper, silver and zinc are much lower in the effluent as compared to the influent. The removal of arsenic and selenium from the effluent is not as efficient There has also been a gradual decline in the influent concentration of most metals over time.

ORGANIC CONSTITUENTS

Tables 2-7a and 2-7b list the organic priority pollutants tested under the current TITP NPDES permit. Where applicable, current effluent discharge limits are listed, along with the 2004 & 2005 annual effluent averages, as well as the maximum and minimum analytical results detected during the year for priority pollutant organics. A numerical limit in the current TITP NPDES permit is not defined unless a constituent shows a reasonable potential to exceed State water quality standards or has been defined in a previous TITP NPDES permit. Among the organic constituents tested in 2004, only Chloroform, Bis (2-ethylhexyl) phthalate, Di-n-butyl phthalate, Dichlorobromomethane, and Chlorodibromomethane were detected. Among the organic constituents tested in 2005, only Halomethanes, Chloroform, Bis (2-ethylhexyl) phthalate, Di-n-butyl phthalate, Dichlorobromomethane, Chlorodibromomethane, and 2,4,6-Trichlorophenol were detected. There were no permit exceedances for these constituents during either year.

RESIDUAL CHLORINE

The current NPDES permit of TITP does not require chlorination of the final effluent. Since chlorination may occur in upstream processes, residual chlorine in the TITP final effluent is monitored continuously with an on-line meter. During 2004 and 2005, residual chlorine was not detected in the effluent.

RADIOACTIVITY

Low levels of gross beta radioactivity were detected in the TITP effluent during the semiannual sampling in 2004-2005. However, the amount detected was always below the 2004 NPDES Permit limit (30 ρCi/L) which is based on an annual average. The current NPDES permit limit

Table 2-5a. The NPDES effluent limits and annual averages of priority pollutant inorganics in 2004.

PRIORITY POLLUTANT INORGANICS:		CURRENT PERMIT LIMITS					
CONSTITUENT	UNITS	MONTHLY AVERAGE	DAILY MAXIMUM	2004 ANNUAL AVERAGE	2004 ANNUAL MAX	2004 ANNUAL MIN	# OF EXCEEDANCES
Antimony	µg/L	---	---	DNQ(0.6)	DNQ(0.7)	DNQ(0.4)	0
Arsenic	µg/L	---	---	2.8	4	0.9	0
Beryllium	µg/L	---	---	ND	DNQ(0.7)	ND	0
Cadmium	µg/L	---	---	ND	DNQ(0.4)	ND	0
Chromium (hexavalent)	µg/L	---	---	ND	ND	ND	0
Chromium (total)	µg/L	---	---	ND	DNQ(0.8)	ND	0
Copper	µg/L	74*	---	DNQ(7)	23	DNQ(2)	0
Lead	µg/L	8.6*	---	DNQ(2.9)	DNQ(3)	DNQ(0.5)	0
Mercury	µg/L	0.3*	---	DNQ(0.03)	DNQ(0.1)	ND	0
Nickel	µg/L	120	---	4.7	6.7	3	0
Selenium	µg/L	---	---	5.7	10.1	2.9	0
Silver	µg/L	3.8*	---	DNQ(0.3)	2.4	ND	0
Thallium	µg/L	---	---	ND	DNQ(0.05)	ND	0
Zinc	µg/L	---	---	24	45	14	0
Cyanide	µg/L	11*	---	ND	ND	ND	0
Tributyltin	ng/L	---	---	ND	ND	ND	0

DNQ=Detected but Not Quantified
Note - A numerical limit in the current NPDES permit is not defined unless a constituent shows a reasonable potential to exceed State water quality standards or has been defined in a previous permit.
* -Current permit limits are interim effluent limits and expire on March 10, 2010.

Table 2-5b. The NPDES effluent limits and annual averages of priority pollutant inorganics in 2005.

PRIORITY POLLUTANT INORGANICS:		CURRENT PERMIT LIMITS					
CONSTITUENT	UNITS	MONTHLY AVERAGE	DAILY MAXIMUM	2005 ANNUAL AVERAGE	2005 ANNUAL MAX	2005 ANNUAL MIN	# OF EXCEEDANCES
Antimony	µg/L	---	---	DNQ(0.6)	DNQ(0.7)	DNQ(0.6)	0
Arsenic	µg/L	---	---	2.8	3.8	1.8	0
Beryllium	µg/L	---	---	ND	ND	ND	0
Cadmium	µg/L	---	---	ND	ND	ND	0
Chromium (hexavalent)	µg/L	---	---	ND	ND	ND	0
Chromium (total)	µg/L	---	---	DNQ(0.6)	DNQ(0.8)	DNQ(0.2)	0
Copper	µg/L	74*	---	DNQ(7)	14	ND	0
Lead	µg/L	8.6*	---	DNQ(1.2)	DNQ(2)	DNQ(0.5)	0
Mercury	µg/L	0.3*	---	ND	DNQ(0.03)	ND	0
Nickel	µg/L	120	---	DNQ(5.9)	8.8	DNQ(4.0)	0
Selenium	µg/L	---	---	8.2	11.9	4.3	0
Silver	µg/L	3.8*	---	DNQ(0.4)	2.5	ND	0
Thallium	µg/L	---	---	DNQ(0.06)	DNQ(0.12)	ND	0
Zinc	µg/L	---	---	24	83	13	0
Cyanide	µg/L	11*	---	ND	5	ND	0
Tributyltin	ng/L	---	---	ND	ND	ND	0
MBAS	mg/L	0.5	---	0.24	0.39	0.16	0

DNQ=Detected but Not Quantified
Note - A numerical limit in the current NPDES permit is not defined unless a constituent shows a reasonable potential to exceed State water quality standards or has been defined in a previous permit.
* -Current permit limits are interim effluent limits and expire on March 10, 2010.

Table 2-6. Annual average concentrations of metal priority pollutants in influent and effluent from 1995 to 2005.

	As		Cr		Cu		Pb		Hg		Se		Ag		Zn	
YEAR	INF µg/L	EFF µg/L	INF µg/L	EFF µg/L	INF µg/L	EFF µg/L	INF µg/L	EFF µg/L	INF µg/L	EFF µg/L	INF µg/L	EFF µg/L	INF µg/L	EFF µg/L	INF µg/L	EFF µg/L
1995	4	4	<5	<4	41	<10*	<6	<4	<0.3	<0.3	20	14	2.0	<0.4	118	47
1996	4	2	4	<4	50	<10	6	<3	<0.3	<0.3	20	14	1.8	<0.4	154	44
1997	4	3	<4	<4	32	<10	4	<3	<0.3	<0.3	29	19	0.9	<0.4	86	25
1998	3	1	<4	<4	40	<10	3	<3	<0.3	<0.3	25	12	0.8	<0.4	103	8
1999	3	2	<4	<4	26	<10	<3	<3	<0.3	<0.3	22	14	0.7	<0.4	107	34
2000	4	3	4	3	33	<10	<3	<3	<0.3	<0.3	26	10	0.5	<0.4	103	27
2001	3	3	<10	<10**	39	<10	<5**	<5**	<0.3	<0.3	21	10	1.0	<0.6**	127	26
2002	3	3	<10	<3***	37	7	16	<3***	<0.2	<0.1***	19	10	0.7	<0.6	115	22***
2003	3	2	3	<1	47	<4	5	3	0.2	<0.1	14	12	2.8	0.3	129	22
2004	4	3	3	<1	37	7	3	<3	0.13	<0.03	12	6	0.6	<0.3	96	24
2005	3	3	2	<1	41	7	2.5	<1	0.11	<0.02	14	8	1.1	<0.4	97	24

*   MDL changed in 1995
** MDL changed in 2001
*** MDL changed in 2002

is based on a daily maximum limit of 50 pCi/L for gross beta radioactivity and 15 pCi/L for gross alpha radioactivity. The amounts of gross beta and gross alpha radioactivity in 2005 were below the new permit limits.

TOXICITY

The Terminal Island Treatment Plant is required under its NPDES permit to conduct both acute and chronic toxicity tests. The acute limit allows no single test with survival less than 70% and no survival less than 90% in three consecutive tests in TITP effluent. In 2004 and 2005, there were no exceedances of the acute toxicity limit using the fathead minnow survival test. Beginning in June 2005, due to a new NPDES permit, the acute toxicity testing was done on mysid shrimp (*Mysidopsis bahia)* and topsmelt (*Atherinops affinis)* for a period of three months to determine the most sensitive species. The mysid shrimp *(Mysidopsis bahia)* was the most sensitive and the acute toxicity testing was continued on the mysid shrimp from September 2005 through December 2005. In 2005, there were no exceedances of the acute toxicity limit using the mysid shrimp (*Mysidopsis bahia)* or topsmelt (*Atherinops affinis)* survival tests. Since November 1998, routine acute toxicity tests have been pH-adjusted to reduce the toxicity of non-ionized ammonia and to prevent pH drift during the test as approved by the Regional Water Quality Control Board (RWQCB). This has greatly reduced the occurrences of acute toxicity permit violations.

The monthly chronic toxicity test limit is based on a TUc=1.0. This is equivalent to a no observable effect concentration (NOEC) of 100% effluent. Due to procedural difficulties of testing a low saline effluent with the saltwater species *Haliotis rufescens* (red abalone), the highest possible concentration of effluent tested is 60%. Therefore, no effect at the highest concentration tested (60%) is not considered a violation.

In 2004, the plant experienced two permit exceedances with chronic toxicity test results using the *Haliotis rufescens* (red abalone) larval development test. A TUc of 2.5 was found in the final effluent in May 2004 and June 2004. The cause(s) of this exceedance using the red abalone *Haliotis rufescens* has not been determined definitively. A toxicity reduction evaluation (TRE) plan (EPA, 1999) was developed by the Terminal Island Treatment Plant operations in 2003. The TRE plan appears to have helped the plant significantly reduce chronic toxicity in the effluent and reduced the number of chronic toxicity permit exceedances.

Table 2-7a. The NPDES effluent limits and annual averages of priority pollutant organics in 2004.

Constituents	Current NPDES Limit Monthly Avg.(ug/L)	Current NPDES Limit Daily Max. (ug/L)	Concentrations (ug/L) in TITP FINAL EFFLUENT during 2004 Avg.	Max.	Min.
PRIORITY POLLUTANT ORGANICS:					
PESTICIDES					
Aldrin	----	----	ND	ND	ND
Dieldrin	0.004*	----	ND	ND	ND
Endrin	----	----	ND	ND	ND
Toxaphene	----	----	ND	ND	ND
DDT & Derivates	----	----	ND	ND	ND
HCH's	----	----	ND	ND	ND
Endosulfan	----	----	ND	ND	ND
PCB's	----	----	ND	ND	ND
Chlordane & Related Compounds	----	----	ND	ND	ND
Heptachlor	----	----	ND	ND	ND
Heptachlor Epoxide	----	----	ND	ND	ND
VOLATILE ORGANIC COMPOUNDS:					
Acrolein	----	----	ND	ND	ND
Acrylonitrile	----	----	ND	ND	ND
Benzene	----	----	ND	ND	ND
Halomethanes	----	----	ND	ND	ND
Carbon tetrachloride	----	----	ND	ND	ND
Chlorobenzene	----	----	ND	ND	ND
Chloroform	----	----	0.5	0.8	0.2
Vinyl Chloride	----	----	ND	ND	ND
1,3-Dichloropropene	----	----	ND	ND	ND
Ethylbenzene	----	----	ND	ND	ND
Methylene chloride	----	----	ND	ND	ND
1,1,2,2-Tetrachloroethane	----	----	ND	ND	ND
Tetrachloroethene	----	----	ND	ND	ND
Toluene	----	----	ND	ND	ND
1,1,1-Trichloroethane	----	----	ND	ND	ND
1,1,2-Trichloroethane	----	----	ND	ND	ND
Trichloroethene	----	----	ND	ND	ND
1,1-Dichloroethylene	----	----	ND	ND	ND
1,2-Dichloroethane	----	----	ND	ND	ND
Dichlorobromomethane	----	----	DNQ(0.2)	DNQ(0.49)	ND
Chlorodibromomethane	----	----	DNQ(0.2)	DNQ(0.47)	ND
ACID EXTRACTABLE COMPOUNDS:					
Non-Chlorinated Phenolic Compounds	----	----	ND	ND	ND
2,4-Dinitrophenol	----	----	ND	ND	ND
4,6-Dinitro-2-Methyl Phenol	----	----	ND	ND	ND
Chlorinated Phenolic Compounds	----	----	ND	ND	ND
2,4,6-Trichlorophenol	----	----	ND	ND	ND
BASE AND NEUTRAL EXTRACTABLE COMPOUNDS:					
PAHs	----	----	ND	ND	ND
Fluoranthene	----	----	ND	ND	ND
Benzidine	----	----	ND	ND	ND
Bis (2-chloroethyl) ether	----	----	ND	ND	ND
Bis (2-chloroethoxy) methane	----	----	ND	ND	ND
Bis (2-chloroisopropyl) ether	----	----	ND	ND	ND
Bis (2-ethylhexyl) phthalate	190	560	DNQ(0.8)	DNQ(1.2)	ND
Di-n-butyl phthalate	----	----	0.6	1.1	0.2
3,3-Dichlorobenzidine	----	----	ND	ND	ND
Diethyl phthalate	----	----	ND	ND	ND
Dimethyl phthalate	----	----	ND	ND	ND
2,4-Dinitrotoluene	----	----	ND	ND	ND
Hexachlorobenzene	----	----	ND	ND	ND
Hexachlorobutadiene	----	----	ND	ND	ND
Hexachlorocyclopentadiene	----	----	ND	ND	ND
Isophorone	----	----	ND	ND	ND
Nitrobenzene	----	----	ND	ND	ND
N-Nitrosodimethylamine	----	----	ND	ND	ND
N-Nitrosodiphenylamine	----	----	ND	ND	ND
N-Nitrosodi-N-propylamine	----	----	ND	ND	ND
Hexachloroethane	----	----	ND	ND	ND
Dichlorobenzenes	----	----	ND	ND	ND
OTHERS:					
2,3,7,8-Dioxin	----	----	Not tested prior to 2005 NPDES permit		

Note - A numerical limit in the current NPDES permit is not defined unless a constituent shows a reasonable potential to exceed State water quality standards or has been defined in a previous permit

* -Current permit limit is an interim effluent limit and expires on March 10, 2010.

Table 2-7b. The NPDES effluent limits and annual averages of priority pollutant organics in 2005.

Constituents	Current NPDES Limit Monthly Avg.(ug/L)	Current NPDES Limit Daily Max. (ug/L)	Concentrations (ug/L) in TITP FINAL EFFLUENT during 2005 Avg.	Max.	Min.
PRIORITY POLLUTANT ORGANICS:					
PESTICIDES					
Aldrin	----	----	ND	ND	ND
Dieldrin	0.004*	----	ND	ND	ND
Endrin	----	----	ND	ND	ND
Toxaphene	----	----	ND	ND	ND
DDT & Derivates	----	----	ND	ND	ND
HCH's	----	----	ND	ND	ND
Endosulfan	----	----	ND	ND	ND
PCB's	----	----	ND	ND	ND
Chlordane & Related Compounds	----	----	ND	ND	ND
Heptachlor	----	----	ND	ND	ND
Heptachlor Epoxide	----	----	ND	ND	ND
VOLATILE ORGANIC COMPOUNDS:					
Acrolein	----	----	ND	ND	ND
Acrylonitrile	----	----	ND	ND	ND
Benzene	----	----	ND	ND	ND
Halomethanes	----	----	ND	DNQ(0.5)	ND
Carbon tetrachloride	----	----	ND	ND	ND
Chlorobenzene	----	----	ND	ND	ND
Chloroform	----	----	DNQ(0.5)	DNQ(0.8)	DNQ (0.4)
Vinyl Chloride	----	----	ND	ND	ND
1,3-Dichloropropene	----	----	ND	ND	ND
Ethylbenzene	----	----	ND	ND	ND
Methylene chloride	----	----	ND	ND	ND
1,1,2,2-Tetrachloroethane	----	----	ND	ND	ND
Tetrachloroethene	----	----	ND	ND	ND
Toluene	----	----	ND	ND	ND
1,1,1-Trichloroethane	----	----	ND	ND	ND
1,1,2-Trichloroethane	----	----	ND	ND	ND
Trichloroethene	----	----	ND	ND	ND
1,1-Dichloroethylene	----	----	ND	ND	ND
1,2-Dichloroethane	----	----	ND	ND	ND
Dichlorobromomethane	----	----	DNQ(0.2)	DNQ(0.3)	ND
Chlorodibromomethane	----	----	DNQ(0.1)	DNQ(0.2)	ND
ACID EXTRACTABLE COMPOUNDS:					
Non-Chlorinated Phenolic Compounds	----	----	ND	ND	ND
2,4-Dinitrophenol	----	----	ND	ND	ND
4,6-Dinitro-2-Methyl Phenol	----	----	ND	ND	ND
Chlorinated Phenolic Compounds	----	----	ND	ND	ND
2,4,6-Trichlorophenol	----	----	DNQ(0.4)	1.0	ND
BASE AND NEUTRAL EXTRACTABLE COMPOUNDS:					
PAHs	----	----	ND	ND	ND
Fluoranthene	----	----	ND	ND	ND
Benzidine	----	----	ND	ND	ND
Bis (2-chloroethyl) ether	----	----	ND	ND	ND
Bis (2-chloroethoxy) methane	----	----	ND	ND	ND
Bis (2-chloroisopropyl) ether	----	----	ND	ND	ND
Bis (2-ethylhexyl) phthalate	190	560	DNQ(1.1)	DNQ(2.0)	ND
Di-n-butyl phthalate	----	----	0.6	1.4	0.2
3,3-Dichlorobenzidine	----	----	ND	ND	ND
Diethyl phthalate	----	----	ND	ND	ND
Dimethyl phthalate	----	----	ND	ND	ND
2,4-Dinitrotoluene	----	----	ND	ND	ND
Hexachlorobenzene	----	----	ND	ND	ND
Hexachlorobutadiene	----	----	ND	ND	ND
Hexachlorocyclopentadiene	----	----	ND	ND	ND
Isophorone	----	----	ND	ND	ND
Nitrobenzene	----	----	ND	ND	ND
N-Nitrosodimethylamine	----	----	ND	ND	ND
N-Nitrosodiphenylamine	----	----	ND	ND	ND
N-Nitrosodi-N-propylamine	----	----	ND	ND	ND
Hexachloroethane	----	----	ND	ND	ND
Dichlorobenzenes	----	----	ND	ND	ND
OTHERS:					
2,3,7,8-Dioxin	----	----	ND	ND	ND

Note - A numerical limit in the current NPDES permit is not defined unless a constituent shows a reasonable potential to exceed State water quality standards or has been defined in a previous permit
* -Current permit limit is an interim effluent limit and expires on March 10, 2010.

In 2005, the plant experienced an increase in permit exceedances with the chronic toxicity test results using the *Haliotis rufescens* (red abalone) larval development test. A TUc of 2.5 was found in the final effluent in June 2005 which resulted in accelerated testing as specified in the TITP NPDES permit. There were 6 more exceedances during the period from July 2005 to December 2005. The cause(s) of these exceedances using the red abalone *Haliotis rufescens* has not been determined definitively at this time. The initial investigation toxicity reduction evaluation work plan was updated in 2005 and submitted to the Executive Officer of the Regional Board as instructed in the current TITP NPDES permit. Due to these chronic toxicity exceedances, this initial investigation TRE work plan has been implemented.

CONCLUSION

In general, TITP achieved overall excellent effluent quality in 2004 and 2005. This is due, in part, to continuous efforts to upgrade the plant. The current level of effluent quality can be attributed mainly to the following:

- Aggressive industrial pretreatment enforcement
- Activated sludge selector system
- Intensive process control program
- Capital improvements such as the addition of an advanced filtration system

The goal at TITP is to reuse and recycle the effluent and eventually eliminate the discharge of effluent into the Los Angeles Harbor. The quality of the effluent and the capital improvements allowed TITP to begin delivering advanced tertiary effluent from the AWTF facility in March 2006 to be used in the City's Harbor Water Recycling Project (HWRP).

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