2009 Annual Reports and Summary Point Loma Wastewater Treatment Plant & Ocean Outfall

City of San Diego
PUBLIC UTILITIES
Water & Wastewater

Monitoring and Reporting
Program No. R-2002-0025
NPDES No. CA 0107409

ISO 14001

THE CITY OF SAN DIEGO

June 30, 2010

Mr. David W. Gibson, Executive Officer
California Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123

Attn: POTW Compliance Unit

Dear Mr. Gibson:

Enclosed are the 2009, Annual Reports and Summary, Pt. Loma Wastewater Treatment Plant Ocean Outfall as specified in discharge permit Order No. R9-2002-0025, NPDES No. CA0107409 (Point Loma).

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, I certify that 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.

Sincerely,

Steve Meyer
Deputy Public Utilities Director

BGB

cc: EPA Region 9
San Diego County Department of Environmental Health
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File

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City of San Diego
Public Utilities Department

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Point Loma Wastewater Treatment Plant and Ocean Outfall Annual Monitoring Report 2009

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I. INTRODUCTION

I. Introduction

A. Executive Summary

Purpose:
This report meets the annual reporting requirements as specified in San Diego Regional Water Quality Control Board, Order No. R-2002-0025[1] (NPDES Permit No. CA0107409) for the E. W. Blom Point Loma Wastewater Treatment Plant (PLWWTP). It also serves as a comprehensive historical record and reference of operational and compliance metrics of value to the public, policy makers, and technical reviewers.

Background:
The Point Loma Wastewater Treatment Plant is located at 1902 Gatchell Road, San Diego, California and is the main treatment facility in the Metropolitan Wastewater System. Located on a 40-acre site at the western end of Point Loma, the plant went into operation in 1963 to serve the growing needs of the region. The plant serves approximately 2.2 million people and treats approximately 166 million gallons (5-year average) of wastewater per day with a maximum capacity of 240 million gallons per day (mgd). In 1993, the outfall was extended from a length of two miles to its present length of 4.5 miles off the coast of Point Loma. The 12-foot diameter outfall pipe terminates in approximately 320 feet under the Pacific in a Y-shaped diffuser structure to ensure dispersal of effluent. The Advanced Primary[2] Treatment system includes chemically enhanced primary sedimentation and anaerobic biosolids processing. For a detailed discussion of the plant and treatment process see subsection D. and section III. Plant Operations Summary.

[1] This is a Clean Water Act section 301(h) modified permit (Clean Water Act), as modified by the Ocean Pollution Reduction Act of 1994 (OPRA).
[2] Sometimes called Chemically Enhanced Primary Treatment (CEPT).

The following table summarizes the 2009 results, as annual averages or annual ranges, of analyses obtained during the monitoring of the effluent at the PLWWTP.

2009 NPDES Compliance Assessment for Conventional Pollutants for the Pt. Loma WWTP (Order No. R9-2002-0025/NPDES No. CA0107409)				
Parameter	**NPDES Permit Limits**		**Values and Annual Ranges**	**Note**
BOD_5	Mean Annual % Removal	≥ 58 %*	67.7%	System-wide (monthly averages).
TSS	Mean Monthly % Removal	≥ 80 %	87 - 91.2%	System-wide (monthly averages).
	Monthly Average	75 mg/L	29 – 36	
	Mass Emissions	13,599 mt/yr	6,774	
Oil and Grease	Monthly Average	25 mg/L	8 – 12	
		34,000 lbs/day	9,717 – 14,969	
	Weekly Average	40 mg/L	7 – 14	
		68,000 lbs/day	8,517 – 20,588	
	Maximum at any time	75 mg/L	47.5	
		130,000 lbs/day	58,353	
Settleable Solids	Monthly Average	1.0 mL/L	<0.1 – 0.5	
	Weekly Average	1.5 mL/L	0.1 – 0.6	
	Maximum at any time	3.0 mL/L	1.4	
Turbidity	Monthly Average	75 NTU	32 – 43	
	Weekly Average	100 NTU	30 – 53	
	Maximum at any time	225 NTU	126	
pH	Range	6.0 – 9.0 pH	6.91-7.52	

Major changes:

- **Mass emissions down** – the mass emissions of solids was down again this year, to 40,214 pounds/day from 43,802 in 2008.

Other Key metrics for 2009	**Annual Daily Average**	**Annual Total** (million gals.)
Effluent Flow (mgd)	153.3	55,819

Parameter	**Annual Daily Average** (mg/L)	**System-wide Removal** (%)	**Plant Removal** (%)	**Annual Mass Emission** (metric tons)
TSS[3]	32	89.6	89.6	6,774
BOD[4]	100	67.7	65.4	21,168

Compliance:

The plant effluent met all required discharge limits. The required monitoring program creates over 15,000 opportunities to be in non-compliance, as well as several dozen annual Mass Emissions Benchmarks applicable to the discharge from the PLWWTP.
A more detailed discussion is in Section E. of this chapter.

[3] Total Suspended Solids) mg/L, i.e. parts per million

[4] Biochemical Oxygen Demand) mg/L

B. Explanatory Notes

The purpose of this document is to both meet the requirements of Monitoring and Reporting Program (MRP) No. R-2002-0025, NPDES Permit No. CA0107409, and to provide a reference source and resource tools for both regulatory agencies and City staff and their consultants. To this end the past year's data is presented in tabular and graphical form. Monitoring results only reported annually are presented, as well as the special items and discussions itemized in Order No. R-2002-0025.

This document is comprehensive, including supporting information on analytical methods, frequency and changes in analyses, long term tables of selected analytes, operational data, background analyses and treatment plant process control. Where the permit sets limits or requests the analysis of various groups of compounds (such as chlorinated and non-chlorinated phenols, PCBs, hexachlorocyclohexanes, etc.) we have provided summaries and averages of these groups and also of the individual compounds. The 6-year tables have been updated to include 2004 through 2009 data.

Note that, for averaging purposes, "less than" and "not detected" (nd) values were treated as zero. In many parts of the report zero values are found. Our computer system reads "less than" values as zero for summaries, as well as in computing averages. In those areas where zeros are found the reader can find appropriate method detection limits (MDL) in the table of data. Because "less than" values are averaged as zero values in summary tables may be less than detection limits; these are simple numeric means (or minimums). The data tables may also contain values expressed as a <X (less than), where x represents the MDL.

A further limitation is that statistical confidence in the results of an analysis is heavily dependent upon the concentration relative to the Method Detection Limit (MDL). Essentially all of our detection limits have been established using the procedure in 40 CFR, part 136. This statistical basis for the MDL results in a defined statistical confidence (at the 99% Confidence Interval) of essentially ±100% where the result is at or near the MDL. Only at concentrations approximately 5 times the MDL is the confidence interval at ±20%. While the precision of our methods generally ranges from 2-3 significant figures, the above limitations of confidence should always be considered.

Where possible, the influent and effluent values of a given parameter have been included on the same graph to make the removals and other relationships readily apparent. Please note that many of the graphs are on expanded scales that don't go to zero concentrations but show, in magnified scale, that range of concentrations where variation takes place. This makes differences and some trends obvious that might normally not be noticed however, it also provides the temptation to interpret minor changes or trends as being of more significance than they are. Please reference the chart axis scales.

E” Qualifier, estimated concentrations:

Ocean data for chlorinated pesticides and PCB congeners contains data that is qualified with a prefixed ―E” (see example below). This indicates Estimated concentrations. Analytical technique is sufficiently specific and sensitive enough (GC-MS-MS) so that qualitative identification has high confidence while the quantitative data is below 40CFR136 confidence intervals for MDL concentrations. The concentrations reported with this qualifier indicate that one or more tests identified the compound was present but below detection limits for quantitation. When reported as part of annual averages, an ―E” qualifier may accompany average concentration values either below or above MDLs.

Analyte	MDL	Units	SD-14 2001 Avg	SD-17 2001 Avg	SD-18 2001 Avg	SD-19 2001 Avg	SD-20 2001 Avg	SD-21 2001 Avg	RF-1 2001 Avg
Hexachlorobenzene	13.3	UG/KG	<13.3	<13.3	<13.3	<13.3	E3.7	<13.3	**E2.8**
BHC, Gamma isomer	100	UG/KG	ND	ND	ND	ND	ND	ND	ND
Heptachlor	20	UG/KG	ND	ND	ND	ND	ND	ND	ND
Aldrin	133	UG/KG	ND	ND	ND	ND	ND	ND	ND
Heptachlor epoxide	20	UG/KG	ND	ND	ND	ND	ND	ND	ND
o,p-DDE	13.3	UG/KG	<13.3	E43.5	<13.3	E107.0	<13.3	<13.3	**E22.0**
Alpha Endosulfan	133	UG/KG	ND	ND	ND	ND	ND	ND	ND
Alpha (cis) Chlordane	13.3	UG/KG	<13.3	<13.3	ND	<13.3	<13.3	ND	<13.3
Trans Nonachlor	20	UG/KG	E11.3	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0
p,p-DDE	13.3	UG/KG	713.0	1460.0	459.0	2030.0	618.0	693.0	712.0
Dieldrin	20	UG/KG	ND	ND	ND	ND	ND	ND	ND
o,p-DDD	13.3	UG/KG	ND	ND	ND	<13.3	<13.3	<13.3	<13.3
Endrin	20	UG/KG	ND	ND	ND	ND	ND	ND	ND
o,p-DDT	13.3	UG/KG	<13.3	ND	ND	<13.3	<13.3	ND	<13.3
p,p-DDD	13.3	UG/KG	E7.5	E5.5	<13.3	<13.3	E7.8	<13.3	E18.2
p,p-DDT	13.3	UG/KG	E5.9	<13.3	<13.3	<13.3	E5.4	<13.3	<13.3
Mirex	13.3	UG/KG	<13.3	ND	ND	ND	ND	ND	ND

nd= not detected
NA= not analyzed
NS= not sampled
E=estimated value, value is less than the Method Detection Limit but confirmed by GC/MS-MS

Variation in summary data in tables

Very small differences may occur (<0.1%), between tables for annual or monthly averages, totals, and other[5] statistical summary data due to rounding differences or how the underlying data is treated. For example, the computerized report programs may perform summary calculations using daily values (even though only monthly values display on the table) or monthly averages. There will be small rounding variation between the two approaches.

Typically, mass emissions are calculated in the monthly summary tables are calculated from the monthly averages shown in the table. In these tables, raw data is rounded one significant figure on the intermediate result. A calculation rounding only after the final result will generally be slightly different in the last significant figure. Additionally, statistical summary data of calculated values (e.g. mass emissions, dry tons, etc.) may be calculated from monthly averages or using the annual average data. This also may introduce variation that is statistically insignificant.

[5] e.g. mass emissions, percent removals, etc.

C. Overview of the Metro System

The City operates wastewater facilities to transport, treat, reclaim, reuse, and discharge wastewater and its by-products collected from the Metropolitan Wastewater System (the System). The System serves a population of approximately 2.2 million people providing for conveyance, treatment, reuse, and disposal of wastewater within a 450 square mile service area. The Metro System currently consists of several service areas including the City of San Diego (serviced by the Municipal Sub-System) and the 15-regional Participating Agencies. Wastewater treatment for the System is provided at the North City Water Reclamation Plant (NCWRP), the South Bay Water Reclamation Plant (SBWRP), and the Pt. Loma Wastewater Treatment Plant (PLWTP). Solids treatment and handling provided at the PLWTP and the Metro Biosolids Center (MBC). The City of San Diego contributes approximately 65% of the flow in the Metro System with the remainder coming from the Participating Agencies.

Each Participating Agency is responsible for the wastewater collection system within its boundaries to the point of discharge to the System. Wastewater flows from the Municipal Sub-System comprise approximately 65% of the Metro Sub-System flows. All System facilities are owned by the City of San Diego and are managed by MWWD.

A map detailing major facilities in the System and the participating agencies is included.

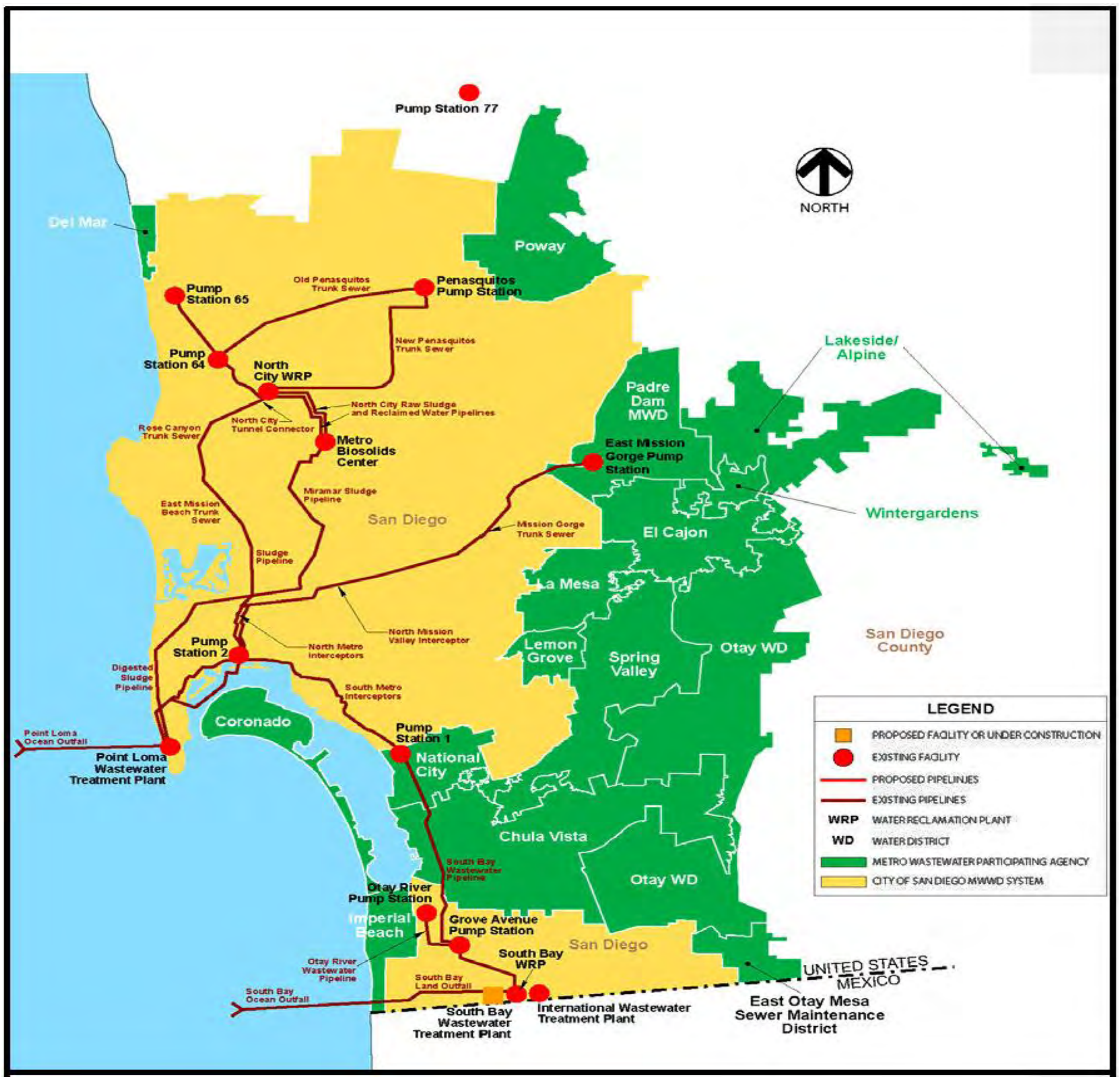
The System is a complex system of pipelines and pump stations that collect wastewater and convey it for treatment and disposal or reuse. The PLWTP serves as the terminus for the System and is capable of treating all flows generated within the System. Within the System are two water reclamation plants, the NCWRP and the SBWRP, that pull flow from the sewers for treatment and reuse. The System also includes the Metro Biosolids Center (MBC) which treats and disposes of all treatment process solids material removed by the treatment plants.

The PLWTP is the largest of the wastewater treatment plants in the System. The PLWTP is an advanced primary treatment WWTP that uses chemical addition to increase performance of the primary clarifiers and is the terminus for the System. The PLWTP discharges effluent through the Pt. Loma Ocean Outfall (PLOO). As an advanced primary treatment WWTP, performance is not measured entirely by effluent quality, but also against the California Ocean Plan and the Basin Plan which address the water quality and beneficial uses of the Pacific Ocean.

The plant has a rated capacity of 240 million gallons per day (mgd) average daily dry weather flow, 432 mgd peak wet weather flow, and currently operates at an average daily flow rate of 153 mgd. The NCWRP has a rated capacity of 30 mgd and currently operates at a nominal flow-rate of 22.5 mgd. The SBWRP has a rated capacity of 15 mgd and is currently treating a nominal 9.5 mgd. The PLWTP is a modern primary treatment facility and the NCWRP and SBWRP are both modern tertiary treatment facilities.

The other two facilities, the NCWRP and the SBWRP are scalping plants that divert water from the System and treat it for reclamation purposes. Both plants currently operate as secondary treatment plants and reclaim water to tertiary standards to meet demand. Demand will fluctuate depending on the time of year and the type and number of customers. The NCWRP returns all secondary effluent that is not reclaimed back to the System for treatment at the PLWTP. However, the solids that are removed, either by sedimentation or biological oxidation, are pumped to the MBC for further treatment. The SBWRP discharges excess secondary effluent to the South Bay Ocean Outfall (SBOO) and returns all solids removed from the sewage to the System for transport to the PLWTP. Performance of both water reclamation plants is measured by each facility's ability to treat reclaimed water to the required standards when discharging to the reclaimed system. Performance of the SBWRP is also measured via secondary treatment standards, as defined in the facility's NPDES permit, when discharging to SBOO.

The MBC processes primary and secondary solids from the NCWRP through anaerobic digestion and dewatering, and processed the digested biosolids from the PLWTP through dewatering. The dewatered biosolids are beneficially used as cover at a local landfill or used as a soil amendment for agricultural purposes. The centrate from the centrifuges is returned to the sewer and treated at the PLWTP. Performance of this facility is measured by the quality of the solids product generated for use or disposal.



ISO 14001 Certification

Wastewater Treatment and Disposal Division (formerly called Operations and Maintenance Division) and the Monitoring and Reporting Programs operated by the Environmental Monitoring and Technical Services Division is certified in ISO[6] 14001, Environmental Management Systems.

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[6] International Organization for Standardization.

D. Overview of Point Loma wastewater Treatment Plant

The Point Loma Wastewater Treatment Plant (PLWTP) is the largest treatment facility in the Metropolitan Wastewater System. The facility is located on a 40 acre site on the Fort Rosecrans military reservation and adjoins the Cabrillo National Monument at the southern tip of Point Loma in the City of San Diego. The plant was first put into operation in 1963 discharging primary treated wastewater 2.5 miles off the coast of Point Loma. In 1993, the existing outfall was lengthened to 4.5 miles which extends 320 feet below the surface in a Y-shaped diffuser to provide for a wide dispersal of effluent into ocean waters.

Presently, the plant is an advanced primary treatment plant capable of removing 85% to 90% of the influent solids and processes approximately 153 million gallons of sewage per day generated by about 2.2 million people. It is the terminal treatment plant in the Metro System. The removed solids are treated in anaerobic digesters before being pumped to the MBC. The current plant configuration can treat up to 240 mgd average daily flow and 432 mgd peak wet weather flow.

Removed solids are anaerobically digested on site. The digestion process yields two products: methane gas and digested biosolids. The methane gas is utilized onsite to fuel electrical generators that produce enough power to make the PLWTP energy self-sufficient. Additional co-generation of electrical power comes from on-site hydroelectric generator utilizing the millions of gallons of daily effluent flow and the energy in the approximately 90-foot drop from the plant to outfall. The plant sells the excess energy it produces to the local electricity grid, offsetting the energy costs at pump stations throughout the service area. The biosolids are conveyed, via a 17-mile pipeline, to the Metro Biosolids Center for dewatering and beneficial use (e.g. soil amendments and landfill cover) or disposal.

The Point Loma Wastewater Treatment Plant recently received the Platinum 15 Peak Performance Award from the National Association of Clean Water Agencies in recognition of fifteen years of complete and consistent National Pollution Discharge Elimination System permit compliance.

E. Discussion of Compliance Record

Discharge from the PLWWTP in 2009 met all effluent limitations for flows, constituents, toxic materials, and physical properties as specified in the permit. Given the number and frequency of monitored parameters, there are over 15,000 opportunities to be in non-compliance, as well as several dozen mass emissions benchmarks applicable to the discharge from the PLWWTP. All permit limits and benchmarks are shown for reference in Chapter 2, Influent and Effluent Data, of this report.

Chemical and Physical Parameters

The Pt. Loma Wastewater Treatment Plant met the two key discharge limits based on annual performance, including BOD (Biochemical Oxygen Demand) annual average removal and TSS (Total Suspended Solids) mass emissions.

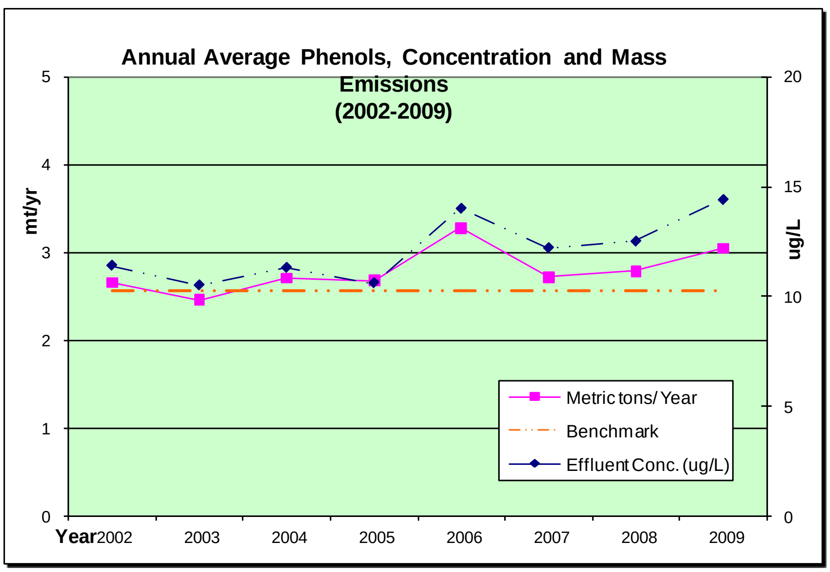
Annual Requirement	2009 Annual Average System-wide Removal (%)	Plant Removal (%)
BOD - met the required ≥58% BOD removal on both the system-wide (required) and plant-only basis.	67.7	65.4
	2009 Annual Mass Emission (metric tons)	
TSS - Mass emission of TSS shall be no greater than 13,599 mt/yr.	6,774	

Other chemical parameters, microbiology, and toxicity.

Note: Permit limits are detailed in Section 1 of this report and effluent data is presented in summary tables in section 2 of this report.

Mass Emissions Benchmarks:

All Mass Emissions Benchmarks were met with the continued exception of non-chlorinated phenols. The Mass Emissions Rate (MER) of 3.05 metric tons/year, for non-chlorinated phenols[7] was slightly higher than the bench mark of 2.57 metric tons/year and last year's 2.79-metric tons.



[7] All found was as phenol itself.

This was based on an average concentration of 14.4-ug/L, which represents approximately 18-pounds per day. The plant removed 23% of the phenol, on average.

Tijuana Interceptor Closure Summary

The Tijuana Interceptor (emergency connection) continues to be a non-factor in the operation of the Metropolitan (Metro) Wastewater System and Pt. Loma WWTP operations. We received no flows from the connector during the year. There is no monitoring data to report and the previously included section for it in the annual reports has been discontinued.

According to the International Boundary Water Commission's staff reports and our flow meter section data, there was no flow of wastewater through the Tijuana Interceptor for 2009. Historically, the flows for the Tijuana Interceptor have included the flow meter readings from the TJ1 and IBWC02 meters. The IBWC02 meter measured all flows through the interceptor and included only sewage flows to the Metro system from Mexico. As of December 1st, 2000 the IBWC02 meter was disconnected by the International Boundary Water Commission and there is no intent for re-establishing it. No data from this meter was submitted in 2009. IBWC staff repeatedly stated that it is their intention that no Tijuana wastewater or International Treatment Plant effluent will be discharged into the interceptor. IBWC staff reported that the Emergency connection was not open during 2009.

No flow data was recorded from September 24, 2003 to September 1, 2006. Beginning in September of 2006 thru April 2009 flow data was recorded at both the TJ1 and the upstream CW1 metering sites. The CW1 meter records flows entering the Metro system from the community of San Ysidro. The flow data at both meters were comparable in magnitude and for 2009 the CW1 flow is considered to be the sole contributor to the downstream TJ1 flow. The nominal positive deviation between these two sites is likely a result of slight differences in flow meter accuracy, independently these meters are considered accurate to +/-10%, and intrusion between the metering sites.

On March 27th, 2009 the TJ1 meter was stopped. On May 5th, 2009 the meter was relocated to a new site named TJ1M at a location prior to the flow from CW1. The new metering site monitors flow from the TJ interceptor exclusively.

No samples were taken the entire year of 2009.

F. Plant Facility Operation Report

POINT LOMA 2009 ANNUAL FACILITY REPORT
Document prepared under the direction of Plant Superintendent K.C. Shankles.

The facility report addresses Process Control concerns and considerations and summarizes Plant Operations and Engineering activities.

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PROCESS CONTROL: FACTORS IMPACTING PLANT PERFORMANCE 2009

The following information is being reported in an effort to identify some of the factors, operational and otherwise, that may have impacted plant performance during 2009. Much of the information contained herein is based on assumptions regarding plant performance for this period. The main point of this effort is to continue identifying possible factors influencing plant performance which in turn will help to more effectively operate this facility. The information is presented in chronological order when possible. **Please note that the numerical values used here are largely based on analysis performed by Plant staff at the Process Laboratory and have not always been validated for official reporting purposes.**

Areas that will be covered include: influent temperature and seasonal impacts, sludge blanket levels in the sedimentation basins and raw sludge pumping volumes, plant performance and coagulation chemical application.

INFLUENT TEMPERATURE AND SEASONAL IMPACTS

Influent temperature variations at the Point Loma Facility are usually minimal throughout the year. The temperature of the influent flow, for 2009, ranged from 70.1 to 84.2degrees Fahrenheit. Typically, the influent temperature changes are very subtle as each season progresses. The most pronounced changes in this parameter occur during the winter, after the rainy season begins and during the summer, after periods of sustained warm weather. Temperature changes related to rain storms were normal in 2009. The effect of these temperature changes is difficult to analyze due to the number of variables affected by the rainfall. The average daily influent temperature was calculated for the same period of time seen previously in this report, and the results are recorded below.

For The Period from January 1 through December 31	
Year	Average Daily Influent Temperature
2002	75.3 degrees Fahrenheit
2003	75.9 degrees Fahrenheit
2004	76.7 degrees Fahrenheit
2005	76.8 degrees Fahrenheit
2006	77.0 degrees Fahrenheit
2007	77.0 degrees Fahrenheit
2008	77.5 degrees Fahrenheit
2009	77.6 degrees Fahrenheit

SLUDGE BLANKET LEVELS AND RAW SLUDGE PUMPING VOLUMES

In most circumstances it is assumed that maintaining lower sludge blanket levels in sedimentation basins and increased raw sludge pumping will produce a plant effluent with a lower total suspended solids (TSS) concentration. Review of data, for daily average sludge blanket levels and daily average total raw sludge pumped shows that the averages for the last eight years were too close to draw any conclusions about the validity of the above assumption.

The average effluent TSS concentration was calculated for 2002, 2003, 2004, 2005, 2006, 2007, 2008 and 2009. This average was then compared to the average sludge blanket level, for all basins in operation, and the average daily raw sludge pumping volume for this same period. The information below reflects the data gathered for this comparison.

For The Period from January 1 through December 31			
Year	Effluent TSS Average Concentration	Average Daily Sludge Blanket Level	Average Daily Raw Sludge Volume
2002	43.5 mg/L	153.5 inches	1.14 MGD
2003	42.0 mg/L	158.0 inches	1.15 MGD
2004	42.6 mg/L	168.0 inches	1.09 MGD
2005	40.7 mg/L	159.0 inches	1.11 MGD
2006	34.9 mg/L	161.0 inches	0.99 MGD
2007	33.9 mg/L	166.0 inches	0.95 MGD
2008	32.2 mg/L	156.4 inches	1.04 MGD
2009	32.0 mg/L	166.2 inches	1.17 MGD

PLANT PERFORMANCE

The patented PRISC-CEPT (Peroxide Regeneration of Iron for Sulfide Control and Chemically Enhanced Primary Treatment) technology in partnership with US Peroxide was utilized in 2009. Essentially, the process consists of ferrous chloride addition at Pump Station 1 for hydrogen sulfide control, hydrogen peroxide addition at Pump Station 2 to regenerate the available iron, hydrogen peroxide addition upstream of PLWTP for regeneration of the available iron, and then ferric chloride addition at the plant for coagulation at a target dose rate of 10.5 mg/L, reduced from 24 mg/L in 2007. The table below demonstrates the average daily gallons of each chemical utilized in the treatment process at the Pump Stations as well as Point Loma Wastewater Treatment Plant for 2007 and 2009. For comparison purposes, the average gallons per day from January 1 – December 31 will be utilized for both years. It should be noted that the ferric chloride and anionic polymer application at PLWTP is flow paced. The ferrous chloride used for hydrogen sulfide control at PLWTP depends on digester hydrogen sulfide levels.

1/1 -12/31 2007 Daily Average	Ferric Chloride gallons	Ferrous Chloride gallons	Anionic Polymer lbs	Hydrogen Peroxide Gallons
Pump Station 1	0	4034	0	0
Pump Station 2	2317	0	0	0
PLWTP	6937*	1346	189*	0
Total	9254	5380	189	0

*Flow paced

1/1 – 12/31 2009 Daily Average	Ferric Chloride gallons	Ferrous Chloride gallons	Anionic Polymer Lbs	Hydrogen Peroxide gallons
Pump Station 1	0	4248	0	0
Pump Station 2	0	0	0	867
PLWTP	2759*	2181	180*	612
Total	2759	6429	180	1479

*Flow paced

The PRISC-CEPT technology has proven to provide TSS and BOD removal rates well above the permit requirements, while reducing the reliance on iron by regenerating the available iron, reducing the amount of iron in the effluent, and reducing costs.

Turbidity testing, at the sedimentation basin effluents, continued in 2009. This has continued to help identify basins where mechanical or other problems are occurring. Analysis of 24 hour discrete effluent samples for TSS concentration continues on an as-needed basis and is providing data on diurnal variations in plant performance. Data from this analytical work has been and will be used to help develop more effective chemical dosing strategies in the plant.

COAGULATION CHEMICAL APPLICATION

Data for ferric chloride and anionic polymer doses was reviewed to determine the impact that rates of product application have on plant performance. The average daily dose for each chemical was calculated and compared to the TSS and BOD concentrations and removal rates.

For The Period from January 1 through December 31						
Year	Ferric Chloride	Polymer	Average Effluent TSS Concentration	Average Effluent TSS Removal Rate	Average Effluent BOD Concentration	Average Effluent BOD Removal Rate
	Average Daily Dose					
2002	25.8 mg/L	0.15 mg/L	43.5 mg/L	84.9%	93.8 mg/L	64.7%
2003	29.9 mg/L	0.18 mg/L	42.0 mg/L	85.1%	105.0 mg/L	61.3%
2004	29.7 mg/L	0.17 mg/L	42.6 mg/L	85.2%	101.8 mg/L	60.2%
2005	26.5 mg/L	0.17 mg/L	40.7 mg/L	85.1%	104.5 mg/L	58.4%
2006	24.0 mg/L	0.14 mg/L	34.9 mg/L	87.7%	101.8 mg/L	62.3%
2007	24.0 mg/L	0.14 mg/L	33.9 mg/L	89.1%	95.3 mg/L	68.4%
2008	15.0 mg/L*	0.14 mg/L	32.2 mg/L	88.2%	96.0 mg/L	65.5%
2009	10.9 mg/L*	0.14 mg/	32.0 mg/L	89.6%	100 mg/L	65.5%

*PRISC related reduction

SPECIAL PROJECTS

On September 3, 2008 PLWTP initiated operation of a prototype effluent disinfection system. This was implemented because of a recent determination by USEPA that bacterial water quality objectives in the San Diego Region apply surface to bottom, up to three nautical miles from shore. USEPA's interpretation of the applicability of bacterial objectives will be incorporated into the requirements of the next NPDES permit for the (PLOO) discharge. (Addendum #2 to Order No. R0-202-0025 NPDES permit No. CA107409). In 2009, Environmental Monitoring and Technical Services (EMTS) along with Plant Staff collected samples and compiled data to determine the ability of the plant to comply with both the bacterial objectives and chlorine residual parameters in the next NPDES permit.

CONCLUSIONS

Plant performance in the year of 2009 exceeded all NPDES Permit requirements.

ENGINEERING REPORT 2009

The following projects were completed at the Point Loma Wastewater facility during 2009:

Hydro Repair

Status of the Operations and Maintenance Manual

Point Loma WWTP:

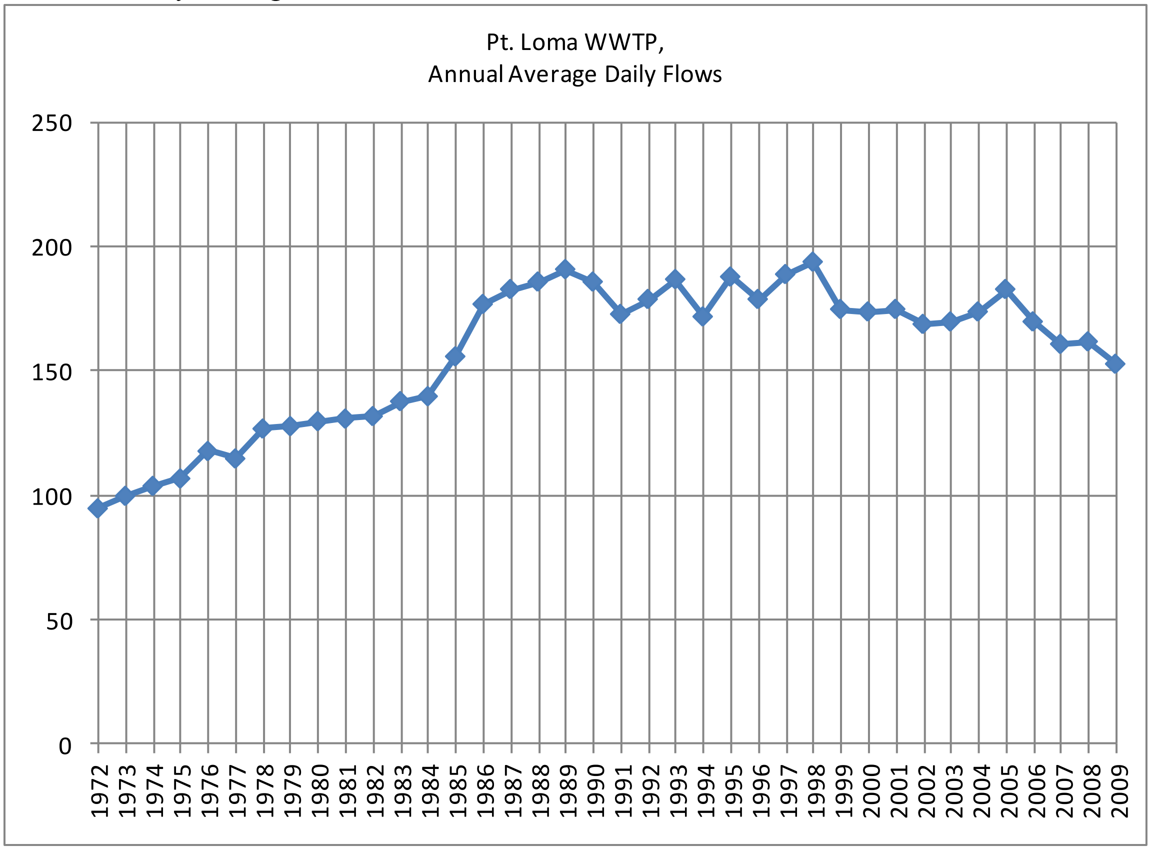
There is an approved O&M Manual for the PLWWTP. Plant staff continues to review and update the Manual and Standard Operating Procedures (SOP's) as necessary to keep current with changes in equipment, processes, and standards of practice. New procedures are included as needs are identified. For example, PLWWTP Staff, in conjunction with the Safety Staff, have developed and established a standard Lock-Out/Tag-Out Program to serve all MWWD Facilities.

Plant Personnel continue the ISO certification and operate the PLWTP facility under the guidelines of the Environmental Management System established under our ISO 14001 program. This program has helped to organize and consolidate facility SOP's, and has been effective in enhancing plant personnel's awareness of industrial and environmental issues as they relate to the work place.

G. Correlation of Results to Plant Conditions

Flow

The 2009 daily average influent flow to the Point Loma WWTP was 153 MGD.



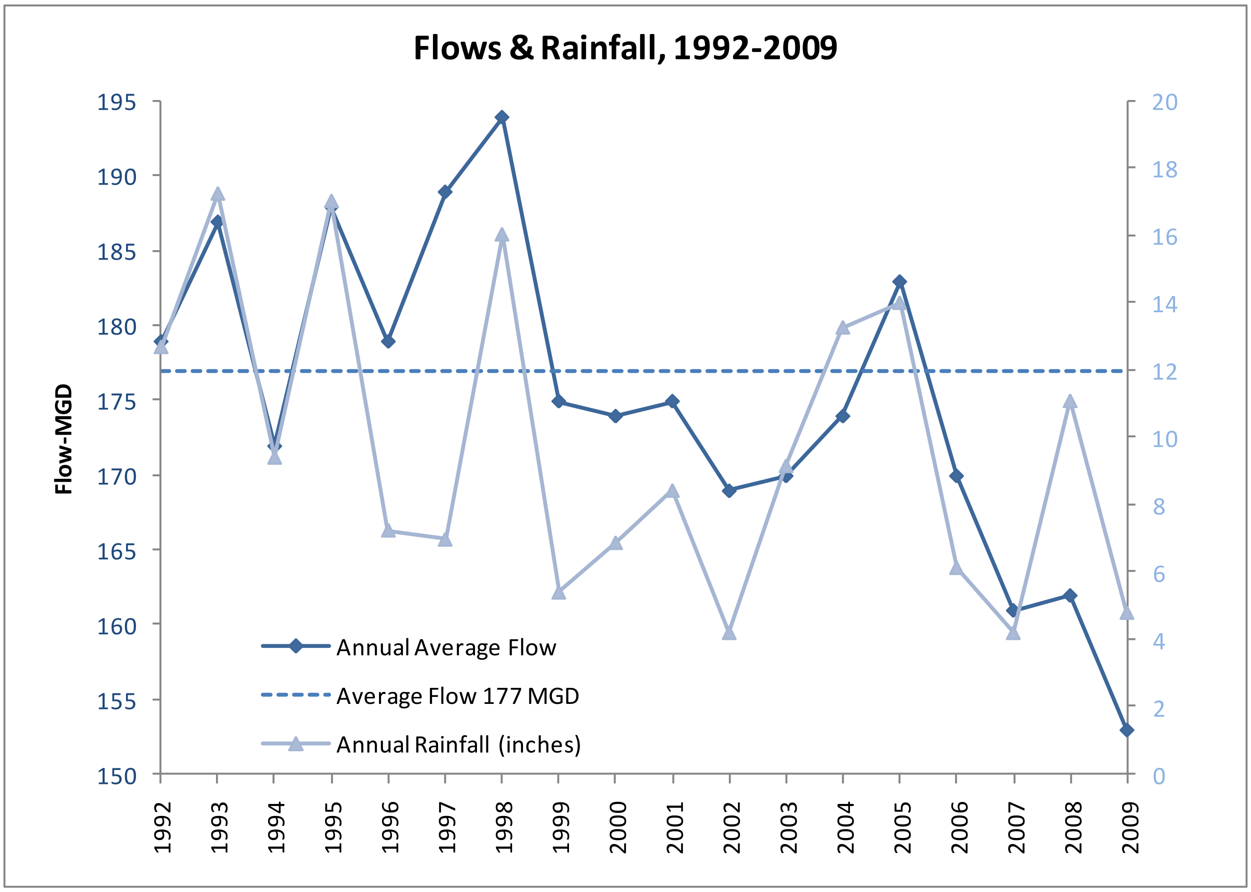
The data shows a continued reduction in the flows vs. what would have been predicted from 1970's and 80's steady increases. It appears that the drought-induced reductions in flows from water conservation efforts, have become permanent. Mandatory water conservation measures remained in effect in San Diego throughout 2009. In the past 18-years, there is no discernable increase in flows on a sustained basis. In fact, since 1987 the regression line would show a slight decrease in flow rates. The significant correlation between rainfall and flow rates (below graph) seems to dominate the changes in flows from year-to-year.

In 2009 the amount of system flows treated at the SBWRP averaged over 8 million gallons per day

Annual Totals

Year	SBWRP Influent (million gals)	SBWRP Discharge to South Bay Outfall (million gals)	System Return Stream (million gals)	Net removed from Metro (million gals)	SBWRP Distributed Recycled Water (million gals)	NCWRP Reclaimed Water Flow to Distribution System (million gals)
2009	3,042	957	564	2,458	1,501	1,672
2008	3,173	1,167	601	2,555	1,388	1,731
2007	3,158	1,467	527	2,568	1,101	1,630
2006	2,216	1,807	341	1,881	73.7	1,356

It is likely that recycling water by North City Water Reclamation Plant is also having an impact on the total system flows. We have not yet quantified and evaluated these contributions.



Precipitation:

The total rainfall in 2009 of 4.83 inches was less than the total rainfall of 11.11 inches in 2008. Although not quantifiable, the low influent flows are partially due to drought reduced infiltration and the continuing conservation effects we have seen over the past 10 – 12 years.

Historical perspective:

The table on this page shows flows back to 1972. New Parshall flumes were installed and calibrated in 1985 and the bugs were worked out over the next year; this accounts for the major jump over the three year period from 1984 to 1986. From 1986 on, multiple meters on the flumes have been calibrated yearly and fairly closely match Venturi meter data at Pump Station II (see tables in the Plant Operations section).

The historical picture of changes to the flow rates and the factors effecting those changes are discussed comprehensively in previous Annual Reports. Those factors include:

- Weather patterns, drought, and water conservation.
- The Tijuana Interceptor.
- Water Reclamation and Reuse by the North City Water Reclamation Plant, and later, by the South Bay Water Reclamation Plant.
- Population.
- Industrial discharger.

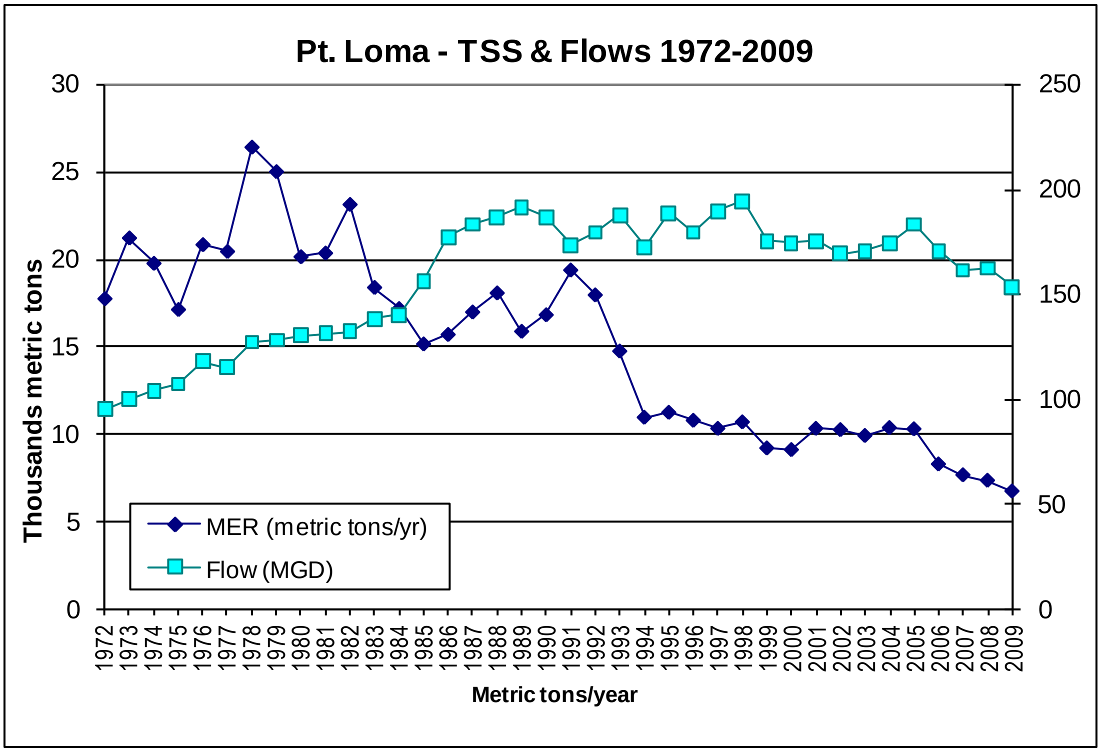
Historical Average Daily Flows

YEAR	FLOW (MGD)	YEAR	FLOW (MGD)
1972	95	1991	173
1973	100	1992	179
1974	104	1993	187
1975	107	1994	172
1976	118	1995	188
1977	115	1996	179
1978	127	1997	189
1979	128	1998	194
1980	130	1999	175
1981	131	2000	174
1982	132	2001	175
1983	138	2002	169
1984	140	2003	170
1985	156	2004	174
1986	177	2005	183
1987	183	2006	170
1988	186	2007	161
1989	191	2008	162
1990	186	2009	153

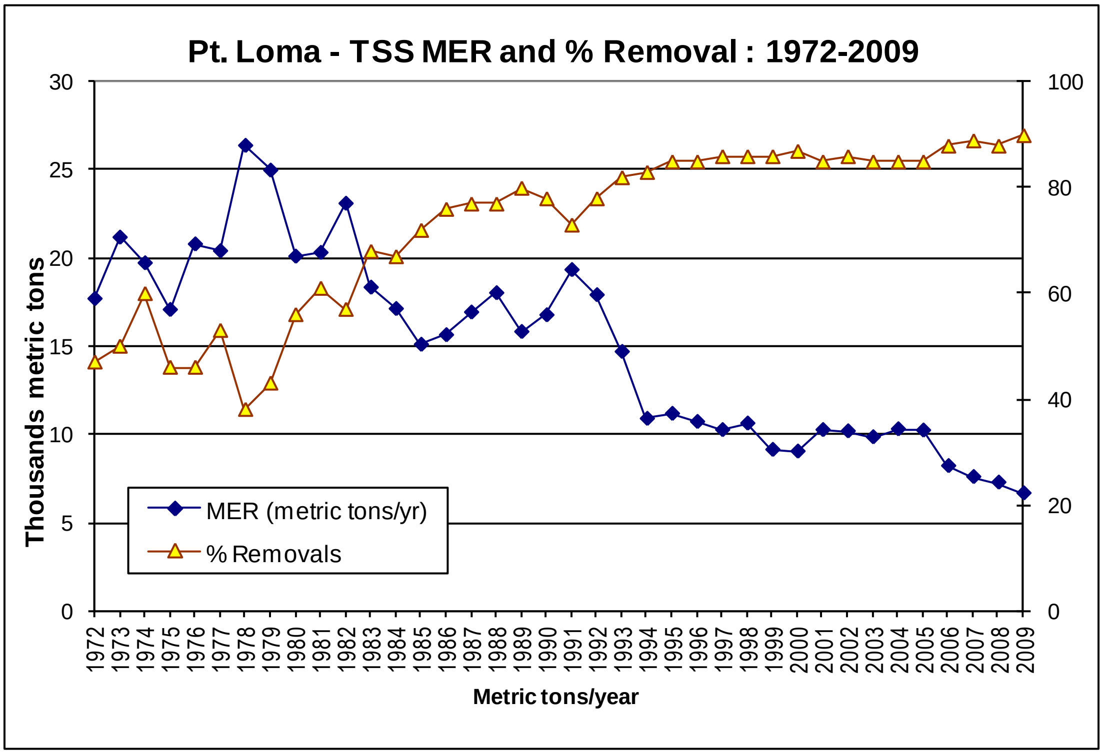
Weather and the various components of water conservation have emerged as more significant factors affecting flows, supplanting the historical role that population growth played.

Suspended Solids, Volatile Suspended Solids and Percent Suspended Solids Removal:

Past data has shown that influent concentrations tend to range from the mid-200's to around 300. The influent suspended solids averaged 308 mg/L this year. This combines with low average daily flows this year resulting in a drop in mass emissions of solids again this year.



Flows continue to follow the decreasing trend described in past reports and include many of the same factors as described earlier although the increasing utilization of capacity at the SBWRP is becoming an increasingly significant factor in reducing flows to PLWWTP from the Metro system.



The historical picture of changes in the annual TSS removals and MER and the factors effecting those changes are discussed comprehensively in previous Annual Reports. The factors include:

- Changes in base industries, e.g. Tuna canneries, etc.
- Weather and infiltration.
- Sludge handling.
- Water reclamation plants.
- Population changes.
- Tijuana Interceptor.

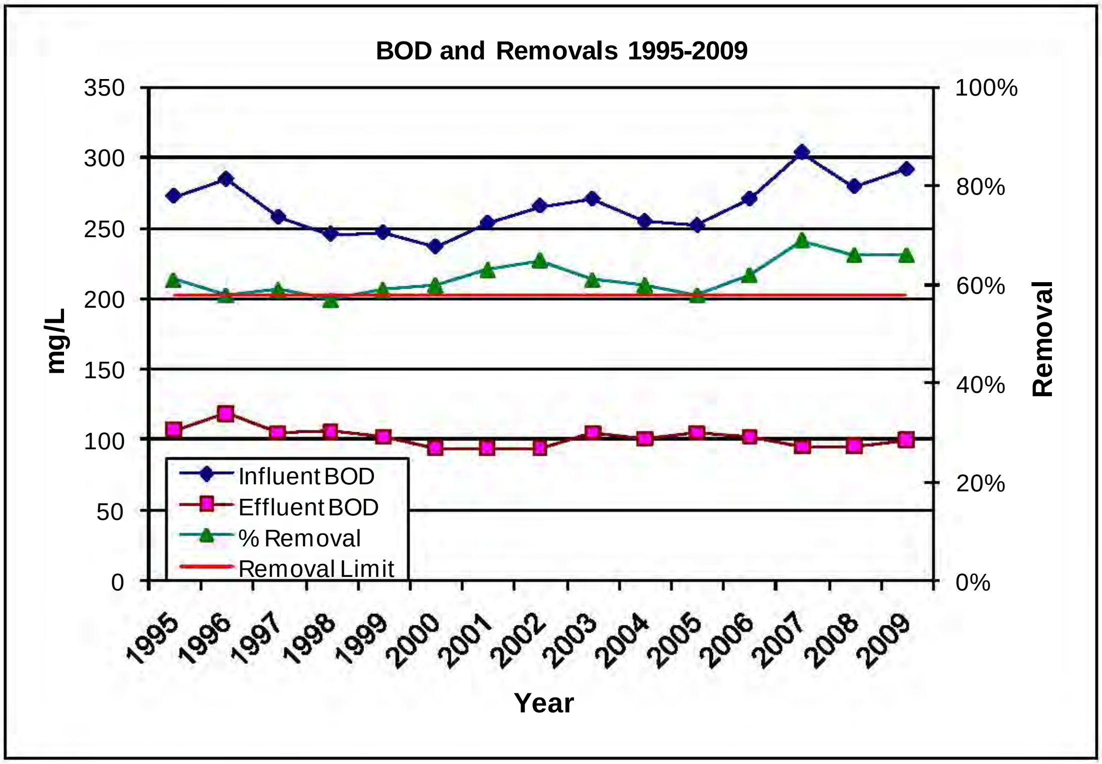
Effluent TSS concentrations also correlates similarly to the MER pattern.

SUSPENDED SOLIDS TRENDS
AVERAGE DAILY SOLIDS

Year	Flow, Annual Average Daily (mgd)	Rainfall, Annual Total (inches)	TSS INFLUENT (mg/L)	TSS EFFLUENT (mg/L)	TSS % Removal	TSS Mass Emission (lbs/day)	TSS Mass Emission (metric tons /year)
1972	95		257	135	47	106,600	17,697
1973	100		310	154	50	127,947	21,183
1974	104		346	138	60	119,143	19,726
1975	107		215	115	46	103,135	17,075
1976	118		238	127	46	125,281	20,799
1977	115		273	128	53	123,277	20,410
1978	127		245	151	38	159,428	26,396
1979	128		248	143	43	150,933	24,989
1980	130		255	113	56	121,088	20,103
1981	131		289	114	61	122,705	20,316
1982	132		296	126	57	139,563	23,107
1983	138		310	98	68	110,789	18,343
1984	140		272	90	67	103,175	17,129
1985	156		251	70	72	91,190	15,098
1986	177		261	64	76	94,476	15,642
1987	183		289	67	77	102,257	16,930
1988	186		303	70	77	108,587	18,027
1989	191	3.8	305	60	80	95,576	15,824
1990	186	7.29	307	65	78	101,301	16,772
1991	173	13.46	295	81	73	116,810	19,340
1992	179	12.71	317	72	78	107,903	17,914
1993	187	17.26	298	55	82	88,724	14,690
1994	172	9.43	276	46	83	65,777	10,890
1995	188	17.04	289	43	85	67,492	11,174
1996	179	7.27	295	43	85	64,541	10,715
1997	189	7	284	39	86	61,923	10,252
1998	194	16.05	278	39	86	64,171	10,624
1999	175	5.43	273	38	86	55,130	9,128
2000	174	6.9	278	37	87	54,413	9,034
2001	175	8.45	275	43	85	61,931	10,254
2002	169	4.23	287	44	86	61,493	10,181
2003	170	9.18	285	42	85	59,459	9,844
2004	174	12.69	291	43	85	62,028	10,298
2005	183	14.02	274	41	85	61,768	10,227
2006	170	6.16	287	35	88	49,581	8,209
2007	161	4.23	319	34	89	45,822	7,586
2008	162	11.11	277	32	88	43,802	7,272
2009	153	4.83	308	32	90	40,214	6,774

(In the table there is more scatter in the data before 1980 because monthly averages were calculated using only the two suspended solids values done on "complete analysis" days, rather than averaging all of the daily test results).

<u>BOD – Biochemical Oxygen Demand</u>



BOD Concentration mg/L

	Influent	Effluent	% Removal		Influent	Effluent	% Removal
1995 - Total	273	107	61%	2003 - Total	271	105	61%
Adjusted Total*	270	107	60%	System-wide Total	292	105	64%
Soluble	99	79	20%	Soluble	86	70	19%
1996 - Total	285	119	58%	2004 - Total	255	101	60%
Adjusted Total*	283	119	58%	System-wide Total	273	101	63%
Soluble	104	89	14%	Soluble	80	70	12%
1997 - Total	258	105	59%	2005 - Total	252	105	58%
Adjusted Total*	256	105	59%	System-wide Total	269	105	61%
Soluble	92	79	14%	Soluble	88	75	15%
1998 - Total	246	106	57%	2006 - Total	271	102	62%
Adjusted Total*	244	106	57%	System-wide Total	295	102	65%
Soluble	89	81	9%	Soluble	87	73	16%
1999- Total	247	102	59%	2007 - Total	304	95	69%
System-wide Total	251	102	59%	System-wide Total	317	95	70%
Soluble	96	79	18%	Soluble	85	69	19%
2000 - Total	237	94	60%	2008 - Total	280	96	66%
System-wide Total	248	94	62%	System-wide Total	296	96	68%
Soluble	84	69	18%	Soluble	85	69	19%
2001 - Total	254	94	63%	2009 - Total	292	100	66%
System-wide Total	270	94	65%	System-wide Total	310	100	68%
Soluble	84	58	31%	Soluble	76	68	11%
2002 - Total	266	94	65%				
System-wide Total	287	94	67%				
Soluble	86	59	31%				

H. Special Studies

Point Loma Wastewater Treatment Plant Prototype Partial Disinfection System

Addendum No. 2 to Order No. R9-2002-0025 (NPDES NO. CA0107409), was approved by the San Diego Regional Water Control Board on August 13, 2008. This addendum permitted the use of sodium hypochlorite (NaOCl) in a prototype partial disinfection system of Point Loma Ocean Outfall (PLOO) effluent.

The system:
Since sodium hypochlorite solution is already in use for odor control at the Pt. Loma facility, metering pumps and distribution piping were installed and connected to existing bulk storage tank. Administration of concentrated hypochlorite solution is accomplished by a feed system that adds a flow-proportional dose of hypochlorite necessary to achieve a predetermined nominal concentration of hypochlorite in effluent. The hypochlorite solution is delivered by tanker truck in concentrate form (12.5%) and added to the hypochlorite bulk storage. Hypochlorite solution is added to the feed tanks on demand. Hypochlorite and carrier water are injected into the effluent channel just after sedimentation tanks at the mid-point of the effluent channel.

Prototype Operations:
Testing and configuration of the hypochlorite feed system continued through the end of August 2008. The first administration of hypochlorite solution began on September 3, 2008. Hypochlorite feed started at an initial rate calculated to obtain a nominal dose of 6 ppm hypochlorite in effluent. In order to maintain close monitoring and control of the feed system and effluent quality, increases in hypochlorite dosing levels occurred in 0.5 ppm increments and were limited to no more than a 2-ppm increase in any day.
An 8.0 ppm dose rate was obtained on the September 4, 2008 and this dose level was maintained through the 16th. Between September 17 and the 24th, feed rates were incrementally increased to a nominal dose of 11 ppm and that feed rate was maintained through the end of September. On October 1, 2008 the dose was increased to 12 ppm and has remained at that level throughout October. During September and October the system was shutdown several times to make minor repairs and to make modifications in the feed system to allow for better mixing of the hypochlorite within the effluent. By the end of October the system was back in continuous operation and nominal chlorine feed rates have been maintained at 12 ppm throughout November as well. While the nominal dose rate was 12 ppm until February 7th, 2009, experience has shown that we obtain a small chlorine residual when rainfall infiltration and intrusion adds to the influent flow. The reduction in apparent chlorine demand is probably due to the decrease in the solids and organics concentrations by dilution. The increased flow rates would correspondingly increase total chlorine dosing if left at the 12 ppm constant feed rate. Operations staff responded to the empirical data by adjusting the feed rate of hypochlorite during the recent series of rain events when rainfall resulted in elevated flows and chlorine residuals occurred. Since February 25th, the nominal feed rate target has remained at 10 ppm.

Monitoring:
Monitoring in accordance with Addendum 2 was initiated on September 3, 2008, coincidental with the initial use of hypochlorite. The monitoring data is now included in the Monthly Monitoring Report. During testing phases of the prototype system, where hypochlorite dosing is being actively increased, additional determinations of total residual chlorine was monitored during and after the incremental increases in hypochlorite feed rates. Through the test period, up to a 12-ppm feed rate, there has been only occasional detectable total chlorine residual in the PLOO effluent. There has been no noted impacts on monitored parameters such as BOD, pH, TSS, and turbidity.

Total and fecal coliforms and enterococcus are determined on samples grabbed from points immediately upstream of the hypochlorite administration (both North and South effluent channels) and at the regular effluent monitoring sample site downstream of the hypochlorite addition. Samples are taken at times before and after the incremental increases in hypochlorite feed rates and the log reduction in indicator organisms (MPN) are calculated. So far, the data on reductions indicates that less than one log reduction is being achieved. Measured bacterial reductions have been variable and studies continue, including receiving water bacteriological determinations.

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