

2003 Annual Reports and Summary Point Loma Wastewater Treatment Plant & Point Loma Ocean Outfall



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



City of San Diego
Metropolitan Wastewater Department
Environmental Monitoring & Technical Services Wastewater Division

Table of Contents

I.	INTRODUCTION	5
A.	EXPLANATORY NOTES.....	5
B.	NOTES ON SPECIFIC ANALYSES:	7
C.	TERMS AND ABBREVIATIONS USED IN THIS REPORT.....	9
D.	FREQUENCY OF ANALYSIS AND TYPE OF SAMPLE - 2003	11
E.	METHODS OF ANALYSIS	13
F.	LABORATORIES CONTRIBUTING RESULTS USED IN THIS REPORT.	25
G.	DISCHARGE LIMITS.....	27
H.	LABORATORY ACCREDITATION CERTIFICATE	30
I.	STAFF CONTRIBUTING TO THIS REPORT	42
J.	ACKNOWLEDGEMENTS	44
II.	INFLUENT AND EFFLUENT DATA SUMMARY	45
A.	INFLUENT AND EFFLUENT DATA SUMMARIES	48
B.	INFLUENT AND EFFLUENT GRAPHS.	75
C.	DAILY VALUES OF SELECTED PARAMETERS.	107
D.	TOXICITY BIOASSAYS	127
E.	6-YEAR TABLES.	133
III.	PLANT OPERATIONS SUMMARY	155
A.	FLOWS.....	156
B.	RAIN DAYS.....	161
C.	SOLIDS PRODUCTION	163
D.	CHEMICAL USAGE	164
E.	GAS PRODUCTION	165
F.	GRAPHS OF CHEMICAL USAGE.....	166
G.	FACILITIES OUT-OF-SERVICE REPORT (2003)	169
H.	GRIT ANALYSES	172
I.	RAW SLUDGE DATA SUMMARY	183
J.	DIGESTER AND DIGESTED SLUDGE DATA SUMMARY	184
IV.	METRO BIOSOLIDS CENTER (MBC) DATA	187
A.	RETURN STREAM DATA SUMMARY	188
B.	MBC DIGESTER AND DIGESTED SLUDGE DATA SUMMARY	204
C.	GAS PRODUCTION	205
D.	CHEMICAL USAGE	206
E.	GRAPHS OF MONTHLY CHEMICAL USAGE	206
F.	FACILITIES OUT-OF-SERVICE REPORT (2003).....	209
G.	SOLIDS HANDLING ANNUAL REPORT	220
H.	RESULTS OF "TITLE 22" SLUDGE HAZARDOUS WASTE TESTS.....	242
V.	OCEAN MONITORING DATA SUMMARY.....	249
A.	OCEAN SEDIMENT CHEMISTRIES	250
B.	FISH TISSUE DATA.....	289
VI.	ANNUAL PRETREATMENT PROGRAM SLUDGE ANALYSIS	307
A.	PT. LOMA AND METRO BIOSOLIDS CENTER SOURCES	309

B.	NORTH CITY WATER RECLAMATION PLANT SOURCES	351
VII.	TIJUANA INTERCEPTOR DATA SUMMARY	379
A.	FLOWS	379
B.	TIJUANA INTERCEPTOR DATA.....	384
VIII.	DISCUSSION OF RESULTS.	385
A.	PLANT FACILITY OPERATION REPORT.....	386
B.	CORRELATION OF RESULTS TO PLANT CONDITIONS.	393
C.	DISCUSSION OF COMPLIANCE RECORD	401
D.	REPORT OF OPERATOR CERTIFICATION.....	402
E.	STATUS OF THE OPERATIONS AND MAINTENANCE MANUAL.....	404
F.	ANNUAL FLOW CALIBRATION REPORT	405

I. Introduction

A. 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 years 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. To make this document more useful we have included information on the method, frequency and changes in analyses, longer term tables, operational data, background analyses and process control information. Wherever 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 1998 through 2003 data.

It should be noted that for averaging purposes "less than" and "not detected" (nd) values were treated as zeros. 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 a number of the summary table values are lower than the detection limits.

The data tables may also contain values expressed as a <X (less than) with some number X. For example, the Diazinon value for PLE on March 10, 1998 (in the table below) is reported as <2.4 ug/L (see the below table); this indicates that one or more, of two or more, determinations was above the MDL, while the average was below the MDL. This value is still treated as a zero for averaging and other summary calculations. Note also, that sub-totals and totals consisting of multiple analytes (see below) are also reported as "<X", where the "X" value is the highest MDL for the particular group of analytes. This has the same significance as a "ND" or not detected.

		Organophosphorus Pesticides								
		PLE		PLE		PLE		PLR		PLR
		10-MAR-1998	27-APR-1998	10-SEP-1998	10-MAR-1998	27-APR-1998	10-SEP-1998	0311980007	0428980007	9809107515
		MDL	Units							
Demeton O	1.69 UG/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
Demeton S	1.82 UG/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diazinon	2.41 UG/L	<2.4	ND	ND	<2.4	ND	ND	ND	ND	ND
Guthion	7.1 UG/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
Malathion	2.98 UG/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
Parathion	2.83 UG/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
Thiophosphorus Pesticides		<7.1	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1
Demeton -O, -S		<1.8	<0.2	<0.2	<1.8	<0.2	<0.2	<0.2	<0.2	<0.2
Total Organophosphorus Pesticides		<7.1	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1	<7.1

A further limitation, that the user of this data should note, is that confidence in the results of an analysis is heavily dependent upon the concentration relative to the Method Detection Limit (MDL). For the most part 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% of the result at or near the MDL. Only at concentrations approximately 5 times the MDL is the confidence interval at "20% relative. 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 so that removals and other relationships are readily apparent. Please note that many of the graphs are on expanded scales, that is they normally 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. Frequent reference to the scales and the actual differences in concentrations is therefore necessary.

B. Notes on Specific Analyses:

1. It should be noted that some of the reference methods are equivalent. The organic priority pollutant analyses listed in E.P.A.'s Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846 (ref. c) are equivalent to the methods E.P.A. prescribes for water in Methods for Chemical Analysis for Water and Wastes, (ref.a). Specifically wastewater methods 3510 and 8270 (ref.d) together are the same as the water method 625 (ref.a), and Method 8240 (ref. c) is equivalent to Method 624 (ref.a). Methods 3550 and 8270 together are equivalent to the E.P.A. Contract Laboratory Program's (ref. aa) method for ultrasonication and gas chromatograph-mass spectrographic analysis. The E.P.A.'s metals analyses for water (ref.a) generally just refers to the procedure in Standard Methods (ref. b, bb).

2. Particle Size A new instrument, the Horiba LA-920 laser scattering particle size analyzer, was used this year. It uses the Mie scattering principle applying a He-Ne laser (632.8 nm, 1 mW) and photodiode arrays to measure the size of particles, such as in ocean sediments. It can measure particles from 0.02 to 2000 microns(μm) in diameter; an increase in range from older methodology. The results can be divided up into 85 channels that determine a specific range of microns. The instrument reports the particle size distribution in percentage.

The final report output reflects 85 micron size choices, from 0.5 to 2000 μm , that allows the data user to sort or aggregate the data in any way desired. Data can be aggregated into Phi sizes or other particle size reporting parameters, or can be looked at in individual micron size ranges. Size ranges corresponding to previously determined phi sizes are annotated on the reports.

The channels were chosen to cover the entire range of particle sizes found in real-world sediments. Some of the channels were selected to reflect common particle size analysis micron cut-offs, such as Phi, sieve sizes, etc. Approximately 40 of the 85 channels relate directly to quality control parameters for National Institute of Standards and Technology (NIST) traceable standards and other Certified Reference Materials (CRM), but are also used as data points in determining overall particle size distribution within each real world sample. These may or may not have value to any given data user. Total distribution percentages may not add up to exactly 100% due to rounding.

The instrument reports channel results as individual micron size ranges which are inclusive of data within the ranges shown on the report. For example, the measurement for channel # 2 (shown as >0.5 to 1 microns, Phi 10) yields data greater than 0.50 microns to 1.00 microns, inclusive. It is also the micron cut-off for Phi 10.

Sample preparation is as follows: A representative sub-sample is taken from a well-mixed field sample. The sub-sample (1/16 tsp to 1/2 tsp, depending on gross size characteristics) is added manually to a closed circuit flow cell.

3. “E” Qualifier, estimated concentrations:

Ocean data for chlorinated pesticides and PCB congeners contains data that is qualified with a prefixed **AE@** (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 indicate that one or more tests identified the compound but was below detection limits for quantitation. When reported as part of annual averages, the **AE@** qualifier may accompany average concentration values either below or above MDLs.

Analyte	MDL	Units	SD-14	SD-17	SD-18	SD-19	SD-20	SD-21	RF-1
			2001	2001	2001	2001	2001	2001	2001
			Avg	Avg	Avg	Avg	Avg	Avg	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

4. Grease and Oil determinations were changed from the traditional gravimetric method using Freon to the new EPA approved **HEM** (Hexane Extractable Material, U.S.EPA Method 1664) method this year. Results for November and December 2003 represent the new determinations while those prior were determined using the old method. This method is for determination of n-hexane extractable material (HEM; oil and grease) in wastewater, surface waters, and saline waters. HEM is a method-defined analyte; i.e., the definition of HEM is dependent on the procedure used, as were the old grease and oil values.

In accordance with the procedures described in Method 1664, a side-by-side comparison was completed prior to changing methods to determine if a conversion factor was appropriate. Our study showed that no significant difference was observed and no conversion factor is currently used. The nature of the oils and/or greases, and the presence of extractable non-oily matter in the sample will influence the material measured and interpretation of results. Extractable materials that may be determined are relatively non-volatile hydrocarbons, vegetable oils, animal fats, waxes, soaps, greases, and related materials. Some crude oils and heavy fuel oils contain a significant percentage of materials that are not soluble in n-hexane. Accordingly, recoveries of these materials may be low. This method is capable of measuring HEM in the range of 5 to 1000 mg/L.

C. Terms and Abbreviations used in this Report

Along with standard abbreviations the following is a list of local/uncommon abbreviations and terms for the readers=reference.

PLANT TERMS

U.S.EPA	- United States Environmental Protection Agency.
NPDES	- National Pollutant Discharge Elimination System.
WWTP	- Wastewater Treatment Plant.
WRP	- Water Reclamation Plant.
PLWWTP	- Pt. Loma Wastewater Treatment Plant
PLR	- Point Loma Raw (influent to the plant).
PLE	- Point Loma Effluent (effluent from the plant).
N-1-P	- North Digester Number 1, Primary, Pt. Loma
N-2-P	- North Digester Number 2, Primary, Pt. Loma
C-1-P	- Central Digester Number 1, Primary, Pt. Loma
C-2-P	- Central Digester Number 2, Primary, Pt. Loma
S-1-P	- South Digester Number 1, Primary, Pt. Loma
S-2-P	- South Digester Number 2, Primary, Pt. Loma
Dig 7	- Digester Number 7, Primary, Pt. Loma
Dig 8	- Digester Number 8, Primary, Pt. Loma
DIG COMP	- Digested Biosolids Composite; a composite of grabs taken from each of the in-service digesters.
RAW COMP	- A Composite of Raw Sludge taken over the preceding 24 hrs.
NCWRP	- North City Water Reclamation Plant
N01-PS_INF	- The plant primary Influent from Pump Station 64
N01-PEN	- The plant primary Influent from the Penasquitos pump station.
N30-DFE	- Disinfected Final Effluent
N34-REC WATER	- Reclaimed Water.
N10-PSP COMB	- raw sludge
N15-WAS LCP	- Waste Activated Sludge
MBC	- Metro Biosolids Center
MBCDEWCN	- Metro Biosolids Center Dewatering Centrifuges; typically the dewatered biosolids from these.
MBC_COMBCN	- MBC Combined Centrate; the centrate from all the dewatering centrifuges. (The return stream from MBC to the sewer system.)
MBC_NC_DSL	- North City to Metropolitan Biosolids Center (MBC) Digested Sludge Line.
Dig 1	- MBC Digester number 1.
Dig 2	- MBC Digester number 2.
Dig 3	- MBC Digester number 3.
Biosolids	- In most cases Biosolids and digested (a processed) Sludge is synonymous.

UNITS

mg/L.....	milligrams per liter
ug/L.....	micrograms per liter = 0.001 milligrams per liter
ng/L.....	nanograms per liter = 0.001 micrograms per liter
mg/Kg.....	milligrams per kilogram
ug/Kg.....	micrograms per kilogram
ng/Kg.....	nanograms per kilogram
pg/L.....	picograms per liter
pg/Kg.....	picograms per kilogram
pc/L or pCi/L.....	pico curies per liter (a measure of radioactivity)
TU.....	toxicity units
ntu.....	nephelometric turbidity units
°C.....	degrees Celsius = degrees centigrade
MGD.....	million gallons per day
umhos/cm.....	micromhos per centimeter (conductivity)
uS.....	microsiemens = umhos (conductivity)
mls/100 mL.....	millions per 100 milliliters
nd.....	not detected
NA.....	not analyzed (when in a data column)
NR.....	not required
NS.....	not sampled

CHEMICAL TERMS & ABBREVIATIONS:

AA.....	Atomic Absorption Spectroscopy.
Ag.....	Silver
Al.....	Aluminum
As.....	Arsenic
B.....	Boron
Ba.....	Barium
Be.....	Beryllium
BOD.....	Biochemical Oxygen Demand
Br.....	Bromide
C.....	Carbon
Ca.....	Calcium
Cd.....	Cadmium
Cl.....	Chlorine
CN ⁻	Cyanide
Co.....	Cobalt
COD.....	Chemical Oxygen Demand
Cr.....	Chromium
Cr ⁶⁺	Hexavalent Chromium
Cu.....	Copper
D.O.....	Dissolved Oxygen
DDD.....	Dichlorodiphenylchloroethane (a.k.a. TDE-tetrachlorodiphenylethane)
DDE.....	Dichlorodiphenylchloroethylene
DDT.....	Dichlorodiphenyltrichloroethane

F.....	Fluorine
Fe.....	Iron
FeCl ₃	Ferric Chloride
G&O.....	Grease and Oil
GC.....	Gas chromatography.
GC-ECD.....	-Electron Capture Detector.
GC-FID.....	-Flame Ionization Detector.
GC-FPD.....	-Flame Photometric Detector.
GC-MS.....	-Mass Spectroscopy.
H.....	Hydrogen
H ₂ S.....	Hydrogen Sulfide
Hg.....	Mercury
I.....	Iodine
IC.....	Ion Chromatography
ICP-AES.....	Inductively Coupled Plasma-Atomic Emission Spectroscopy
K.....	Potassium
Li.....	Lithium
MDL.....	Method Detection Limit
Mg.....	Magnesium
Mn.....	Manganese
Mo.....	Molybdenum
MSD.....	Mass Spectroscopy Detector
N.....	Nitrogen
Na.....	Sodium
NH ₃	Ammonia
NH ₃ -N.....	Ammonia Nitrogen
NH ₄ ⁺	Ammonium ion
Ni.....	Nickel
NO ₃ ⁻	Nitrate
O.....	Oxygen
PAD.....	Pulsed Amperometric Detector
Pb.....	Lead
PCB.....	Polychlorinated Biphenyls
PO ₄ ³⁻	Phosphate
S.....	Sulfur
Sb.....	Antimony
Se.....	Selenium
Sn.....	Tin
SO ₄ ²⁻	Sulfate
SS.....	Suspended Solids
TBT.....	Tributyl tin
TCH.....	Total Chlorinated Hydrocarbons (i.e. chlorinated pesticides & PCB's)
TCLP.....	Toxicity Characteristic Leaching Procedure
TDS.....	Total Dissolved Solids
Tl.....	Thallium
TS.....	Total Solids
TVS.....	Total Volatile Solids
V.....	Vanadium
VSS.....	Volatile Suspended Solids
Zn.....	Zinc

D. Frequency of Analysis and Type of Sample - 2003

1. Definitions.

D = Daily	R = Required test	C = Composite-24 hour flow proportioned
W = Weekly	B = Background information	G = Grab samples
F = Fortnightly	RB = Test is performed more frequently than required	() = Number of compounds
M = Monthly		
Q = Quarterly		
S = Semi-annually		
A = Annually		

2. Schedule.

CONSTITUENT	PLR	PLE	C/G Comments
<u>Process Control</u>			
Biochemical Oxygen Demand -Total (5-day)	D R	D R	C
Biochemical Oxygen Demand -Soluble	D B	D B	C M-F
Chemical Oxygen Demand	W B	W B	C
Conductivity	W B	W B	C
Floating Particulates	D R	D R	C
Flow	D R	D R	Same meter used
Oil and Grease	D R	D R	G
pH	D R	D R	G
Settleable Solids	D R	D R	G
Temperature	D R	D R	G
Total Dissolved Solids	D R	D R	C
Total Solids	W B	W B	C
Total Suspended Solids	D R	D R	C
Total Volatile Solids	W B	W B	C
Turbidity	D R	D R	C
Volatile Suspended Solids	D R	D R	C
<u>Metals</u>			
As,Cd,Cr,Cu,Pb,Hg,Ni,Se,Ag,Zn	W R	W R	C
Sb, Be, Tl	W RB	W RB	C Required monthly, analyzed weekly
Fe	W B	W B	C
<u>Ions</u>			
Alkalinity	W B	W B	C
Ammonia-Nitrogen	W R	W R	C
Anions (F ⁻ ,Cl ⁻ ,Br ⁻ ,SO ₄ ²⁻ ,NO ₃ ⁻ ,PO ₄ ³⁻)	W B	W B	C
Cations (Ca ²⁺ , Mg ²⁺ , Li ⁺ ,Na ⁺ ,K ⁺)	W B	W B	C
Cyanide	W R	W R	C
Hardness (Total, Ca, Mg)	W B	W B	C By calculation

CONSTITUENT	PLR	PLE	C/G	Comments
<u>Organic Priority Pollutants</u>				
Acrolein and Acrylonitrile	M R	M R	G	Method 8260.
Base/Neutral Compounds	M R	M R	C	Method 625
Benzidines	M R	M R	C	
Dioxin	M R	M R	C	Performed by a contract lab.
Pesticides, chlorinated	W R	W R	C	
Pesticides, organophosphorus	B	B	C	For background use only. Discontinued as a monthly analysis after Sept. 1997.
Phenols, non-chlorinated	W R	W R	C	*for background use only. Method 625
Phenols, chlorinated	W R	W R	C	Method 625
Polychlorinated Biphenyls	W R	W R	C	
Purgeable (Volatile) Compounds	M R	M R	G	Method 8260
Tri, Di, & monobutyl tins	M R	M R	C	
<u>Miscellaneous</u>				
Radiation	M R	M R	C	Performed by a contract lab.
Toxicity (Acute & Chronic)	M R	M B	C	Reported monthly in the <u>Toxicity Testing Report</u> by the Biology Section.

E. Methods of Analysis

WASTEWATER INFLUENT and EFFLUENT (General)

Analyte	Description	Instrumentation	Reference ¹
Alkalinity	Selected Endpoint Titration	Mettler DL-25 Titrator	(h) 2320 B
Ammonia Nitrogen	Distillation and Titration	Buchi Distillation Unit K-314	(h) 4500-NH3 B & E
Biochemical Oxygen Demand (BOD-5 Day)	Dissolved Oxygen Probe	YSI-5000 DO Meter YSI-59 DO Meter	(h) 5210 B
Biochemical Oxygen Demand (BOD-Soluble)	Dissolved Oxygen Probe	YSI-5000 DO Meter YSI-59 DO Meter	(h) 5210 B
Chemical Oxygen Demand (COD)	Closed Reflux / Colorimetric	Hach DR-2010 UV/Vis spectrophotometer	(h) 5220 D
Conductivity	Wheatstone Bridge	YSI-3200 Cond Meter & Accumet 150 Titration Controller (multi purpose meter)	(h) 2510 B
Cyanide	Acid Digest-Distil / Colorimetric	Hach DR-4000/Vis	(h) 4500-CN E
Floating Particulates	Flotation Funnel	Mettler A2-100 Balance	(h) 2530 B
Flow	Continuous Meter	Gould (pressure sensor), ADS (sonic sensor), or Venturi (velocity sensor)	
Hardness; Ca, Mg, Total	ICP-AES / Calculation	TJA Atomscan-25	(a) 200.7 (h) 2340 B
Kjeldahl Nitrogen (TKN)	Micro-Digestion / Titration	Hach DR-2000 UV/Vis	(h) 4500-NH3 B,C
Oil and Grease	Freon Extraction / Gravimetric	AND HM-120	(h) 5520 B
Organic Carbon (TOC)	Catalytic Oxidation / IR Water Production Laboratory)	Shimadzu ASI-5000	(bb) 5310 B
pH	Hydrogen+Reference Electrode	Various models of pH meters.	(h) 4500-H+ B
Radiation (alpha & beta)	Gross proportional counter (Truesdail Labs Inc.)	Protean IPC-9025 (alpha) Tennelec LB-50100 (beta)	(h) 7110 B
Solids, Dissolved-Total	Gravimetric @ 180°C	Mettler AE-100 Balance & Mettler AG204	(h) 2540 C
Solids, Settleable	Volumetric	Imhoff Cone	(h) 2540 F
Solids, Suspended-Total	Gravimetric @ 103-105°C	Mettler AE-100 Balance	(h) 2540 D
Solids, Suspended-Volatile	Gravimetric @ 500°C	Mettler AE-100 Balance	(h) 2540 E
Solids, Total	Gravimetric @ 103-105°C	Mettler AE-100 Balance	(a) 160.3
Solids, Total-Volatile	Gravimetric @ 500°C	Mettler AE-100 Balance	(a) 160.4
Temperature	Direct Reading	Fisher Digital Thermometer	(h) 2550 B
Turbidity	Nephelometer Turbidimeter	Hach 2100-N Meter	(h) 2130 B

INFLUENT and EFFLUENT (Anions)

Analyte	Description	Instrumentation	Reference ¹
Bromide, Chloride, Fluoride, Nitrate, Phosphate, Sulfate	Ion Chromatography	Dionex DX-500	(a) 300.0

¹ Reference listing is found following this listing of analytical methods.

WASTEWATER INFLUENT and EFFLUENT (Metals)

Analyte	Description	Instrumentation	Reference ¹
Aluminum	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Antimony	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Arsenic	Hydride Generation / AA	TJA Solaar M6	(h) 3114 B
Barium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Beryllium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Boron	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Cadmium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Calcium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Chromium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Cobalt	Acid Digestion / ICP-AES	TJA Atomscan -25	(a) 200.7
Copper	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Iron	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Lead	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Lithium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Magnesium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Manganese	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(h) 3112 B
Molybdenum	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Nickel	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Potassium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Selenium	Hydride Generation / AA	TJA Solaar M6	(h) 3114 B
Silver	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Sodium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Thallium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Vanadium	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7
Zinc	Acid Digestion / ICP-AES	TJA Atomscan-25	(a) 200.7

¹ Reference listing is found following this listing of analytical methods.

WASTEWATER INFLUENT and EFFLUENT (Organics)

Analyte	Description	Instrumentation	Reference ¹
Acrolein and Acrylonitrile	Purge & Trap, GC-MSD	Tekmar/Dohrman P2AS/3100C HP-5890GC / 5972MSD Capillary HP-624	(c) 8260 B
Base/Neutral Extractables	Basic / CH ₂ Cl ₂ continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5ms	(a) 625 (aa)
Benzidines	HPLC- ED / UV/Vis Diode Array	Dionex DX-500 / PDA-40/ED-40 C-18 Luna 5um	(a) 605
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD	Varian 3800 GC-ECD Varian 3800 GC-ECD RTX-5/60m : RTX-1701/60m	(a) 608
Dioxin	CH ₂ Cl ₂ extraction, GC/MS/MS	Varian GC-MS-MS	(a) 8280A
Organophosphorus Pesticides	CH ₂ Cl ₂ extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD DB-1/30m DB-608/30m	(a) 622
Phenolic Compounds	Acidic / CH ₂ Cl ₂ continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5ms	(a) 625 (aa)
Purgeables (VOCs)	Purge & Trap, GC-MSD	Tekmar/Dohrman 2016 HP-5890GC / 5972MSD Capillary HP-624	(a) 8260B (aa)
Tri, Di, and Monobutyl Tin	CH ₂ Cl ₂ extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m / DB-608/30m	(z)

¹ Reference listing is found following this listing of analytical methods.

LIQUID SLUDGE: Raw, Digested, and Filtrate (General)

Analyte	Description	Instrumentation	Reference ¹
Alkalinity	Selected Endpoint Titration	Mettler DL-25 Titrator	(h) 2320 B
Cyanide	Acid Digest-Distil / Colorimetric	Hach DR/4000V	(h) 4500-CN E
pH	Hydrogen+Reference Electrode	Various models of pH meters.	(c) 9010 B
Radiation (alpha & beta)	Gross proportional counter (Truesdail Labs Inc.)	Protean IPC-9025 (alpha) Tennelec LB-50100 (beta)	(h) 7110 B
Sulfides	Acid Digest-Distil / Titration	Class A Manual Buret	(c) 9030 B
Sulfides, reactive	Distillation / Titration	Class A Manual Buret	7.3.4.2
Solids, Total	Gravimetric @ 103-105°C	Mettler PM 4600 Balance	(h) 2540 B
Solids, Total-Volatile	Gravimetric @ 500°C	Mettler PM 4600 Balance	(h) 2540 E

LIQUID SLUDGE: Raw, Digested, and Filtrate (Metals)

Analyte	Description	Instrumentation	Reference ¹
Aluminum	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Antimony	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Arsenic	Hydride Generation / AA	TJA Solaar M6	(c) 7062
Beryllium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Barium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Boron	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Cadmium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Chromium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Cobalt	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Copper	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Iron	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Lead	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Manganese	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(c) 7471 A
Molybdenum	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Nickel	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Selenium	Hydride Generation / AA	TJA Solaar M6	(c) 7742
Silver	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Thallium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Vanadium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Zinc	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B

¹ Reference listing is found following this listing of analytical methods.

LIQUID SLUDGE: Raw, Digested, and Decant (Organics)

Analyte	Description	Instrumentation	Reference ¹
Acrolein and Acrylonitrile	Purge & Trap, GC-MSD	Tekmar/Dohrman 2016 HP-5890GC / 5972MSD Capillary HP-624	(c) 8260 B (aa)
Base/Neutral Extractables	Basic / CH ₂ Cl ₂ continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(a) 625 (aa)
Benzidines	HPLC-ED / UV/Vis Diode Array	Dionex DX-500 / PDA-40/ED-40 C-18 Luna 5um	(a) 605
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD	Varian 3800 GC-ECD RTX-5/60m : RTX-1701/60m	(c) 8081 A
PCBs	CH ₂ Cl ₂ extraction, GC-ECD	Varian 3800 GC-ECD RTX-5/60m : RTX-1701/60m	8082
Dioxin	CH ₂ Cl ₂ extraction	Varian GC-MS/MS	(a) 1613
Herbicides	HPLC-UV/Vis Diode Array	Dionex DX-500 / PDA-40 C-18 Hypersil 5um	(c) 8280 A
Organophosphorus Pesticides	CH ₂ Cl ₂ extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD DB-1/30m : DB-608/30m	(a) 622
Phenolic Compounds	Acidic / CH ₂ Cl ₂ continuous extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(a) 625 (aa)
Purgeables (VOCs)	Purge & Trap, GC-MSD	Tekmar/Dohrman 2016 HP-5890GC / 5972MSD Capillary HP-624	(c) 8260 B (aa)
Tri, Di, and Monobutyl Tin	CH ₂ Cl ₂ extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m : DB-608/30m	(z)

LIQUID SLUDGE: Raw, Digested, and Decant (Digester Gases)

Analyte	Description	Instrumentation	Reference ¹
Methane	Gas Chromatography	EG&G Chandler Eng. 100-AGC	(h) 2720 C
Carbon Dioxide	Gas Chromatography	EG&G Chandler Eng. 100-AGC	(h) 2720 C
Hydrogen Sulfide	Colorimetric	Draeger H2S 2/a	

¹ Reference listing is found following this listing of analytical methods.

DRIED SLUDGE: Metro Biosolids Center (General)

Analyte	Description	Instrumentation	Reference ¹
Cyanide	Acid Digest-Distillation Colorimetric	Hach DR/4000V UV/Vis	(c) 9010 A
Cyanide Reactive	Distillation / Colorimetric	Hach DR/4000V UV/Vis	7.3.3.2
pH	Hydrogen+Reference Electrode	Various models of pH meters.	(c) 9045 C
Radiation (alpha & beta)	Gross proportional counter (Truesdail Labs Inc.)	Protean IPC-9025 (alpha) Tennelec LB-50100 (beta)	(h) 7110 B
Sulfides	Acid Digest-Distil / Titration	Class A Manual Buret	(c) 9030 B
Sulfides, reactive	Distillation / Titration	Class A Manual Buret	7.3.4.2
Solids, Total	Gravimetric @ 103-105°C	Denver PI-314 Balance	(h) 2540 B
Solids, Total-Volatile	Gravimetric @ 500°C	Denver PI-314 Balance	(h) 2540 E

DRIED SLUDGE: Metro Biosolids Center (Metals)

Analyte	Description	Instrumentation	Reference ¹
Aluminum	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Antimony	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Arsenic	Hydride Generation / AA	TJA Solaar M6	(c) 7062
Barium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Beryllium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Boron	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Cadmium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Chromium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Cobalt	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Copper	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Iron	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Lead	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Manganese	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(c) 7471 A
Molybdenum	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Nickel	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Selenium	Hydride Generation / AA	TJA Solaar M6	(c) 7742
Silver	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Thallium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Vanadium	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B
Zinc	Acid Digestion / ICP-AES	TJA Atomscan-25	(c) 6010 B

Waste Extraction Test (WET)	Extraction with Sodium Citrate ICP-AES	Burrel wrist action shaker	(r) Section 66261.100
-----------------------------	--	----------------------------	-----------------------

¹ Reference listing is found following this listing of analytical methods.

DRIED SLUDGE: Metro Biosolids Center (Organics)

Analyte	Description	Instrumentation	Reference ¹
Acrolein and Acrylonitrile	Purge & Trap, GC-MSD	Tekmar/Dohrman P2AS/3100C HP-5890GC / 5972MSD Capillary HP-624	(c) 8260 B (aa)
Base/Neutral Extractables	CH ₂ Cl ₂ /Acetone sonication extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(c) 8270 C (c) 3550 A (aa)
Benzidines	Basic / CH ₂ Cl ₂ Sonication extraction	HP-6890GC / 5976MSD Capillary HP-5MS	(c) 8270C (c) 3550 A
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD	Varian 3400 GC-ECD RTX-5/60m : RTX-1701/60m	(c) 8081 A
PCBs	CH ₂ Cl ₂ extraction, GC-ECD	Varian 3400 GC-ECD RTX-5/60m : RTX-1701/60m	(c) 8082
Dioxin	Outside Contact (Severn Trent Labs)	GC-MS	(a) 8290
Herbicides	HPLC-UV/Vis Diode Array	Dionex DX-500 / PDA-40 C-18 Hypersil 5um	(c) 8321/3545
Organophosphorus Pesticides	CH ₂ Cl ₂ extraction, hexane exchange, GC-PFPD	Varian 3800 GC-PFPD DB-1/30m DB-608/30m	(c) 8141 A
Phenolic Compounds	CH ₂ Cl ₂ / Acetone sonication extraction, GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(c) 8270 C (c) 3550 A (aa)
Purgeables (VOCs)	Purge & Trap, GC-MSD	Tekmar/Dohrman 2016 HP-5890GC / 5972MSD Capillary HP-624	(c) 8260 B
Tri, Di, and Monobutyl Tin	CH ₂ Cl ₂ extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m DB-608/30m	(z)

¹ Reference listing is found following this listing of analytical methods.

OCEAN SEDIMENT (General)

Analyte	Description	Instrumentation	Reference ¹
Biochemical Oxygen Demand (BOD-5 Day)	Dissolved Oxygen Probe	YSI-5000 DO Meter	(h) 5210 B
Particle Size	Coarse fraction by sieve; fine fraction by laser scatter	Horiba LA-900	(v) 3-380
Sulfides	Acid Digest-Distil / IC-PAD	Dionex IC-PAD(Ag)	(x)
Solids, Total	Gravimetric @ 103-105°C	AND HM-120	(h) 2540 B
Solids, Total-Volatile	Gravimetric @ 500°C	AND HM-120	(h) 2540 E
Total Organic Carbon (TOC) and Total Nitrogen (TN)	Combustion / GC-TCD	Carlo-Erba NC-2500 Porapak QS	(#)

OCEAN SEDIMENT (Metals)

Analyte	Description	Instrumentation	Reference ¹
Aluminum	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Antimony	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Arsenic	Hydride Generation / AA	TJA IRIS	(c) 7062
Beryllium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Cadmium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Chromium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Copper	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Iron	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Lead	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Manganese	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(c) 7471 A
Nickel	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Selenium	Hydride Generation / AA	TJA IRIS	(c) 7742
Silver	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Thallium	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Tin	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B
Zinc	Acid Digestion / ICP-AES	TJA IRIS	(c) 6010 B

¹ Reference listing is found following this listing of analytical methods.

OCEAN SEDIMENT (Organics)

Analyte	Description	Instrumentation	Reference ¹
Base/Neutral Extractables	CH ₂ Cl ₂ / Acetone ASE GC-MSD	HP-6890GC / 5973MSD HP-5890GC / 5972MSD Capillary HP-5MS	(c) 8270 C (aa)
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD/MS/MS	Varian 3800 GC-ECD/MS/MS DBXLB/60m	(c) 8081 A
PCBs as Congeners	CH ₂ Cl ₂ extraction, GC-ECD/MS/MS	Varian 3600 GC-ECD/MS/MS DBXLB/60m	(c) 8082
Organophosphorus Pesticides	CH ₂ Cl ₂ extraction, hexane exchange, GC-PFPD	Varian 3600 GC-PFPD DB-5/30m DB-608/30m	(c) 8141 A
Tri, Di, and Monobutyl Tin	CH ₂ Cl ₂ extraction, derivatization, hexane exchange, GC-FPD	Varian 3400 GC-FPD DB-1/30m DB-608/30m	(z)

¹ Reference listing is found following this listing of analytical methods.

FISH TISSUE: Liver, Muscle, and Whole (General)

Analyte	Description	Instrumentation	Reference ¹
Solids, Total	Freeze Drying Gravimetric	Labconco Freezone 4.5 Mettler AG-104 Balance	(%)
Lipids	Hexane/Acetone Extraction Gravimetric	Dionex ASE-200 Mettler AG-104 Balance	(*)

FISH TISSUE: Liver, Muscle, and Whole (Metals)

Analyte	Description	Instrumentation	Reference ¹
Aluminum	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Antimony	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Arsenic	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Beryllium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Cadmium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Chromium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Copper	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Iron	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Lead	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Manganese	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Mercury	Cold Vapor Generation / AA	Leeman PS 200II	(a) 245.6
Nickel	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Selenium	Hydride Generation / AA	TJA IRIS	(c) 7742
Silver	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Thallium	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Tin	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7
Zinc	Acid Digestion / ICP-AES	TJA IRIS	(a) 200.3 / 200.7

FISH TISSUE: Liver, Muscle, and Whole (Organics)

Analyte	Description	Instrumentation	Reference ¹
Base/Neutral Extractables	Basic / CH ₂ Cl ₂ ASE extraction, GC-MSD	Dionex ASE-200 HP-5890GC / 5971MSD Capillary DB-XLB/30m	(c) 3545 / 8270 C
Chlorinated Compounds	CH ₂ Cl ₂ extraction, GC-ECD/MS/MS	Varian 3800 GC Saturn 2000 MS-Ion Trap DB-XLB/60m	(c) 3545 / 8081 A
PCBs	CH ₂ Cl ₂ extraction, hexane exchange, GC-ECD/MS/MS	Varian 3800 GC Saturn 2000 MS-Ion Trap DB-XLB/60m	(c) 3545 / 8082

¹ Reference listing is found following this listing of analytical methods.

Method References: Methods of Analysis Used to Produce the Data Presented in this Report.

- a) Methods for Chemical Analysis of Water and Wastes, EPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio, March 1979 (EPA-600/4-79-020), 1983 Revision, and March 1984 (EPA-600/4-84-017).
- aa) U.S. EPA Contract Laboratory Program, Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration, 7/85 revision and 1/91 revision.
- b) Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF, 16th Edition, 1985
- bb) Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF, 17th Edition, 1989
- c) Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. EPA Office of Solid Waste and emergency Response, Washington, D.C. 20460, November 1986, SW-846, Third Edition.
- g) Laboratory Procedures for the Examination of Seawater and Shellfish, 5th Edition, 1984, American Public Health Association.
- h) Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WPCF, 18th Edition, 1992.
- j) Methods for Organic Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057, July 1982.
- o) Official Methods of Analysis, 15th Edition, Association of Official Analytical Chemists (AOAC), 1990.
- q) Federal Register, Vol. 56, No. 5, pp 636-643, January 8, 1991.
- r) Criteria for Identification of Hazardous and Extremely Hazardous Wastes, California Code of Regulations (CCR), Title 22.
- t) ADirect Current Plasma (DCP) Optical Emission Spectrometric Method for Trace Elemental Analysis of Water and Wastes, Method AES0029", 1986, revised 1991, Applied Research Laboratories (ARL) Inc., 24911 Avenue Stanford, Valencia, CA 91355.
- u) Radiochemical Procedures Manual, EPA-520/5-84-006, August 1984 (EPA 1984a) Eastern Environmental Radiation Facility, Montgomery, AL 36109.
- v) Procedures for Handling and Chemical Analysis of Sediment and Water Samples, Russel H. Plumb, Jr., May 1981, EPA/Corp of Engineers Technical Committee on Criteria for Dredged and Fill Material, EPA Contract 4805572010.
- w) California Administrative Code, Title 22, Division 4, Chapter 30, Section 66700.
- x) DIONEX AU 107, R.D.Rocklin and E.L.Johnson, ANAL. CHEM., 1983, 55, 4

- y) Manual of Analytical Methods For the Analysis of Pesticides In Humans and Environmental Samples, EPA-600/8-80-038, June 1980.
- z) Adaptation of method by the Naval Ocean Systems Center, San Diego, Marine Environment Branch, San Diego, CA 92152-5000
- #) **ATOC/TN in Marine Sediments...**@ SCCWRP Annual Report, 1990-1991, and 1991-1992.
- %) **AA Guide to Freeze Drying for the Laboratory...**@ LABCONCO, 3-53-5/94-Rosse-5M-R3, 1994.
- *) **ALipids Content in Fish Tissues via Accelerated Solvent Extraction...**@WWChem, EMTS/MWWD, 1998

F. Laboratories Contributing Results used in this report.

1. Metropolitan Wastewater Chemistry Laboratory
(EPA Lab Code: CA00380,
ELAP Certificate: 1609)
5530 Kiowa Drive
La Mesa, CA 91942
(619)668-3205
All results except those listed below.

2. Point Loma Wastewater Chemistry Laboratory
(EPA Lab Code: CA01435,
ELAP Certificate: 2474)
1902 Gatchell Road
San Diego, CA 92106
(619)221-8765
Process control analyses and wet methods for the plant.

3. North City Wastewater Chemistry Laboratory
(EPA Lab Code: CA01436,
ELAP Certificate: 2477)
4949 Eastgate Mall
San Diego, CA 92121
(858)824-6009
Process control analyses and wet methods for the plant.

4. Metro Biosolids Center Chemistry Laboratory
(EPA Lab Code: CA01437,
ELAP Certificate: 2478)
5240 Convoy Street
San Diego, CA 92111
(858)614-5834
Process control analyses and wet methods for the plant.

5. South Bay Water Reclamation Plant
(EPA Lab Code: CA01460,
ELAP Certificate: 2539)
2411 Dairy Mart Road
San Diego, CA 92173
619.428.7349
Process control analyses and wet methods for the plant.

6. City of San Diego - Water Quality Laboratory
(EPA Lab Code: CA00080,
ELAP Certificate: 1058)
5530 Kiowa Drive
La Mesa, CA 91942
(619)668-3237
Total Organic Carbon in Wastewater

7. City of San Diego - Marine Microbiology and Vector Management (EPA LabCode: CA01393, ELAP
Certificate: 2185)
5530 Kiowa Drive
La Mesa, CA 91942
(619)668-3226
Microbiology

8. City of San Diego - Toxicity Bioassay Laboratory
(EPA Lab Code: CA01302,
ELAP Certificate: 1989)
4918 Harbor Drive, Suite 101
San Diego, CA 92106
(619) 758-2347
Bioassays

9. Pacific Analytical, Inc.
(EPA Lab Code: CA00052,
ELAP Certificate: 1466)
6349 Paseo Del Lago
Carlsbad, CA 92009
(760)438-3100
Dioxins/Furans

10. Truesdail Laboratories, Inc.
(EPA Lab Code: CA09469,
ELAP Certificate: 1237)
14201 Franklin Ave.
Tustin, CA 92780-7008
(714)730-6239
Gross Alpha/Beta Radioactivity and some mercury, arsenic and selenium values.

11. Severn Trent Labs
880 Riverside Parkway
Sacramento, CA 95605
NELAP Certification: 01119CA
Telephone# (916) 373-5600
Dioxins/Furans

G. Discharge Limits

NPDES Permit No. CA0107409/RWQCB Order No. R-2002-0025

DISCHARGE SPECIFICATIONS from NPDES Permit No. CA0107409/RWQCB Order No. R-2002-0025 effective on September 13, 2002 with limits on pollutant discharges.

The discharge of waste through the Point Loma Ocean Outfall containing pollutants in excess of the following effluent limitations are prohibited:

NPDES Permit No. CA0107409/RWQCB Order No. R-2002-0025						
Constituent	Units	6-month Median	30-day Average	7-Day Average	Daily Maximum	Instantaneous Maximum
Biochemical Oxygen Demand BOD ₅ @ 20EC	mg/L	The "Mean Annual Percent Removal" limit for BOD is 58%. There is no mass emission limit.				
Total Suspended Solids ¹	mg/L lb/day		75			
pH	pH units	Within the limits of 6.0 - 9.0 at all times.				
Grease & Oil	mg/L lb/day		25 34,000	40 68,000		75 130,000
Settleable Solids	mL/L		1.0	1.5		3.0
Turbidity	NTU		75	100		225
Acute Toxicity	TUa				6.5	
Arsenic	ug/L	1,000			5,900	16,000
Cadmium	ug/L	200			800	2,100
Chromium ² (Hexavalent)	ug/L	400			2,000	4,100
Copper	ug/L	200			2,100	5,700
Lead	ug/L	400			2,000	4,100
Mercury	ug/L	8.1			33	80
Nickel	ug/L	1,000			4,100	10,000
Selenium	ug/L	3,100			12,000	30,800
Silver	ug/L	100			540	1,000
Zinc	ug/L	2,500			15,000	39,400
Cyanide	mg/L	0.2			0.8	2.1
Total Residual Chlorine(TRC)	mg/L	0.400			2.0	12
Ammonia (expressed as Nitrogen)	mg/L	123			492	1,230
Chronic Toxicity	TUc				205	
Phenolic Compounds (non- chlorinated)	ug/L	6,200			24,600	61,500
Chlorinated Phenolics	ug/L	200			800	2,100

¹ Total Suspended Solids (TSS)- The discharger shall achieve a mass emission of TSS of no greater than 15,000 mt/yr; this requirement shall be effective through December 31, 2005. Effective January 1, 2006, the discharger shall achieve a mass emission of TSS of no greater than 13,599 mt/yr. These mass emission requirements shall only apply to TSS discharged from POTWs which are owned and operated by the discharger, and the discharger's wastewater generated in the Metro System service area. These mass emission requirements do not apply to wastewater (and the resulting TSS) generated in Mexico as a result of upset or shutdown and treated at and discharged from the PLMWTP.

² Hexavalent Chromium limit met as Total Chromium.

Constituent	Units	6-month Median	30-day Average	7-Day Average	Daily Maximum	Instantaneous Maximum
Endosulfan	ng/L	2,000			3,700	5,500
Endrin	ng/L	400			800	1,000
HCH (hexachlorocyclohexanes)	ng/L lb/day	800			2,000	2,500

Radioactivity - Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30269 of the California Code of Regulations.

Note: mg/L= milligrams per liter
 ug/L = micrograms per liter
 ng/L = nanograms per liter
 lb/day= pounds per day
 NTU= Nephelometric turbidity units
 TUa = Acute toxicity units
 TUc = Chronic toxicity units

Constituent	Units	Monthly Average (30-Day)
-------------	-------	--------------------------

LIMITATIONS FOR PROTECTION OF HUMAN HEALTH--NONCARCINOGENS

Acrolein	ug/L	45,000
Antimony	ug/L	250,000
Bis(2-chloroethoxy) methane	ug/L	900
Bis(2-chloroisopropyl) ether	ug/L	250,000
Chlorobenzene	ug/L	120,000
Chromium (III) ³	ug/L	39,000,000
di-n-butyl phthalate	ug/L	720,000
dichlorobenzenes	ug/L	1,000,000
Diethyl phthalate	ug/L	6,800,000
Dimethyl phthalate	ug/L	170,000,000
4,6-dinitro-2-methylphenol	ug/L	45,000
2,4-dinitrophenol	ug/L	820
Ethylbenzene	ug/L	840,000
Fluoranthene	ug/L	3,100
Hexachlorocyclopentadiene	ug/L	12,000
Nitrobenzene	ug/L	1,000
Thallium	ug/L	400
Toluene	ug/L	17,000,000
Tributyltin	ug/L	0.29
1,1,1-trichloroethane	ug/L	110,000,000

LIMITATIONS FOR PROTECTION OF HUMAN HEALT—CARCINOGENS

Acrylonitrile	ug/L	21
Aldrin	ng/L	4.5
Benzene	ug/L	1,200
Benzidine	ug/L	0.014
Beryllium	ug/L	6.8
Bis(2-chloroethyl)ether	ug/L	9.2
Bis(2-ethylhexyl)phthalate	ug/L	720

³ Chromium (III) limit is met by Total Chromium.

Constituent	Units	Monthly Average (30-Day)
Carbon Tetrachloride	ug/L	180
Chlordane	ng/L	4.7
Chloroform	ug/L	27,000
DDT	ng/L	35
1,1,2,2-tetrachloroethane	ug/L	470
1,1-dichloroethylene	ug/L	200
1,1,2-trichloroethane	ug/L	1,900
1,4-dichlorobenzene	ug/L	3,700
3,3-dichlorobenzidine	ug/L	1.7
1,2-dichloroethane	ug/L	5,700
Dichloromethane	ug/L	92,000
1,3-dichloropropene	ug/L	1,800
Dieldrin	ng/L	8.20
2,4-dinitrotoluene	ug/L	530
1,2-diphenylhydrazine	ug/L	33
Halomethanes	ug/L	27,000
Heptachlor	ng/L	10
Hexachlorobenzene	ug/L	0.043
Hexachlorobutadiene	ug/L	2,900
Hexachloroethane	ug/L	510
Isophorone	ug/L	150,000
N-nitrosodimethylamine	ug/L	1,500
N-nitrosodiphenylamine	ug/L	510
PAHs	ug/L	1.80
PCBs	ng/L	3.90
TCDD equivalents	pg/L	0.8
Tetrachloroethylene	ug/L	410
Toxaphene	ng/L	430
Trichloroethylene	ug/L	5,500
Vinyl Chloride	ug/L	7,400

H. Laboratory Accreditation Certificate

Our wastewater laboratory consists of a main laboratory with three satellite laboratories, one at each wastewater treatment plant; Point Loma Wastewater Treatment Plant, North City Water Reclamation Plant, South Bay Water Reclamation Plant, and the Metro Biosolids Center. The main laboratory performs analyses for permit regulated parameters. The Point Loma, North City, South Bay, and Metro Biosolids Center laboratories perform some of our permit regulated analyses, as well as process control analyses. All of our laboratories are California Environmental Laboratory Accreditation Program (ELAP) Certified Laboratories. A copy of all the Laboratory Certifications from the California Department of Health Services (DOHS), Environmental Laboratory Accreditation Program (ELAP) follows.



STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to

**CITY of SAN DIEGO ENVIRONMENTAL MONITORING SERVICE
METROPOLITAN WASTEWATER CHEMISTRY LABORATORY
5530 KIOWA DRIVE
LA MESA, CA 91942-1331**

Scope of certification is limited to the
"List of Approved Fields of Testing and Analytes"
which accompanies this Certificate.

Continued certification status depends on successful completion of site visit,
proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No: **1609**
Expiration Date: **08/31/2005**
Effective Date: **08/01/2003**

Berkeley, California
subject to forfeiture or revocation.

George C. Kulasingam, Ph.D.
Program Chief
Environmental Laboratory Accreditation Program

**CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing**

CITY of SAN DIEGO ENVIRONMENTAL MONITORING SERVICE
METROPOLITAN WASTEWATER CHEMISTRY LABORATORY
5530 KIOWA DRIVE
LA MESA, CA 91942

Lab Phone (619) 668-3212

Certificate No: 1609 Renew Date: 08/31/2003

Field of Testing: 09 - Physical Properties Testing of Hazardous Waste

09.02	02	Corrosivity - pH Determination	EPA 9045C
09.04A	01	Reactive Cyanide	Section 7.3 SW-846
09.04B	01	Reactive Sulfide	Section 7.3 SW-846

Field of Testing: 10 - Inorganic Chemistry and Toxic Chemical Elements of Hazardous Waste

10.01	04	Antimony	EPA 6010B
10.02	02	Arsenic	EPA 7061A
10.03	03	Barium	EPA 6010B
10.04	03	Beryllium	EPA 6010B
10.05	03	Cadmium	EPA 6010B
10.06	03	Chromium, Total	EPA 6010B
10.07	03	Cobalt	EPA 6010B
10.08	03	Copper	EPA 6010B
10.09	03	Lead	EPA 6010B
10.10	01	Mercury	EPA 7470A
10.10	02	Mercury	EPA 7471A
10.11	03	Molybdenum	EPA 6010B
10.12	03	Nickel	EPA 6010B
10.13	02	Selenium	EPA 7741A
10.14	03	Silver	EPA 6010B
10.15	03	Thallium	EPA 6010B
10.16	03	Vanadium	EPA 6010B
10.17	03	Zinc	EPA 6010B
10.19	03	Cyanide	EPA 9014
10.21	01	Sulfide	EPA 9034

Field of Testing: 11 - Extraction Tests of Hazardous Waste

11.01	01	Waste Extraction Test (WET)	CCR Chapter11, Article 5, Appendix II
-------	----	-----------------------------	---------------------------------------

Field of Testing: 12 - Organic Chemistry of Hazardous Waste by GC/MS

12.03A	01	Extractable Organics	EPA 8270C
12.06A	01	Volatile Organic Compounds	EPA 8260B

Field of Testing: 13 - Organic Chemistry of Hazardous Waste (excluding GC/MS)

13.24C	01	PCBs	EPA 8082
13.25C	01	Organochlorine Pesticides	EPA 8081A

Field of Testing: 16 - Wastewater Inorganic Chemistry, Nutrients and Demand

16.02	01	Alkalinity	SM2320B
16.04	01	Biochemical Oxygen Demand	SM5210B
16.05	03	Boron	EPA 200.7
16.06	02	Bromide	EPA 300.0
16.07	04	Calcium	EPA 200.7
16.08	01	Carbonaceous BOD	SM5210B
16.09	06	Chemical Oxygen Demand	SM5220D
16.10	06	Chloride	EPA 300.0
16.12	02	Cyanide	SM4500-CN C,E

As of 03/07/2003, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

CITY of SAN DIEGO ENVIRONMENTAL MONITORING SERVICE

Certificate No: 1609
Renew Date: 08/31/2003

16.14	07	Fluoride	EPA 300.0
16.15	05	Hardness - Total as CaCO3	EPA 200.7
16.17	04	Magnesium	EPA 200.7
16.18	08	Nitrate	EPA 300.0
16.22	01	Oxygen,dissolved	SM4500-O C
16.23	01	pH	SM4500-H+ B
16.25	06	Phosphate, Ortho	EPA 300.0
16.26	03	Phosphorus, Total	EPA 365.2
16.27	04	Potassium	EPA 200.7
16.28	02	Residue, Total	EPA 160.3
16.29	01	Residue, Filterable	SM2540C
16.30	01	Residue, Non-filterable	SM2540D
16.32	01	Residue, Volatile	EPA 160.4
16.34	04	Sodium	EPA 200.7
16.35	01	Conductivity	SM2510B
16.36	05	Sulfate	EPA 300.0
16.41	01	Turbidity	SM2130B

Field of Testing: 17 - Toxic Chemical Elements in Wastewater

17.01	05	Aluminum	EPA 200.7
17.02	05	Antimony	EPA 200.7
17.03	02	Arsenic	SM3114B 4,d
17.04	06	Barium	EPA 200.7
17.05	06	Beryllium	EPA 200.7
17.06	07	Cadmium	EPA 200.7
17.08	08	Chromium, Total	EPA 200.7
17.09	07	Cobalt	EPA 200.7
17.10	07	Copper	EPA 200.7
17.13	07	Iron	EPA 200.7
17.14	07	Lead	EPA 200.7
17.15	06	Manganese	EPA 200.7
17.16	01	Mercury	SM3112B
17.17	06	Molybdenum	EPA 200.7
17.18	07	Nickel	EPA 200.7
17.24	05	Selenium	SM3114B
17.25	07	Silver	EPA 200.7
17.27	05	Thallium	EPA 200.7
17.28	05	Tin	EPA 200.7
17.30	05	Vanadium	EPA 200.7
17.31	06	Zinc	EPA 200.7

Field of Testing: 18 - Organic Chemistry of Wastewater by GC/MS

18.01	01	All Volatile Organics	EPA 624
18.02	01	All Acid/base/neutral Compounds	EPA 625

Field of Testing: 19 - Organic Chemistry of Wastewater (excluding GC/MS)

19.05	01	Benzidine	EPA 605
19.08A	01	PCBs and Organochlorine Pesticides	EPA 608
19.08B	01	PCBs	EPA 608

As of 03/07/2003, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

*Waiting for ELAP to send current FoTs. ELAP is a year behind in performing site visits.



STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to

**PT. LOMA WASTEWATER CHEMISTRY LAB
CITY OF SAN DIEGO ENVIRONMENTAL MONITORING
1902 GATCHELL ROAD
SAN DIEGO, CA 92106**

Scope of certification is limited to the
"List of Approved Fields of Testing and Analytes"
which accompanies this Certificate.

Continued certification status depends on successful completion of site visit,
proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No: **2474**
Expiration Date: **07/31/2005**
Effective Date: **07/01/2003**

Berkeley, California
subject to forfeiture or revocation.

George C. Kulasingam, Ph.D.
Program Chief
Environmental Laboratory Accreditation Program

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

PT. LOMA WASTEWATER CHEMISTRY LAB
CITY OF SAN DIEGO ENVIRONMENTAL MONITORING
1902 GATCHELL ROAD
SAN DIEGO, CA 92106

Lab Phone (619) 668-3222

Certificate No: 2474 Renew Date: 07/31/2005

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.080	001	Residue, Total	EPA 180.3
108.090	001	Residue, Volatile	EPA 180.4
108.380	001	Oil and Grease	EPA 1864
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.421	001	Hardness	SM2340C
108.430	001	Conductivity	SM2510B
108.441	001	Residue, Filterable	SM2540C
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.490	001	pH	SM4500-H+ B
108.500	001	Ammonia	SM4500-NH3 C
108.530	001	Dissolved Oxygen	SM4500-O C
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.601	001	Chemical Oxygen Demand	SM5220C
108.630	001	Oil and Grease	SM5520B
108.670	001	Nitrite	HACH8507
108.672	001	Phosphate, Ortho	HACH9048

As of 03/09/2004, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

Page 1 of 1



STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to

**NORTH CITY WASTEWATER CHEMISTRY LAB
CITY OF SAN DIEGO ENVIRONMENTAL MONITORING
4949 EASTGATE MALL
SAN DIEGO, CA 92121**

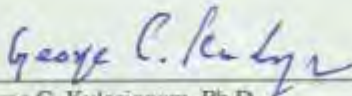
Scope of certification is limited to the
"List of Approved Fields of Testing and Analytes"
which accompanies this Certificate.

Continued certification status depends on successful completion of site visit,
proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No: 2477
Expiration Date: 07/31/2005
Effective Date: 07/01/2003

Berkeley, California
subject to forfeiture or revocation.


George C. Kulasingam, Ph.D.
Program Chief
Environmental Laboratory Accreditation Program

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

NORTH CITY WASTEWATER CHEMISTRY LAB
CITY OF SAN DIEGO ENVIRONMENTAL MONITORING
4949 EASTGATE MALL
SAN DIEGO, CA 92121

Lab Phone (619) 658-3286

Certificate No: 2477 Renew Date: 07/31/2005

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.080	001	Residue, Total	EPA 160.3
108.090	001	Residue, Volatile	EPA 160.4
108.370	001	Surfactants	EPA 425.1
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.430	001	Conductivity	SM2510B
108.441	001	Residue, Filterable	SM2540C
108.442	001	Residue, Non-filterable	SM2540D
108.465	001	Chlorine	SM4500-Cl G
108.490	001	pH	SM4500-H+ B
108.501	001	Kjeldahl Nitrogen	SM4500-NH3 C
108.502	001	Ammonia	SM4500-NH3 E
108.503	001	Kjeldahl Nitrogen	SM4500-NH3 E
108.530	001	Dissolved Oxygen	SM4500-O C
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.602	001	Chemical Oxygen Demand	SM5220D

As of 02/03/2004, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

Page 1 of 1



STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to

SOUTH BAY WASTEWATER CHEMISTRY LABORATORY
CITY of SAN DIEGO - ENVIRONMENTAL MONITORING & TECH
2411 DAIRY MART ROAD
SAN DIEGO, CA 92173

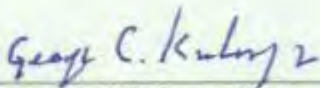
Scope of certification is limited to the
"Accredited Fields of Testing"
which accompanies this Certificate.

Continued certification status depends on successful completion of site visit,
proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No: **2539**
Expiration Date: **01/31/2005**
Effective Date: **01/31/2003**

Berkeley, California
subject to forfeiture or revocation.


George C. Kulasingam, Ph.D.
Program Chief
Environmental Laboratory Accreditation Program

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

SOUTH BAY WASTEWATER CHEMISTRY LABORTORY
CITY of SAN DIEGO - ENVIRONMENTAL MONITORING & TECH
2411 DARY MART ROAD
SAN DIEGO, CA 92173

Lab Phone (619) 688-3212

Certificate No: 2539 Renew Date: 01/31/2005

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.070	001	Residue, Non-filterable	EPA 160.2
108.080	001	Residue, Total	EPA 160.3
108.090	001	Residue, Volatile	EPA 160.4
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.430	001	Conductivity	SM2510B
108.441	001	Residue, Filterable	SM2540C
108.443	001	Residue, Settleable	SM2540F
108.465	001	Chlorine	SM4500-Cl G
108.490	001	pH	SM4500-H+ B
108.502	001	Ammonia	SM4500-NH3 E
108.530	001	Dissolved Oxygen	SM4500-O C
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.602	001	Chemical Oxygen Demand	SM5220D
108.640	001	Surfactants	SM5540C

As of 01/31/2003, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

Page 1 of 1



STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

ENVIRONMENTAL LABORATORY CERTIFICATION

Is hereby granted to

CITY of SAN DIEGO ENVIRONMENTAL / TECHNICAL SERVICES
METRO BIOSOLIDS CENTER WASTEWATER CHEMISTRY
5240 CONVOY STREET
SAN DIEGO, CA 92111

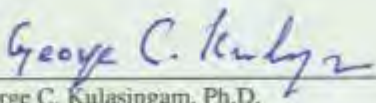
Scope of certification is limited to the
"List of Approved Fields of Testing and Analytes"
which accompanies this Certificate.

Continued certification status depends on successful completion of site visit,
proficiency testing studies, and payment of applicable fees.

This Certificate is granted in accordance with provisions of
Section 100825, et seq. of the Health and Safety Code.

Certificate No: 2478
Expiration Date: 07/31/2005
Effective Date: 07/01/2003

Berkeley, California
subject to forfeiture or revocation.


George C. Kulasingam, Ph.D.
Program Chief
Environmental Laboratory Accreditation Program

**CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing**

CITY of SAN DIEGO ENVIRONMENTAL / TECHNICAL SERVICES
METRO BIOSOLIDS CENTER WASTEWATER CHEMISTRY
5240 CONVOY STREET
SAN DIEGO, CA 92111

Lab Phone (858) 614-5834

Certificate No: 2478 Renew Date: 7/31/2005

Field of Testing: 105 - Inorganic Chemistry of Wastewater

105.080	001	Residue, Total	EPA 150.3
105.090	001	Residue, Volatile	EPA 150.4
105.410	001	Alkalinity	SM2320E
105.442	001	Residue, Non-Biodegradable	SM2540D
105.490	001	pH	SM4500-H+ B

As of: 2/25/2004, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

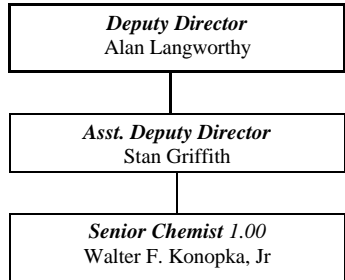
Page 1 of 1

I. Staff Contributing to this Report

Initials	ID	First Name	Last Name	Signature
LA	LOA	Liliana	Arriaga	
BOA <i>BOA</i>	BOA	Ben	Andoh	<i>Benjamin Andoh</i>
TB <i>TB</i>	TSB	Tan	Bao	<i>Tan Bao</i>
VB <i>VB</i>	VFB	Virginia	Basilan	<i>Virginia Basilan</i>
EB <i>EB</i>	EMB	Eric	Becker	<i>Eric Becker</i>
EB <i>EB</i>	BTX	Enrique	Blanco	<i>Enrique Blanco</i>
BGB <i>BGB</i>	N8B	Brent	Bowman	<i>Brent Bowman</i>
TB <i>TB</i>	TMB	Tom	Burger	<i>Tom Burger</i>
DC <i>DC</i>	DVC	Doug	Campbell	<i>Doug Campbell</i>
LC <i>LC</i>	UEC	Laura	Carr	<i>Laura Carr</i>
LC <i>LC</i>	G3C	Jose	Castro	<i>Jose Castro</i>
JCM <i>JCM</i>	U8C	Jacqueline	Cazares-Medina	<i>Jacqueline Cazares Medina</i>
CC <i>CC</i>	I5C	CC	Chou	<i>Chou</i>
NC <i>NC</i>	NLC	Nancy	Coglan	<i>Nancy Coglan</i>
MC <i>MC</i>	M5C	Maricela	Coronel	<i>Maricela Coronel</i>
JCM <i>JCM</i>	G8C	Jerry	Czajkowski	<i>Jerry Czajkowski</i>
KD <i>KD</i>	KOD	Ken	Dang	<i>Ken Dang</i>
HHD <i>HHD</i>	HZD	Heather	Duckett	<i>Heather Duckett</i>
ACD <i>ACD</i>	AD4	Angelica	Duran	<i>Angelica Duran</i>
SE <i>SE</i>	SZE	Steve	Evans	<i>Steve Evans</i>
JF <i>JF</i>	JRF	Jeff	Findley	<i>Jeff Findley</i>
KG <i>KG</i>	KG3	Kenneth	Genz	<i>Kenneth Genz</i>
RJ <i>RJ</i>	RCJ	Ron	Jardine	<i>Ron Jardine</i>
LK	LNK	Lee	King	<i>Lee King</i>
WK <i>WK</i>	WXK	Walter	Konopka	<i>Walter Konopka</i>
EL <i>EL</i>	EVL	Estela	Lanez	<i>Estela Lanez</i>
NL	NDL	Ninette	Lilienthal	
RL	AUL	Ron	Lilienthal	
AM <i>AM</i>	M5U	Armando	Martinez	<i>Armando Martinez</i>
FM <i>FM</i>	YBM	Fernando	Martinez	<i>Fernando Martinez</i>
SWM	SWM	Steve	Meyer	<i>Steve Meyer</i>
FM <i>FM</i>	IZM	Francisco	Meza	<i>Francisco Meza</i>
JM	G7M	Jeff	McAnally	<i>Jeff McAnally</i>
JN <i>JN</i>	IEN	Jesus	Nieto	<i>Jesus Nieto</i>
PO <i>PO</i>	A2O	A. Patricia	Ortega	<i>A. Patricia Ortega</i>
LP <i>LP</i>	LJP	Lorena	Pantoja	<i>Lorena Pantoja</i>
LP <i>LP</i>	LXP	Leonard	Przybylo	<i>Leonard Przybylo</i>
CAQ <i>CAQ</i>	CQ5	Corinna	Quinata	<i>Corinna Quintana</i>
JS	JVS	Jovanne	Sanchez	
RS <i>RS</i>	RDS	Robert	Sandoval	<i>Robert Sandoval</i>
DWS <i>DWS</i>	DXS	David	Schlickman	<i>David Schlickman</i>
GS <i>GS</i>	GTS	Greg	Schlimme	<i>Greg Schlimme</i>
GR <i>GR</i>	HIR	Gloria	Siqueiros	<i>Gloria Siqueiros</i>
MS <i>MS</i>	D8U	Miles	Slattery	<i>Miles Slattery</i>
MRS <i>MRS</i>	MWS	Michael	Stewart	<i>Michael Stewart</i>
SV <i>SV</i>	SCV	Sandra	Valenzuela	<i>Sandra Valenzuela</i>
GV	JRV	Gabriel	Velarde	<i>Gabriel Velarde</i>
JW <i>JW</i>	AIW	Julie	Webb	<i>Julie Webb</i>
CW <i>CW</i>	C2W	Crystal	Winkler	<i>Crystal Winkler</i>
KW <i>KW</i>	KLW	Kristof	Witczak	<i>Kristof Witczak</i>
MZ <i>MZ</i>	MZ	Maria	Zapata	<i>Maria Zapata</i>

Figure 1. Chemistry Laboratory Organization Chart. (2002)

Metropolitan Wastewater Department
 Environmental Monitoring and Technical Services Division
Wastewater Chemistry Laboratory



<i>Pesticides/ Wet Chemistry Group</i> <i>Associate Chemist 1.00</i> JEFF MCANALLY	<i>QA/DM Group</i> <i>Associate Chemist 1.00</i> STEVE MEYER	<i>Metals Group</i> <i>Associate Chemist 1.00</i> DAVID SCHLICKMAN	<i>Point Loma Process Control Group</i> <i>Associate Chemist 1.00</i> BRENT BOWMAN	<i>North Process Control Group</i> <i>Associate Chemist 1.00</i> NANCY COGLAN	<i>GC/MS & So. Bay Process Control Group</i> <i>Associate Chemist 1.00</i> ROBERT SANDOVAL
<i>Assistant Chemists: 9.00</i> TAN BAO CC CHOU KEN DANG CRYSTAL WINKLER MARIA ZAPATA SANDRA VALENZUELA JAQUELINE CAZARES-MEDINA HEATHER DUCKETT MICHAEL STEWART	<i>Assistant Chemists: 4.00</i> LEE KING RONALD JARDINE TOM BURGER MILES SLATTERY	<i>Assistant Chemists: 5.00</i> BEN ANDOH JERRY CZAJKOWSKI JEFF FINDLEY JESUS NIETO LEONARD PRZYBYLO	<i>Assistant Chemists: 3.00</i> JULIE WEBB GREG SCHLIMME ENRIQUE BLANCO	<i>Assistant Chemists: 4.00</i> VIRGINIA BASILAN KRIS WITCZAK LAURA CARR LORENA PANTOJA	<i>Assistant Chemists: 6.00</i> FRANCISCO MEZA STEVE EVANS ESTELA LANEZ -SB FERNANDO MARTINEZ DOUG CAMPBELL
<i>Laboratory Technician: 1.00</i> ERIC BECKER	<i>Laboratory Technician: 1.00</i> ARMANDO MARTINEZ	<i>Laboratory Technician: 2.00</i> GABRIEL VELARDE GLORIA SIQUEIROS	<i>Laboratory Technician: 3.00</i> MARICELA CORONEL NINETTE LILIENTHAL ALMA PATRICIA ORTEGA	<i>Laboratory Technician: 2.00</i> ANGELICA DURAN KENNETH GENZ	<i>Laboratory Technician: 1.00</i> JOSE CASTRO -SB
<i>Intern:</i> ROBERTO SANDOVAL	<i>Word Processing Operator:</i> <i>1.00</i> CORINNA QUINATA <i>Intern:</i> JOVANNE SANCHEZ	<i>Intern:</i> LILIANA ARRIAGA			

J. Acknowledgements

**Point Loma Wastewater Treatment Plant and Ocean Outfall Annual
Monitoring Report
2002**

City of San Diego
Metropolitan Wastewater Department

Environmental Monitoring & Technical Services Division
Wastewater Chemistry Laboratory
5530 Kiowa Drive
La Mesa, CA 91942
Phone: (619) 668-3212/3205 FAX: (619) 668-3250

Supervising Editors & Science Staff:

Walter F. Konopka, Jr.
Steve Meyer

Editorial Production & Support

Corinna Quinata

Data Management, Report Generation, Data Tables & Graphics

Tom Burger
Ronald Jardine
Lee King
Miles Slattery

Operations & Maintenance Division

1902 Gatchell Road
San Diego, CA

Phone: (619) 221-8770 FAX: (619) 221-8305

Annual

Point Loma Wastewater Treatment Superintendent: Joe A. Cordova

Senior WW Operations Supervisor

James C. Lindsay

Senior Plant Technician Supervisor

Theodore Taylor

**Senior WW Operations Supervisor- Process
Control**

Andrew P. Stoecker (through November 2003)
James C. Lindsay

**Senior Plant Technician Supervisor -
Planning**

Robin Bowman

Senior Civil Engineer

Jerry D. Williams

Senior Power Plant Supervisor

Jerry L. Fabula