CITY OF SANTA CRUZ WASTEWATER TREATMENT FACILITY

2019

2019 Wastewater Treatment Facility Annual Summary Report & Outfall Inspection Report

CITY OF
SANTA CRUZ

CITY OF SANTA CRUZ POTW ANNUAL REPORT

2019

CONTENTS

Section I. Introduction and Overview

This document is the Annual Report of the water pollution control activities of the City of Santa Cruz Wastewater Treatment Facility for 2019. It was prepared and submitted in fulfillment of the City's obligations to the Regional Water Quality Control Board (Region III), accordance to Board Order No. R3-2017-0030 in compliance with the Standard Provisions and Reporting Requirements of the National Pollutant Discharge Elimination System Permits (NPDES), General Reporting Requirements, § 16.C.

The City of Santa Cruz treats sewage from domestic and industrial sources at the Wastewater Treatment Facility near Neary Lagoon and discharges its effluent into the Pacific Ocean under the NPDES permit No CA0048194. The area served includes the Cities of Santa Cruz and Capitola, the areas of Live Oak, Soquel, and Aptos, and the University of California at Santa Cruz. The City also provides capacity for the City of Scotts Valley to discharge its wastewater treatment system's effluent into the Pacific Ocean. However all data contained within this report relate only to the effluent of the City's wastewater treatment plant.

The estimated population served is approximately 140,000 people.

Wastewater Flows and Projection:

The design treatment capacity of the Plant is 81 million gallons per day (MGD). The NPDES mandatory limit for the average dry weather (ADW) flow is 17 MGD.

The City continuously upgrades the treatment facility to accommodate population growth, to respond to regulatory and environmental challenges, and to implement improved technologies for wastewater treatment; the most recent structural upgrades were completed in 1998. These were the addition of the trickling filter/solids contact units to the primary treatment plant; which was rebuilt in 1991, and the commissioning of a new ocean outfall in 1989.

- The maximum daily flow in 2019 was 30.6 MGD
- 3.2 billion gallons of treated wastewater effluent gallons was discharged from the Plant at an average daily rate of 8.7 MGD;
- There are expectations that wastewater flows to the POTW and discharge to the ocean will continue within design and regulatory limits through the next year.
- Total Suspended Solids (TSS) removal averaged 97.7 **%** throughout the year;
    - Final Effluent concentration averaged 7.0mg/L in 2019, with an
    - Average Influent intake concentration of 309.1mg/L.
- Total Organic Carbon (TOC) removal averaged 88.8**%** throughout the year. The monthly average effluent concentration was 15.9mg/L.
- Metals removal was variable with a high efficiency greater than 90% for Aluminum and Copper and less than 10% for Boron and Potassium. Performance efficiencies in metals and metalloids are constrained by the paucity of data. They were measured twice only during the year.
- Trace organic compounds, including some of emerging concern were analyzed in the Influent and Effluent using integrative sampling techniques. Details of these calculations are contained in the numerical entries into CIWQS from the CCLEAN data.

Introduction to Section II.

Summary of Monitoring Data – Tables of selected conventional and priority pollutants in plant effluent, and of plant performance data in 2019.

The following pages contain summary tables of compliance monitoring data compiled by the City's laboratory, contract laboratories, and other wastewater treatment staff for compliance monitoring purposes in 2019.

The analytical data were derived from daily and weekly laboratory analyses and/or instrumentation readings from plant effluent and process samples through 2019.

All laboratory analyses were performed using methods specified and/or approved in the plant's NPDES permit CA 0048194 and the Code of Federal Regulations at 40 CFR 136; Table 1B.

The implementation of Integrated High Volume Water Sampling mechanisms for compounds of emerging environmental concern continued in the last year. These compounds including: trace organic compounds (TOrC) such as Dioxins; Plasticizers; Pharmaceuticals and Pesticides require the implementation of sampling methods validated by USGS, or other integrative sampling methods as approved for use by the Water Board, Region 3, under the regional monitoring program (CCLEAN) Central Coast Long-Term Environmental Assessment Network. The analytical methods deployed to derive the water concentrations are those validated by USGS or/and USEPA for environmental and regulatory purposes. Those data are not discussed within this summary report.

The Laboratory and Environmental Compliance programs at the WWTF implemented the Semi-Permeable Membrane Devices (SPMD) at the Influent and Effluent of the facility to perform these analyses, while the CCLEAN program implemented an approved sampling protocol developed by Physis and Axys in the Effluent stream for the City of Santa Cruz and the City of Scotts Valley. Data from both sources are integrated into the detailed report submitted through CCLEAN into the State's database CIWQS (California Integrated Water Quality System) as required by the NPDES permit.

Following these summary pages are presentations of the following two analytical data sections:

1. Summary of Monitoring Data in Tables
2. Summary of Monitoring Data in Graphs

Section II. Summary of Monitoring Data - Tables

Table 1: WWTF WASTEWATER TREATMENT DATA - MONTHLY FLOW AVERAGES 2019

2019 MONTHS	Average Influent Flow	Peak Influent Instantaneous Maximum Flow	Average City Influent Flow	Average County Influent Flow	Average Effluent Flow	Peak Effluent Instantaneous Maximum
	MGD	MG	MG	MG	MGD	MG
January	10.6	21.7	6.6	4.0	9.7	16.8
February	14.8	28.0	9.5	5.4	13.7	21.8
March	11.7	21.6	7.2	4.5	11.5	17.1
April	8.6	15.8	5.3	3.4	8.9	13.5
May	8.8	16.2	5.5	3.4	8.9	13.5
June	7.4	13.8	4.1	3.3	7.5	12.1
July	6.8	13.4	3.6	3.3	6.9	10.9
August	6.4	15.4	3.2	3.3	6.5	10.6
September	6.3	14.0	3.1	3.2	6.4	10.7
October	6.9	17.3	3.8	3.1	6.8	12.9
November	6.9	17.7	3.7	3.2	6.8	12.9
December	11.1	22.2	6.6	4.5	10.5	16.9
Average	8.6	18.1	5.2	3.7	8.7	14.1
Maximum	11.7	28.0	9.5	5.4	13.7	21.8
NPDES Limit 1: Average Dry Weather Maximum Effluent Flow 17 MGD						
NPDES LIMIT 2: Maximum Daily Effluent Flow: 81 MGD						

Table 2: WWTF TOTAL SUSPENDED SOLIDS (TSS) TREATMENT DATA - MONTHLY AVERAGES 2019

2019 Monthly Averages	Influent TSS	Effluent TSS	TSS Removal	Average Monthly Effluent TSS Load	Average Monthly Effluent TSS Load
	mg/l	mg/l	%	pounds/day	pounds/week
January	232.9	6.7	96.6	547.5	557.4
February	228.1	7.3	96.1	886.6	916.9
March	250.2	5.8	97.1	588.6	558.8
April	318.1	6.1	97.6	446.6	465.8
May	331.1	6.5	97.5	475.3	486.3
June	365.9	8.7	97.0	539.2	543.2
July	326.6	8.0	97.1	456.6	470.8
August	358.1	7.4	97.4	400.1	406.4
September	366.2	11.4	96.4	617.0	705.0
October	344.4	4.8	98.0	266.7	266.4
November	352.8	6.4	97.7	359.0	355.4
December	233.9	5.1	97.3	516.4	378.7
Averages	309.0	7.0	97.2	508.3	509.3
Maximum	366.2	11.4	98.0	886.6	916.9
NPDES Limit 1 (Maximum 30-Day Effluent)		≤30 mg/L		4,253	4,253
NPDES Limit 2 (Maximum 7-Day Effluent Limit)		≤45 mg/L		6,380	6,380
NPDES Limit 3 (Minimum Monthly Average Removal)			85%		

Table 3: WWTF TOTAL ORGANIC CARBON (TOC) TREATMENT DATA - MONTHLY AVERAGES 2019

2019 Monthly Averages	Influent TOC (mg/l)	Effluent TOC (mg/l)	TOC Removal%	Average Monthly Effluent TOC Load pounds/week	Average Monthly Effluent TOC Load pounds/day
January	101	14.3	84.0	1,281.5	1,170.7
February	78.5	14.0	80.0	1,591.5	1,593.2
March	87.6	12.8	85.0	1,221.6	1,222.3
April	100.4	14.1	85.3	1,064.6	1,066.6
May	122.7	16.2	86.4	1,214.8	1,157.0
June	141.5	16.9	87.3	1,048.2	1,058.8
July	135.6	17.0	87.3	974.0	972.3
August	156.6	17.3	88.6	943.0	895.3
September	142.2	17.7	87.4	949.3	973.2
October	157.4	17.5	88.4	4,821.8	944.1
November	149.5	19.0	86.9	4,556.7	1,076.5
December	88.3	13.9	82.5	1,139.5	1,282.5
Averages	121.8	15.9	85.8	1,733.9	1,117.7
NPDES Limit 1 (Maximum 30-Day Effluent TOC)		17 mg/L			2,412 lb/D
NPDES Limit 2 (Maximum Weekly Effluent TOC Limit)		23 mg/L			3,263 lb/D
NPDES Limit 3 (Site-specific TOC Equivalent Minimum Monthly Average TOC Removal)			85%		

Table 4: WWTF Metals and Metalloids treatment data 2019

	Mar-19 Influent (µg/L)	Aug-19 Influent (µg/L)	Annual Influent Average (µg/L)	Mar-19 Effluent (µg/L)	Aug-19 Effluent (µg/L)	Annual Effluent Average (µg/L)	Annual % Metals Removal
Aluminum	690	1,100	895	51	32	41.5	95%
Antimony	1.1	<2	1.1	0.69	0.66	0.675	39%
Arsenic	5.6	1.6	3.6	3.00	1.3	2.15	40%
Barium	79	52	65.5	29	11	20	69%
Beryllium	<0.5	<0.56	<0.5	<0.5	<0.056	<0.5	
Boron	260	360	310	270	300	285	8%
Cadmium	<0.5	<0.6	<0.5	<0.5	<0.06	NA	
Cobalt	0.59	0.59	0.59	0.5	0.4	0.45	24%
Chromium	1.8	<3.6	1.8	<1	0.55	0.55	69%
Hexavalent Chromium	<0.2	<0.13	<0.2	<0.2	<0.51	NA	
Copper	41	60	50.5	4	4.7	4.35	91%
Iron	900	1,500	1,200	180	220	200	83%
Lead	1.7	<3.2	1.7	<0.5	<0.32	NA	
Mercury	0.085	<0.33	0.085	<0.5	<0.033	NA	
Molybdenum	2.8	5.1	3.95	2.5	3.5	3	24%
Nickel	4.1	<5.8	4.1	3.3	3.0	3.15	23%
Potassium	23,000	26,000	24,500	20,000	25,000	22,500	8%
Selenium	1	<1.8	1	0.63	0.37	0.5	50%
Silver	<0.5	<0.42	<0.5	<0.5	<0.042	NA	
Thallium	<0.5	<0.47	<0.5	<0.5	<0.047	NA	
Vanadium	2.3	1.4	1.85	1	0.59	0.795	57%
Zinc	160	200	180	31	28	29.5	84%

TABLE 5: SELECT WWTF TRACE ORGANIC COMPOUNDS ANALYZED IN THE EFFLUENT- 2019

	INFLUENT		ANNUAL INFLUENT AVERAGE (µg/L)			ANNUAL EFFLUENT AVERAGE (µg/L)
	Mar-19	Aug-19	Annual	Mar-19	Aug-19	Annual
COMPOUND	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
1-1-1TRICHLOROETHANE	<0.5	<0.05	NA	<0.5	<0.05	NA
1-1-2-2TETRACHLOROETHANE	<0.5	<0.11	NA	<0.5	<0.11	NA
1-1-2TRICHLOROETHANE	<0.5	<0.18	NA	<0.5	<0.18	NA
1-1DICHLOROETHANE	<0.5	<0.06	NA	<0.5	<0.06	NA
1-1DICHLOROETHENE	<0.5	<0.086	NA	<0.5	<0.086	NA
1-2-4TRICHLOROBENZENE	<0.5	<0.086	NA	<0.5	<0.086	NA
1-2DIBROMOETHANE	<0.5	<0.12	NA	<0.5	<0.12	NA
1-2DICHLOROBENZENE	<0.5	<0.08	NA	<0.5	<0.08	NA
1-2DICHLOROETHANE	<0.5	<0.09	NA	<0.5	<0.09	NA
1-2DICHLOROPROPANE	<0.5	<0.055	NA	<0.5	<0.055	NA
1-2DIPHENYLHYDRAZINE	<190	<76	NA	<1.9	<3.8	NA
1-3DICHLOROBENZENE	<0.5	<0.071	NA	<0.5	<0.071	NA
1-4DICHLOROBENZENE	<0.5	<0.072	NA	<0.5	<0.072	NA
2-4-5TRICHLOROPHENOL	<9.6	<1.2	NA	<0.096	<0.059	NA
2-4-6TRICHLOROPHENOL	<9.6	<0.93	NA	0.130	0.230	NA
2-4DICHLOROPHENOL	<1.9	<1.2	NA	0.0410	<0.059	NA
2-4DIMETHYLPHENOL	<190	<150	NA	<1.9	<7.8	NA
2-4DINITROPHENOL	<96	<29	NA	<0.96	<1.4	NA
2-4DINITROTOLUENE	<4.8	<1.3	NA	<0.048	<0.063	NA
2-6DINITROTOLUENE	<1.9	<1	NA	0.340	0.600	NA
2-CHLORONAPHTHALENE	<190	<110	NA	<1.9	<5.5	NA
2-CHLOROPHENOL	<3.9	<1.6	NA	<0.038	<0.083	NA
2-CHLROETHYLVINYLETHER	<1	<0.5	NA	<1	<0.5	NA
2-METHYLNAPHTHALENE	<1.9	<1	NA	<0.019	<0.051	NA
2-NITROANILINE	<960	<340	NA	<9.6	<17	NA

2-NITROPHENOL	<960	<460	NA	<9.6	<23	NA
3-3DICHLOROBENZIDINE	<3.9	<1.5	NA	<0.038	<0.078	NA
3-NITROANILINE	<960	<590	NA	<9.6	<30	NA
4-6DINITRO-2METHYLPHENOL	<960	<340	NA	<9.6	<17	NA
4-BROMOPHENYLPHENYLETHER	<190	<86	NA	<1.9	<4.3	NA
4-CHLORO-3-METHYLPHENOL	<190	<100	NA	<1.9	<5.3	NA
4-CHLOROANILINE	<3.9	<0.97	NA	<0.038	<0.049	NA
4-CHLROPHENYLPHENYLETHER	<190	<92	NA	<1.9	<4.6	NA
4-NITROANILINE	<960	<510	NA	<9.6	<26	NA
4-NITROPHENOL	<960	<210	NA	<9.6	<11	NA
ACENAPHTHENE	<1.9	<0.97	NA	<0.019	<0.049	NA
ACENAPHTHYLENE	<1.9	<0.95	NA	<0.019	<0.048	NA
ACROLEIN	<5	<2.5	NA	<5	<2.5	NA
ACRYLONITRILE	<2	<1	NA	<2	<1	NA
ALDRIN	<0.1	<0.14	NA	<0.01	<0.0028	NA
ANTHRACENE	<1.9	<0.82	NA	<0.019	<0.041	NA
BENZENE	<0.5	<0.051	NA	<0.5	<0.051	NA
BENZIDINE	<960	<100	NA	<9.6	<5.3	NA
BENZO-A-A	<3.9	<3.6	NA	<0.038	<0.18	NA
BENZO-A-P	<1.9	<1.2	NA	<0.019	<0.061	NA
BENZO-B	<0.96	<0.76	NA	<0.0096	<0.038	NA
BENZO-GHI	<3.9	<1.4	NA	<0.038	<0.068	NA
BENZO-K	<1.9	<1.2	NA	<0.019	<0.061	NA
BHC-A	<0.1	<0.16	NA	<0.01	0.00600	NA
BHC-B	<0.1	<0.34	NA	<0.01	<0.0069	NA
BHC-D	<0.1	<0.07	NA	<0.01	<0.0014	NA
BHC-G	<0.1	<0.22	NA	<0.01	<0.0045	NA
BIS2CHLOROETHOXYMETHANE	<190	<160	NA	<1.9	<8.1	NA
BIS2CHLOROETHYLETHER	<0.96	0.440	NA	<0.0096	0.0400	NA
BIS2CHLOROISOPROPYLETHER	<1.9	<1.7	NA	<0.019	<0.085	NA
BIS2ETHYLHEXYLADIPATE	<580	<74	NA	<5.8	<3.7	NA
BIS2ETHYLHEXYLPHTHALATE	11.0	27.0	NA	0.220	13.0	NA
BROMODICHLOROMETHANE	<0.5	0.600	NA	<0.5	<0.2	NA

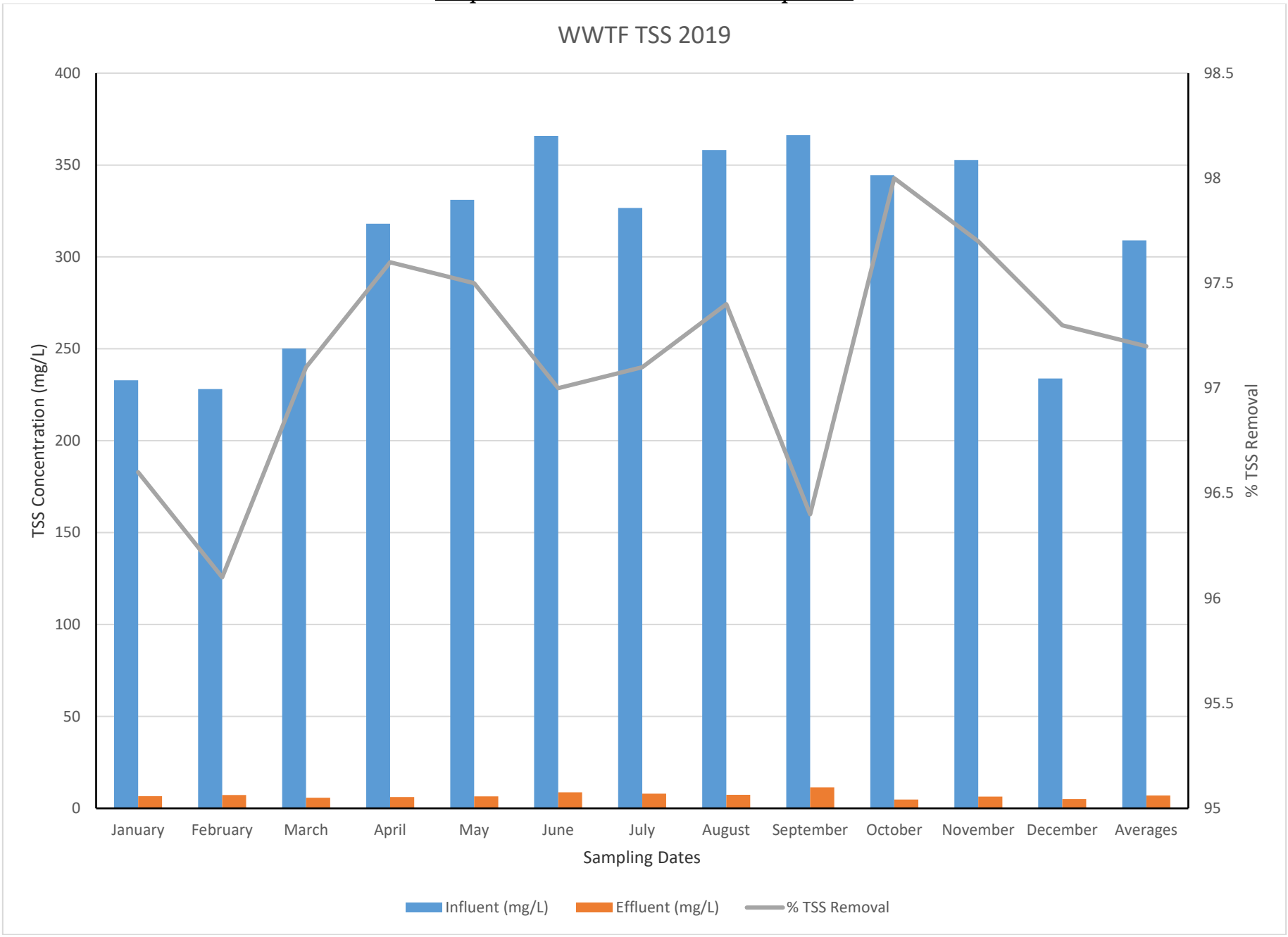
BROMOFORM	<0.5	0.0890	NA	<0.5	<0.066	NA
BROMOMETHANE	<0.5	<0.16	NA	<0.5	0.270	NA
BUTYLBENZYLPHTHALATE	<39	<5.3	NA	<0.38	<0.27	NA
CARBONTETRACHLORIDE	<0.5	<0.069	NA	<0.5	<0.069	NA
CHLORDANE	<2	<1.2	NA	<0.2	<0.023	NA
CHLORDANE-A	<0.1	<0.42	NA	<0.01	<0.0085	NA
CHLORDANE-G	<0.1	<0.075	NA	<0.01	<0.0015	NA
CHLOROBENZENE	<0.5	<0.05	NA	<0.5	<0.05	NA
CHLOROETHANE	<0.5	<0.31	NA	<0.5	<0.31	NA
CHLOROFORM	1.90	3.00	NA	<0.5	0.810	NA
CHLOROMETHANE	<0.5	<0.13	NA	<0.5	0.270	NA
CHRYSENE	<1.9	<1.8	NA	<0.019	<0.089	NA
CIS-1-3DICHLOROPROPENE	<0.5	<0.09	NA	<0.5	<0.09	NA
DDD-PP	<0.1	<0.055	NA	<0.01	<0.0011	NA
DDE-PP	<0.1	<0.09	NA	<0.01	<0.0018	NA
DDT-PP	<0.1	<0.085	NA	<0.01	<0.0017	NA
DIBENZ-AH	<1.9	<1.8	NA	<0.019	<0.09	NA
DIBENZOFURAN	<190	<71	NA	<1.9	<3.6	NA
DIBROMOCHLOROMETHANE	<0.5	0.440	NA	<0.5	<0.08	NA
DIELDRIN	<0.1	<0.07	NA	<0.01	<0.0014	NA
DIETHYLPHTHALATE	<3.9	4.10	NA	<0.038	<0.14	NA
DIMETHYLPHTHALATE	<3.9	<2.1	NA	<0.038	<0.11	NA
DINBUTYLPHTHALATE	<3.9	<2.3	NA	0.0610	<0.12	NA
DINOCTYLPHTHALATE	<24	<3.8	NA	<0.24	<0.19	NA
ENDOSULFAN-I	<0.1	<0.055	NA	<0.01	<0.0011	NA
ENDOSULFAN-II	<0.1	<0.23	NA	<0.01	<0.0046	NA
ENDOSULFAN-SULFATE	<0.2	<0.16	NA	<0.02	<0.0033	NA
ENDRIN	<0.1	<0.09	NA	<0.01	<0.0018	NA
ENDRIN-ALDEHYDE	<0.1	<0.26	NA	<0.01	<0.0053	NA
ENDRIN-KETONE	<0.1	<0.13	NA	<0.01	<0.0026	NA
ETHYLBENZENE	<0.5	<0.05	NA	<0.5	<0.05	NA
FLUORANTHENE	<1.9	<1.3	NA	<0.019	<0.065	NA
FLUORENE	<1.9	<1.2	NA	<0.019	<0.061	NA

HEPTACHLOR	<0.1	<0.21	NA	<0.01	<0.0041	NA
HEPTACHLOR-EPOXIDE	<0.1	<0.12	NA	<0.01	<0.0025	NA
HEXACHLOROBENZENE	<0.96	<0.82	NA	<0.0096	<0.041	NA
HEXACHLOROBUTADIENE	<1.9	<0.67	NA	<0.019	<0.034	NA
HEXACHLOROETHANE	<1.9	<1.3	NA	<0.019	<0.065	NA
HEXACHLROCYCLOPENTADIENE	<960	<92	NA	<9.6	<4.6	NA
INDENO-123	<3.9	<1.2	NA	<0.038	<0.062	NA
ISOPHORONE	<190	<130	NA	<1.9	<6.3	NA
METHOXYCHLOR	<0.1	<0.06	NA	<0.01	<0.0012	NA
METHYLENECHLORIDE	<2	<1.2	NA	<2	<1.2	NA
N-NITROSO-DI-N-PROPYLAM	<190	<120	NA	<1.9	<6.2	NA
N-NITROSODIMETHYLAMINE	<960	<530	NA	<9.6	<27	NA
N-NITROSODIPHENYLAMINE	<190	<78	NA	<1.9	<3.9	NA
NAPTHALENE	<1.9	<0.92	NA	<0.019	<0.046	NA
NITROBENZENE	<190	<180	NA	<1.9	<9.1	NA
PCB_TOTAL	<2		NA	<0.2		NA
PCB1016	<2	<0.95	NA	<0.2	<0.019	NA
PCB1221	<2	<1.2	NA	<0.2	<0.024	NA
PCB1232	<2	<1.9	NA	<0.2	<0.038	NA
PCB1242	<2	<1.4	NA	<0.2	<0.028	NA
PCB1248	<2	<0.9	NA	<0.2	<0.018	NA
PCB1254	<2	<0.75	NA	<0.2	<0.015	NA
PCB1260	<2	<1.4	NA	<0.2	<0.028	NA
PENTACHLOROPHENOL	<48	<10	NA	<0.48	<0.53	NA
PHENANTHRENE	<3.9	<1	NA	<0.038	<0.053	NA
PHENOLTOTAL	<0.050	0.094	NA	<0.050	0.01	NA
PHOSPHOROUS TOTAL	4	7	NA	2	3	NA
PYRENE	<3.9	<1.1	NA	<0.038	<0.055	NA
TETRACHLOROETHENE	<0.5	<0.082	NA	<0.5	0.200	NA
TOLUENE	0.590	3.60	NA	<0.5	<0.25	NA
TOXAPHENE	<2	<1	NA	<0.2	<0.02	NA
TRANS-1-2DICHLOROETHENE	<0.5	<0.06	NA	<0.5	<0.06	NA
TRANS-1-3DICHLOROPROPENE	<0.5	<0.07	NA	<0.5	<0.07	NA

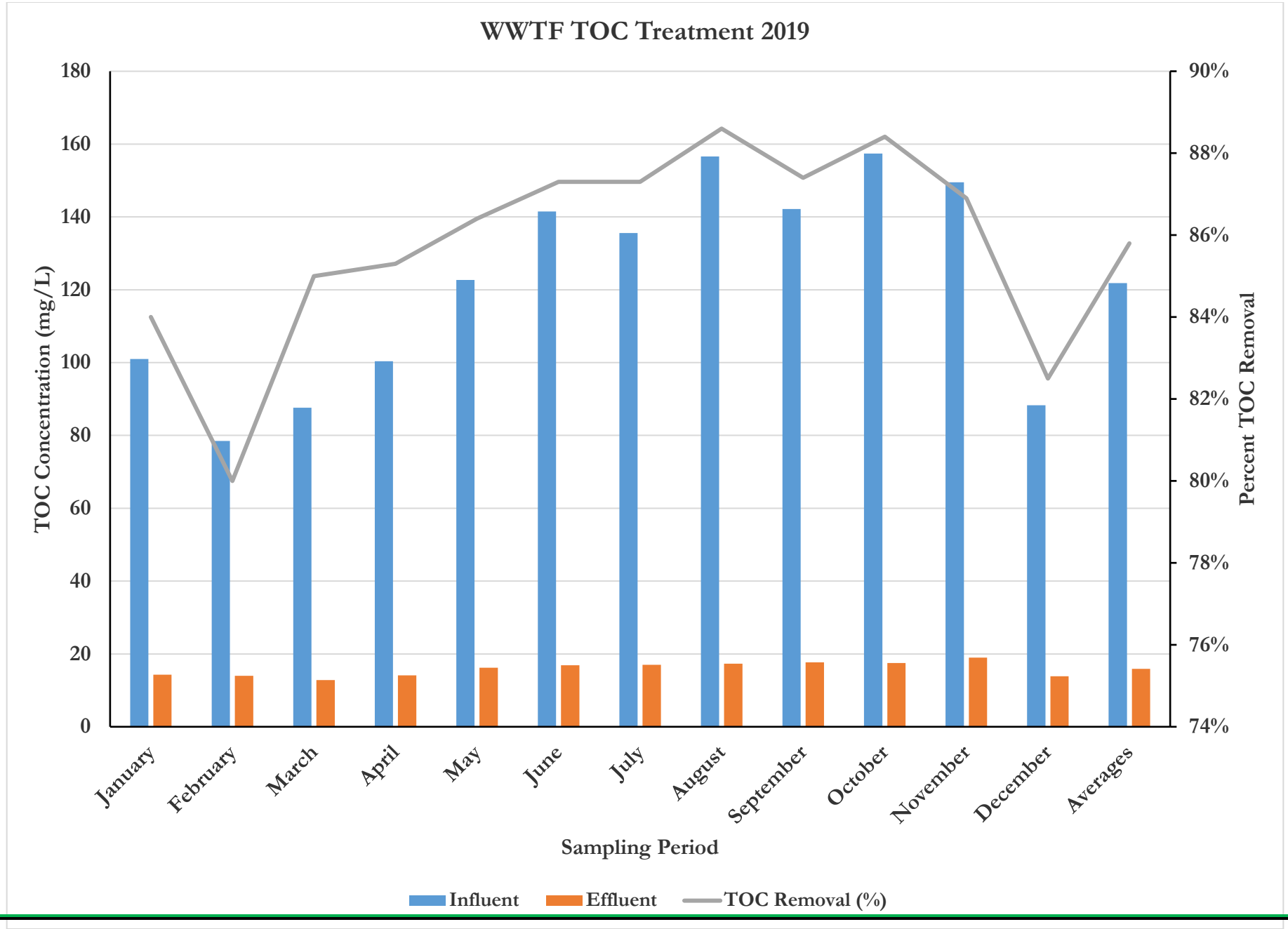
TRIBUTYLTIN	<0.6	<0.14	NA	<0.06	<0.014	NA
TRICHLOROETHENE	<0.5	<0.06	NA	<0.5	<0.06	NA
TRICHLOROFLUOROMETHANE	<0.5	<0.047	NA	<0.5	<0.047	NA
VINYLCHLORIDE	<0.5	<0.07	NA	<0.5	<0.07	NA
XYLENES	<0.5		NA	<0.5		NA
CL2PHENOL	<48	<100	NA	<0.48	0.23	NA
AVG_TKN			NA	14.7	32.2	NA
BHC_TOTAL			NA	<0.01		NA
DICHLOROBENZENE			NA	<0.50		NA
HALOMETHANES		0.089	NA	<0.50	0.54	NA
HEXACHLOROCYCLOHEXANE		<0.34	NA		0.006	NA
ENDOSULFAN_TOTAL		<0.23	NA		<0.0046	NA
PYRIDINE		<93	NA		<4.7	NA
XYLENE-MP		<0.11	NA		<0.11	NA
XYLENE-O		<0.06	NA		<0.06	NA

Section III. Summary of Monitoring Data - Graphs

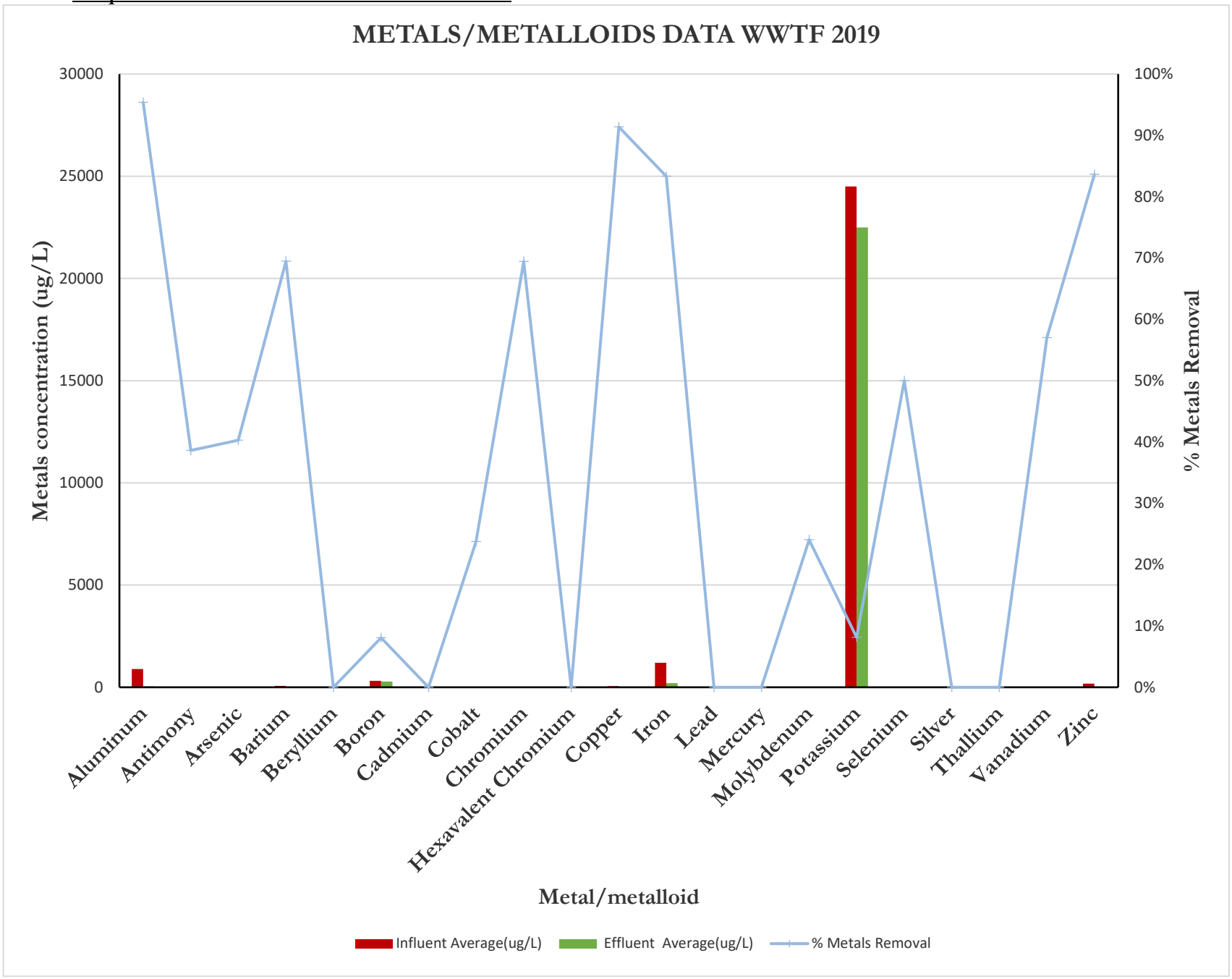
Graph 1: WWTF TSS Treatment Graph 2019



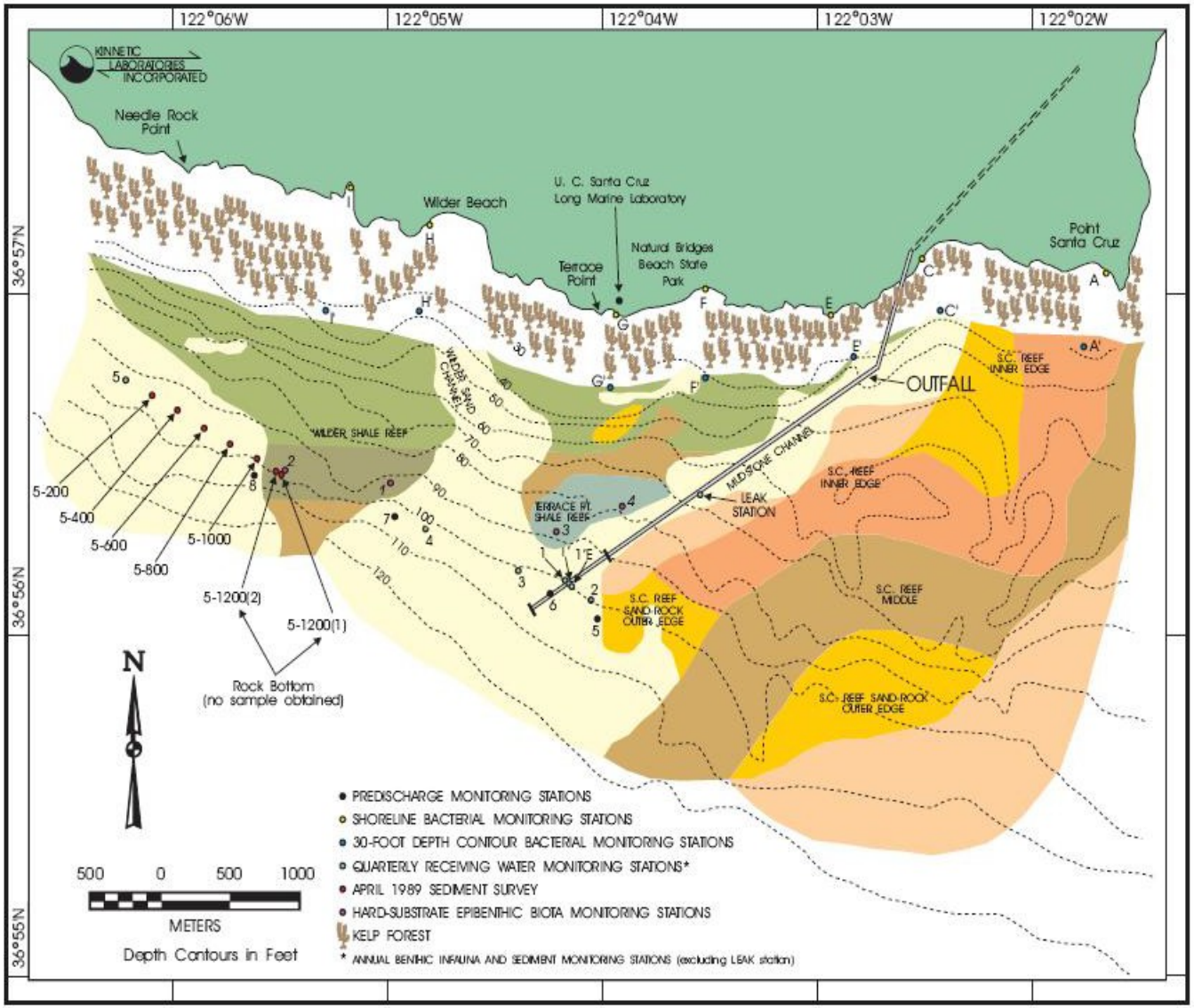
Graph 2: WWTF TOC Treatment Graph 2019



Graph 3: 2019 WWTF Metals and Metalloids



AERIAL VIEW OF NEARSHORE BACTERIAL SAMPLING LOCATIONS:



Bottom Characteristics Legend

- Sediment - Sand with a general absence of boulders or rock. Sea floor is smooth except for sand wave features
- Low Density of Boulders (5-20%) 1-4 feet in diameter on sea floor. Large areas of sandy bottom probably less than 2 feet thick.
- Moderate Density of Boulders (20-60%) 1-4 feet in diameter and isolated rock exposures on the sea floor. Local sand pockets are probably 1 foot thick or less.
- High Density of Boulders and Rock Exposures (Over 60%) with Bottom Relief 2-6 feet - Occasional localized sand pockets probably less than 1 foot thick.
- Rock - Sea floor generally flat with occasional boulders 1-3 feet in diameter. May have thin veneer of sediments overlying a more irregular rock surface than bottom features indicate.
- Rock - Discontinuous rock ledges 1-4 feet high and 10-100 feet wide. General trend of ledges is west to northwest. Localized thin sediment pockets less than 1 foot thick.
- Rock - Continuous ledges 2-4 feet high, 60-90 feet wide, and traceable for 100 to over 500 feet. Localized thin sediment pockets less than 1 foot thick. (Boundaries of this zone are approximated.)
- Rock - Resistant ridge up to 24 feet bottom relief. Rock surface is rough and irregular.

Figure 1. Location of Santa Cruz predischarge monitoring stations (5, 6, 7, and 8), outfall shoreline bacterial monitoring stations (A, C, E, F, G, H, and I), 30-foot depth contour bacterial monitoring stations (A', C', E', F', G', H', and I'), quarterly receiving water monitoring stations (1, 2, 3, 4, 5, and LEAK), benthic infauna and sediment stations locations (1, 2, 3, 4 and 5), April 1989 sediment survey (Stations 5-200 through 5-1200(2)), and hard-substrate epibenthic biota monitoring stations (Wilder Reef: *1* and *2*; and Terrace Point Reef: *3* and *4*).

Section IV. Compliance Record and Corrective Actions Taken

The Plant recorded violations of the 30-day TOC effluent limitation of 17mg/L, and of Fecal Coliform discharge limits during the year. These issues are reviewed below in a brief discourse in sequential order.

1. **TOC% removal and TOC effluent excursions:**

   Although the plant's overall TOC removal percentage met mandated secondary removal standards throughout most of the reporting period, it failed to meet the 85% TOC removal in January 2019 when it recorded 82.2% removal.

   The plant also had episodic excursions of the monthly average TOC concentration in the effluent in 2019 although the annualized value of the monthly removal was approximately 89%; and the monthly effluent compliance record showed an average of 15.6mg/L throughout the year.

   These data validate the fact that plant would consistently satisfy the requirements of secondary treatment with further assessment and/or optimization as may be necessary. This assessment was consistent with plant performance records of previous years, and record formed the rational for the Plant's request for a Time Schedule Order (TSO) to allow for the evaluating of treatment and optimization options during the year.

   The TSO was granted in April, and was extended through December 1, 2019.

   Relevant Corrective Actions: Several studies were undertaken during the TSO, including a review of the initial equations that derived the NPDES limit for the 30 day average at 17mg/L.

   Although the plant is consistently meeting the 17mg/L limit, it is now clear that the more appropriate limit is approximately 20mg/L. This fact will be communicated to the Water Board in a more appropriate vehicle this year.

   Furthermore the plant invested in professional engineering services to further assist in strategies to understand and control this priority pollutant in the facility. Specific engineering moves designed to improve the efficiency of removal at the end of the secondary treatment have been implemented at the Solids Contact Tanks (SCT).

2. **Fecal Coliform violations:**

   Although the plant recorded violations of all three disinfection indicators during the year, the record on the Fecal Coliform standard was unique in its failure when the other two indicators passed in September and October. Plant Operations promptly elevated UV dose at the facility after each data report.

Relevant Corrective Actions: These episodes prompted deeper analyses of the failure, and the Laboratory working with Operations implemented analyses of UV transmittance measurement within the UV influent flow matrix. With this information the POTW was able to identify periods of large filamentous and large size bacteria dominated matrix that generally corresponded to UV quenching as measured in the laboratory. The Environmental Compliance program also implemented a survey of the industrial dischargers for probable sources of these bacteria and/or discharges likely to promote their abundance.

Finally, the performance records indicate that the Plant will continue to meet the NPDES standards in the current year.

Section V. Outfall Monitoring Report 2019

This section of the report contains the unedited submittal of the contractor hired by the City to perform the annual outfall inspection in 2019.
This section also includes a copy of the 2019 outfall Dye Study.
Both documents are embedded in this section without additional comments.

City of Santa Cruz Submarine Outfall Inspection Report

Prepared for:

CITY OF SANTA CRUZ

Department of Public Works

Submitted By:

Global Diving & Salvage, Inc.
1080 Nimitz Ave. Suite 440
Vallejo, CA 94592

GLOBAL

Santa Cruz Submarine Outfall Diffuser Section **May 10, 2019**

INTRODUCTION

On May 10, 2019, Global Diving & Salvage completed the annual inspection of the submarine outfall diffuser section. Ocean conditions for vessel maneuverability were favorable with cool, calm winds and seas to three feet. Conditions for ROV flight were also favorable with lights currents and underwater visibility to approximately 20 feet.

INSPECTION SUMMARY

The annual inspection revealed a few minor changes to previous surveys in respect to diffuser port flow. The open diffuser ports were observed to be flowing normally. Additionally, no significant deviation in bottom topography was noted from last inspection.

The inspection included a survey of the out of service, 2000 foot long, and 36 inch outfall. This open ended submarine outfall has no diffusers. Although a rip rap wall was located in an area with a barren sand bottom, at the coordinates provided, the outfall was never physically viewed.

ROV operations were conducted utilizing the local work vessel M/V *Shanae Rae*.

OBSERVATIONS/RECOMMENDATIONS

Previous reports have discussed the limitations of the rubber diffuser port flaps in preventing material from entering the pipe if the bottom topography should change or flow rates should deviate. If concerns are present with respect to internal sediment deposition, a diving survey could be performed in which a video probe could be inserted through individual diffuser ports or a micro class ROV could be flown internally from the end gate for a more thorough internal inspection. If a dive operation were to take place, it would be advisable to clear away sand and rock that are covering certain diffuser ports to minimize the introduction of sediment into the outfall.

NOTE: Any change from the previous report is noted in red.

INSPECTION DETAILS

DIFFUSER NO	POSITION	COMMENTS
End Gate Vault	Open	No leaks or damage observed in transition section
1 South	Open	Flowing
2 North	Closed	
3 South	Closed	
4 North	Open	Flowing
5 South	Closed	
6 North	Closed	

Santa Cruz Submarine Outfall Diffuser Section

May 10, 2019

DIFFUSER NO	POSITION	COMMENTS
7 South	Open	Flowing
8 North	Open	Flowing
9 South	Closed	
10 North	Open	Flowing
11 South	Open	Flowing
12 North	Closed	
13 South	Closed	
14 North	Open	Flowing
15 South	Closed	
16 North	Closed	
17 South	Open	Flowing
18 North	Open	Flowing
19 South	Closed	
20 North	Closed	
21 South	Open	Flowing
22 North	Closed	
23 South	Closed	
24 North	Open	Flowing
25 South	Closed	
26 North	Closed	
27 South	Open	Flowing
28 North	Unknown	Too many anenomes to be able to determine if flowing or not
29 South	Closed	
30 North	Closed	Lower section of port obstructed by bedding rock
31 South	Open	Flowing
32 North	Closed	
33 South	Closed	
34 North	Open	Flowing
35 South	Closed	
36 North	Open	Flowing
37 South	Open	Flowing
38 North	Open	Flowing
39 South	Closed	
40 North	Closed	
41 South	Open	Flowing
42 North	Closed	
43 South	Closed	
44 North	Open	Flowing
45 South	Closed	
46 North	Closed	The diffuser flapper is covered by a protective rubber pad that was left banded over the port. GPS Co-ord 36° 56'04.3 122° 04'17.3
47 South	Open	Flowing
48 North	Open	Flowing
49 South	Closed	
50 North	Closed	Stainless steel band left in place over the flapper.

GLOBAL

Santa Cruz Submarine Outfall Diffuser Section May 10, 2019

DIFFUSER NO	POSITION	COMMENTS
51 South	Closed	
52 North	Closed	
53 South	Open	Flowing
54 North	Open	Flowing
55 South	Closed	
56 North	Closed	
57 South	Open	Flowing
58 North	Open	Flowing
59 South	Closed	
60 North	Closed	
61 South	Closed	
62 North	Closed	
63 South	Open	Flowing
64 North	Open	Flowing
65 South	Closed	
66 North	Closed	
67 South	Open	Flowing
68 North	Open	Flowing
69 South	Closed	
70 North	Closed	Strapping remnant in place over cover
71 South	Closed	
72 North	Closed	
73 South	Open	Flowing
74 North	Open	Flapper installed in open position, but rubber is held down by two stainless steel bands not removed after installation. Flow rate is somewhat degraded. The installation protective cover has moved down inside the banding, and is below the port opening.
75 South	Closed	
76 North	Closed	
77 South	Open	Flowing
78 North	Open	Flowing
79 South	Closed	
80 North	Closed	
81 South	Closed	
82 North	Closed	
83 South	Open	Flowing
84 North	Closed	
85 South	Closed	
86 North	Open	Flowing
87 South	Open	Flowing
88 North	Closed	
89 South	Closed	
90 North	Closed	
91 South	Open	Flowing
92 North	Open	Flowing
93 South	Closed	

GLOBAL

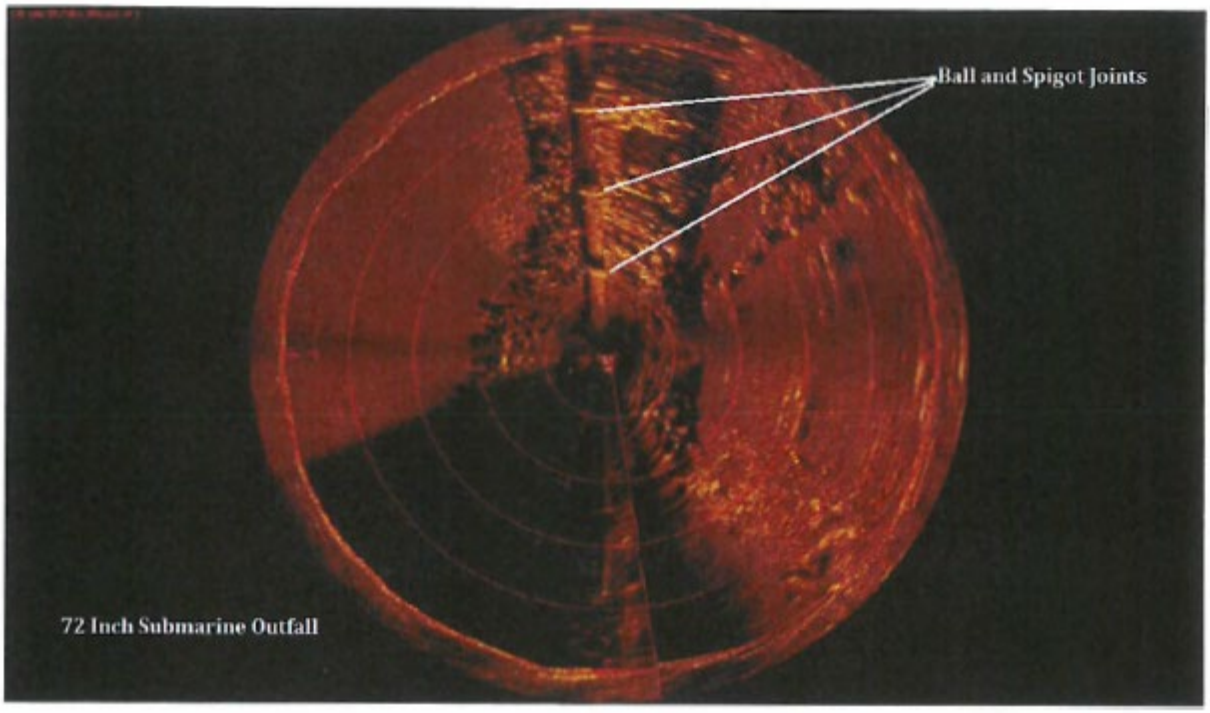
Santa Cruz Submarine Outfall Diffuser Section **May 10, 2019**

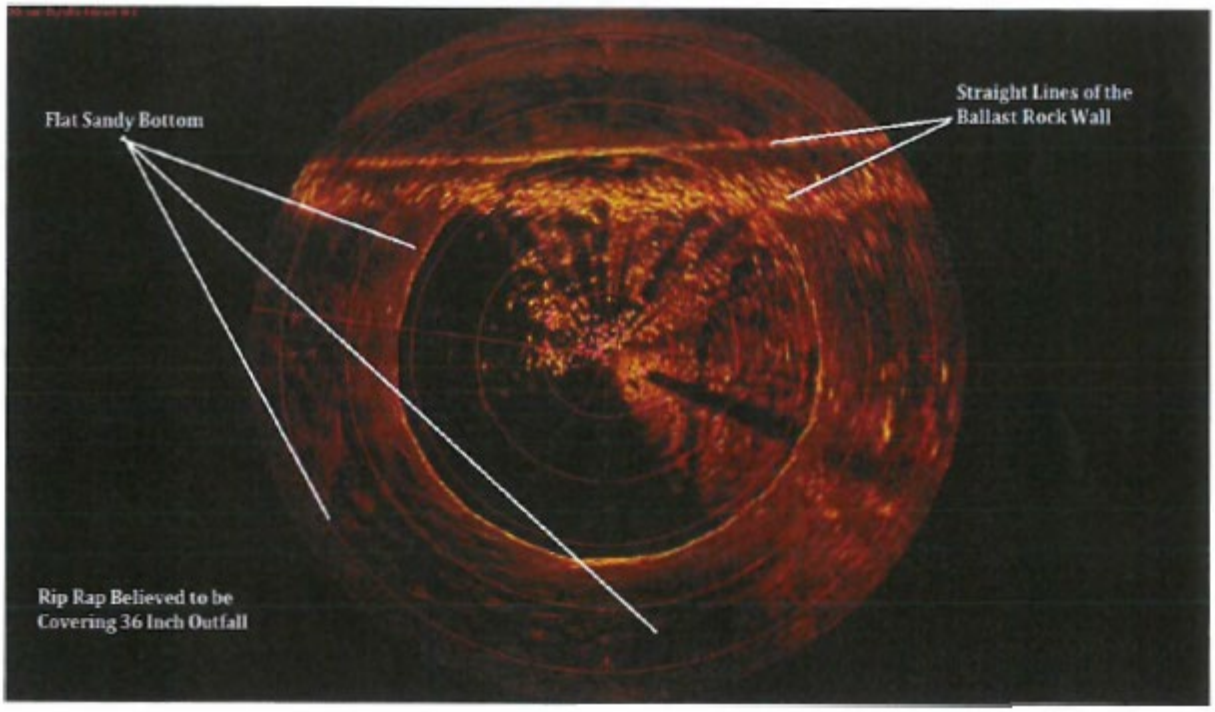
DIFFUSER NO	POSITION	COMMENTS
94 North	Closed	
95 South	Closed	
96 North	Closed	Rip rap at diffuser flap.
97 South	Open	Flowing
98 North	Open	Flowing
99 South	Closed	
100 North	Closed	Buried with small rock and sand
101 South	Open	Flowing
102 North	Open	Flowing
103 South	Closed	
104 North	Closed	
105 South	Closed	
106 North	Closed	Small rip rap at lower end of closed flap.
107 South	Open	Flowing. Lower portion of rubber flapper missing.
108 North	Open	Flowing
109 South	Closed	
110 North	Closed	Stainless steel band left in place over the flapper.
111 South	Open	Flowing
112 North	Open	Flowing. Tear observed in rubber flapper.
113 South	Closed	Closed
114 North	Closed	
115 South	Closed	
116 North	Closed	
117 South	Open	Flowing
118 North	Open	Flowing
119 South	Closed	
120 North	Closed	
121 South	Open	Flowing
122 North	Open	Flowing
123 South	Closed	
124 North	Closed	
125 South	Closed	
126 North	Closed	
127 South	Open	Flowing
128 North	Open	Flowing
129 South	Closed	
130 North	Closed	
131 South	Open	Flowing
132 North	Open	Flowing
133 South	Closed	
134 North	Closed	
135 South	Closed	
136 North	Closed	
137 South	Open	Flowing
138 North	Open	Rip rap elevation to flap but flowing.

Santa Cruz Submarine Outfall Diffuser Section May 10, 2019

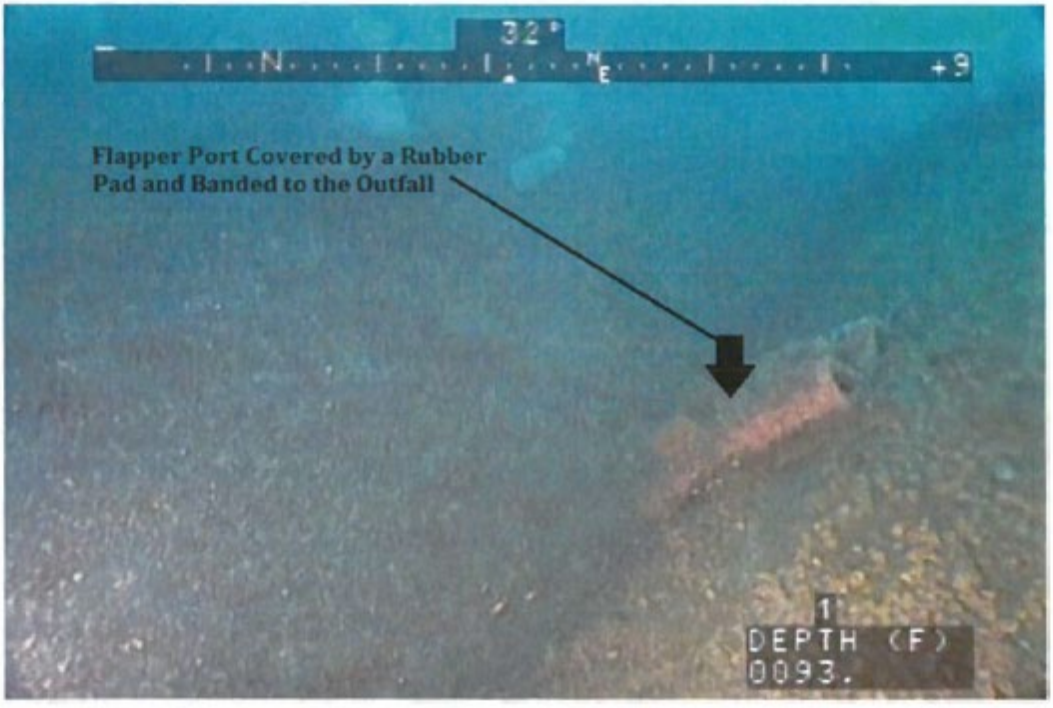
DIFFUSER NO	POSITION	COMMENTS
139 South	Closed	
140 North	Closed	
141 South	Open	Flowing
142 North	Open	Flowing
143 South	Closed	Rock at flap.
144 North	Closed	
145 South	Closed	
146 North	Closed	
147 South	Closed	
148 North	Open	Flowing
149 South	Closed	
150 North	Closed	
151 South	Open	Flowing
152 North	Open	Flowing
153 South	Closed	
154 North	Closed	
155 South	Closed	
156 North	Closed	
157 South	Open	Flowing
158 North	Open	Flowing Rip Rap up to flap
159 South	Closed	Buried with small rip rap
160 North	Closed	
161 South	Open	Flowing
162 North	Open	Flowing
163 South	Closed	
164 North	Closed	
165 South	Closed	
166 North	Closed	
167 South	Open	Flowing
168 North	Open	Flowing
169 South	Open	Flowing
170 North	Closed	
171 South	Open	Flowing
172 North	Open	Flowing
173 South	Open	No rubber diffuser flap in place. Semi-flexible plastic cover is secured at its top half over the port. The material is torn at the lower half. One of the lower bolt holes on the pipe contains a broken stud. No clamping bar is in place. Effluent is flowing through the port.
174 North	Closed	Bottom 1/2 of diffuser port is covered with bedding rock.

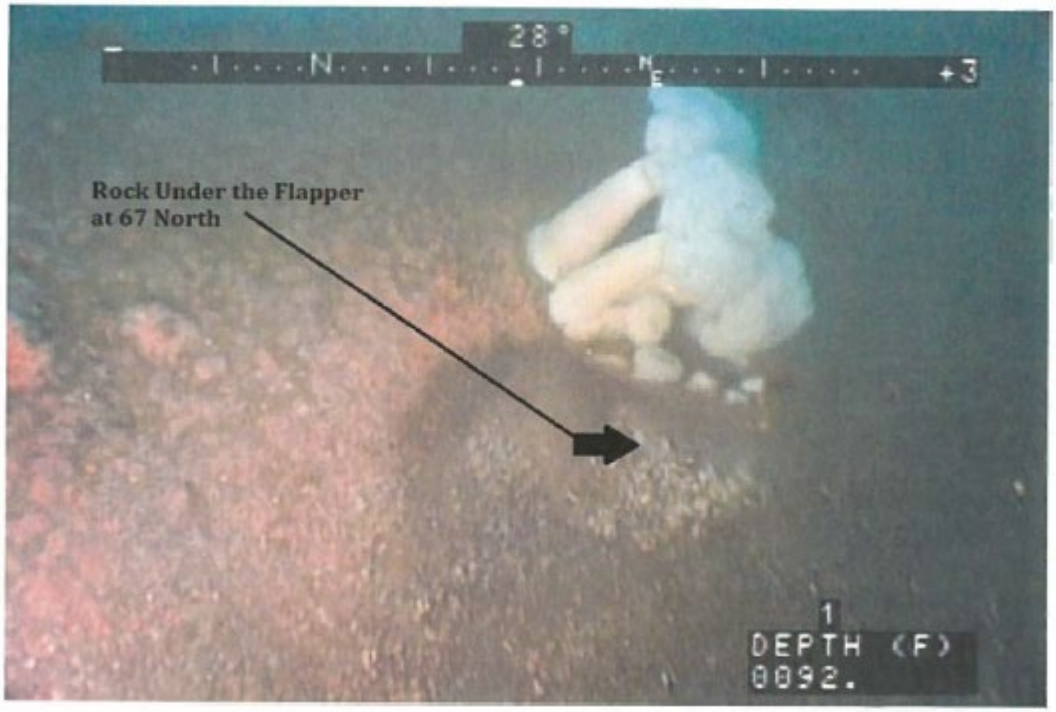
Santa Cruz Submarine Outfall Diffuser Section **May 10, 2019**



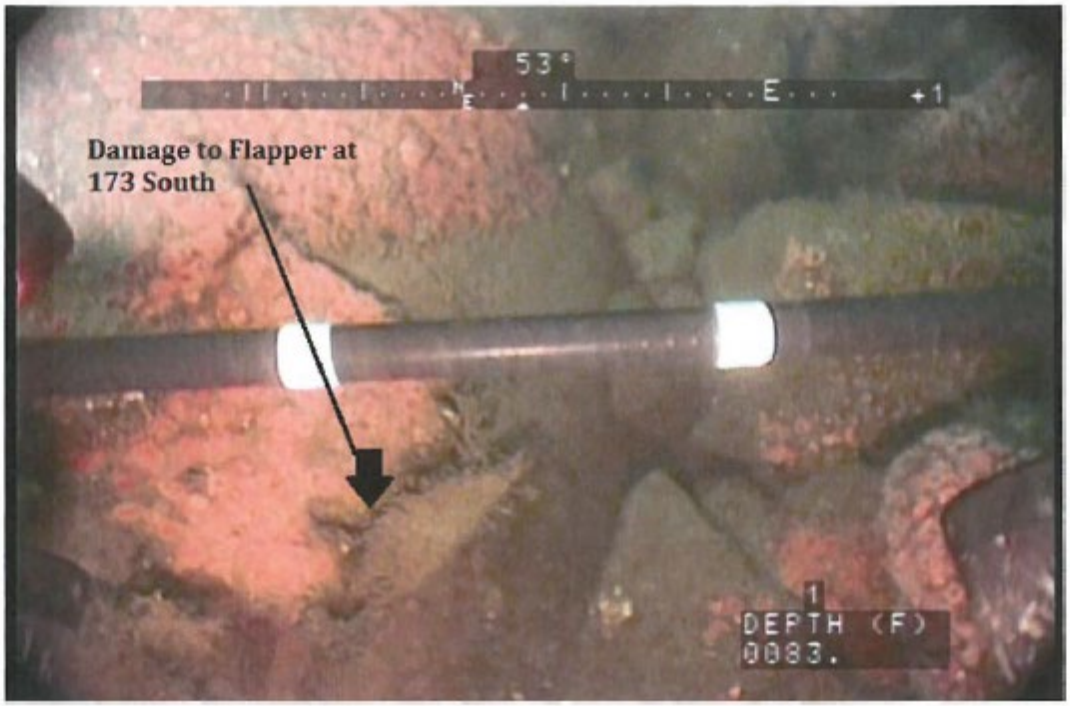



42°
N
E
+7
Anenome Growth at
28 South
1
DEPTH (F)
0094.


32°
N
E
+9
Flapper Port Covered by a Rubber
Pad and Banded to the Outfall
1
DEPTH (F)
0093.


28°
N
NE
+3
Rock Under the Flapper
at 67 North
1
DEPTH (F)
0092.


7°
N
NE
+2
Hard Marine Growth
Beneath Flapper
1
DEPTH (F)
0085.



Respectfully Submitted,

Fred Foster
Diving Supervisor
Global Diving & Salvage Inc.

2019 Dye Study

Wastewater Treatment Effluent Ocean Outfall Overflight

On Thursday, November 21,2019 the City of Santa Cruz conducted a dye test of the Wastewater Treatment effluent ocean outfall to visually search for leaks. An overflight was performed between 11:50 & 12:35 pm using the aerial services of **Skywords Aerial Services**. An on-board standard global positioning system (GPS) was used for navigation and positioning.

Figure 1

Observational and upwelling conditions were very good. There was a hight cloud cover and visibility exceeded 20 miles. Swells were 2′ to 5 ′ and wind was 4-8 knots. Wastewater flow was 9.7 million gallons per day.

From 11:57-12:06 pm 90 gallons of yellow liquid dye were added at the Wastewater Treatment facility.

Continuous flight lines were flown and observations made along the pipeline from the vault to the outfall from 11:55 to 12:30pm. The dye dispersed rapidly along the diffuser line and exiting at the outflow end of the pipe.The dye plume was very quickly and broadly dispersed. An additional broadly dispersed plume was observed along the pipeline depicted in Figures 2&3 at point B. No other dye was observed along the length of the pipeline during the course of the flight.

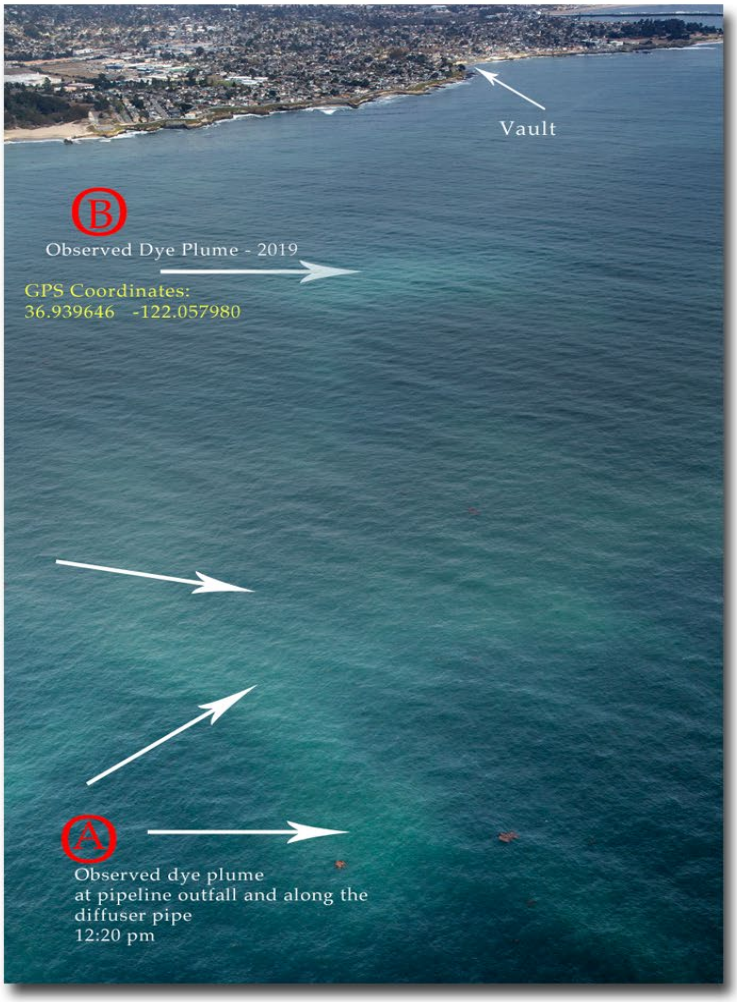


Figure 2 - At 12:20 a broadly dispersed dye plume was seen emanating from the pipeline along the diffuser pipe and at the outfall location A.
A plume is also visible at location B-GPS coordinates of 36.939646 / -122.057980.

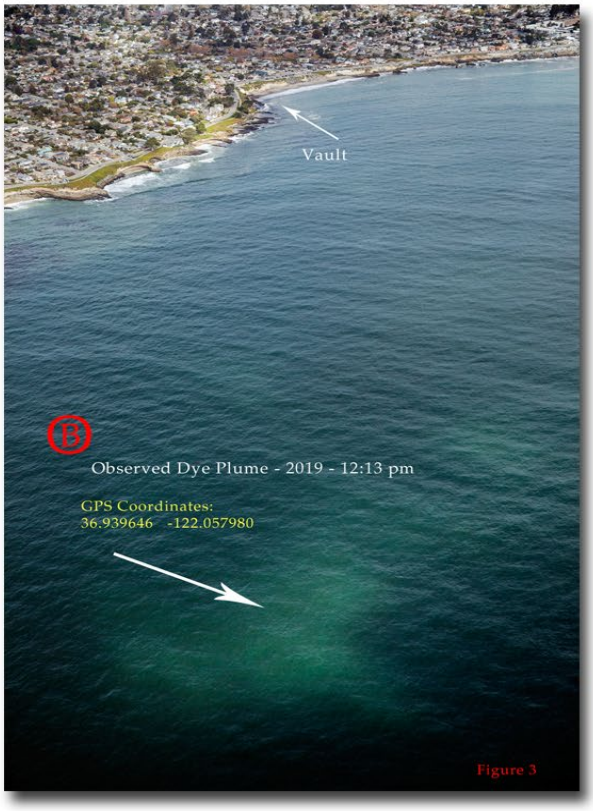


Figure 3 - At 12:13 the dye was observed at location B from a closer viewpoint.

Figure 3

Section VI. The Operating Staff: Operator staff and certification

The following section summarizes the credentials and designations of staff employed at the Wastewater Treatment facility and the City's compliance with the California Water Code, the California Code of Regulations, in maintaining appropriate staffing.

The Waste Discharge Requirements, and the NPDES Permit require operators and their supervisors at municipal wastewater treatment plants to be certified at specific minimum levels of certification based upon the wastewater treatment plant processes and design flows. All of the operations personnel of the City of Santa Cruz Wastewater Treatment Facility are certified by the California State Water Resources Control Board at or above the required levels.

The Operations and Maintenance division of the facility is staffed as follows:

- 1 (one) Wastewater Treatment Facility Operations Manager;
- 1 (one) Wastewater Operations Supervisor
- 4 (four) Senior Wastewater Plant Operators;
- 7 (seven) Wastewater Plant Operators

The maintenance unit consists of nine mechanics and two electricians as follows:

- 1 (one) Mechanical Supervisor;
- 1 (one) Electrical Supervisor (vacant);
- 1 (one) Maintenance Lead
- 5 (five) Plant Maintenance Mechanics II;
- 3 (three) Plant Maintenance Mechanics I; and
- 2 (two) Electrical Instrumentation Technicians.

Additional management, engineering, consultative, clerical and analytical support services are provided by:

- The Director of Public Works;
- Wastewater System Manager
- 1 Associate Civil Engineer; and 1 Civil Engineering Associate

MANAGEMENT/ADMINISTRATION		
NAME	**DESIGNATION**	**CREDENTIALS: GRADE CERT; & EXPIRY DATE**
Hogan, Ann	Wastewater System Manager	PE
Husome, Trisha	Administrative Assistant II	
Ashby, Brandon	SCADA Systems & Network Administrator	BS (Maths)
Sanders, Michael	Wastewater Treatment Facility Operations Manager	SCWRCB Wastewater Operator IV 4753;
Babatola, Akin	Laboratory/Environmental Compliance Manager	MS (Mol. Biol); BS (Micro)
Norman, Rome	Collection System Manager	

NAME	DESIGNATION	CREDENTIALS	EXPIRY DATE
SANDERS, Mike	Wastewater Treatment Facility Operations Manager	WW Operator IV 4753	12-30-2021
MEYERS, Dave	Operations Supervisor	WW Operator IV 10986	6-30-2020
DELOERA, Armando	Senior WW Operator III	WW Operator III 34807	2-7-2021
DOUANGPANNHA, Sang	Senior WW Operator IV	WW Operator V 41481	12-20-2021
BIRD, Amanda	Senior WW Operator IV	WW Operator V 40623	2-7-2020
FRAZIER, Ron	Senior WW Operator III	WW Operator III 7436	6-30-2021
LOCKYER, Vince	WW Plant Operator III	WW Operator V 10317	12-31-2020
KNOPP, Cameron	WW Plant Operator III	WW Operator III 41277	9-25-2021
ROSAS, Jose Miguel	WW Plant Operator III	WW Operator V 41267	1-3-2021
JOHNS, Austin	WW Plant Operator III	WW Operator III 43440	12-15-2020
STAINES, Daniel	WW Plant Operator III	WW Operator IV 43428	8-26-2022
MONIGHETTI, Ryan	WW Plant Operator III	WW Operator III 29060	6-22-2021
SPENCER, Novim	WW Plant Operator III	WW Operator III 42200	7-2-2020

MAINTENANCE

NAME	DESIGNATION	CREDENTIALS GRADE CERTIFICATE	EXPIRY DATE
Pretzer, Thomas	Maintenance Supervisor	CWEA Mechanical Tech II #599	1-31-2021
LOCATELLI, Al	Lead Mech Tech	CWEA Mechanical Tech II #1308210302	6-30-2020
LOCATELLI, Forrest	Mech Tech II	NA	NA
CARLSON, Ron	Mech Tech I	NA	NA
FAMBRINI, Steve	Mech Tech I	CWEA Mechanical Tech I #90951004	9-30-2020
CLINE, Brian	Mech Tech II	CWEA Mechanical Tech II #1308218270	12-31-2020
COURTROUL, Jaime	Mech Tech II	CWEA Mechanical Tech II #1308215135	1-31-2021
LOCATELLI, John	Mech Tech II	NA	NA
HEIMSOTH, Chris	Mech Tech I-Trainee	NA	NA
PIMENTEL, Adrian	Mech Tech II	CWEA Mechanical Tech I #1308219776	10-31-20

ELECTRICAL			
NAME	**DESIGNATION**	**CREDENTIALS GRADE CERTIFICATE**	**EXPIRY DATE**
Vacant	Electrical Supervisor		
Guy, Johnathan	Electrical Technician II	CWEA Elect/Inst Grade 2 #1308217940	12-31-2020
Miller, Ralph	Electrical Technician II	CWEA Elect/Inst Grade 2 #80172006	1-31-2021

Section VII. The Operation & Maintenance Manual and Contingency Plans.

The operation and maintenance manual was last reviewed in November 2000 and found to be complete and valid for the current facility. The facility's written Standard Operating Procedures are periodically reviewed and frequently updated to maintain documentation and direction on the operation of the facility.

The maintenance division provides routine preventative maintenance for all plant equipment. This ensures that equipment receives routine lubrication and relevant maintenance, and that standby equipment is ready for service.

Safeguards to minimize accidental discharge from the wastewater treatment plant are built into the design and operation of facility and equipment. These are also tested periodically to ensure their integrity. Scenarios for accidental discharge have been reviewed and concluded to be minimal. However, the location most vulnerable to an accidental discharge was identified as the Bar Screening room. This room is located proximate to the Pump house. A long-term power outage at peak flow may cause an overflow into the Pump house if the main sewage pumps were disabled. However, the two engines capable of driving all six main sewage pumps are diesel driven, and would provide power in case of such an outage. These diesel engines are tested for performance on a monthly schedule, and for a minimum of 1 hour each time. These engines and all equipment in the pump house are maintained with the highest priority.

Additional standby equipment has also been installed with the Plant upgrade to advanced secondary in 1998. These include power to the Sodium Hypochlorite disinfection system, which is the back up to the UV disinfection system.

Section VIII. Laboratories Used for Compliance Monitoring

The listing of the professional laboratories used by the City of Santa Cruz for compliance monitoring at the Wastewater Treatment Facility.

1. **City of Santa Cruz Environmental Laboratory**
   110 California Street
   Santa Cruz CA 95060
   831.420.6040
   ELAP Certificate CA 1176
   E-Mail: wwlab@cityofsantacruz.com
   Website: http://www.cityofsantacruz.com/government/city-departments/public-works/wastewater-treatment-facility/laboratory
   Director: Akin Babatola

2. **McCampbell Analytical**
   1543 Willow Pass Road,
   Pittsburg, CA 94565-1701
   877.252.9262
   NELAP Certificate 4033; ELAP CA 1644
   E-mail: main@mccampbell.com
   Website: http://www.mccampbell.com

3. **Frontier Analytical Laboratory**
   5172 Hillsdale Circle
   El Dorado Hills, CA 95762
   916.934.0900
   ELAP Certificate CA 2934
   E-mail: info@frontieranalytical.com
   Website: http://www.frontieranalytical.com/v3/index.html
   Director: Brad Silverbush

4. **City of Watsonville Utilities Department Laboratory**
   500 Clearwater Lane
   P O Box 50000
   Watsonville, CA 95077
   831.768.3179
   E-mail: michael.crane@cityofwatsonville.org
   Website: http://cityofwatsonville.org/public-works-utilities

5. **Aquatic Bioassay Laboratory**
   29 Olive,
   Ventura CA 93001
   805.643.5621
   ELAP Certificate 1907
   E-mail: Mike@aquaticbioassay.com
   Director: Mike Machuzak

6. **Environmental Sampling Technologies**
   502 South Fifth Street
   St. Joseph MO 64501
   816.232.8860
   E-Mail: information@EST-Lab.com
   Website:http://www.est-lab.com/

Section IX. Biosolids Monitoring and Reporting

Representative sampling and analyses of sludge biosolids from the last handling point at the facility are performed on a bi-monthly basis to monitor the process and product quality. The biosolids product is hauled to a third party site under a multi-year contract between the City and the hauler. Although the hauler provides feedback as to the ultimate destination and disposal of the product, the hauler has ultimate responsibility for the appropriate reuse of the commodity. Additionally, the hauler provides analytical data to the City's Environmental laboratory to validate the quality of the biochemical and physical quality of the biosolids product.

The data generated through the City's biosolids monitoring program indicate that the processes of biosolids generation at the facility and the quality of the biosolids product remain both stable, and predictable. Additional data generated by the City's contractors provide another layer of confirmation that the biosolids product meets and exceeds the limits for hazardous waste disposal or for land application purposes for biosolids uses in California.

The following table is the summary of the monthly dry weight biosolids produced and reused by the POTW in the reporting period.

WWTF Biosolids Production and Reuse Annual Report 2019 Monthly Averages

Monthly Average	Dry Metric Tons Produced	Dry Metric Tons Reused
January	157	157
February	178	178
March	184	184
April	181	181
May	187	187
June	148	148
July	180	180
August	165	165
September	173	173
October	188	188
November	150	150
December	189	189
Annual Total	2,080	2,080
Monthly Average	173.3	173.3

Biosolids Quality Monitoring Data - 2019

Bi-Monthly Sludge Monitoring ANALYTES	ANALYTICAL RESULTS IN DRY WEIGHT ONLY (MG/KG) 14 January	26 March	28 May	310 July	24 September	5 November	Average	Hazardous Waste Limits (Max Allowable) mg/Kg Wet Weight TTLC	Land Applied Limits (mg/Kg Dry Weight)
Antimony	2.2	2.2	2.5	2.4	<2.2	2.2	2.3	500.0	NA
Arsenic	11	13	14	12	7	10	11	500.0	41.0
Asbestos	<1	<1	<1	<1	<1	<1	<1	<1%	NA
Barium	360	420	480	380	240	340	370	10,000.0	NA
Beryllium	<2.2	<2.2	<2.2	<2.2	<2.2	<0.31	<2.2	75.0	NA
Cadmium	1.8	2.2	2.2	2	<1.1	1.5	1.9	100.0	39.0
Chromium	25	34	28	27	19	28	27	500.0	NA
Cobalt	2.9	3.4	3.8	2.7	<2.2	2.6	3.1	8,000.0	NA
Copper	530	510	530	520	360	560	502	2,500.0	1,500.0
Fluoride	22	10	8	9	18	15	14	18,000.0	NA
Lead	13	18	19	14	11	14	15	1,000.0	300.0
Mercury	0.57	0.63	0.88	0.48	0.41	0.77	0.6	20.0	17.0
Moisture	76	76	76	77	77	77	77	NA	NA
Molybdenum	8.8	8.0	8.8	8.3	6.9	9.4	8.4	35,000.0	NA
Nickel	17	24	21	17	13	17	18	2,000.0	420.0
Nitrate-N	<4	<4	<4	<4	<4	<4	<4	NA	NA
Nitrogen-Organic	47,900	46,600	44,920	53,800	43,660	46,500	47,230	NA	NA
Nitrogen-Total Kjeldahl	54,300	53,660	52,600	64,200	50,000	52,400	54,530	NA	NA
Nitrogen-Ammonia	6,400	7,060	7,680	10,400	6,340	5,900	7,300	NA	NA
Selenium	6.1	8.0	7.0	6.1	4.2	6.0	6.2	100.0	100.0
Silver	3.7	3.5	3.6	3.1	<2.2	4.7	3.7	500.0	NA
Thallium	<2.2	<2.1	<2.2	<2.2	<2.2	<0.43	<2.2	700.0	NA
Vanadium	13	26	18	14	9.5	12	15	2,400.0	NA
Zinc	1,100	1,100	1,300	1,300	1,000	1,300	1,183	5,000.0	2,800.0

Section X. Effectiveness of Source Control: Pretreatment Program

The following is a summary of the performance of the source control and pretreatment program actions relative to plant performance in 2019. A full program report is being submitted under the annual Pretreatment program report currently under preparation, as mandated at 40CFR 430.12.

Assessing the effectiveness of the Pretreatment program utilizing the frequency of violations of NPDES permit limits; of incidents of Pass-through; Interference and Plant upset, indicate that the program was both successful and effective in the prevention of these standard metrics.

Analyses of the NPDES violations in TOC and Fecal Coliform limits in 2019 indicated that these were not attributable to deficits in the program. The violation types examined were reflective of processes within the treatment stream that were not controllable through source control mechanisms.

It is noteworthy that the program completed the 10th year of implementing the revised Local Limits which incorporated trace organic compounds for the protection of the receiving waters in 2010.

The effectiveness of these limits is validated in the continued low levels of all PCBs and trace organic compounds as reported in the 2018 CIWQS report. The 2019 reports are in preparation, and preliminary indications are that the low levels of these emerging compounds have been maintained.

Finally the Pretreatment program implemented specific permits and limits on the introduction of a new bacteria based odor and Sulfide controlling product in 2019.

This time-limited permit allows the program and the discharger to mutually assess the effectiveness of this bacteria product on its intended purpose as well as its impact on the POTW by the controlling authority of the Pretreatment Program.

End of the 2019 Annual Summary and Outfall Report.