



**GOLETA SANITARY DISTRICT**  
**NPDES MONITORING PROGRAM**  
**2021 ANNUAL REPORT**

*Submitted: January 24, 2022*

## CHAPTER 1

### INTRODUCTION

The Goleta Sanitary District (GSD) treatment plant operated under WDR Order No. R3-2017-0021 and NPDES Permit No. CA0048160 which became effective November 10, 2017. January through December 2021 the plant was operating utilizing the full secondary process.

The Goleta wastewater treatment plant (WWTP) is located in an unincorporated coastal area of Santa Barbara County, California. Treated wastewater is discharged to the Pacific Ocean approximately one mile offshore of Goleta Beach County Park via a south-trending ocean outfall. The outfall lies within and extends outside of a small embayment formed by Goleta Point directly to the west.

The Goleta WWTP treats wastewater from the service areas of the Goleta Sanitary District (GSD), the Goleta West Sanitary District, the University of California at Santa Barbara, the Santa Barbara Municipal Airport, and certain Santa Barbara County facilities. Existing agreements among the agencies establish GSD as the owner of the joint wastewater treatment facilities and assign the responsibility of operation and maintenance of the facilities to GSD. However, each agency “owns” an “indeterminate, perpetual and exclusive capacity right” in the facilities and an “easement right of flow through” the facilities.

## WASTEWATER TREATMENT PROCESS

The following discussion focuses on the principal features of GSD's full secondary process of wastewater and sludge treatment. The performance capacities and characteristics of the treatment plant are detailed in Chapter 2.

### Treatment Plant Facilities

The Goleta Sanitary District Wastewater Treatment Plant is located at One William Moffett Place, in an unincorporated area of Santa Barbara County, CA. The plant site is approximately 10 miles west of the City of Santa Barbara, near the Pacific Coast. A regional view of the study area is shown in Figure 1-1.

On average, over the past 10 years, 2012 to 2021, the plant has discharged about 3.60 million gallons per day (MGD) of treated effluent to the open coastal waters of the Santa Barbara Channel via an ocean outfall. The treatment plant is currently discharging municipal wastewater in accordance with NPDES permit CA 0048160. The treatment plant's discharge meets the state water quality standards as set forth in the Water Quality Control Plan for Ocean Waters of California (California Ocean plan) and the federal Clean Water Act.

### Facilities Description

The Goleta wastewater treatment plant underwent its first substantial upgrade completed in June 1988. The upgraded plant was designed to assure compliance with monthly 30-day average discharge limitations of 63 mg/L for suspended solids and 98 mg/L for BOD under an average dry weather flow 9.0 MGD. The facility utilized a split-stream process of physical and biological treatment until December of 2013. The current biological treatment is provided by two trickling filters and an aeration basin to achieve full secondary treatment. The following sections describe the treatment process.

### Collection System

Over 190 miles of pipelines collect wastewater that flows almost entirely by gravity to pump stations located in each agency's service area. These stations pump the flow to the treatment facility.

### Pump Station and Headworks

Influent from the collection system of each agency is pumped to the treatment plant headworks where raw wastewater flows through two bar screens with ¼ inch screen spacing, which removes large debris. Influent is then routed to aerated grit tanks where sand and grit are allowed to settle out and pumped to screening washer/compactor units. This debris and grit is then transported via truck to a local landfill. Air collected from the influent pump stations and headworks is scrubbed in a biological odor reduction tower.

### **Primary Sedimentation**

Wastewater then flows into one of three circular primary sedimentation basins (primary clarifiers) where solids settling to the bottom and floatable materials rising to the surface are mechanically collected and pumped to digesters.

### **Secondary Treatment**

Secondary treatment involves three treatment elements: the biofilters, an aeration basin, and secondary sedimentation tanks. In the biofilter, primary effluent trickles over plastic media where bacteria feed on organic wastes, thus removing these wastes from the water. Effluent from the trickling filter flows to an aeration basin where air is injected and the effluent is mixed with recirculated sludge from the secondary sedimentation basins. The resulting biological action coagulates these fine particles and the organic solids settle out as sludge in two secondary sedimentation tanks. The waste activated sludge (WAS) is pumped to two mechanical thickeners and then is pumped to the three anaerobic digesters. A portion of the secondary process flow can be diverted to the reclamation facilities for tertiary treatment with gravity filters.

### **Chlorine Contact Channel**

The secondary effluent flows to the head of the chlorine contact channel where sodium hypochlorite is injected to kill bacteria in the effluent. Prior to discharge into the ocean, sodium bisulfite is added for dechlorination, thus completing the disinfection process.

### **Sludge Treatment and Biosolids Disposal**

Settleable solids and floatable materials from the primary clarifiers are treated in three heated anaerobic sludge digesters for at least 15 days. Anaerobic digestion decomposes organic material and produces digester gas composed primarily of methane. This digester gas fuels boilers used to heat sludge in the digesters. Sludge from the digesters then flows to one of two stabilization basins where it settles and bacteria can continue the organic decomposition. Stabilized sludge is dredged from the bottom of these basins and is dewatered by two screw presses. During 2021, a centrifuge was also utilized to dewater the stabilization basin sludge. The digested supernatant from the three anaerobic digesters can also be diverted from the stabilization basins directly to the two screw presses for dewatering.

The centrifuged and screw pressed biosolids, identified as Class B, were transported to Liberty Composting Inc. located at 12421 Holloway Road, Lost Hills, CA 93249. Copies of the agreement with Liberty Composting are available upon request.

A complete biosolids report describing the treatment and disposal process is prepared each year and submitted to the EPA. The deadline for submittal of this report is February 19<sup>th</sup> of each year.

Figure 1-1. Regional View of the Goleta Valley



## **Reclamation Facilities**

On September 13, 1991, the California Regional Water Quality Control Board, Central Coast Region approved Order No. 91-03 that permits the Goleta Sanitary District to produce up to 3.0 MGD of reclaimed water. The reclaimed water produced at the Goleta Sanitary District is distributed by the Goleta Water District for use within their service area. Reclaimed water is used for landscape irrigation and for incidental uses including construction dust control and compaction, and to flush toilets within several buildings located in Goleta. The Goleta Water District is regulated by separate water reclamation requirements.

Secondary effluent enters the reclamation facilities where a flash mixer disperses aluminum sulfate (alum) and polymer into the water. The flocculated suspension is then filtered through a bed of anthracite coal where the floc is removed. The filtered water then flows to a chlorine contact tank where sodium hypochlorite is added for disinfection. The highly chlorinated treated water then flows to a 3 million-gallon underground storage tank where it is stored until needed. Reclaimed water is distributed throughout the Goleta Valley by a distribution system operated and maintained by the Goleta Water District.

An annual report describing the reclamation treatment process, operational parameters, water quality, and production rates is prepared and submitted to the RWQCB by January 31<sup>st</sup>.

## **Ocean Outfall**

The treated secondary effluent is discharged to the ocean through an outfall pipe that extends 5800 feet offshore and terminates at a depth of approximately 92 feet below Mean Lower Low Water (MLLW) level. At the pipe terminus, a multi-port diffuser with 36, four inch diameter ports mixes one part of effluent with approximately 122 parts of seawater (Tetra Tech, Inc. 1993) to achieve a high initial wastewater dilution.

## **Staff**

Mr. Steve Wagner, P.E., currently serves as GSD's General Manager and District Engineer. The General Manager is responsible for overall operation and performance of the treatment plant.

Ten state certified treatment plant operators operated the wastewater treatment plant under the direction of the Plant Operations Manager, Mr. John Crisman. The Plant Operations Manager also supervises the treatment plant's industrial waste staff. Mr. Chuck Smolnikar, supervises the maintenance staff and the laboratory is under the direction of Ms. Lena Cox, the Laboratory and Technical Services Manager. The grade and certification number of operations, maintenance, industrial waste control, and laboratory personnel employed during the 2021 operational year are shown in Table 1-1.

Table 1-1. Goleta Sanitary District Operation Staff, 2021

Staff	Grade	California Certification No.
<b>Operators</b>		
John Crisman	V	28857
Matthew Hayden	V	43906
Pete Regis	IV	28277
Stephen Conklin	III	7065
Ricardo Lopez	III	10756
Francisco M. Lemus	III	10893
Morgan Lea	III	28400
Jes Hulbert	I	28266
River Ferrara	I	28488
Justin Graves	I	43450
Bronson Thomas	OIT-I	Issued 2/3/2020
<b>Lab Analysts</b>		
Lena Cox	IV	90334003
Matthew Hayden	II	1308217625
Teresa Kistner	I	99076111
River Ferrara	I	1308214257
John Crisman	I	1308214787
Justin Graves	I	1308219530
<b>Maintenance Technologist</b>		
Alejandro Bautista	III	1308216605
Torrey Jones	I	1308217681
<b>Electrical / Instrumentation</b>		
Charles Smolnikar	II	60172004
Ramon Garza	II	1308216032
<b>Dept. of Industrial Relations – Electrician</b>		
Charles Smolnikar	NA	107709
Ramon Garza	NA	160174
<b>Environmental Compliance</b>		
Teresa Kistner	IV	1308218096
<b>Biosolids Land Application Management</b>		
Lena Cox	I	70711001

## Monitoring and Reporting Program

The Goleta Sanitary District's monitoring and reporting program was conducted in accordance with the requirements of the NPDES permit CA0048160. The objectives of the monitoring program and this report are to:

- Determine compliance with NPDES permit terms and conditions.
- Document training and certification of wastewater treatment facility operators.
- Assess treatment plant performance and the effectiveness of industrial pretreatment and toxics control programs.
- Evaluate the monitoring and reporting program and make recommendations for improving the program.

The self-monitoring and reporting program consists of assessing water quality and compliance with effluent limits. Table 1-2 summarizes the sampling schedule for various elements of the monitoring and reporting program conducted during 2021. However, due to a commercial laboratory error some of the holding times were missed for the effluent priority pollutant samples and valid samples had to be recollected in November.

Table 1-2. Schedule for NPDES Monitoring, Goleta Sanitary District, 2021

Monitoring Program Component	Frequency	Schedule
Standard Wastewater Parameters	Daily – Weekly	As Specified
Chronic Toxicity	Quarterly	Jan, April, July, and Oct
Effluent Metals	Annually	October
Effluent Priority Pollutants	Annually	October
Outfall Inspection	Annually	October

Influent, and effluent water monitoring is conducted in accordance with U.S. Environmental Protection Agency approved test procedures as stipulated under Title 40 of the Code of Federal Regulations, Section 136 (40 CFR 136): *Guidelines establishing test procedures for the analysis of pollutants*. Water quality analyses for compliance monitoring are performed by analytical laboratories certified by the California Environmental Laboratory Accreditation Program. Bioassay testing is conducted in accordance with guidelines approved by the State Water Resources Control Board and the EPA.

In order to comply with a request from the Central Coast RWQCB in a letter dated June 27, 2008 the District is no longer submitting hard copies of NPDES reports to the RWQCB. All documents are converted into a searchable PDF format and are submitted electronically.



## REPORT ORGANIZATION

This report summarizes data collected during the 2021 monitoring and reporting program, and analyzes this data to determine compliance with the discharge permit terms and conditions.

Chapter presentation is as follows:

Chapter 1	Introduction
Chapter 2	Treatment Plant Performance
Chapter 3	Collection System Summary
Chapter 4	Outfall Dive Survey

## CHAPTER 2

### TREATMENT PLANT PERFORMANCE

The performance of a wastewater treatment plant is measured by its ability to reduce influent contaminants to levels acceptable for discharge to the environment. Federal and state authorities mandate these levels of treatment in order to protect the marine environment. Proper operation of the Goleta Sanitary District's wastewater treatment plant is assured through the monitoring of several effluent parameters such as flow, total suspended solids, biochemical oxygen demand, residual chlorine, hydrogen-ion concentration (pH), turbidity, settleable solids, oil and grease, and toxicity concentration. Metals, pesticides, and other priority pollutants are also analyzed to aid in determining the impact the wastewater discharge has on receiving waters, evaluating compliance with discharge permit limitations, and monitoring the effectiveness of the industrial pretreatment and toxic control program.

### WASTEWATER CHARACTERIZATION

Goleta Sanitary District's NPDES monitoring program requires measurement of many parameters at frequencies ranging from continuous to once per year. During 2021, influent, effluent, and biosolids (sludge) samples were collected by treatment plant personnel, and analyzed by the Goleta Sanitary District wastewater treatment plant laboratory and various contract laboratories such as: Aquatic Testing Laboratories (ATL) for chronic toxicity, OEC Laboratory, McCampbell Analytical Laboratory and Ceres Analytical Laboratory. Treatment plant personnel monitored and analyzed wastewater for performance-evaluating parameters including wastewater flow, suspended solids, biochemical oxygen demand (BOD), pH, turbidity, settleable solids, oil and grease, temperature, residual chlorine, coliform and enterococcus bacteria. The previously mentioned environmental laboratories performed annual analysis of priority pollutants, metals and other parameters in final effluent and biosolids samples. Final effluent samples were also analyzed for radioactivity.

Analytical methodologies used by Goleta Sanitary District Laboratory and other contract laboratories used by GSD are based on approved U.S. Environmental Protection Agency (EPA) methods (EPA 1983; Federal Register 1984) and other methods in *Standard Methods for the Examination of Water and Wastewater, 22<sup>nd</sup> ed.* All methodologies employed during 2021 were approved for NPDES monitoring programs. Quality assurance and quality control procedures followed those presented in *Standard Methods for the Examination of Water and Wastewater, 22<sup>nd</sup> edition.*

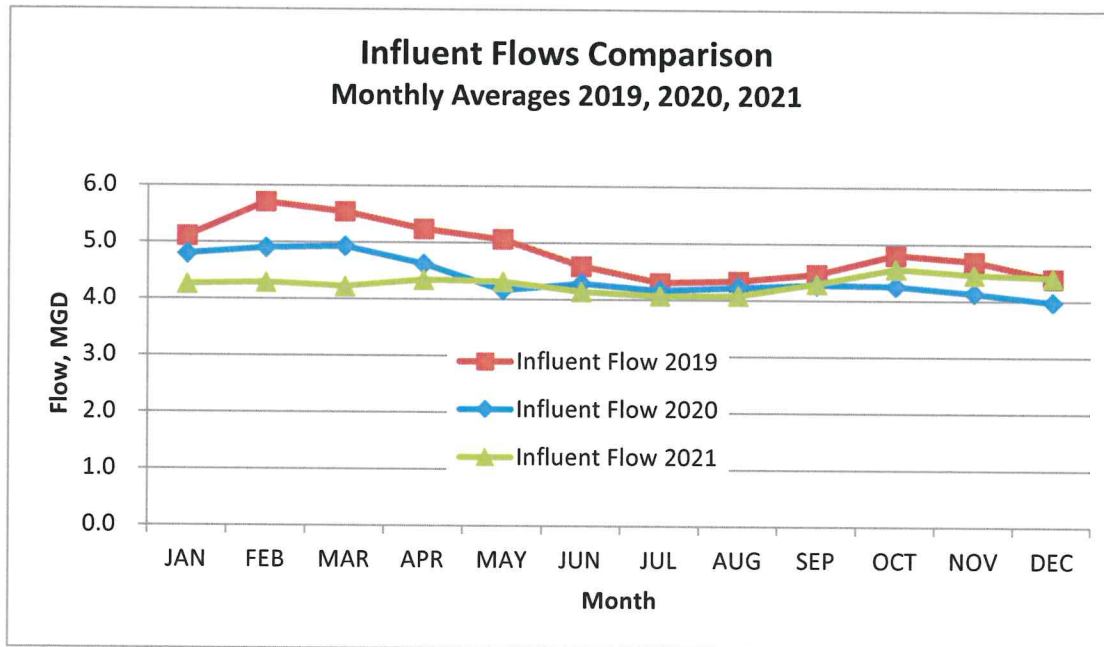
Results of the wastewater chemical analyses used to monitor proper operation of the treatment plant during 2021, and the respective discharge permit limitations, are presented in Tables 2-1 and Table 2-2. All monthly averaged data presented in these tables are calculated from daily values at the treatment plant, with the exception of removal efficiencies, which are calculated from the monthly averages of the respective influent and effluent parameters.

## Influent Flow

The daily influent flow into the treatment plant was monitored continuously throughout 2021. Influent flow without the internal plant recirculated flow, averaged 4.3 million gallons per day (MGD) which is a 2% decrease compared to the average of 4.4 MGD that was treated in 2020.

Overall, the average monthly influent flows for 2021 varied throughout the year, fluctuating from a low of 4.06 MGD in July to a high of 4.56 MGD in October. The decrease in average influent flow observed at the plant is likely due to water conservation implemented by residents in response to the drought conditions. Another probable reason for the flow reduction is related to a decline in the population associated with the University in response to the COVID-19 pandemic. See Figure 2-1 for a visual flow comparison.

**Figure 2-1. Influent Flows Monthly Average Comparison for 2019, 2020 and 2021**



The highest flows into the plant during 2021 occurred during the end of the year, and may be associated with the rain events that occurred in October and December.

Since 2001 the Goleta West Sanitary District and Goleta Sanitary District have maintained an aggressive collection system rehabilitation program. Numerous sections of the collection system in both Districts have been relined or replaced to correct structural deficiencies while significantly reducing the inflow and infiltration (I&I) problems. However, even with the reduction of I&I the amount of rainfall during the year can affect the total amount of influent flow measured. The District's storm water pollution prevention plan requires all storm water collected from process areas to be treated before disposal. After several dry years the low ground water table and dry creeks can reduce the potential for ground water intrusion into the collection systems.

## Effluent Flow

The effluent flow from the treatment plant was monitored continuously during 2021 and averaged 3.3 MGD for the year. The difference between the influent and effluent flow is due to the production of reclaimed water, which is not discharged into the ocean but is distributed throughout the community for landscape irrigation and other uses.

**Figure 2-2. Influent and Effluent Flows 2021 Monthly Averages**

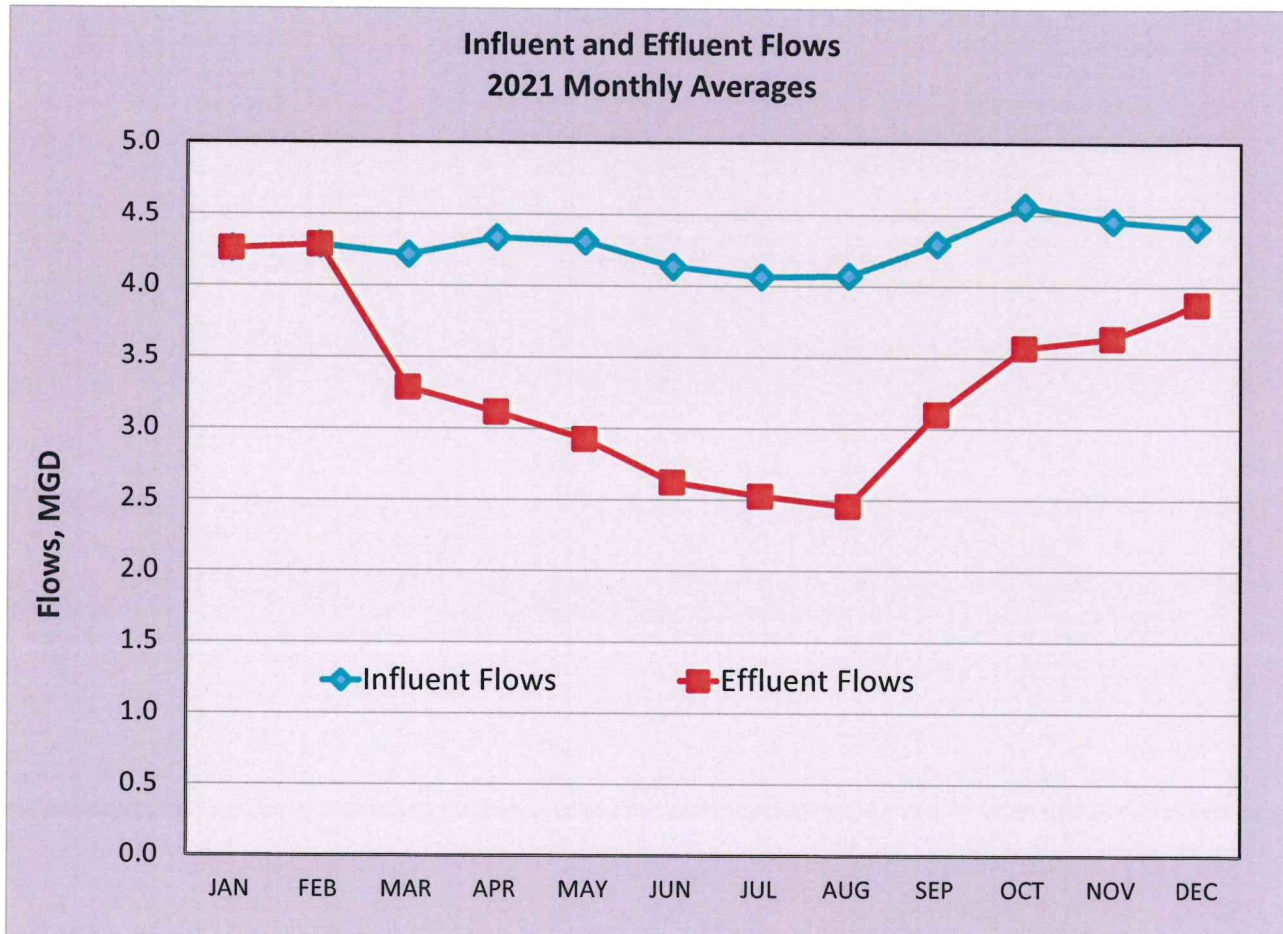


Figure 2-2 shows the monthly average influent and effluent flows for 2021. Higher wastewater effluent flow generally occurs during the winter months when influent flow is also the highest and recycling is minimal. The most important factor contributing to fluctuations in the effluent flow is the amount of wastewater that is processed into reclaimed water and used for irrigation. The lowest effluent flow occurred during July and August when the amount of flow discharged to the Pacific Ocean dropped to 2.5 MGD. The temporal variations in the monthly average effluent flow seen in 2021 fluctuated from a low of 2.46 MGD in August, when the daily production of reclaimed water was one of the highest production months of the year and averaged 1.41 MGD for the month to a high of 4.29 MGD during February when the reclaimed facility was off line for the month. There was also significant rainfall during January with approximately 5 inches of rain. Figure 2-2 is a time

history of the influent and effluent flows and Table 2-1 shows the actual monthly flow average values.

Table 2-1. Monthly Averages Flow, Suspended Solids and BOD, Goleta Sanitary District, 2021.

Month	Flow		Total Suspended Solids				Biochemical Oxygen Demand			
	Influent MGD	Effluent MGD	Influent mg/L	Effluent mg/L	Removal (%)	Mass Emission (lbs/day)	Influent mg/L	Effluent mg/L	Removal (%)	Mass Emission (lbs/day)
Jan	4.26	4.26	430	7.9	98.1	297	393	9.5	97.5	342
Feb	4.29	4.29	446	6.5	98.5	234	377	7.8	97.9	280
Mar	4.22	3.29	380	5.6	98.5	146	363	7.0	98.1	184
Apr	4.34	3.11	403	3.7	99.0	98	376	11.5	96.8	298
May	4.31	2.92	414	5.5	98.7	133	401	7.8	98.2	191
Jun	4.13	2.62	400	7.4	98.2	167	403	7.4	98.1	166
Jul	4.06	2.53	406	4.4	98.8	93	365	7.5	97.8	159
Aug	4.07	2.46	430	4.0	99.1	82	321	7.7	97.5	163
Sep	4.29	3.10	408	3.5	99.1	93	328	11.9	96.2	307
Oct	4.56	3.57	400	3.6	99.0	108	334	9.8	97.0	289
Nov	4.46	3.64	418	5.0	98.7	153	327	9.7	96.9	291
Dec	4.41	3.87	447	4.5	99.0	145	318	8.4	97.3	270
<b>Average</b>	4.28	3.30	415	5.1	98.7	146	359	8.8	97.4	245
<b>Limit</b>	NL	7.64	NL	30	85	1912	NL	30	85	1912

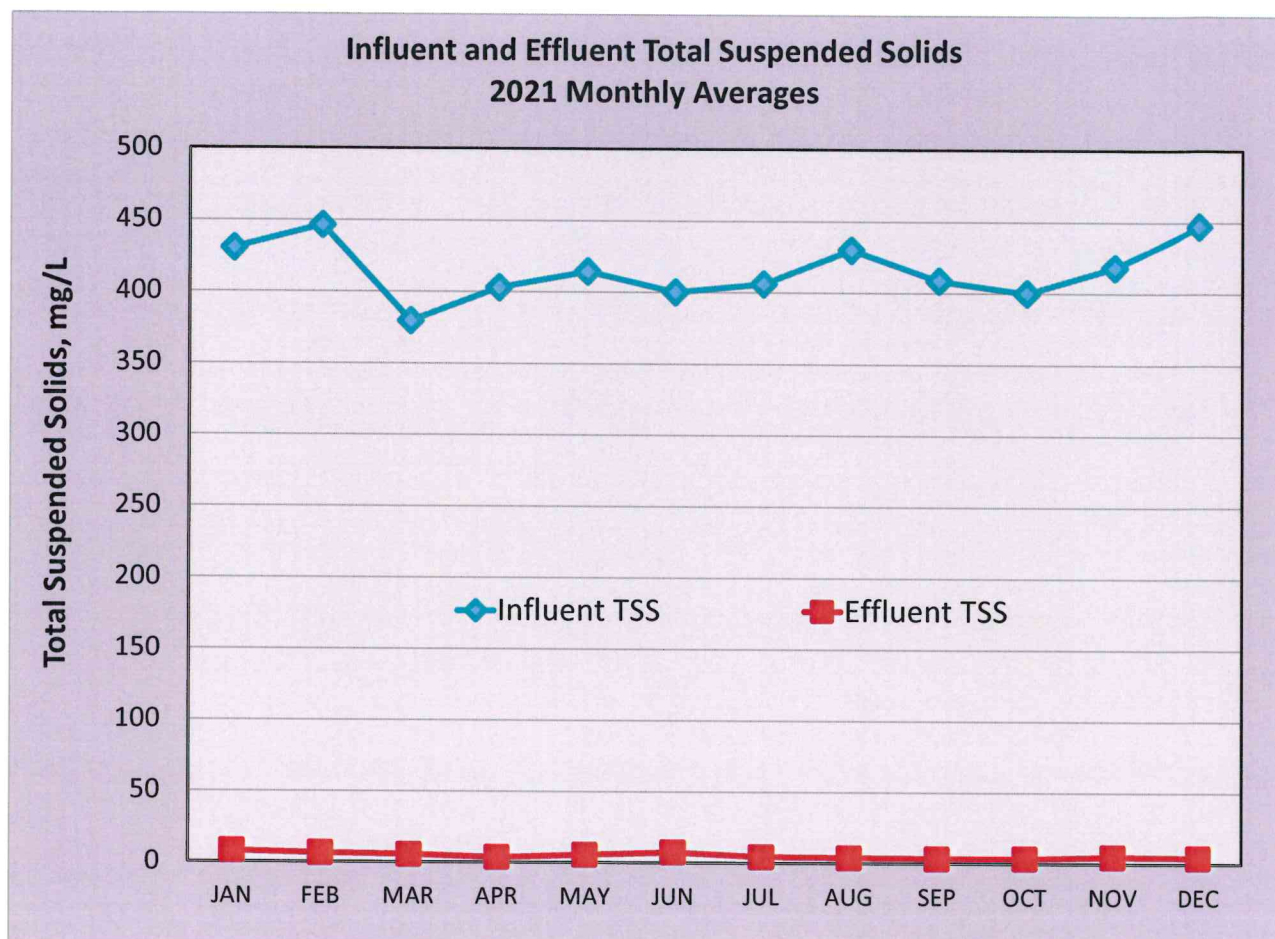
NL = No Limit

### Suspended Solids

Influent and effluent suspended solids were measured five days per week on 24-hour composite samples. The effectiveness of the treatment plant in removing suspended solids is demonstrated by the variation of influent solids versus the low-level and consistent output of effluent solids (see Figure 2-3). Influent suspended solids concentrations averaged 415 mg/L for the year showing a decrease of about 13% from the 2020 annual average of 476 mg/L. Figure 2-3 shows a fluctuation in concentration of suspended solids that occurred during the year. The treatment process reduced the concentration of total suspended solids in the effluent to an annual average of 5.1 mg/L which is a slight increase from the 4.9 mg/L average of 2020.

All effluent 30-day monthly averages were well below the 30-mg/L monthly average limitation. Overall removal efficiency for the year was an average of 98.7 percent, see Table 2-1.

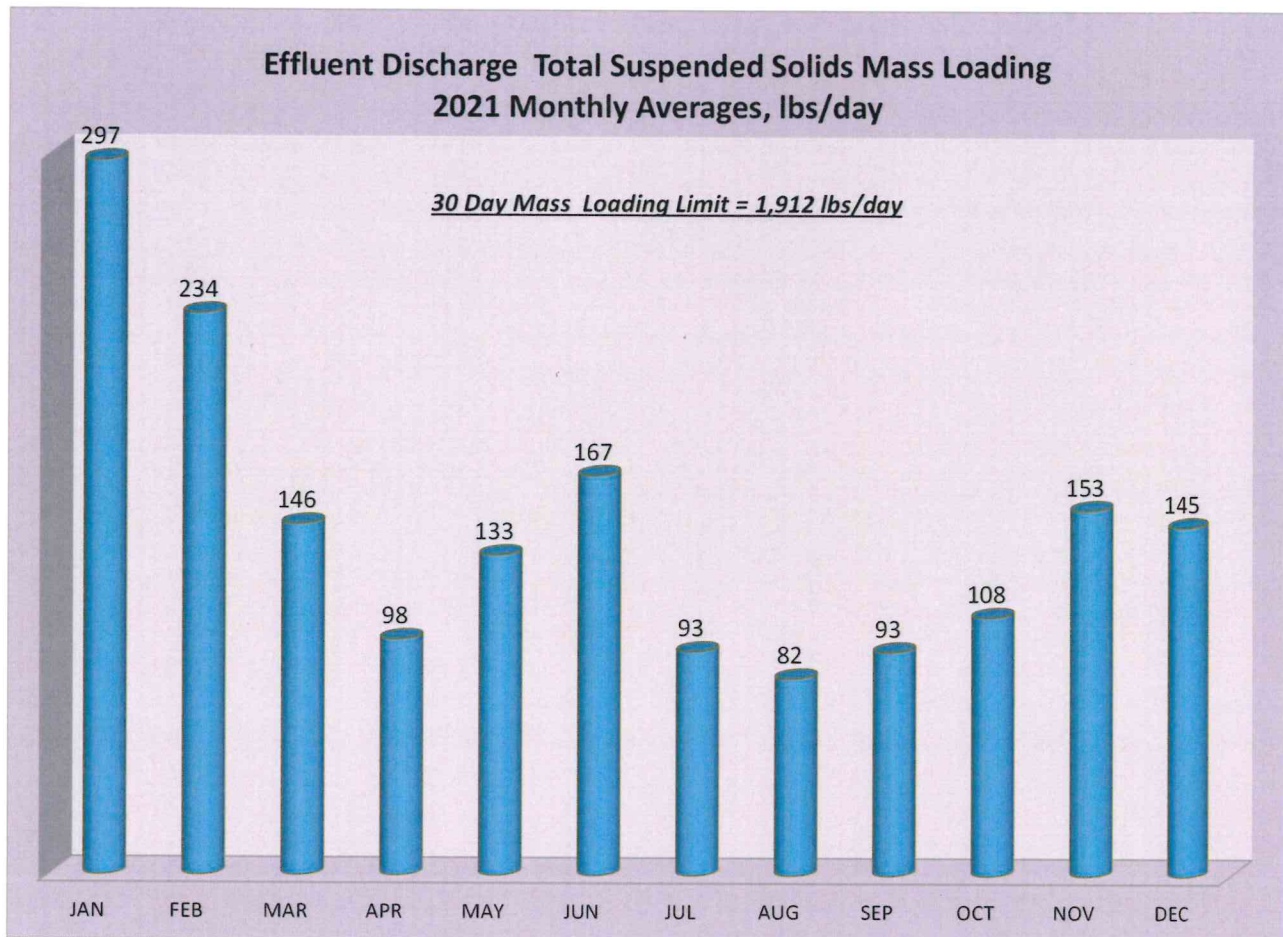
Figure 2-3. Influent and Effluent Total Suspended Solids 2021 Monthly Averages



Average monthly suspended solids mass loading rates for 2021 are represented graphically in Figure 2-4. The mass emission limit is based on average dry weather flow (ADWF) and is a limit applied to dry weather flows (DWF). There is no limit for mass emissions on wet weather flows.

The maximum average monthly mass emission loading for 2021 occurred in January at a high of 297 lbs/day, which is approximately 16 percent of the permitted monthly 30-day average limit of 1,912 lbs/day. Loading rates were well below the discharge limits throughout the year.

**Figure 2-4. Effluent Discharge Total Suspended Solids Mass Loading, 2021 Monthly Averages, lbs/day**



### Biochemical Oxygen Demand

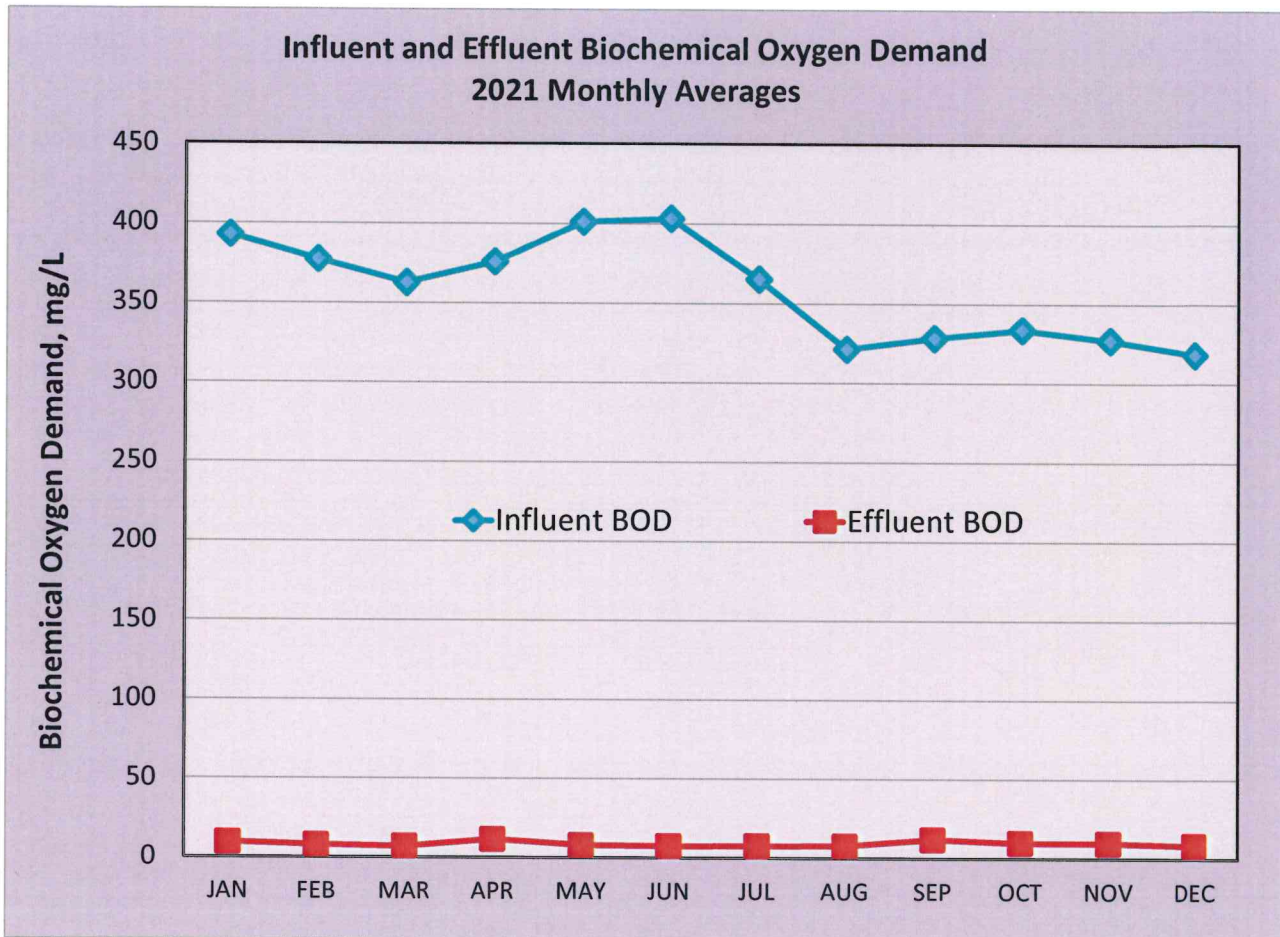
Biochemical oxygen demand (BOD) levels were measured on 24 hour composite samples of the influent and effluent, at least monthly and five days per week, respectively.

During 2021 influent BOD averaged 359 mg/L showing a decrease of 8% from the annual influent average of 388 for 2020. The influent BOD varied throughout the year, ranging from a monthly average low of 318 mg/L in December to a high of 403 mg/L in June.

A small variation in the monthly average final effluent BOD concentration was observed throughout the year with the annual average of 8.8 mg/L and the range extending from a low of 7.4 in June to a high of 11.9 in September, (Table 2-1). The difference between influent and effluent BOD represents an average overall removal rate of 97.4 percent.

The NPDES R3-2017-0021 permit limits are an average of 30 mg/L and weekly average of 45 mg/L. All BOD NPDES limitations were achieved throughout the year.

Figure 2-5. Influent and Effluent Biochemical Oxygen Demand 2021 Monthly Averages



In 2021, all effluent BOD mass emission values were below all limitations. The maximum monthly average mass emission was 342 lbs/day for January. The mass emission limit is based on average dry weather flow (ADWF) and is a limit that only applies to dry weather flows (DWF). There is no limit for mass emissions on wet weather flows. The mass emissions limits specified in permit R3-2017-0021 are a monthly average of 1,912 lbs/day and the average weekly limitation of 2,867 lbs/day. None of the permit limits were exceeded during 2021.



Table 2-2. Monthly Averages of Effluent Parameters, Goleta Sanitary District, 2021

	pH		Turbidity	Settleable Solids	Oil and Grease		Toxicity Chronic
	Influent	Final Effluent	Final Effluent	Final Effluent	Final Effluent	Mass Emission	Final Effluent
Month	SU	SU	NTU	mL/L/hr	mg/L	lbs/day	TUc
January	7.6	7.0	2.4	0.10	2.1	71	17.9
February	7.7	7.1	2.1	0.10	3.5	127	
March	7.6	7.2	2.2	0.10	2.9	72	
April	7.6	7.3	1.7	0.10	4.7	130	17.9
May	7.5	7.0	1.6	0.10	4.0	101	
June	7.7	7.3	1.9	0.10	9.5	220	
July	7.6	7.3	1.4	0.10	4.5	91	10.0
August	7.6	7.3	1.1	0.10	3.4	78	
September	7.6	7.3	1.2	0.10	2.6	68	
October	7.7	7.2	1.5	0.14	2.8	89	10.0
November	7.6	7.3	2.0	0.10	2.6	81	
December	7.6	7.4	2.0	0.10	2.0	63	
Average	7.6	7.2	1.8	0.10	3.7	99	14.0
Limit	NL	6 to 9	75	1.0	25	1590	123

NL = No Limit

### Hydrogen-Ion Concentration (pH)

Influent pH was monitored weekly and effluent pH levels were monitored five days per week to ensure that the effluent remained within an acceptable range when discharged into the ocean. Influent pH averaged 7.6 units for the year; effluent pH averaged 7.2 units. The NPDES effluent pH limitations are established as a minimum of 6.0 and a maximum of 9.0 pH units, all pH values were well within these limitations for 2021.

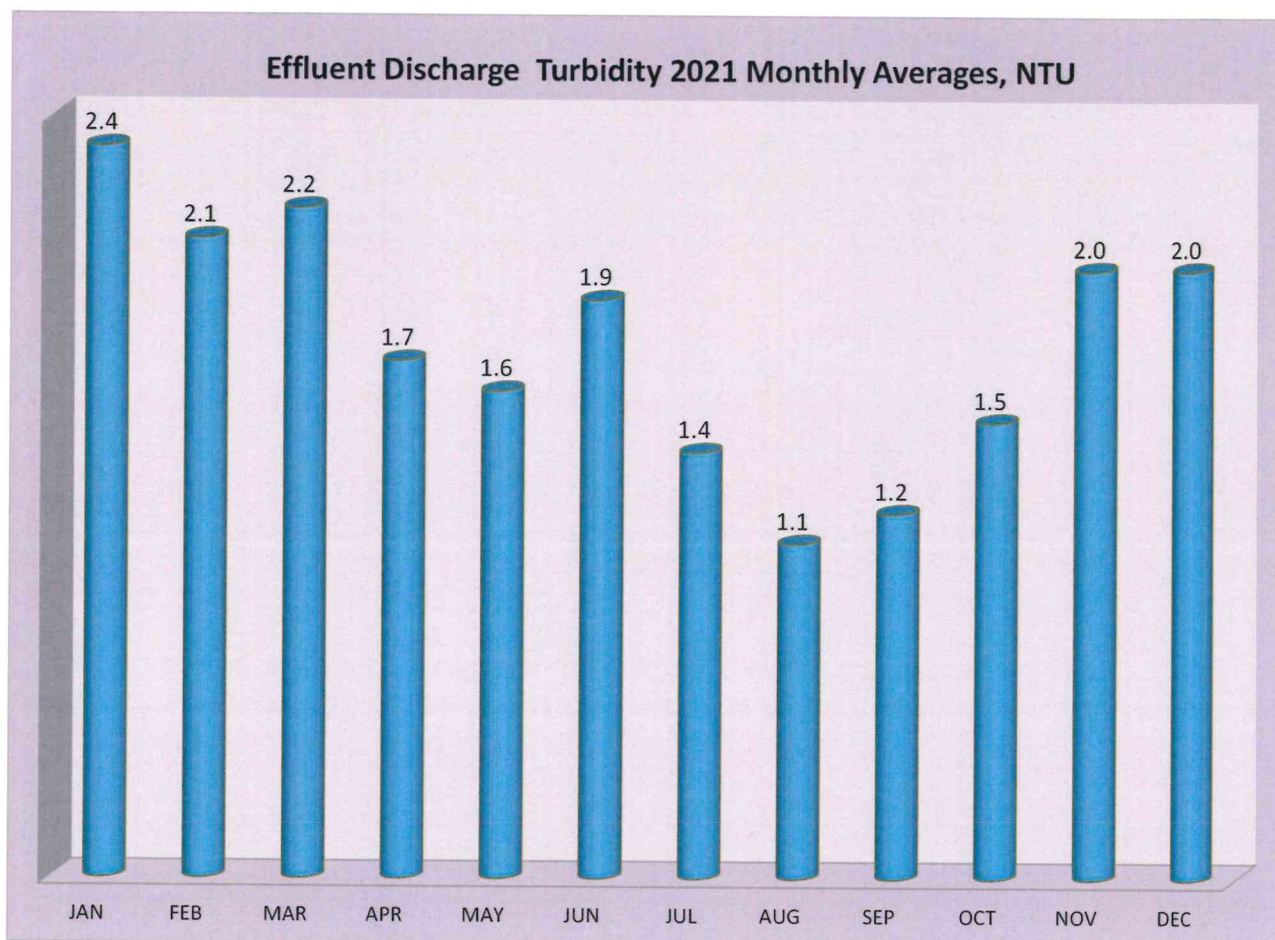
### Ammonia

The effluent was monitored once during October by a certified commercial laboratory, to determine the concentration of ammonia. The current permit, R3-2017-0021, does not include ammonia effluent limits or monthly testing requirements because no reasonable potential was determined for the pollutant during the permit renewal reasonable potential analysis. However, the measured ammonia concentration of the effluent was 17 mg/L.

## Turbidity

Effluent turbidity was monitored five days per week. The permit limitations for effluent turbidity consists of a monthly average of 75 Nephelometric Turbidity Units (NTU), a weekly average of 100 NTU, and a maximum at any time limitation of 225 NTU. Effluent turbidity data are shown graphically in Figure 2-6. The maximum value at any time, 4.1 NTU, occurred on January 27<sup>th</sup> which was still well below the effluent limits. Monthly averages ranged from a low of 1.1 NTU to a high of 2.4 NTU. All values were significantly below their respective permit limitations.

**Figure 2-6. Effluent Discharge Turbidity 2021 Monthly Averages, NTU**



## Chronic Toxicity Concentration

The effluent was analyzed for chronic toxicity ( $TU_C$ ) on a quarterly basis in January, April, July, and October. The special testing conducted during 2011 to identify the most sensitive chronic toxicity organism showed that the abalone development test was the most sensitive. All results were well below the daily maximum limitation of 123  $TU_C$ . See Table 2-2.

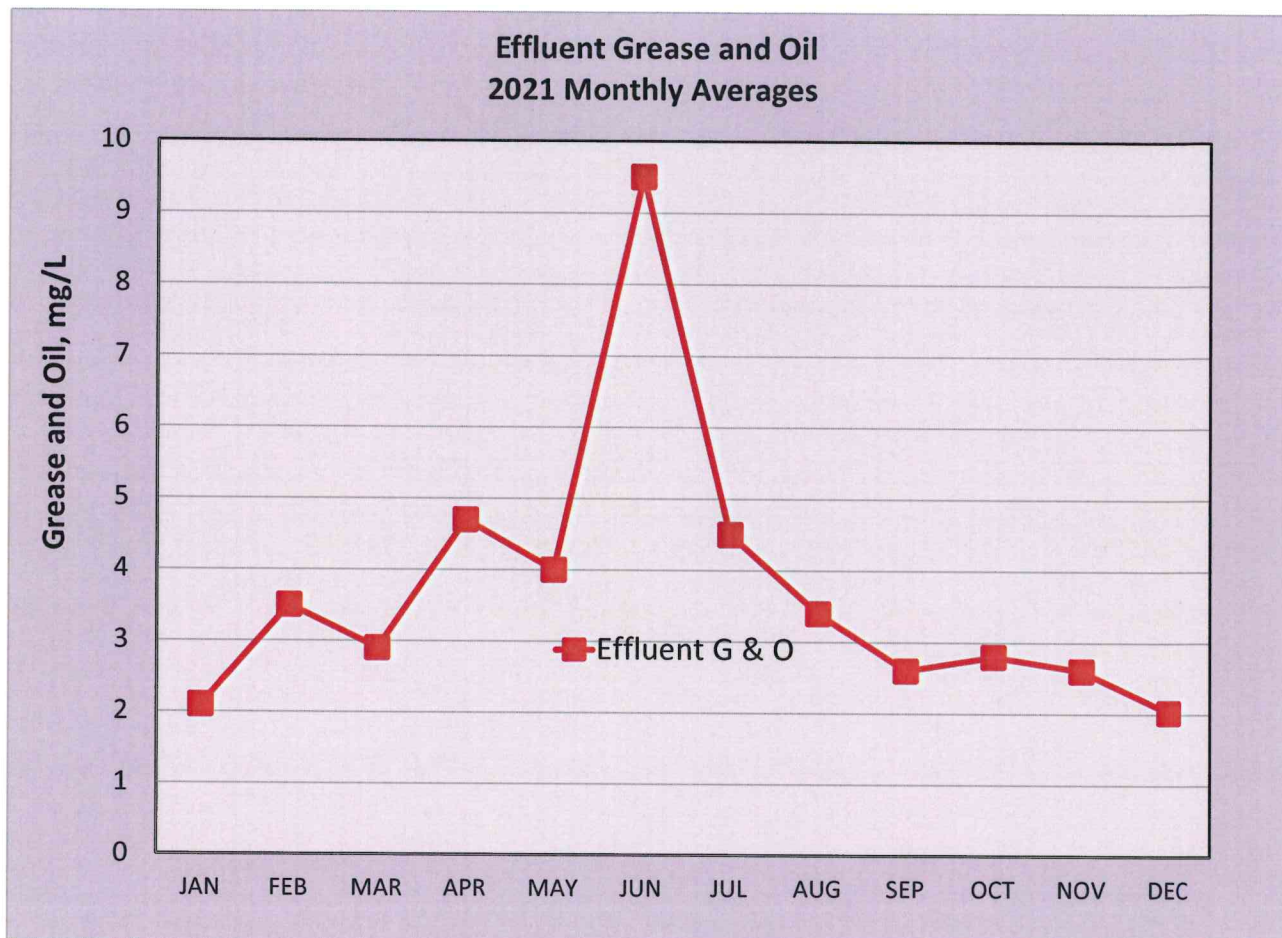
## Settleable Solids

The effluent was monitored for settleable solids concentrations 5 days per week. The permit specifies that the monthly average, weekly average, and maximum at any time may not exceed 1.0 milliliters/liter/hour (ml/L/hr), 1.5 ml/L/hr, and 3.0 ml/L/hr, respectively. Monthly averages were consistently 0.10 ml/L/hr. The maximum value at any time was 0.80 mL/L/hr which occurred on the 20<sup>th</sup> of October. All values were well below their respective permit limitations.

## Oil and Grease

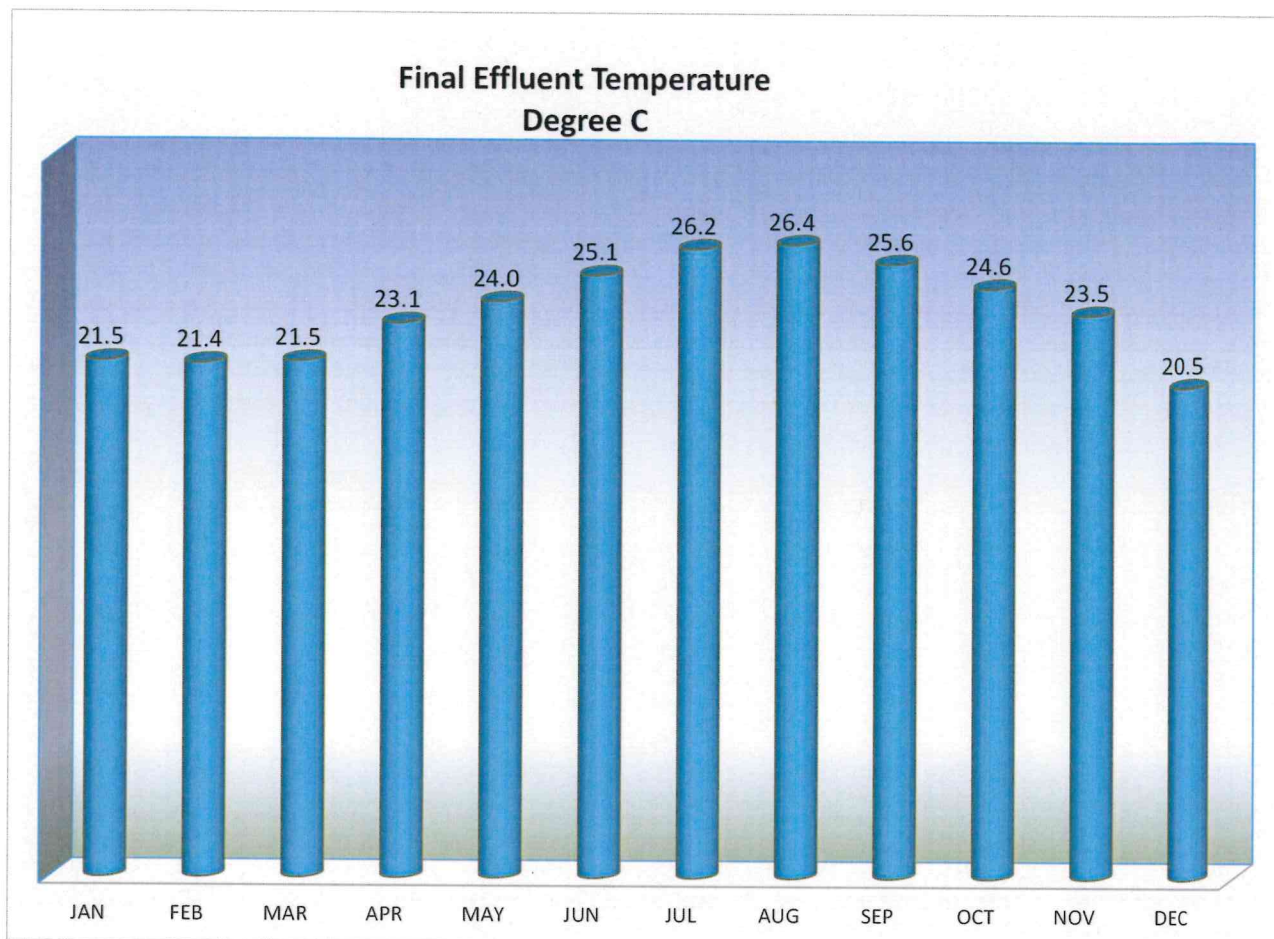
Effluent oil and grease were monitored weekly. Monthly average results are shown graphically in Figure 2-7. Prior to August 2007 Freon was the solvent used in the standard method to extract oil and greases from water samples. According to EPA regulations, in August 2007 the GSD laboratory ceased using Freon as the extraction solvent and began using hexane as the required solvent. The District continued to use the liquid-liquid extraction method, the only change at this time was the solvent. In December 2010, the GSD laboratory began analyzing for oil and grease using the approved standard solid phase extraction (SPE) method. The current permit, R3-2017-0021, eliminated the influent oil and grease monitoring requirement.

Effluent grease and oil concentrations were very low and consistent during 2021. All monthly, weekly, and maximum permit limits were met. Mass emissions values ranged from a monthly average low of 63 lbs/day in December to a high of 220 lbs/day in June. Both are well below the permit limitation of 1,590 lbs/day. Monthly average oil and grease concentrations in the effluent ranged from 2.0 mg/L to 9.5 mg/L. See Table 2-2 for a visual representation of the monthly average results. All permit limitations for effluent oil and grease were met during 2021.

**Figure 2-7. Effluent Grease and Oil 2021 Monthly Averages**

### Temperature

Effluent temperature was sampled five days per week throughout 2021. The data reflect a typical response to seasonal changes (Figure 2-8). The coolest temperatures occurred during December with average monthly temperatures of 20.5 °C. A warming trend continued throughout the summer and fall months to reach a monthly averaged high of 26.4 °C in August. As expected, the year began with a cooling trend and ended with the coolest average temperature during the year.

**Figure 2-8. Effluent Discharge Temperature 2021 Monthly Averages**

### Wastewater Disinfection

Sodium hypochlorite is used to disinfect the treated wastewater at the Goleta Sanitary District. The sodium hypochlorite is flash mixed into the wastewater at the beginning of the chlorine contact channel. At an average effluent flow rate of 4 MGD, the chlorine is in contact with the wastewater for approximately 2½ hours (145 minutes).

The Goleta Sanitary District maintains its chlorine contact tank to provide maximum chlorination effectiveness at all times. The chlorine residual at the end of the chlorine contact channel averaged 3.3 mg/L during 2021. The average monthly values are reported in Table 2-3.

After the disinfection process is complete, the sodium hypochlorite is neutralized (dechlorinated) by adding sodium bisulfite to the wastewater stream. This process lowers residual chlorine to levels that are environmentally safe, before discharge to the ocean such that the chlorine poses no risk to the receiving water environment. Treatment plant

personnel continuously monitor the residual chlorine levels as required by the NPDES permit.

The permit limitations for residual chlorine in the effluent immediately prior to discharge and after dechlorination are as follows: 6-month median of 0.25 mg/L, daily maximum of 0.98 mg/L, and instantaneous maximum of 7.4 mg/L. After dechlorination, the monthly average residual chlorine levels were very consistent throughout the year; ranging from 0.02 mg/L to 0.13 mg/L. The monthly average values are shown in Table 2-3.

### Effluent Bacteria

The effluent was analyzed five days a week for total coliforms, fecal coliforms and enterococcus bacteria. The permit specifies that effluent limits will apply if the Executive Officer concludes that the discharge consistently exceeds receiving water limitations. The monthly average values for total coliform, fecal coliform, and enterococcus bacteria detected in the effluent are presented in Table 2.3. Monthly average values ranged from 9 to 121 MPN/100 mL for total coliform, from 1.8 to 8.5 MPN/100 mL for fecal coliform, and 1.1 to 789 MPN/100 mL for enterococcus. The monthly mean values presented below illustrate that the results were relatively low throughout the year, thereby demonstrating the effectiveness of the chlorination process.

Table 2-3. Chlorine and Bacteria Monthly Averages, 2021

Month	Chlorine at the end of the CCC	Chlorine after Dechlorination	Total Coliform	Fecal Coliform	Enterococcus
	mg/L	mg/L	MPN/100mL		
January	4.5	0.06	113	3.1	2.6
February	4.5	0.07	14	1.8	2.0
March	3.8	0.12	13	1.8	2.6
April	4.5	0.09	30	1.8	1.3
May	4.5	0.02	9	1.9	1.1
June	3.1	0.05	106	1.9	31.0
July	2.0	0.06	63	3.9	14.1
August	2.4	0.13	108	6.2	119
September	2.5	0.02	121	8.5	149
October	2.8	0.06	79	3.0	64.8
November	2.6	0.03	26	2.8	789
December	2.5	0.10	58	3.0	2.8

### Priority Pollutants and Metals

The NPDES permit requires priority pollutant and metals analyses to be performed on the final effluent composite samples annually. Compounds detected in the final effluent samples are presented in Table 2-4; complete copies of all the laboratory reports listing all the chemical compounds and analytical methods are available for review at the Goleta Sanitary District laboratory. Sixteen compounds were detected in the effluent.

Concentrations of detected chemicals are all reported as parts per billion except for TCDD and radioactivity which the units are noted next to the parameter in the table.

**Table 2-4. Detected Priority Pollutants and Metals, Goleta Sanitary District, 2021**

Parameter, units	Effluent, ug/L
Ammonia	17,000
Antimony	0.95
Arsenic	0.92
Beryllium	ND
Bromodichloromethane	0.046
Cadmium	ND
Carbon Tetrachloride	0.039
Chloroform	0.51
Chromium	0.43
Chromium III	<0.5
Chromium 6 <sup>+</sup>	ND
Copper	12
Dibromochloromethane	0.10
Lead	ND
Mercury	ND
Naphthalene	0.017
Nickel	2.8
Selenium	0.57
Silver	ND
TCDD, equivalents, pg/L	0
Thallium	ND
Zinc	46
2,4,6-Trichlorophenol	0.040
Radioactivity, Gross Alpha pCi/L	-3.82 ± 2.11
Radioactivity, Gross Beta pCi/L	22.7 ± 4.40
ND = Not Detected	

### DISCHARGE COMPLIANCE

Throughout 2021 the wastewater discharge from Goleta Sanitary District complied with all applicable permit effluent limitations. All other monitored parameters were below their respective limitations as required by the permit. All metals, priority pollutants, and pesticides were low or undetected throughout the year.

## OCEAN OUTFALL CONDITIONS

The outfall pipeline, diffuser section, and armor rock protection were inspected by divers from Aquatic Bioassay and Consulting Laboratories, Inc. in October 2021. A report was prepared documenting the inspection findings of the diffuser section and along the outfall pipeline and armor rock.

During the diffuser dive survey, 36 diffuser ports were carefully inspected for flow and general efficiency. The remainder of the outfall pipe was inspected for damage, leaks or evidence of leaks and general stability of the pipe and armor rock. Inspection of the outfall yielded no evidence of damage, holes, cracks, or erosion. The pipe and associated armor rock appeared stable with little or no displacement.

The complete report of the outfall dive survey is included as Chapter 4 of this report. The outfall dive video is available for review.



## CHAPTER 3

### COLLECTION SYSTEM ANNUAL SUMMARY

#### Background

Sanitary sewer overflows associated with the Goleta Sanitary District's collection system are subject to the online reporting and notification requirements set forth in the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems Order NO. 2006-0003-DWQ. The Goleta Sanitary District has enrolled under the statewide waste discharge requirement for sanitary sewer systems.

GSD completed the Sanitary Sewer Management Plan (SSMP) in December 2006 and reviews and revises the SSMP annually, as needed. The District's SSMP was updated in January 2021 in accordance with SWRCB Order No. WQ 2013-0058 – EXEC MRP.

This annual report summarizes all lift station and collection system overflows that occurred during 2021 and includes, if any, the cause, corrective actions taken and corrective actions planned. In conjunction with the annual report the District has adopted an updated SSMP. The update is required to ensure that the elements of the sewer system management plan are current and being used effectively to minimize the frequency and impacts of any sewer overflows which may occur in the District service area.

#### Annual Reporting Requirement

This chapter is included as part of the wastewater treatment plant annual report.

#### Summary of 2021 Spills

##### Lift Station Overflows

There were no lift station overflows that occurred within the Goleta Sanitary District service area during 2021.

##### Collection System Overflows

There were two (2) overflows that occurred in 2021. On January 12, 2021 District crews responded to and addressed an overflow from a private property line clean-out on the 1100 block of North Patterson Avenue in unincorporated Santa Barbara. Approximately three hundred (300) gallons of wastewater flowed from the clean out before District crews were able to clear the main sewer line. The overflow was reported on the CIWQS on line reporting system as SSO Event 871606.

On February 10, 2021 District crews responded to and addressed an overflow from a District manhole on the 700 block of Russell Way. Approximately one hundred and twenty (120) gallons of wastewater flowed from the manhole before District crews were able to clear the main sewer line. The overflow was reported on the CIWQS on line reporting system as SSO Event 872278.

**Discussion**

The Goleta Sanitary District's wastewater collection system management plan has been completed and complies with all of the requirements of MRP No. R3-2017-0021. All detailed tasks have been addressed in a timely manner and the collection system has complied with all requirements of the monitoring and reporting program.

## 4.0 Introduction

Aquatic Bioassay biologists conducted underwater dive surveys and underwater videos of the outfall pipe and diffuser from the Goleta Sanitary District Wastewater Treatment Plant on October 15<sup>th</sup>, 2021. The purposes of the survey were to inspect the physical integrity of the outfall pipe and associated armor rock and note any impediments to flow from the 36 diffuser ports. Aquatic Bioassay biologists also assessed the presence of attached and mobile marine organisms that were associated with the outfall and the diffuser.

## 4.1 Materials and Methods

Two divers, using GoPro 7 Hero enclosed in underwater housings, conducted the survey. Once the outfall had been located by global positioning (GPS) and bottom finder, a buoy, attached to a line and a weight, was deployed over the side. Divers entered the water, descended down the line, swam to the diffuser terminus, and began filming. At the end of each dive, a lift float was deployed as a marker for the subsequent dive. On deck between dives, the camera was removed from the housing, the footage was inspected, batteries were replaced, and the housing was reassembled. A total of six dives were completed for the video: diffuser, west and east ports (100 ft. to 60 ft.); deep and middle outfall (60 ft. to 40 ft) and shallow outfall (40 ft. to surf zone).

The footage was downloaded to computer files, edited using *Adobe Premiere* software. The footage was then reviewed by the survey team to assess conditions of the outfall. The video is arranged from the deepest part of the dives (outfall terminus) to the shallowest part of the dives (outfall beginning).

## 4.2 Results

Outfall dive surveys were conducted between approximately 0900 and 1200 hours on October 15<sup>th</sup>, 2021, aboard the *Hey Jude*. Weather conditions were overcast with a 4 knot wind and 2 ft. swell from the southwest (225 °). There was a thermocline at 12 meters. Water color was green with moderate turbidity. Visibility at the terminus of the diffuser (100 feet) and throughout the dive was approximately 3 meters.

### 4.2.1 Diffuser Section (Depth: 100 TO 60 ft)

#### 4.2.1.1 Physical Description

The pipe survey was conducted in the October in hopes that water quality would be optimal for taking video footage of the pipe. This year's visibility was moderate at approximately 3 meters. The diffuser section contains 34 lateral and two terminal discharge ports. The lateral ports are alternately arranged 17 on each side of the diffuser. The end of the pipe is closed except for the two terminal ports, which are situated one above the other. There were no obstructions on the upper port of the terminus cap, however there was little or no flow from both the upper and lower terminal ports.

Lateral ports were observed and videotaped, starting at the terminus and moving shoreward on the east side of the pipe, then from the terminus down the west side until



the most shoreward west port was occupied at the beginning of the diffuser. Along the length of the diffuser pipe, no evidence of leaks, damage, erosion, holes, or cracks were observed, and all of the ports were flowing freely.

An approximately one meter high bed of armor rock supports the diffuser section. Intermittent observations of the supporting armor rock revealed a stable bed of rock with little displacement throughout the diffuser section. Probably during initial construction, the diffuser section appears to have been rotated counter-clockwise (as if one were facing the terminus). Thus, the line across east and west diffuser ports is not parallel to the sea floor, and west ports are about 30 cm lower than east ports. Armor rock covers the outfall from the shoreward beginning of the diffuser to the shoreward beginning of the outfall in very shallow water. The thickness of the armor rock is about one meter.

#### 4.2.1.2 Biological Description

Because of the depth and relative low light at the diffuser (100 ft), algal species are typically scarce. Algae that were present included the kelp *Desmarestia ligulate*, a tubular and leafy red alga (Rhodophyta), crustose coralline algae (Corallinaceae) and the Turkish Towel (*Gigartina sp.*). Among invertebrates, brown cup coral (*Paracyathus sternsi*), colonial strawberry anemones (*Corynactis californica*), red gorgonian (*Lophogorgia chilensis*), California golden gorgonian (*Muricea fruticose*), bat star (*Patiria miniate*) and various species of colonial hydroids and bryozoans dominated. Tube worms and especially the strawberry anemones were commonly observed surrounding the diffuser ports. Sheepshead (*Semicossyphus pulcher*) barred sandbass (*Paralabrax nebulifer*), sargo (*Anisotremus davidsonii*), lingcod (*Ophiodon elongatus*), blacksmith (*Chromis punctipinnis*), rockfish (*Sebastes sp*) and kelp bass (*Paralabrax clathratus*) were observed either on the pipe, or in its immediate vicinity.

#### 4.2.2 Deep and Middle Outfall Section (Depth: 60 TO 40 ft)

##### 4.2.2.1 Physical Description

Throughout the dive survey, the outfall was completely covered by approximately one-meter layer of armor rock. The rock covered pipe extended vertically from the sea floor for about 2 to 3 meters and laterally for about 6 to 7 meters. The armor rock bed appeared stable with little displacement throughout this section. No obvious leaks or discoloration were observed from the armor rock covering the top or sides of the outfall pipe.

##### 4.2.2.2 Biological Description

In this section of the outfall, crustose coralline alga (Corallinaceae), foliose red algae (*Gigartina sp.*) and several species of brown algae (Phaeophyta) dominated the algal community. Among invertebrates, the most abundant were the colonial strawberry anemones (*Corynactis californica*), red gorgonian (*Loptogorgia chilensis*), California golden gorgonian (*Muricea fruticose*), several species of bryozoans, tunicates, sponges, purple urchin (*Strongylocentrotus purpuratus*), red urchin (*Strongylocentrotus franciscanus*), giant sea start (*Pisaster giganteus*), bat star (*Patriana miniate*), California spiny lobster (*Panulirus interruptus*), abalone (*Haliotis sp*) and the giant keyhole limpets



(*Megathura crenulata*). Several fish species were observed including sheepshead (*Semicossyphus pulcher*), barred sandbass (*Paralabrax nebulifer*), kelpbass (*Paralabrax clathratus*), Garibaldi (*Hypsypops rubicundus*), opaleye (*Girella nigricans*), gopher rockfish (*Sebastes carnatus*), blue rockfish (*Sebastes mystinus*), rubberlip perch (*Rhacochilus toxotes*) and blacksmith (*Chromis punctipinnis*).

#### 4.2.3 Middle and Shallow Outfall Section (Depth: 40 ft To Surf Zone)

##### 4.2.3.1 Physical Description

As with the previous section, this outfall section was covered by about one meter of armor rock. The armor rock covered pipe extended horizontally and laterally as above. The armor rock bed appeared stable with little displacement throughout this section. No obvious leaks or discoloration were observed from the armor rock covering the top or sides of the outfall pipe.

##### 4.2.3.2 Biological Description

Dominant algae in this pipe section included foliose red algae (*Gigartina sp.*) and crustose coralline algae and several species of brown algae including giant kelp (*Macrocystis pyrifera*). Among the macroinvertebrates, tunicates, purple urchin (*Strongylocentrotus purpuratus*), giant keyhole limpets (*Megathura crenulata*), giant sea start (*Pisaster giganteus*), bat star (*Patiria miniata*), and abalone (*Haliotis sp.*) were most dominant. Fish species observed at this depth included sheepshead (*Semicossyphus pulcher*), opaleye (*Girella nigricans*), Garibaldi (*Hypsypops rubicundus*), kelp bass (*Paralabrax clathratus*), sargo (*Anisotremus davidsoni*), white perch (*Phanerodon furcatus*) and blacksmith (*Chromis punctipinnis*).



## Discussion

During the diffuser dive survey, 36 diffuser ports were carefully inspected for flow and general efficiency. This year, none of the diffuser ports were obstructed with debris and all of the ports were flowing freely. The remainder of the outfall pipe was inspected for damage, leaks or evidence of leaks and general stability of the pipe and armor rock. Inspection of the outfall yielded no evidence of damage, holes, cracks, or erosion. The pipe and associated armor rock appeared stable with little or no displacement.

The outfall continues to support a rocky reef community typical of other areas on the central California coast. A visual survey yielded numerous different species of kelp, macroinvertebrates, and fishes. A number of species of fish were represented by juvenile or larval forms, which indicates that recruitment has been occurring. Fish appeared healthy, with no evidence of deformities, tumors, fin rot, or lesions.

