

**City of Morro Bay and
Cayucos Sanitary District**

**OFFSHORE MONITORING
AND REPORTING PROGRAM**

SEMI-ANNUAL EFFLUENT SAMPLING

**CHEMICAL AND BIOASSAY
ANALYSIS RESULTS**

JANUARY 2018



Marine Research Specialists

**4744 Telephone Rd., Suite 3 PMB 315
Ventura, California 93003**

Report to
City of Morro Bay and
Cayucos Sanitary District

955 Shasta Avenue
Morro Bay, California 93442
(805) 772-6272

MONITORING
AND
REPORTING PROGRAM

SEMI-ANNUAL EFFLUENT REPORT

CHEMICAL AND BIOASSAY
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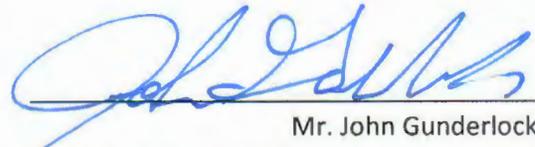
Prepared by
Douglas A. Coats

Marine Research Specialists
4744 Telephone Rd., Suite 3 PMB 315
Ventura, California 93003

Telephone: (805) 644-1180
E-mail: Marine@Rain.org

February 2018

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Mr. John Gunderlock
Wastewater/Collections System Supervisor
City of Morro Bay/Cayucos CSD Wastewater Treatment Plant

Date: 2/20/18

marine research specialists

4744 Telephone Rd., Suite 3 PMB 315 · Ventura, CA 93003 · 805-644-1180

John Gunderlock
Wastewater & Collection Systems Supervisor
City of Morro Bay/Cayucos Sanitary District
955 Shasta Avenue
Morro Bay, CA 93442

19 February 2018

Reference: Semiannual Effluent Self-Monitoring Report for January through June 2018

Dear Mr. Gunderlock:

This self-monitoring report documents the chemical and bioassay analysis results for effluent samples collected on 30 January 2018 as required by NPDES discharge permit CA0047881.¹ Analyses of effluent samples were conducted in accordance with the monitoring requirements specified in the permit, including:

- Chemical analyses conducted on a composite sample;
- Nutrient compounds measured in a grab sample; and
- Chronic bioassays conducted on a composite sample.

Three attachments to this report demonstrate that all chemical concentrations and toxicological endpoints were within the limitations specified in the discharge permit. Attachment A compares the results of the analyses with the limitations established for each of the effluent parameters specified in the permit. The comparisons are consistent with the minimum-level (ML) reporting requirements of the permit, and all units have been converted to those used in the discharge monitoring report (DMR) that was submitted electronically within the California Integrated Water Quality System (Attachment B). Attachment C collates the original laboratory reports, including raw data and results, pertinent QA/QC analyses, and chains of custody.

The chemical and bioassay analyses of effluent samples collected in January 2018 augment a comprehensive dataset spanning two-and-a-half decades. Together, these measurements demonstrate the consistently benign character of the discharge from the MBSCD² treatment plant. The general lack of toxicity and chemical contaminants within the effluent samples reflects the absence of heavy industry within the collection area and the high performance of the treatment process. The concentrations of the few chemical compounds detected in the January 2018 samples were typical of wastewater derived from domestic sources, and all concentrations were considerably below the limits specified in the NPDES discharge permit.

Six of the eleven chemicals that are monitored on a semiannual basis were detected in the January 2018 composite sample. Of those, four had concentrations high enough to be quantified above their respective MLs: copper, lead, selenium, and zinc. Copper, lead, and zinc are commonly occurring metals that enter the wastewater collection system through erosion of natural mineral deposits along the central California coast. They may also enter the system through corrosion of household plumbing systems. Nevertheless, the concentrations of these compounds that were detected in the January 2018 effluent were well below the levels deemed deleterious to marine organisms.

Small but quantifiable concentrations of the metalloid selenium were also detected within the January 2018 effluent sample. The occurrence of selenium within effluent is similar to that of the commonly occurring

¹ Regional Water Quality Control Board (RWQCB) - Central Coast Region and the Environmental Protection Agency (EPA) – Region IX. 2009. Waste Discharge Requirements (Order No. R3-2008-0065) and National Pollutant Discharge Elimination System (Permit No. CA0047881) for the Morro Bay and Cayucos Wastewater Treatment Plant Discharges to the Pacific Ocean, Morro Bay, San Luis Obispo County. Effective 1 March 2009.

² City of Morro Bay and the Cayucos Sanitary District, joint owners of the wastewater treatment and disposal facility

Mr. J. Gunderlock
19 February 2018

Page 2

metals because it too occurs naturally in the mineralogy of the central California coast. As in past effluent samples, its concentration in the January effluent sample was two orders of magnitude below levels deemed deleterious to marine organisms.

The low overall toxicity found in the chronic bioassay affirmed the effluent's low contaminant load. The chronic toxicity test conducted on a January 2018 composite effluent sample measured the effluent's potential to impact the development of larval red abalone (*Haliotis rufescens*) by exposing those organisms to a range of effluent dilutions in the laboratory. Although the larval abalone are highly sensitive to contaminants, adverse effects were not observed in effluent that was seven times more concentrated than that allowed by the discharge permit.

Please contact the undersigned if you have questions regarding these results.

Sincerely,

 **MARINE RESEARCH SPECIALISTS**
Vice President

2018.02.20 09:18:01 -08'00'

Douglas A. Coats
Program Manager

ATTACHMENT A
MINIMUM LEVEL REPORTING

ATTACHMENT A
Analytical Results for Effluent Samples Collected during January 2018

Chemical Compound or Parameter	Units	Method	Detection Limit ^a	Practical ^b Quantification Limit	Minimum Level ^c	Permit ^d Limit	Reported Value
Nutrients							
Nitrate (as N)	mg/L	300.0	—	0.1	—	— ^e	ND
Urea (as N)	mg/L	Mulvenna & Savid	—	0.01	—	—	0.079 as measured
Ortho-Phosphate (as P)	mg/L	300.0	—	0.1	—	—	0.8 as measured
Dissolved Silica (SiO ₂)	mg/L	200.7	—	0.5	—	—	12 as measured
Objectives for the Protection of Marine Aquatic Life							
Arsenic	mg/L	200.8	0.0007	0.002	0.002	0.67	DNQ 0.00097 Est. Conc.
Cadmium	mg/L	200.7	0.0011	0.01	0.01	0.13	ND
Chromium VI ^f	mg/L	200.7	0.0012	0.01	0.01	0.27	ND
Copper	mg/L	200.7	0.0012	0.01	0.01	0.14	0.011 as measured
Lead	mg/L	200.8	0.0001	0.001	0.0005	0.27	0.00054 as measured ^g
Mercury	µg/L	245.1	0.029	0.2	0.2	5.29	ND
Nickel	mg/L	200.7	0.0023	0.01	0.02	0.67	DNQ 0.0048 Est. Conc.
Selenium	mg/L	200.8	0.00019	0.002	0.002	2.01	0.0029 as measured
Silver	mg/L	200.7	0.0013	0.01	0.01	0.07	ND
Zinc	mg/L	200.7	0.0095	0.05	0.02	1.62	0.041 as measured ^g
Cyanide	mg/L	335.4	0.0017	0.005	0.005	0.13	ND
Toxicity-Chronic: H. Rufescens	TUc	600/R-95/136	—	—	—	134.	17.9 as measured

^a The Method Detection Limit (MDL) is the analysis- and instrument-specific minimum concentration at which the presence of a substance can be reported with 99% confidence. It is determined from an analysis of a sample in a matrix containing the analyte.

^b The Practical Quantification Limit (PQL) is the analysis- and instrument-specific minimum concentration of a substance that can be routinely determined with a high degree of certainty (>99.9% confidence).

^c The Minimum Level (ML) is the method-specific minimum concentration of a substance that can be quantitatively measured in a sample given the current analytical performance used by most certified laboratories within California, as specified in the 2005 Ocean Plan.

^d The Permit Limit is the lowest, most-stringent threshold that is associated with the longest-duration averaging period. For limits established to protect marine aquatic life, the six-month median is the most stringent threshold. For other constituents, limits are imposed only on monthly averages.

^e No permit limits have been established for nutrients.

^f Total chromium concentration was reported rather than the concentration of the hexavalent oxidation state alone.

^g The reported concentration was below the PQL and was flagged “as estimated” by the chemistry laboratory (See Attachment C). However, in accordance with the guidance from the COP, the reported value is listed “as measured” herein, because the measured value exceeded the ML.

ATTACHMENT B
DISCHARGE MONITORING REPORTS

eSMR PDF

Summary: DMR

NPDES Permit #: CA0047881

Facility: THE CITY OF MORRO BAY/CAYUCOS SANITARY DISTRICT WWTP

DMR Parameters

Feature - LS: 001-S				Monitoring Period: 01/01/2018 - 06/30/2018							
Loc	Sea	Param	Param Text	Q1	Q2	C1	C2	C3	Excur Count	Analy Freq	Sample Type
1	0	00620	Nitrogen, nitrate total (as N)					NODI: B Daily Maximum			
1	0	00720	Cyanide, total (as CN)			NODI: B 6 Month Median	NODI: B Daily Maximum	NODI: B Instantaneous Maximum			
1	0	00955	Silica, dissolved (as SiO2)					12.0 mg/L Daily Maximum	0	Semiannual	GRAB
1	0	00978	Arsenic, total recoverable			NODI: Q 6 Month Median	NODI: Q Daily Maximum	NODI: Q Instantaneous Maximum			
1	0	00981	Selenium, total recoverable			0.0029 mg/L 6 Month Median	0.0029 mg/L Daily Maximum	0.0029 mg/L Instantaneous Maximum	0	Semiannual	COMP24
1	0	01032	Chromium, hexavalent (as Cr)			NODI: B 6 Month Median	NODI: B Daily Maximum	NODI: B Instantaneous Maximum			
1	0	01074	Nickel, total recoverable			NODI: Q 6 Month Median	NODI: Q Daily Maximum	NODI: Q Instantaneous Maximum			
1	0	01079	Silver total recoverable			NODI: B 6 Month Median	NODI: B Daily Maximum	NODI: B Instantaneous Maximum			
1	0	01094	Zinc, total recoverable			0.041 mg/L 6 Month Median	0.041 mg/L Daily Maximum	0.041 mg/L Instantaneous Maximum	0	Semiannual	COMP24
1	0	01113	Cadmium, total recoverable			NODI: B 6 Month Median	NODI: B Daily Maximum	NODI: B Instantaneous Maximum			

Feature - LS: 001-S				Monitoring Period: 01/01/2018 - 06/30/2018							
Loc	Sea	Param	Param Text	Q1	Q2	C1	C2	C3	Excur Count	Analy Freq	Sample Type
1	0	01114	Lead, total recoverable			5.4E-4 mg/L 6 Month Median	5.4E-4 mg/L Daily Maximum	5.4E-4 mg/L Instantaneou s Maximum	0	Semiannual	COMP24
1	0	01119	Copper, total recoverable			0.011 mg/L 6 Month Median	0.011 mg/L Daily Maximum	0.011 mg/L Instantaneou s Maximum	0	Semiannual	COMP24
1	0	04175	Phosphate, ortho (as P)					0.8 mg/L Daily Maximum	0	Semiannual	GRAB
1	0	71800	Urea					0.079 mg/L Daily Maximum	0	Semiannual	GRAB
1	0	71901	Mercury, total recoverable			NODI: B 6 Month Median	NODI: B Daily Maximum	NODI: B Instantaneou s Maximum			
1	0	TTK1D	Static 48Hr Chronic Macrocystis Pyrifera					NODI: 9 Daily Maximum			
1	0	TTK3R	Static 48Hr Chronic Haliotis Rufescens					17.9 tox chronic Daily Maximum	0	Semiannual	COMP24

ATTACHMENT C
LABORATORY REPORTS



Date of Report: 02/08/2018

Doug Coats

Marine Research Specialists

4744 Telephone Rd

Ste 3-315

Suite A

Ventura, CA 93003-3238

Client Project: [none]

BCL Project: Semi-Annual Eff

BCL Work Order: 1803374

Invoice ID: B293555

Enclosed are the results of analyses for samples received by the laboratory on 1/31/2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Christina Herndon
Client Service Rep

Stuart Buttram
Technical Director

Certifications: CA ELAP #1186; NV #CA00014; OR ELAP #4032-001; AK UST101

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Analysis Effluent Samples to be collected from the Morro Bay Wastewater Treatment Plant in January 2018

1803368^{6/1/15} 1803374

Analysis	Sample	Method
Level IIA QC Report concentrations that are detected above the MDL, but are below the PQL		
10 Metals:		
Ag Silver	Composite	EPA 200.7
As Arsenic	Composite	EPA 200.8
Cd Cadmium	Composite	EPA 200.7
Cr Chromium (Total)	Composite	EPA 200.7
Cu Copper	Composite	EPA 200.7
Hg Mercury	Composite	EPA 245.1
Ni Nickel	Composite	EPA 200.7
Pb Lead	Composite	EPA 200.8
Se Selenium	Composite	EPA 200.8
Zn Zinc	Composite	EPA 200.7
Cyanide	Composite	EPA 335.3

Bottle Order to be sent to: Morro Bay Wastewater Treatment Plant
 160 Atascadero Rd.
 Morro Bay, CA 93442
 Telephone: (805) 772-6272

Invoice and Report to be sent to: Dr. Douglas A. Coats (Marine@Rain.org)
 Marine Research Specialists
 4744 Telephone Rd Ste 3-315
 Ventura, CA 93003-5258
 Telephone: (805) 644-1180

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BC LABORATORIES INC. 602 11/31 COOLER RECEIPT FORM Page 1 Of 1

Submission #: 1803374 18-03374

SHIPPING INFORMATION: Fed Ex UPS Ontrac Hand Delivery BC Lab Field Service Other (Specify) _____

SHIPPING CONTAINER: Ice Chest None Box Other (Specify) _____

FREE LIQUID: YES NO W / S

Refrigerant: Ice Blue Ice None Other Comments: _____

Custody Seals: Ice Chest Containers None Comments: _____

Intact? Yes No Intact? Yes No

All samples received? Yes No All samples containers intact? Yes No Description(s) match COC? Yes No

COC Received: YES NO Emissivity: 0.96 Container: PE Thermometer ID: 706 Date/Time: 11/31/1990

Temperature: (A) 0.7 °C (C) 0.4 °C Analyst Init: RL

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT PE UNPRES										
4oz / 8oz / 16oz PE UNPRES										
2oz Cr ⁴⁺										
QT INORGANIC CHEMICAL METALS										
INORGANIC CHEMICAL METALS 4oz / 8oz / 16oz										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT CHEMICAL OXYGEN DEMAND										
PA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 1664										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/508/5080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz EPA 548										
QT EPA 549										
QT EPA 8015M										
QT EPA 820										
8oz / 16oz / 32oz AMBER										
8oz / 16oz / 32oz JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
TEDLAR BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
SUMMA CANISTER										

Comments: _____

Sample Numbering Completed By: 602 Date/Time: 11/31 1990

A = Actual / C = Corrected

Rev 21 05/23/2016
(S:\WPDoc\WordPerfect\LAB_SDCS\FORMS\SAMREC.rvt 20)



Marine Research Specialists
4744 Telephone Rd
Ste 3-315
Suite A
Ventura, CA 93003-3238

Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information		
1803374-01	COC Number:	---	Receive Date: 01/31/2018 19:30
	Project Number:	---	Sampling Date: 01/30/2018 09:45
	Sampling Location:	---	Sample Depth: ---
	Sampling Point:	BC1 Comp ARS Comp Eff ARS	Lab Matrix: Water
	Sampled By:	John Gunderlock	Sample Type: Wastewater

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4744 Telephone Rd
Ste 3-315
Suite A
Ventura, CA 93003-3238

Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (General Chemistry)

BCL Sample ID: 1803374-01	Client Sample Name: BC1 Comp ARS Comp Eff ARS, 1/30/2018 9:45:00AM, John Gunderlock
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Cyanide	ND	mg/L	0.0050	0.0017	EPA-335.4	ND		1

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC
			Date/Time					Batch ID
1	EPA-335.4	02/05/18 08:52	02/07/18 13:00		JNC	KONE-1	1	B003872

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4744 Telephone Rd
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Suite A
Ventura, CA 93003-3238

Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Metals Analysis

BCL Sample ID: 1803374-01	Client Sample Name: BC1 Comp ARS Comp Eff ARS, 1/30/2018 9:45:00AM, John Gunderlock
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Mercury	ND	ug/L	0.20	0.029	EPA-245.1	ND		1
Total Recoverable Arsenic	0.97	ug/L	2.0	0.70	EPA-200.8	ND	J	2
Total Recoverable Cadmium	ND	ug/L	10	1.1	EPA-200.7	ND		3
Total Recoverable Chromium	ND	ug/L	10	1.2	EPA-200.7	ND		3
Total Recoverable Copper	11	ug/L	10	1.2	EPA-200.7	ND		3
Total Recoverable Lead	0.54	ug/L	1.0	0.10	EPA-200.8	ND	J	2
Total Recoverable Nickel	4.8	ug/L	10	2.3	EPA-200.7	ND	J	3
Total Recoverable Selenium	2.9	ug/L	2.0	0.19	EPA-200.8	0.40		2
Total Recoverable Silver	ND	ug/L	10	1.3	EPA-200.7	ND		3
Total Recoverable Zinc	41	ug/L	50	9.5	EPA-200.7	ND	J	3

Run #	Method	Prep Date	Run		Analyst	Instrument	Dilution	QC
			Date/Time					Batch ID
1	EPA-245.1	02/05/18 09:00	02/07/18 14:37		JP1	CETAC2	1	B003870
2	EPA-200.8	02/06/18 08:30	02/06/18 22:42		ARD	PE-EL3	1	B004044
3	EPA-200.7	02/05/18 08:30	02/05/18 20:59		JRG	PE-OP2	1	B003878

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4744 Telephone Rd
Ste 3-315
Suite A
Ventura, CA 93003-3238

Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B003872						
Total Cyanide	B003872-BLK1	ND	mg/L	0.0050	0.0017	

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Marine Research Specialists
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Suite A
Ventura, CA 93003-3238

Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
QC Batch ID: B003872										
Total Cyanide	B003872-BS1	LCS	0.13842	0.15000	mg/L	92.3		90 - 110		

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Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Control Limits		
								Percent Recovery	RPD	Percent Recovery
QC Batch ID: B003872		Used client sample: N								
Total Cyanide	DUP	1803537-02	ND	ND		mg/L			10	
	MS	1803537-02	ND	0.097071	0.10000	mg/L		97.1		90 - 110
	MSD	1803537-02	ND	0.098494	0.10000	mg/L	1.5	98.5	10	90 - 110

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Ventura, CA 93003-3238

Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Metals Analysis

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: B003870						
Total Mercury	B003870-BLK1	ND	ug/L	0.20	0.029	
QC Batch ID: B003878						
Total Recoverable Cadmium	B003878-BLK1	ND	ug/L	10	1.1	
Total Recoverable Chromium	B003878-BLK1	ND	ug/L	10	1.2	
Total Recoverable Copper	B003878-BLK1	ND	ug/L	10	1.2	
Total Recoverable Nickel	B003878-BLK1	ND	ug/L	10	2.3	
Total Recoverable Silver	B003878-BLK1	ND	ug/L	10	1.3	
Total Recoverable Zinc	B003878-BLK1	ND	ug/L	50	9.5	
QC Batch ID: B004044						
Total Recoverable Arsenic	B004044-BLK1	ND	ug/L	2.0	0.70	
Total Recoverable Lead	B004044-BLK1	ND	ug/L	1.0	0.10	
Total Recoverable Selenium	B004044-BLK1	0.40200	ug/L	2.0	0.19	J

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Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Metals Analysis

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab
								Percent Recovery	RPD	
QC Batch ID: B003870										
Total Mercury	B003870-BS1	LCS	0.97250	1.0000	ug/L	97.2		85 - 115		
QC Batch ID: B003878										
Total Recoverable Cadmium	B003878-BS1	LCS	202.79	200.00	ug/L	101		85 - 115		
Total Recoverable Chromium	B003878-BS1	LCS	211.30	200.00	ug/L	106		85 - 115		
Total Recoverable Copper	B003878-BS1	LCS	393.43	400.00	ug/L	98.4		85 - 115		
Total Recoverable Nickel	B003878-BS1	LCS	430.07	400.00	ug/L	108		85 - 115		
Total Recoverable Silver	B003878-BS1	LCS	99.374	100.00	ug/L	99.4		85 - 115		
Total Recoverable Zinc	B003878-BS1	LCS	554.18	500.00	ug/L	111		85 - 115		
QC Batch ID: B004044										
Total Recoverable Arsenic	B004044-BS1	LCS	110.41	100.00	ug/L	110		85 - 115		
Total Recoverable Lead	B004044-BS1	LCS	104.52	100.00	ug/L	105		85 - 115		
Total Recoverable Selenium	B004044-BS1	LCS	102.72	100.00	ug/L	103		85 - 115		

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Marine Research Specialists
4744 Telephone Rd
Ste 3-315
Suite A
Ventura, CA 93003-3238

Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Metals Analysis

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Control Limits		Lab Quals
								Percent Recovery	RPD	
QC Batch ID: B003870		Used client sample: Y - Description: BC1 Comp ARS Comp Eff ARS, 01/30/2018 09:45								
Total Mercury	DUP	1803374-01	ND	ND		ug/L			20	
	MS	1803374-01	ND	1.2125	1.0000	ug/L		121		70 - 130
	MSD	1803374-01	ND	1.1400	1.0000	ug/L	6.2	114	20	70 - 130
QC Batch ID: B003878		Used client sample: N								
Total Recoverable Cadmium	DUP	1803452-02	ND	ND		ug/L			20	
	MS	1803452-02	ND	195.51	200.00	ug/L		97.8		75 - 125
	MSD	1803452-02	ND	200.09	200.00	ug/L	2.3	100	20	75 - 125
Total Recoverable Chromium	DUP	1803452-02	ND	ND		ug/L			20	
	MS	1803452-02	ND	198.74	200.00	ug/L		99.4		75 - 125
	MSD	1803452-02	ND	203.28	200.00	ug/L	2.3	102	20	75 - 125
Total Recoverable Copper	DUP	1803452-02	ND	ND		ug/L			20	
	MS	1803452-02	ND	390.64	400.00	ug/L		97.7		75 - 125
	MSD	1803452-02	ND	400.86	400.00	ug/L	2.6	100	20	75 - 125
Total Recoverable Nickel	DUP	1803452-02	2.5006	3.5680		ug/L	35.2		20	J,A02
	MS	1803452-02	2.5006	396.12	400.00	ug/L		98.4		75 - 125
	MSD	1803452-02	2.5006	404.24	400.00	ug/L	2.0	100	20	75 - 125
Total Recoverable Silver	DUP	1803452-02	ND	ND		ug/L			20	
	MS	1803452-02	ND	95.365	100.00	ug/L		95.4		75 - 125
	MSD	1803452-02	ND	96.760	100.00	ug/L	1.5	96.8	20	75 - 125
Total Recoverable Zinc	DUP	1803452-02	62.278	83.304		ug/L	28.9		20	A02
	MS	1803452-02	62.278	553.95	500.00	ug/L		98.3		75 - 125
	MSD	1803452-02	62.278	569.97	500.00	ug/L	2.9	102	20	75 - 125
QC Batch ID: B004044		Used client sample: N								
Total Recoverable Arsenic	DUP	1803470-01	ND	ND		ug/L			20	
	MS	1803470-01	ND	104.15	100.00	ug/L		104		70 - 130
	MSD	1803470-01	ND	106.45	100.00	ug/L	2.2	106	20	70 - 130
Total Recoverable Lead	DUP	1803470-01	ND	ND		ug/L			20	
	MS	1803470-01	ND	101.38	100.00	ug/L		101		70 - 130
	MSD	1803470-01	ND	103.50	100.00	ug/L	2.1	104	20	70 - 130
Total Recoverable Selenium	DUP	1803470-01	0.24500	0.42700		ug/L	54.2		20	J,A02
	MS	1803470-01	0.24500	95.974	100.00	ug/L		95.7		70 - 130
	MSD	1803470-01	0.24500	98.342	100.00	ug/L	2.4	98.1	20	70 - 130

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Marine Research Specialists
4744 Telephone Rd
Ste 3-315
Suite A
Ventura, CA 93003-3238

Reported: 02/08/2018 15:56
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Notes And Definitions

- J Estimated Value (CLP Flag)
- MDL Method Detection Limit
- ND Analyte Not Detected
- PQL Practical Quantitation Limit
- A02 The difference between duplicate readings is less than the quantitation limit.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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LABORATORY REPORT



"dedicated to providing quality aquatic toxicity testing"

4350 Transport Street, Unit 107
Ventura, CA 93003
(805) 650-0546 FAX (805) 650-0756
CA ELAP Cert. No.: 1775

Date: February 4, 2018
Client: Marine Research Specialists
4744 Telephone Rd
Suite 3-315
Ventura, CA 93003-5258
Attn: Doug Coats

Laboratory No.: A-18013101-001
Sample I.D.: Morro Bay Effluent

Sample Control: The sample was received by ATL within the recommended hold time, in a chilled state, and with the chain of custody record attached.

Date Sampled: 01/30/18 (composite)
Date Received: 01/31/18
Temp. Received: 0.8°C
Chlorine (TRC): 0.0 mg/l
Dates Tested: 01/31/18 to 02/02/18

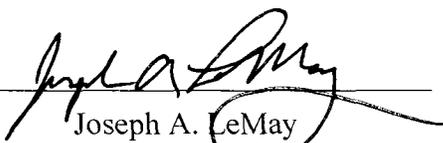
Sample Analysis: The following analyses were performed on your sample:
Abalone Larval Development Short-Term Toxicity Test (EPA 600/R-95/136).

Attached are the test data generated from the analysis of your sample.

Result Summary:

<u>Test</u>	<u>NOEC</u>	<u>TUc</u>
Abalone Development:	5.6%	17.9

Quality Control: Reviewed and approved by:


Joseph A. LeMay
Laboratory Director

ABALONE LARVAL DEVELOPMENT SHORT-TERM TOXICITY TEST



Lab No.: A-18013101-001
Client/ID: Morro Bay WWTP

Date tested: 01/31/18 - 02/02/18

TEST SUMMARY

Species: *Haliotis rufescens*.
Protocol: EPA/600/R-95/136.
Test type: Static.
Test chamber: glass beakers.
Temperature: 15 +/- 1°C.
Number of embryos per chamber: 1600 (approx.).
QA/QC Batch No.: RT-180131 (ran concurrently)

Source: Cultured Abalone Farms.
Dilution water: Lab seawater.
Endpoints: NOEC.
Test volume: 200 ml.
Aeration: None.
Number of replicates: 5.

RESULTS SUMMARY

Sample Concentration	Percent Normal Development	
Control (Brine)	91.3%	
Control (Dilution)	92.1%	
3.2%	91.7%	
5.6%	91.4%	
10.0%	0%	*
18.0%	0%	*
32.0%	0%	*
* Statistically significantly less than control at P = 0.05 level		

CHRONIC TOXICITY

NOEC	5.6%
TUc	17.9

QA/QC TEST ACCEPTABILITY

Parameter	Result
Average control normality ≥80%	PASSED (91.3%)
%MSD <20% relative to control	PASSED (%MSD = 3.2%)
Please see RT-180131 report for additional test acceptability criteria.	

Abalone Larval Development Test-Proportion Normal

Start Date: 1/31/2018 15:00 Test ID: 18013101ab Sample ID: Morro Bay
 End Date: 2/2/2018 15:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF1-POTW
 Sample Date: 1/30/2018 09:45 Protocol: EPAW 95-EPA/600/R-95/136 Test Species: HR-Haliotis rufescens
 Comments:

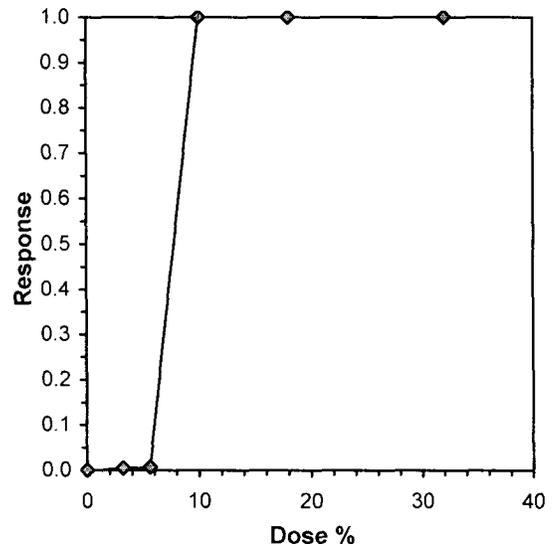
Conc-%	1	2	3	4	5
B-Control	0.9397	0.9273	0.8966	0.8889	0.9130
D-Control	0.8992	0.9266	0.9455	0.9099	0.9217
3.2	0.9138	0.9060	0.9322	0.9391	0.8917
5.6	0.8862	0.9328	0.9138	0.9439	0.8957
10	0.0000	0.0000	0.0000	0.0000	0.0000
18	0.0000	0.0000	0.0000	0.0000	0.0000
32	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					N	t-Stat	1-Tailed Critical	MSD	Isotonic	
			Mean	Min	Max	CV%	Mean					N-Mean	
B-Control	0.9131	0.9919	1.2732	1.2310	1.3226	2.970	5				0.9202	1.0000	
D-Control	0.9206	1.0000	1.2865	1.2476	1.3351	2.575	5	*			0.9164	0.9958	
3.2	0.9166	0.9956	1.2792	1.2354	1.3215	2.749	5	0.303	2.110	0.0504	0.9138	0.9930	
5.6	0.9145	0.9934	1.2763	1.2267	1.3317	3.453	5	0.425	2.110	0.0504	0.0000	0.0000	
10	0.0000	0.0000	0.0500	0.0500	0.0500	0.000	5				0.0000	0.0000	
18	0.0000	0.0000	0.0500	0.0500	0.0500	0.000	5				0.0000	0.0000	
32	0.0000	0.0000	0.0500	0.0500	0.0500	0.000	5				0.0000	0.0000	

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94219	0.881	0.18109	-1.2891
Bartlett's Test indicates equal variances (p = 0.84)	0.3395	9.21034		
The control means are not significantly different (p = 0.57)	0.58948	2.306		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	5.6	10	7.48331	17.8571	0.02922	0.03172	0.00014	0.00143	0.90923	2, 12

Linear Interpolation (200 Resamples)					
Point	%	SD	95% CL(Exp)		Skew
IC05	5.7906	0.0420	5.6490	5.8288	-0.6395
IC10	6.0122	0.0398	5.8780	6.0483	-0.6395
IC15	6.2337	0.0376	6.1070	6.2679	-0.6395
IC20	6.4553	0.0354	6.3360	6.4874	-0.6395
IC25	6.6768	0.0332	6.5650	6.7070	-0.6395
IC40	7.3415	0.0265	7.2520	7.3656	-0.6395
IC50	7.7845	0.0221	7.7100	7.8046	-0.6395



ABALONE CHRONIC BIOASSAY



Lab No.: A-18013101-001

Client ID: MRS - Morro Bay Effluent

Start Date: 01/31/2018

WATER QUALITY READINGS

Sample	Initial Readings				24 Hrs		Final Readings			
	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)	Temp (°C)	pH	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)
Control (brine)	15.3	8.3	8.0	34	14.9	7.9	15.0	7.9	8.1	34
Control (lab)	15.2	8.4	8.0	34	14.8	7.9	14.9	7.5	8.1	34
3.2%	15.2	8.4	8.0	34	14.8	7.9	15.0	7.5	8.1	34
5.6%	15.3	8.4	8.0	34	14.9	7.9	15.0	7.8	8.1	34
10%	15.3	8.4	8.0	34	14.7	7.9	14.9	7.5	8.1	34
18%	15.2	8.4	8.0	34	14.7	7.9	14.8	7.5	8.1	34
32%	15.3	8.4	8.1	34	14.8	7.9	14.8	7.2	8.1	34

Sample as received: Chlorine: 4 mg/l; pH: 8.0; Salinity: 0 ppt; Temp: 0.8 °C; DO: 5.9 mg/l.

Initial readings: pk Date/Time: 1-31-18 1500 Final readings: pk Date/Time: 2-2-18 1500 NH₄-N = 66 mg/L

MICROSCOPIC EXAMINATION

Beaker No.	Sample Conc.	Number Normal	Number Abnormal	Beaker No.	Sample Conc.	Number Normal	Number Abnormal	Beaker No.	Sample Conc.	Number Normal	Number Abnormal
1	5.6	109	14	13	18	0	100	25	3.2	108	7
2	BC	109	7	14	5.6	111	8	26	BC	104	13
3	3.2	106	10	15	C	104	6	27	3.2	0	100
4	3.2	0	100	16	10	0	100	28	10	0	100
5	18	0	100	17	3.2	0	100	29	C	106	9
6	C	107	12	18	5.6	106	10	30	5.6	103	12
7	10	0	100	19	BC	104	12	31	18	0	100
8	BC	102	8	20	18	0	100	32	BC	105	10
9	3.2	106	11	21	3.2	110	8	33	3.2	0	100
10	10	0	100	22	18	0	100	34	3.2	107	13
11	3.2	0	100	23	5.6	101	6	35	10	0	100
12	C	101	8	24	C	101	10				

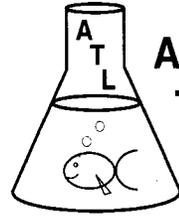
Microscopic examination: Analyst: pk Date: 2-3-18 Time: 0900



CHAIN OF CUSTODY

CHAIN OF CUSTODY

Client: City of Morro Bay
 Wastewater Treatment Plant
 Address: 160 Atascadero Road
 Morro Bay, CA 93442
 Project Manager: Doug Coats - MRS
 Phone: (805) 644-1180
 Fax: (805) 289-3935
 Purchase Order No:



**Aquatic
 Testing
 Laboratories**

4350 Transport Street, Unit 107
 Ventura, CA 93003
 (805) 650-0546 Fax (805) 650-0756

Sample ID	Sample Date	Sample Time	Sample Type *	Chlorine (TRC)**	Number of Containers	Testing Requested
Comp. Eff.	1/30/18	0945	E	<.05	1 (one gallon)	Abalone Chronic
Sample by: John Gunderlock						

Special Instructions:

**** Note: Total residual chlorine must be taken immediately after sample collection if sample is a chlorinated effluent.**

* L - Liquid, S - Solid, SS - Semi-Solid/sludge, RW - Receiving Water, GW - Ground Water, E - Effluent

CUSTODY TRANSFERS

Relinquished by (signature)	Received by (signature)	Date (mm/dd/yy)	Time (hh:mm)	Sample Intact? (Yes, No)	Temperature Received (°C)
<i>[Signature]</i>	Fel Ex	1/30/18	1345	Y	-
Fel Ex	<i>[Signature]</i>	1-31-18	1000	Y	0.8°



***REFERENCE
TOXICANT
DATA***

**ABALONE LARVAL DEVELOPMENT
SHORT-TERM TOXICITY TEST
* REFERENCE TOXICANT ***



QA/QC Batch No.: RT-180131

Date tested: 01/31/18 – 02/02/18

TEST SUMMARY

Species: *Haliotis rufescens*.
 Protocol: EPA/600/R-95/136.
 Test type: Static.
 Test chamber: Plastic beakers.
 Temperature: 15 +/- 1°C.
 Number of embryos per chamber: 1600 (approx.).
 Reference Toxicant: ZnSO₄(7H₂O).

Source: Cultured Abalone Farm.
 Dilution water: Lab seawater.
 Endpoints: NOEC, IC25 at 48 hrs.
 Test volume: 200 ml.
 Aeration: None.
 Number of replicates: 5.
 Ref. Tox. source: VWR.
 Lot No.: 3357C295.

RESULTS SUMMARY

SAMPLE CONCENTRATION	PERCENT NORMAL DEVELOPMENT
Control	92.8%
10 µg/l	91.3%
18 µg/l	90.2%
32 µg/l	39.4% *
56 µg/l	0% *
100 µg/l	0% *

* Statistically significantly less than control at P = 0.05 level

CHRONIC TOXICITY

NOEC	18 µg/l
IC25	23.7 µg/l

QA/QC TEST ACCEPTABILITY

Parameter	Result
Average control normality ≥80%	Yes (92.8%)
56 µg/l treatment response significantly less than control response	Yes (NOEC = 18 µg/l)
%MSD <20% relative to control	Yes (%MSD = 5.3%)

Abalone Larval Development Test-Proportion Normal

Start Date: 1/31/2018 15:00 Test ID: RT180131ab Sample ID: REF-Ref Toxicant
 End Date: 2/2/2018 15:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: ZNSO-Zinc sulfate
 Sample Date: 1/31/2018 Protocol: EPAW 95-EPA/600/R-95/136 Test Species: HR-Haliotis rufescens
 Comments:

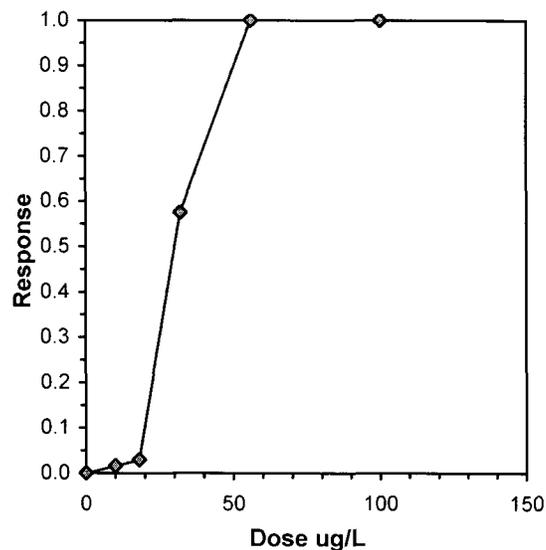
Conc-ug/L	1	2	3	4	5
D-Control	0.9115	0.9266	0.9099	0.9279	0.9636
10	0.8957	0.9286	0.8852	0.9115	0.9455
18	0.9450	0.9035	0.9273	0.8833	0.8487
32	0.4608	0.4811	0.3585	0.2941	0.3750
56	0.0000	0.0000	0.0000	0.0000	0.0000
100	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-ug/L	Transform: Arcsin Square Root							1-Tailed			Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
D-Control	0.9279	1.0000	1.3018	1.2659	1.3789	3.513	5				0.9278	1.0000
10	0.9133	0.9842	1.2742	1.2252	1.3351	3.479	5	0.728	2.230	0.0845	0.9126	0.9836
18	0.9016	0.9716	1.2560	1.1713	1.3340	5.056	5	1.208	2.230	0.0845	0.9003	0.9704
*32	0.3939	0.4245	0.6774	0.5732	0.7665	11.699	5	16.473	2.230	0.0845	0.3942	0.4249
56	0.0000	0.0000	0.0500	0.0500	0.0500	0.000	5				0.0000	0.0000
100	0.0000	0.0000	0.0500	0.0500	0.0500	0.000	5				0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.94525	0.905	0.07709	-0.7215						
Bartlett's Test indicates equal variances (p = 0.64)	1.70329	11.3449								
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs D-Control	18	32	24		0.04923	0.05297	0.45175	0.00359	2.5E-11	3, 16

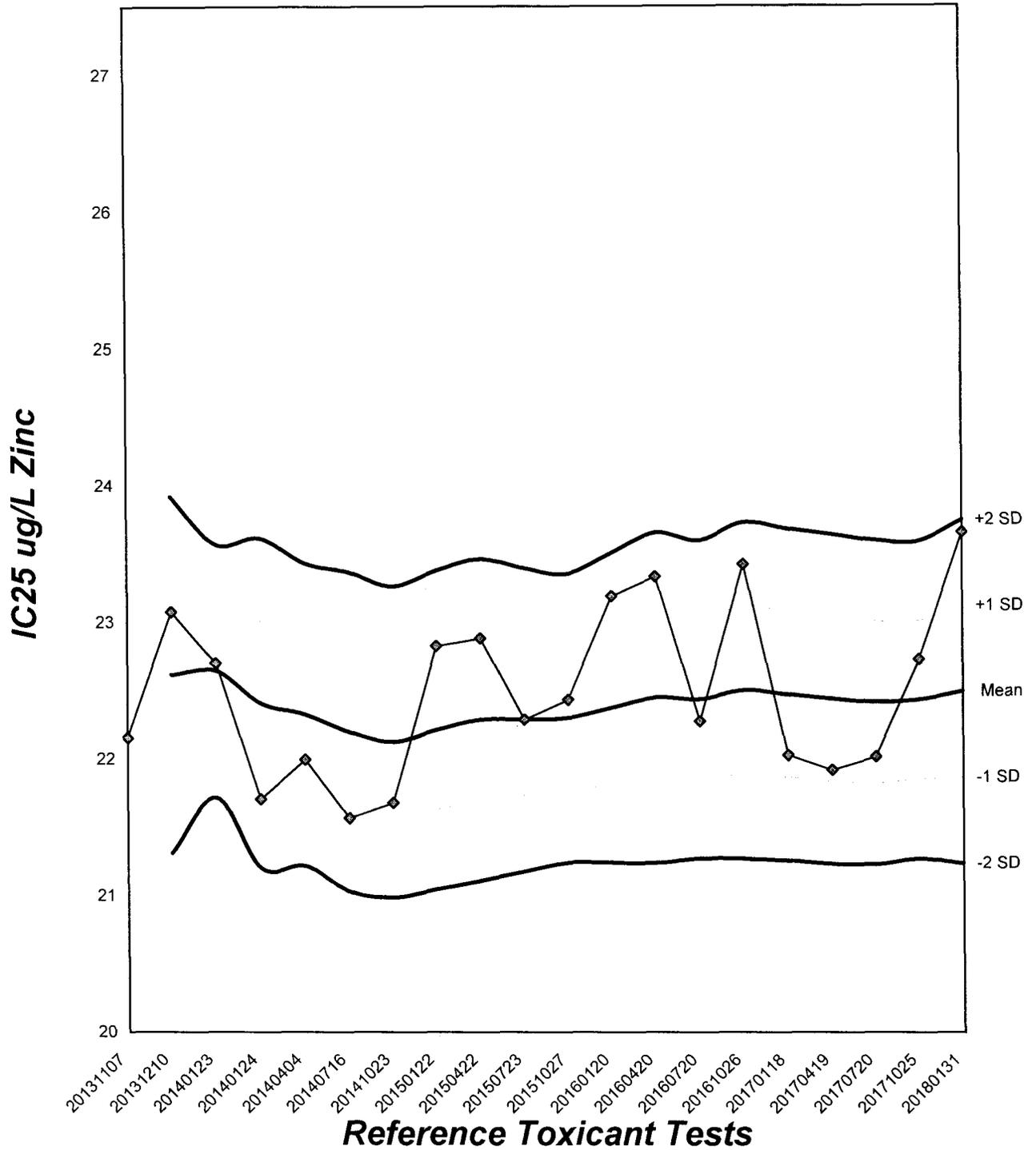
Linear Interpolation (200 Resamples)

Point	ug/L	SD	95% CL(Exp)		Skew
IC05	18.524	1.311	11.749	19.565	-3.5063
IC10	19.807	0.407	18.382	20.815	-0.3433
IC15	21.090	0.398	19.877	22.139	-0.1754
IC20	22.374	0.407	21.346	23.485	-0.0650
IC25	23.657	0.435	22.524	24.932	-0.0230
IC40	27.506	0.595	26.013	29.281	-0.0239
IC50	30.073	0.738	28.295	32.295	0.0047



Abalone Larval Development Laboratory Control Chart

CV% = 2.79



ABALONE CHRONIC BIOASSAY

Reference Toxicant - Zinc Sulfate



QA/QC No.: RT-180131

Start Date: 01/31/2018

WATER QUALITY READINGS

Sample	Initial Readings				24 Hr		Final Readings			
	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)	Temp (°C)	pH	Temp (°C)	DO (mg/l)	pH	Salinity (o/oo)
Control	14.9	8.3	8.0	34	15.2	7.9	15.2	7.8	8.0	34
10 µg/l Zn	14.7	8.3	7.9	34	15.2	7.9	15.2	7.8	8.0	34
18 µg/l Zn	14.7	8.3	7.9	34	15.3	7.9	15.2	7.8	8.0	34
32 µg/l Zn	14.5	8.3	7.9	34	15.1	7.9	15.3	7.8	8.0	34
56 µg/l Zn	14.5	8.2	7.9	34	15.2	7.9	15.3	7.8	8.0	34
100 µg/l Zn	14.4	8.3	7.9	34	15.2	7.9	15.3	7.8	8.0	34

Control and dilutions made with laboratory reference seawater filtered to 0.2 µm.

Initial readings: *JM* Date/Time: 1-31-18 1500 Final readings: *JM* Date/Time: 2-2-18 1500

MICROSCOPIC EXAMINATION

Beaker No.	Sample Conc.	Number Normal	Number Abnormal	Beaker No.	Sample Conc.	Number Normal	Number Abnormal	Beaker No.	Sample Conc.	Number Normal	Number Abnormal
1	56	0	100	11	100	0	100	21	100	0	100
2	C	103	10	12	56	0	100	22	32	30	72
3	32	47	65	13	10	108	14	23	C	103	8
4	10	103	12	14	100	0	100	24	56	0	100
5	100	0	100	15	32	38	68	25	10	104	6
6	18	103	6	16	C	101	10	26	100	0	100
7	10	104	8	17	18	102	8	27	32	39	65
8	32	51	55	18	56	0	100	28	C	106	4
9	C	101	8	19	10	103	10	29	18	101	18
10	18	103	11	20	18	106	14	30	156	0	100

Microscopic examination: Analyst: *JM* Date: 2-3-18 Time: 0800

ABALONE CHRONIC BIOASSAY
Reference Toxicant - Zinc Sulfate



QA/QC No.: RT-180131

Start Date: 01/31/2018

RANDOMIZATION WORKSHEET

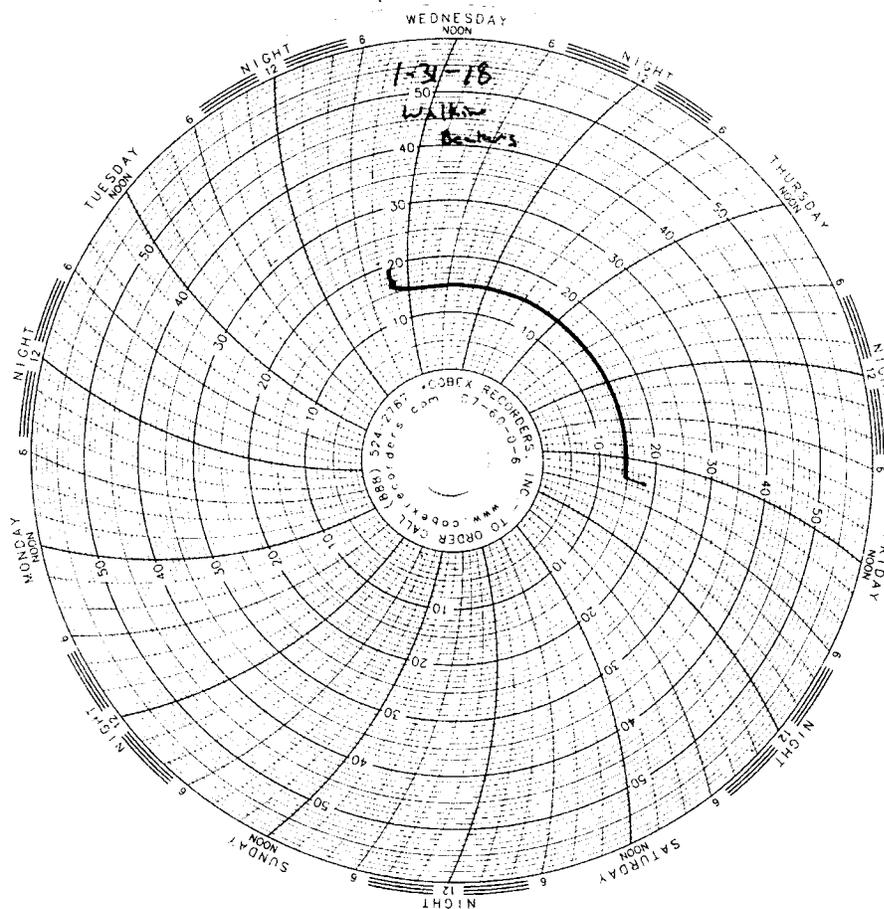
Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Notes
1	56	11	100	21	100	Number Males used: <u>5</u> Number females used: <u>6</u> Time H ₂ O ₂ added: <u>11:35</u> Time water changed: <u>14:05</u> Time spawned: <u>14:45</u> Time placed in test: <u>15:15</u> Add 1600 fertilized eggs per 200 ml.. Time glutaraldehyde added: <u>15:15</u>
2	L	12	56	22	32	
3	32	13	10	23	L	
4	10	14	100	24	56	
5	100	15	32	25	10	
6	18	16	L	26	100	
7	10	17	18	27	32	
8	32	18	56	28	L	
9	L	19	10	29	18	
10	18	20	18	30	56	
Analyst: <u>gml</u> Date: <u>1-31-18</u> Time: <u>1000</u>						

Test Temperature Chart

Test No: RT-180129

Date Tested: 01/29/18 to 02/02/18

Acceptable Range: 15 +/- 1°C





Monterey Bay Analytical Services

4 Justin Court Suite D, Monterey, CA 93940

831.375.MBAS (6227)

www.MBASinc.com

ELAP Certification Number: 2385

Marine Research Specialists

Douglas A Coats

4744 Telephone Rd Ste 3 PMB 315

Ventura, CA 93003-5258

Friday, February 16, 2018

Lab Number: 180131_03-01

Collection Date/Time: 1/30/2018 9:50

Sample Collector: Gunderlock J

Client Sample #: Morro Bay WWTP
Semi Annual Effluent

Submittal Date/Time: 1/31/2018 9:46

Sample ID: H1 2018

Sample Description: M1 ARS Grab

Analyte	Method	Unit	Result	Dil.	Qual	PQL	MCL	Anal. Date	Anal. Time	Analyst
Nitrate as N	EPA300.0	mg/L	ND	1		0.1	10	1/31/2018	16:50	HM
Orthophosphate as P	EPA300.0	mg/L	0.80	1	IH	0.1		1/31/2018	16:50	HM

Comments: " " @ G'UbX#f'77J'VYck'UWVdHUbW"ja]hg"

Lab Number: 180131_03-02

Collection Date/Time: 1/30/2018 9:50

Sample Collector: Gunderlock J

Client Sample #: Morro Bay WWTP
Semi Annual Effluent

Submittal Date/Time: 1/31/2018 9:46

Sample ID: H1 2018

Sample Description: M2 ARS Grab

Analyte	Method	Unit	Result	Dil.	Qual	PQL	MCL	Anal. Date	Anal. Time	Analyst
Urea-N	Mulvenna & Savidge	ug/L	79	1		10		2/13/2018	12:00	MW

Comments:

Lab Number: 180131_03-03

Collection Date/Time: 1/30/2018 9:50

Sample Collector: Gunderlock J

Client Sample #: Morro Bay WWTP
Semi Annual Effluent

Submittal Date/Time: 1/31/2018 9:46

Sample ID: H1 2018

Sample Description: M3 ARS Grab

Analyte	Method	Unit	Result	Dil.	Qual	PQL	MCL	Anal. Date	Anal. Time	Analyst
Silica SiO ₂ , Dissolved	EPA200.7	mg/L	12	1		0.5		2/8/2018	11:20	HM

Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L : Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

MCL : Maximum Contamination Level

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See Report attachments

T = Temperature Exceedance

MDL = Method Detection Limit

J = Result is less than PQL



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Ventura, CA 93003-5258

Friday, February 16, 2018

QC Results

QCBatch ID	QC ID	Parameter	Results	Units	% Rec	% RPD	Control Limits
QC18020101	180131_14-02: MS 1	Nitrate as N	5.8	mg/L	99.64		80 - 120
	180131_14-02: MS 1	Orthophosphate as P	2.1	mg/L	105.14		80 - 120
	180131_14-02: MSD 1	Nitrate as N	5.8	mg/L	99.2	0.44	0 - 10
	180131_14-02: MSD 1	Orthophosphate as P	2.3	mg/L	115.16	9.09	0 - 10
	CCVB 1	Nitrate as N	ND	mg/L	0.0	0.0	
	CCVB 1	Orthophosphate as P	ND	mg/L	0.0	0.0	
	LCS 1	Nitrate as N	2.0	mg/L	99.34		90 - 110
	LCS 1	Orthophosphate as P	1.8	mg/L	87.77		90 - 110
	LCSD 1	Nitrate as N	2.1	mg/L	103.24	3.85	0 - 10
	LCSD 1	Orthophosphate as P	2.1	mg/L	105.54	18.39	0 - 10
	LCSL 1	Nitrate as N	0.19	mg/L	93.2		50 - 150
	LCSL 1	Orthophosphate as P	0.16	mg/L	78.49		50 - 150
	Method Blank 1	Nitrate as N	ND	mg/L	0.0	0.0	
	Method Blank 1	Orthophosphate as P	ND	mg/L	0.0	0.0	
QC18021404	180130_14-10: MS 1	Urea-N	110	ug/L	104.0		85 - 115
	180130_14-10: MSD 1	Urea-N	110	ug/L	101.0	2.93	0 - 20
	180208_08-01: MS 2	Urea-N	99	ug/L	88.0		85 - 115
	180208_08-01: MSD 2	Urea-N	110	ug/L	96.0	8.7	0 - 20
	180208_08-09: MS 3	Urea-N	150	ug/L	100.0		85 - 115
	180208_08-09: MSD 3	Urea-N	150	ug/L	100.0	0.0	0 - 20
	180208_08-16: MS 4	Urea-N	110	ug/L	94.0		85 - 115
	180208_08-16: MSD 4	Urea-N	100	ug/L	89.0	5.46	0 - 20
	CCVB 1	Urea-N	ND	ug/L	0.0	0.0	
	LFB 1	Urea-N	110	ug/L	106.0		85 - 115
	LFB 2	Urea-N	97	ug/L	97.0		85 - 115
	LFB 3	Urea-N	93	ug/L	93.0		85 - 115
	LFBD 1	Urea-N	99	ug/L	99.0	6.83	0 - 25
	LFBL 1	Urea-N	8.0	ug/L	80.0		80 - 120
	LFBLD 1	Urea-N	10	ug/L	100.0	22.22	0 - 25
	Method Blank 1	Urea-N	ND	ug/L	0.0	0.0	

mg/L : Milligrams per liter (=ppm)

H = Analyzed outside of hold time

MDL = Method Detection Limit

ug/L : Micrograms per liter (=ppb)

E = Analysis performed by External Laboratory; See Report attachments

J = Result is less than PQL

PQL : Practical Quantitation Limit

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T = Temperature Exceedance



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Ventura, CA 93003-5258

Friday, February 16, 2018

QCS 1	Urea-N	46	ug/L	97.87		90 - 110
QCSD 1	Urea-N	48	ug/L	102.13	4.26	0 - 25

mg/L : Milligrams per liter (=ppm)

H = Analyzed outside of hold time

MDL = Method Detection Limit

ug/L : Micrograms per liter (=ppb)

E = Analysis performed by External Laboratory; See Report attachments

J = Result is less than PQL

PQL : Practical Quantitation Limit

MCL : Maximum Contamination Level

T = Temperature Exceedance

1801 31-03

Monterey Bay Analytical Services Chain Of Custody / Analysis Request

4 Justin Ct. Suite D • Monterey, Ca 93940 • (831) 375-MBAS (6227) • (831) 641-0734 (Fax)



Client/Company Name: Marine Research Specialists		Attention: Douglas A Coats	
Billing Address: 4744 Telephone Rd Ste 3 PMB 315, Ventura CA 93003-5258			
E-Mail Address(es): Marine@Rain.org		Contract/P.O. #:	
Turn Around Time: STD (7-14 Days) <input checked="" type="checkbox"/> 48-Hour <input type="checkbox"/> 5-Day <input type="checkbox"/> 24-Hour <input type="checkbox"/>		Phone # 805.218.3662 Fax #	
Drinking water <input type="checkbox"/> Wastewater <input checked="" type="checkbox"/> Monitoring Well <input type="checkbox"/> Soil <input type="checkbox"/> Sludge <input type="checkbox"/> Other <input type="checkbox"/>			

Project/System Information:
Morro Bay WWTP Semi Annual Effluent

For Regulatory Compliance? YES NO
 For State or Local Health Department reporting:
 Electronic Data Transfer (EDT)? YES NO
 System ID Number: _____

Analysis Requested			
Nitrate as NO3 [EPA 300.0]	O-Phosphate-P [EPA 300.0]	Dissolved Silica as SiO2 [EPA 4500-Si-E]	Urea [Mulvenna & Savid]
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

MBAS Lab #	Project ID or Source Code #	Sample Site / Description (Well Name, APN#, Address, Stormdrain #)	Sampling		Receiving Temp.	CL2 Residual	Coliform Analysis					# Cont.	Container				
			Date	Time			Routine	Other	Repeat	Special	Type		Size				
01	H1 2018	M1 ARS Grab	1/30/18	0950	1.1						1			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
02	H1 2018	M2 ARS Grab*	1/30/18	0950	1.4						1						<input checked="" type="checkbox"/>
03	H1 2018	M3 ARS Grab**	1/30/18	0950	1.1						1					<input checked="" type="checkbox"/>	

Printed Name	Signature	Date	Time	Comments or Special Instructions:
Sampled by: John Gunderlock		1/30/18	0950	*Pour off 50 ml & freeze to hold for Urea test **The Silica sample (H1 2018 M3 ARS Grab) will be prefiltered at the treatment plant prior to shipping
Relinquished by: John Gunderlock		1/30/18	1345	
Received by:				
Relinquished by:				
Received by: Monterey Bay Analytical Services		1/31/18	09:40	

<input type="checkbox"/> Payment received	Check #	Amount:	Receipt #	Date:
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180131-03

Sample Condition Upon Receipt

COC Info

Was temp acceptable? Chemistry $\leq 6^{\circ}\text{C}$ Micro $\leq 10^{\circ}\text{C}$
Did bottles arrive intact?
Did bottle labels agree with COC?

YES NO NA <2 Hr
YES NO NA
YES NO NA

Is there evidence of chilling?

YES NO NA

Discrepancy Documentation:

Person Contacted: _____ Method: In Person/Phone/Email _____

Problem _____

Resolution _____

Person Contacted: _____ Method: In Person/Phone/Email _____

Problem _____

Resolution _____

Sample Split/Filtration

Lab ID	Cont. Size	Pres	Date/Initials
03	250ml	HNO ₃	KC 01/31/18

Lab ID	Cont. Size	Pres	Date/Initials

Comments
