

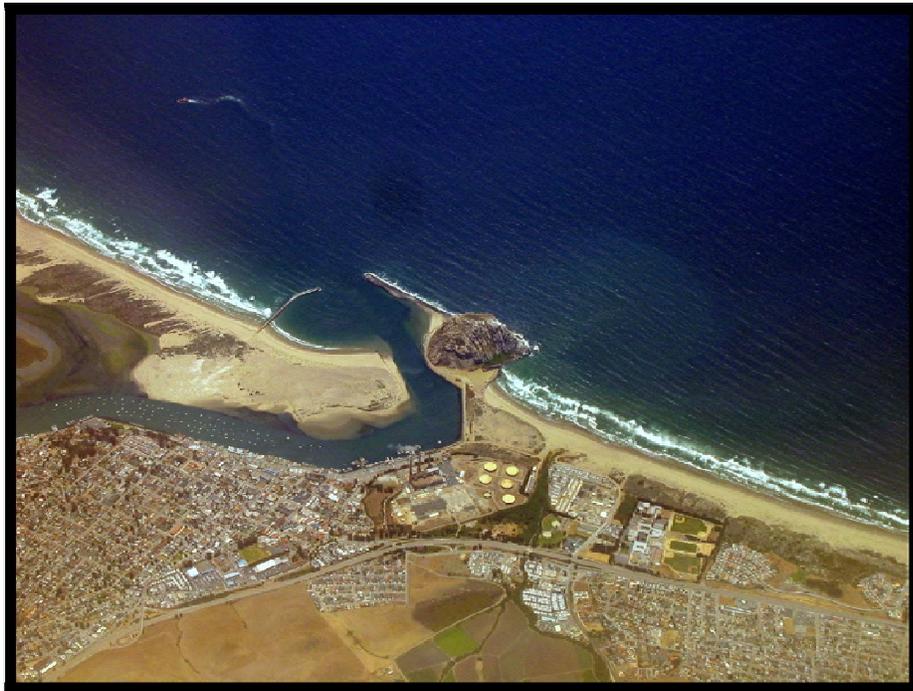
**City of Morro Bay and
Cayucos Sanitary District**

**OFFSHORE MONITORING
AND REPORTING PROGRAM**

SEMIANNUAL EFFLUENT SAMPLING

**CHEMICAL AND BIOASSAY
ANALYSIS RESULTS**

JANUARY 2011



Marine Research Specialists

**3140 Telegraph Rd., Suite A
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

SEMIANNUAL EFFLUENT REPORT

CHEMICAL AND BIOASSAY
ANALYSIS RESULTS

JANUARY 2011

Prepared by
Bonnie Luke
Douglas A. Coats

Marine Research Specialists

3140 Telegraph Rd., Suite A
Ventura, California 93003

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E-mail: Marine@Rain.org

January 2011

Bruce Keogh
Wastewater Division Manager
City of Morro Bay
955 Shasta Avenue
Morro Bay, CA 93442

24 January 2011

Reference: Semiannual Effluent Self-Monitoring Report for January through June 2011

Dear Mr. Keogh:

This self-monitoring report documents the chemical and bioassay analysis results for effluent samples collected in January 2011 as required by NPDES discharge permit CA0047881.¹ Analyses of effluent samples collected on 11 and 12 January 2011 were conducted in accordance with the monitoring requirements specified in the permit, including:

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

The three attachments to this report demonstrate that all chemical concentrations and toxicological endpoints were well 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 based on the minimum-level (ML) reporting requirements of the permit, and all units have been converted to those used in the discharge monitoring forms that were submitted under separate cover to the California Division of Water Quality (Attachment B). Attachment C collates the original laboratory reports, including raw data and results, pertinent QA/QC analyses, and chains of custody.

The comprehensive chemical and bioassay analyses of effluent samples collected in January 2011 augment data collected over the past two decades. Together, the 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 2011 samples were typical of wastewater derived from domestic sources, and all concentrations were considerably below the limits specified in the NPDES discharge permit.

Eight chemicals that are monitored on a semiannual basis were detected in the January 2011 effluent. Of those, only four had concentrations high enough to be reliably quantified above their respective MLs. Three of the quantifiable concentrations were associated with commonly occurring metals: copper, lead, and zinc. These metals enter the wastewater collection system through erosion of natural mineral deposits along the central California coast, and through corrosion of household plumbing systems. The concentrations of all three metals were an order of magnitude below levels deemed deleterious to marine organisms.

Selenium, another naturally occurring element within the mineralogy of the central California coast, was the only additional semiannual chemical detected at quantifiable levels within the January 2011 effluent sample. Low-level concentrations of selenium in MBCSD effluent have typically been associated with the mobilization of naturally occurring selenium in surficial soils following heavy rainfall events. However, as

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

with the other detected elements, selenium's measured concentration was low compared to its permit limit and therefore, not of ecological concern.

A chronic bioassay further affirmed the effluent's overall low toxicity. Chronic toxicity tests on the January 2011 composite effluent sample measured its effect on the development of larval red abalone (*Haliotis rufescens*) after exposure to a range of effluent dilutions. A toxicity screening study conducted from July 2009 to January 2010 found larval abalone to be somewhat more sensitive to MBCSD effluent than the giant kelp zoospores used previously to evaluate chronic toxicity. Although the larval abalone were highly sensitive to contaminants, adverse effects were not observed in effluent that was 13 times more concentrated than that allowed by the discharge permit.

Semi-annual monitoring for the presence of four nutrient constituents within effluent is also required as part of the NPDES permit, although no discharge limits are imposed on their concentrations or loading. The nutrient concentrations within the January 2011 effluent grab sample are incorporated within the attachments to this document to satisfy reporting requirements. A discussion of all the nutrient concentrations and loadings reported in 2011 will be discussed and compared with other oceanic sources as part of the 2011 annual report.

Ammonia as nitrogen³ is measured in grab effluent samples that are collected on a monthly basis. Because it is not part of the semiannual reporting requirements, it is not included in the DMR forms contained herein (Attachment B). Ammonia has always been present in detectable concentrations that are well below the most-stringent permit limit of 80.4 mg/L, which applies to a 6-month median. The ammonia concentration of 24 mg/L measured in the January 2011 sample was comparable to the historical average concentration of 25 mg/L.

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

Sincerely,

Bonnie Luke
Program Manager

Submitted via email

³ NH₃-N

ATTACHMENT A
MINIMUM LEVEL REPORTING

ATTACHMENT A
Analytical Results for Effluent Samples Collected during January 2011

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	0.002	0.05	—	— ^e	ND
Urea (as N)	mg/L	Mulvenna & Savid	0.0007	0.01	—	—	0.091 as measured
Ortho-Phosphate (as P)	mg/L	300.0	0.003	0.05	—	—	1.6 as measured
Dissolved Silica (SiO ₂)	mg/L	4500-SI-E	0.04	0.5	—	—	16 as measured
Objectives for the Protection of Marine Aquatic Life							
Arsenic	mg/L	200.8	0.00061	0.002	0.002	0.67	DNQ 0.00062 Est. Conc.
Cadmium	mg/L	200.7	0.001	0.01	0.01	0.13	ND
Chromium VI ^f	mg/L	200.7	0.001	0.01	0.01	0.27	DNQ 0.0018 Est. Conc.
Copper	mg/L	200.7	0.0023	0.01	0.01	0.14	0.016 as measured
Lead	mg/L	200.8	0.00012	0.001	0.0005	0.27	0.00097 as measured ^g
Mercury	µg/L	245.1	0.017	0.2	0.2	5.29	ND
Nickel	mg/L	200.7	0.0012	0.01	0.02	0.67	DNQ 0.0043 Est. Conc.
Selenium	mg/L	200.8	0.00036	0.002	0.002	2.01	0.0025 as measured
Silver	mg/L	200.7	0.001	0.01	0.01	0.07	ND
Zinc	mg/L	200.7	0.0029	0.05	0.02	1.62	0.05 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.

Analytical Results for Effluent Samples Collected during January 2011

Chemical Compound or Parameter	Units	Method	Detection Limit ^a	Practical ^b Quantification Limit	Minimum Level ^c	Permit ^d Limit	Reported Value
Cyanide	mg/L	335.4	0.0016	0.005	0.005	0.13	DNQ 0.0027 Est. Conc.
Toxicity-Chronic: H. Rufescens	TUc	600/R-95/136	—	—	—	134.	10 as measured
Ammonia	mg/L	350.1	2.0	4.0	—	80.4	24 as measured

ATTACHMENT B
DISCHARGE MONITORING REPORTS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
 OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: MORRO BAY, CITY OF AND CAYUCOS SANITARY I

ADDRESS: 160 ATASCADERO ROAD
 MORRO BAY, CA 93442

FACILITY: MORRO BAY/CAYUCOS WWTP

LOCATION: 160 ATASCADERO ROAD
 MORRO BAY, CA 93442

ATTN: BRUCE KEOGH

CA0047881
PERMIT NUMBER

001-S
DISCHARGE NUMBER

DMR Mailing ZIP CODE: 93442
 MAJOR
 (SUBR 03)
 DISCHARGE 001/ SEMIANNUALLY
 External Outfall

MONITORING PERIOD	
MM/DD/YYYY	MM/DD/YYYY
FROM 01/01/2011	TO 06/30/2011

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Nitrogen, nitrate total (as N) 00620 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	*****	*****	<i>NODI (B)</i>	mg/L	0	<i>Semi-annual</i>	<i>Grab</i>
	PERMIT REQUIREMENT						Req. Mon. DAILY MX	mg/L		Semiannual	GRAB
Cyanide, total (as CN) 00720 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	<i>NODI (Q)</i>	<i>NODI (Q)</i>	<i>NODI (Q)</i>	mg/L	0	<i>Semi-annual</i>	<i>Comp24</i>
	PERMIT REQUIREMENT				.13 6 MO MED	.54 DAILY MX	1.34 INST MAX	mg/L		Semiannual	COMP24
Silica, dissolved (as SiO2) 00955 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	*****	*****	16.	mg/L	0	<i>Semi-annual</i>	<i>Grab</i>
	PERMIT REQUIREMENT						Req. Mon. DAILY MX	mg/L		Semiannual	GRAB
Arsenic, total recoverable 00978 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	<i>NODI (Q)</i>	<i>NODI (Q)</i>	<i>NODI (Q)</i>	mg/L	0	<i>Semi-annual</i>	<i>Comp24</i>
	PERMIT REQUIREMENT				.67 6 MO MED	3.89 DAILY MX	10.3 INST MAX	mg/L		Semiannual	COMP24
Selenium, total recoverable 00981 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	0.0025	0.0025	0.0025	mg/L	0	<i>Semi-annual</i>	<i>Comp24</i>
	PERMIT REQUIREMENT				2.01 6 MO MED	8.04 DAILY MX	20.1 INST MAX	mg/L		Semiannual	COMP24
Chromium, hexavalent (as Cr) 01032 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	<i>NODI (Q)</i>	<i>NODI (Q)</i>	<i>NODI (Q)</i>	mg/L	0	<i>Semi-annual</i>	<i>Comp24</i>
	PERMIT REQUIREMENT				.27 6 MO MED	1.07 DAILY MX	2.68 INST MAX	mg/L		Semiannual	COMP24
Nickel, total recoverable 01074 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	<i>NODI (Q)</i>	<i>NODI (Q)</i>	<i>NODI (Q)</i>	mg/L	0	<i>Semi-annual</i>	<i>Comp24</i>
	PERMIT REQUIREMENT				.67 6 MO MED	2.68 DAILY MX	6.7 INST MAX	mg/L		Semiannual	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Bruce Keogh Wastewater Division Manager TYPED OR PRINTED	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.	TELEPHONE (805) 772-6272		DATE 01/26/2011
		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	AREA Code	NUMBER

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

AFTER SCREENING PERIOD FOR CHRONIC TOXICITY TESTING, REPORT "NODI(9)" FOR SPECIES NOT TESTED.

Total chromium is reported for hexavalent chromium.

DISCHARGE MONITORING REPORT (DMR)

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: MORRO BAY, CITY OF AND CAYUCOS SANITARY I

ADDRESS: 160 ATASCADERO ROAD
MORRO BAY, CA 93442

FACILITY: MORRO BAY/CAYUCOS WWTP

LOCATION: 160 ATASCADERO ROAD
MORRO BAY, CA 93442

ATTN: BRUCE KEOGH

CA0047881
PERMIT NUMBER

001-S
DISCHARGE NUMBER

DMR Mailing ZIP CODE: 93442
MAJOR
(SUBR 03)
DISCHARGE 001/ SEMIANNUALLY
External Outfall

MONITORING PERIOD			
MM/DD/YYYY		MM/DD/YYYY	
FROM	01/01/2011	TO	06/30/2011

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Silver total recoverable	SAMPLE MEASUREMENT	*****	*****	*****	<i>NODI (B)</i>	<i>NODI (B)</i>	<i>NODI (B)</i>	<i>mg/L</i>	0	<i>Semi-annual</i>	<i>Comp24</i>
01079 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	.07 6 MO MED	.35 DAILY MX	.92 INST MAX	mg/L		Semiannual	COMP24
Zinc, total recoverable	SAMPLE MEASUREMENT	*****	*****	*****	<i>0.05</i>	<i>0.05</i>	<i>0.05</i>	<i>mg/L</i>	0	<i>Semi-annual</i>	<i>Comp24</i>
01094 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	1.62 6 MO MED	9.66 DAILY MX	25.7 INST MAX	mg/L		Semiannual	COMP24
Cadmium, total recoverable	SAMPLE MEASUREMENT	*****	*****	*****	<i>NODI (B)</i>	<i>NODI (B)</i>	<i>NODI (B)</i>	<i>mg/L</i>	0	<i>Semi-annual</i>	<i>Comp24</i>
01113 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	.13 6 MO MED	.54 DAILY MX	1.34 INST MAX	mg/L		Semiannual	COMP24
Lead, total recoverable	SAMPLE MEASUREMENT	*****	*****	*****	<i>0.00097</i>	<i>0.00097</i>	<i>0.00097</i>	<i>mg/L</i>	0	<i>Semi-annual</i>	<i>Comp24</i>
01114 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	.27 6 MO MED	1.07 DAILY MX	2.68 INST MAX	mg/L		Semiannual	COMP24
Copper, total recoverable	SAMPLE MEASUREMENT	*****	*****	*****	<i>0.016</i>	<i>0.016</i>	<i>0.016</i>	<i>mg/L</i>	0	<i>Semi-annual</i>	<i>Comp24</i>
01119 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	.14 6 MO MED	1.34 DAILY MX	3.75 INST MAX	mg/L		Semiannual	COMP24
Phosphate, ortho (as P)	SAMPLE MEASUREMENT	*****	*****	*****	*****	*****	<i>1.6</i>	<i>mg/L</i>	0	<i>Semi-annual</i>	<i>Grab</i>
04175 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	*****	Req. Mon. DAILY MX	mg/L		Semiannual	GRAB
Urea	SAMPLE MEASUREMENT	*****	*****	*****	*****	*****	<i>0.091</i>	<i>mg/L</i>	0	<i>Semi-annual</i>	<i>Grab</i>
71800 1 0 Effluent Gross	PERMIT REQUIREMENT	*****	*****	*****	*****	*****	Req. Mon. DAILY MX	mg/L		Semiannual	GRAB

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Bruce Keogh Wastewater Division Manager TYPED OR PRINTED	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.	TELEPHONE (805) 772-6272		DATE 01/26/2011
		SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		AREA Code

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

AFTER SCREENING PERIOD FOR CHRONIC TOXICITY TESTING, REPORT "NODI(9)" FOR SPECIES NOT TESTED.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved
OMB No. 2040-0004

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if Different)

NAME: MORRO BAY, CITY OF AND CAYUCOS SANITARY I

ADDRESS: 160 ATASCADERO ROAD
MORRO BAY, CA 93442

FACILITY: MORRO BAY/CAYUCOS WWTP

LOCATION: 160 ATASCADERO ROAD
MORRO BAY, CA 93442

ATTN: BRUCE KEOGH

CA0047881
PERMIT NUMBER

001-S
DISCHARGE NUMBER

DMR Mailing ZIP CODE: 93442
MAJOR
(SUBR 03)
DISCHARGE 001/ SEMIANNUALLY
External Outfall

MONITORING PERIOD
FROM **MM/DD/YYYY** 01/01/2011 TO **MM/DD/YYYY** 06/30/2011

No Discharge

PARAMETER		QUANTITY OR LOADING			QUALITY OR CONCENTRATION				NO. EX	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		VALUE	VALUE	UNITS	VALUE	VALUE	VALUE	UNITS			
Mercury, total recoverable 71901 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	<i>NODI (B)</i>	<i>NODI (B)</i>	<i>NODI (B)</i>	<i>µg/L</i>	0	<i>Semi-annual</i>	<i>Comp24</i>
	PERMIT REQUIREMENT	*****	*****	*****	5.29 6 MO MED	21.4 DAILY MX	53.5 INST MAX	ug/L		Semiannual	COMP24
Static 48Hr Chronic Macrocystis Pyrifera TTK1D 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	*****	*****	<i>NODI (9)</i>	<i>TUc</i>	0	<i>Semi-annual</i>	<i>Comp24</i>
	PERMIT REQUIREMENT	*****	*****	*****	*****	*****	134 DAILY MX	tox chronic		Semiannual	COMP24
Static 48Hr Chronic Haliotis Rufescens TTK3R 1 0 Effluent Gross	SAMPLE MEASUREMENT	*****	*****	*****	*****	*****	<i>10.0</i>	<i>TUc</i>	0	<i>Semi-annual</i>	<i>Comp24</i>
	PERMIT REQUIREMENT	*****	*****	*****	*****	*****	134 DAILY MX	tox chronic		Semiannual	COMP24

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER Bruce Keogh Wastewater Division Manager TYPED OR PRINTED	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.	TELEPHONE		DATE
		(805) 772-6272		01/26/2011
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT		AREA Code	NUMBER	MM/DD/YYYY

COMMENTS AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

AFTER SCREENING PERIOD FOR CHRONIC TOXICITY TESTING, REPORT "NODI(9)" FOR SPECIES NOT TESTED.

ATTACHMENT C
LABORATORY REPORTS



Date of Report: 01/21/2011

Doug Coats

Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

RE: Semi-Annual Eff
BC Work Order: 1100676
Invoice ID: B093747

Enclosed are the results of analyses for samples received by the laboratory on 1/12/2011. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

Certifications: CA ELAP #1186; NV #CA00014



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[Handwritten signature]



Chain of Custody Form

Report To: Marine Research Specialists Client: Marine Research Specialists		Project #: _____ Project Name: MBCSD SemiAnn		Analysis Requested Ammonia (EPA 350.1) Metals (See comments) Cyanide (EPA 335.3)		Comments: Metals: Silver, Arsenic, Cadmium, Chromium (Total), Copper, Mercury, Nickel, Lead, Selenium, and Zinc (EPA 200.7, 200.8, and 245.1)	
Attn: Doug Coats Street Address: 3140 Telegraph Rd. Suite A City, State, Zip: Ventura, CA 93003 Phone: 805-644-1180 Email Address: doug.coats@mrsenv.com Work Order# 11-00676		Global ID #: _____ Sampler(s): SRA				Sample Matrix <input type="checkbox"/> Soil <input type="checkbox"/> Sludge <input type="checkbox"/> Drinking Water <input type="checkbox"/> Ground Water <input type="checkbox"/> Waste Water <input type="checkbox"/> Other	
Sample #	Description	Date Sampled	Time Sampled	Ammonia (EPA 350.1)	Metals (See comments)	Cyanide (EPA 335.3)	Notes
1	Grab Eff	1/12/11	0900	✓			
2	Comp Eff	1/12/11	0900	✓	✓		see comments
				CHK BY: <i>[Signature]</i> DISTRIBUTION: <i>[Signature]</i> ANALYST: <i>[Signature]</i>		SHORT HOLDING TIME Cr ⁶⁺ NO ₂ NO ₃ OF SS LC BLD MEAS L C T	
Billing <input checked="" type="checkbox"/> Same as above		EDF Required? <input type="checkbox"/> Yes <input type="checkbox"/> No		Sample Disposal <input type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by lab <input type="checkbox"/> Archive <input type="checkbox"/> Monthly		Special Reporting <input type="checkbox"/> QC <input type="checkbox"/> EDF <input type="checkbox"/> Raw Data	
Client: City of Morro Bay Address: _____ City: Morro Bay State CA Zip 95496 Attn: _____ PO#: _____		Send Copy to State of CA? <input type="checkbox"/> Yes <input type="checkbox"/> No		1. Requested By: <i>[Signature]</i> Date: 1/12/11 Time: 12:50 2. Requested By: <i>[Signature]</i> Date: 1-12-11 Time: 1950 3. Requested By: _____ Date: _____ Time: _____		1. Requested By: <i>[Signature]</i> Date: 1/12/11 Time: 1250 2. Requested By: <i>[Signature]</i> Date: 1/12/11 Time: 0900 3. Requested By: _____ Date: _____ Time: _____	

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. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation. 4100 Atlas Court Bakersfield, CA 93308 (661) 327-4911 FAX (661) 327-1918 www.bclabs.com



BC LABORATORIES INC. SAMPLE RECEIPT FORM Rev. No. 12 06/24/08 Page 2 of 2

Submission #: 11-00676

SHIPPING INFORMATION
 Federal Express UPS Hand Delivery
 BC Lab Field Service Other (Specify) _____

SHIPPING CONTAINER
 Ice Chest None
 Box Other (Specify) _____

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: 0.95 Container: PPE Thermometer ID: #63 Date/Time: 1/2/11 9:45
 Temperature: A 1.5 °C / C 1.5 °C Analyst Initials: S

SAMPLE CONTAINERS	SAMPLE NUMBERS									
	1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/GENERAL PHYSICAL										
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS	A									
PT TOTAL SULFIDE										
Loc. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PTa PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
5 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										

Comments: _____ Date/Time: 1/2/11 2:00
 Sample Numbering Completed By: [Signature] [Signature]
 A = Actual / C = Corrected [Signature]



Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Reported: 01/21/2011 15:33
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1100676-01	COC Number:	---	Receive Date:	01/12/2011 19:50
	Project Number:	---	Sampling Date:	01/12/2011 09:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Grab Eff	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water
	<hr/>			
1100676-02	COC Number:	---	Receive Date:	01/12/2011 19:50
	Project Number:	---	Sampling Date:	01/12/2011 09:00
	Sampling Location:	---	Sample Depth:	---
	Sampling Point:	Comp Eff	Lab Matrix:	Water
	Sampled By:	---	Sample Type:	Water
	<hr/>			



Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Reported: 01/21/2011 15:33
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (General Chemistry)

BCL Sample ID: 1100676-01	Client Sample Name: Grab Eff, 1/12/2011 9:00:00AM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Ammonia as N (Distilled)	24	mg/L	4.0	2.0	EPA-350.1	ND	A01	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-350.1	01/17/11	01/18/11 13:01	SDU	SC-1	40	BUA0887



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Reported: 01/21/2011 15:33
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (General Chemistry)

BCL Sample ID: 1100676-02	Client Sample Name: Comp Eff, 1/12/2011 9:00:00AM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Cyanide	0.0027	mg/L	0.0050	0.0016	EPA-335.4	ND	J	1

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-335.4	01/14/11	01/14/11 12:12	TDC	KONE-1	1	BUA0833



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Reported: 01/21/2011 15:33
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (Metals)

BCL Sample ID: 1100676-02	Client Sample Name: Comp Eff, 1/12/2011 9:00:00AM
----------------------------------	--

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Total Cadmium	ND	ug/L	10	1.0	EPA-200.7	ND		1
Total Chromium	1.8	ug/L	10	1.0	EPA-200.7	ND	J	1
Total Copper	16	ug/L	10	2.3	EPA-200.7	ND		1
Total Mercury	ND	ug/L	0.20	0.017	EPA-245.1	ND		2
Total Nickel	4.3	ug/L	10	1.2	EPA-200.7	ND	J	1
Total Silver	ND	ug/L	10	1.0	EPA-200.7	ND		1
Total Zinc	50	ug/L	50	2.9	EPA-200.7	6.6		1
Total Recoverable Arsenic	0.62	ug/L	2.0	0.61	EPA-200.8	ND	J	3
Total Recoverable Lead	0.97	ug/L	1.0	0.12	EPA-200.8	ND	J	3
Total Recoverable Selenium	2.5	ug/L	2.0	0.36	EPA-200.8	ND		3

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	01/18/11	01/18/11 19:06	JRG	PE-OP2	1	BUA1022
2	EPA-245.1	01/18/11	01/20/11 11:43	MEV	CETAC1	1	BUA1076
3	EPA-200.8	01/17/11	01/19/11 23:43	PPS	PE-EL1	1	BUA0928



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Suite A
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Reported: 01/21/2011 15:33
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: BUA0833						
Total Cyanide	BUA0833-BLK1	ND	mg/L	0.0050	0.0016	
QC Batch ID: BUA0887						
Ammonia as N (Distilled)	BUA0887-BLK1	ND	mg/L	0.10	0.050	



Marine Research Specialists
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Ventura, CA 93003-3238

Reported: 01/21/2011 15:33
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	Quals
								Percent Recovery	RPD		
QC Batch ID: BUA0833											
Total Cyanide	BUA0833-BS1	LCS	0.14893	0.15000	mg/L	99.3		90 - 110			
QC Batch ID: BUA0887											
Ammonia as N (Distilled)	BUA0887-BS1	LCS	1.0026		mg/L			85 - 115			



Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Reported: 01/21/2011 15:33
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		Lab Quals
								Percent Recovery	RPD	
QC Batch ID: BUA0833		Used client sample: N								
Total Cyanide	DUP	1100719-01	0.0019640	0.0019980		mg/L	1.7		10	J
	MS	1100719-01	0.0019640	0.095000	0.10000	mg/L		93.0		90 - 110
	MSD	1100719-01	0.0019640	0.094518	0.10000	mg/L	0.5	92.6	10	90 - 110
QC Batch ID: BUA0887		Used client sample: N								
Ammonia as N (Distilled)	DUP	1100628-01	0.15330	0.19130		mg/L	22.1		20	A02
	MS	1100628-01	0.15330	1.1304		mg/L				80 - 120
	MSD	1100628-01	0.15330	1.1039		mg/L	2.4		20	80 - 120



Marine Research Specialists
3140 Telegraph Road, Suite A
Suite A
Ventura, CA 93003-3238

Reported: 01/21/2011 15:33
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (Metals)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BUA0928						
Total Recoverable Arsenic	BUA0928-BLK1	ND	ug/L	2.0	0.61	
Total Recoverable Lead	BUA0928-BLK1	ND	ug/L	1.0	0.12	
Total Recoverable Selenium	BUA0928-BLK1	ND	ug/L	2.0	0.36	
QC Batch ID: BUA1022						
Total Cadmium	BUA1022-BLK1	ND	ug/L	10	1.0	
Total Chromium	BUA1022-BLK1	ND	ug/L	10	1.0	
Total Copper	BUA1022-BLK1	ND	ug/L	10	2.3	
Total Nickel	BUA1022-BLK1	ND	ug/L	10	1.2	
Total Silver	BUA1022-BLK1	ND	ug/L	10	1.0	
Total Zinc	BUA1022-BLK1	6.5504	ug/L	50	2.9	J
QC Batch ID: BUA1076						
Total Mercury	BUA1076-BLK1	ND	ug/L	0.20	0.017	



Marine Research Specialists
3140 Telegraph Road, Suite A
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Ventura, CA 93003-3238

Reported: 01/21/2011 15:33
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (Metals)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits		Lab Quals
								Percent Recovery	RPD	
QC Batch ID: BUA0928										
Total Recoverable Arsenic	BUA0928-BS1	LCS	99.259	100.00	ug/L	99.3		85 - 115		
Total Recoverable Lead	BUA0928-BS1	LCS	95.724	100.00	ug/L	95.7		85 - 115		
Total Recoverable Selenium	BUA0928-BS1	LCS	99.409	100.00	ug/L	99.4		85 - 115		
QC Batch ID: BUA1022										
Total Cadmium	BUA1022-BS1	LCS	206.77	200.00	ug/L	103		85 - 115		
Total Chromium	BUA1022-BS1	LCS	217.01	200.00	ug/L	109		85 - 115		
Total Copper	BUA1022-BS1	LCS	413.47	400.00	ug/L	103		85 - 115		
Total Nickel	BUA1022-BS1	LCS	442.24	400.00	ug/L	111		85 - 115		
Total Silver	BUA1022-BS1	LCS	103.92	100.00	ug/L	104		85 - 115		
Total Zinc	BUA1022-BS1	LCS	532.87	500.00	ug/L	107		85 - 115		
QC Batch ID: BUA1076										
Total Mercury	BUA1076-BS1	LCS	1.0550	1.0000	ug/L	106		85 - 115		

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. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



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Reported: 01/21/2011 15:33
Project: Semi-Annual Eff
Project Number: [none]
Project Manager: Doug Coats

Water Analysis (Metals)

Quality Control Report - Precision & Accuracy

Table with columns: Constituent, Source Type, Source Sample ID, Source Result, Result, Spike Added, Units, RPD, Percent Recovery, Control Limits (RPD, Percent Recovery), Lab Qualls. Includes sections for QC Batch ID: BUA0928, BUA1022, and BUA1076.

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. All results listed in this report are for the exclusive use of the submitting party. BC Laboratories, Inc. assumes no responsibility for report alteration, separation, detachment or third party interpretation.



Marine Research Specialists
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Suite A
Ventura, CA 93003-3238

Reported: 01/21/2011 15:33
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 at or above the reporting limit
- PQL Practical Quantitation Limit
- RPD Relative Percent Difference
- A01 PQL's and MDL's are raised due to sample dilution.
- A02 The difference between duplicate readings is less than the PQL.



Dr. Doug Coats
 Marine Research Specialists
 3140 Telegraph Road Suite A
 Ventura CA, 93003

4 Justin Court Suite D, Monterey, CA 93940
 831.375.MBAS
 montereybayanalytical@usa.net
 ELAP Certification Number: 2385

Lab Number: AA72448

Collection Date/Time: 1/12/2011 9:20 Sample Collector: ASCHENBRENER
 Submittal Date/Time: 1/13/2011 9:35 Sample ID

Sample Description: Morro Bay WWTP, Grab Effluent A.R.S.

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Nitrate as NO ₃ -N	EPA300.0	mg/L	Not Detected		0.05	10	1/13/2011
o-Phosphate-P	EPA300.0	mg/L	1.60		0.05		1/13/2011
Silica as SiO ₂ , Dissolved	EPA200.7	mg/L	16		0.5		1/19/2011
Urea-N	Mulvenna&Savid	ug/L	91		10		1/20/2011

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter ug/L : Micrograms per liter PQL : Practical Quantitation Limit MCL: Maximum Contamination Level
 H = Analyzed outside of hold time E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

20110113
QC SUMMARY EPA 300

		FI	CI	NO2	SO4	Br	NO3-N	NO3	PO4
		2	20	2	20	2	2	8	2
1 lcs high		1.941	20.44	1.926	18.77	2.124	1.826	8.089	1.683
% Recovery	85%-115%	97.1	102.2	96.3	93.8	106.2	91.3	101.1	84.1
		2.019	20.82	1.981	19.18	2.206	1.897	8.402	1.778
% Recovery	85%-115%	101.0	104.1	99.1	95.9	110.3	94.8	105.0	88.9
RPD	10%	3.9	1.8	2.8	2.2	3.8	3.8	3.8	5.5

		FI	CI	NO2	SO4	Br	NO3-N	NO3	PO4
		2	20	2	20	2	2	8	2
3 lcs high		2.01	20.85	1.978	19.14	2.179	1.89	8.373	1.767
% Recovery	85%-115%	100.5	104.3	98.9	95.7	109.0	94.5	104.7	88.4

MS check:	FI	CI	NO2	SO4	Br	NO3-N	NO3	PO4
72438	0.000	302.98	0.074	188.95	0.292	0.781	3.46	5.516
72438 + ms	1.923	326.47	1.958	210.65	1.915	2.626	11.63	7.287
72438 + msd	1.907	310.58	1.945	200.51	1.865	2.587	11.46	6.983
average:	1.92	326.47	1.96	210.65	1.91	2.63	11.63	7.29
% Recovery: 80%-120%	96.1	117.5	94.2	108.5	81.1	92.2	92.2	88.6
% Difference < 10%	0.8	4.9	0.7	4.8	2.6	1.5	1.5	4.2

MS check:	FI	CI	NO2	SO4	Br	NO3-N	NO3	PO4
72467	0.399	274.48	0.052	145.61	0.342	1.648	7.30	0.104
72467 + ms	2.383	303.46	1.907	168.94	2.165	3.588	15.89	1.748
72467 + msd	2.430	307.91	1.946	171.35	2.013	3.660	16.21	1.768
average:	2.38	303.46	1.91	168.94	2.16	3.59	15.89	1.75
% Recovery: 80%-120%	99.2	144.9	92.8	116.7	91.1	97.0	97.0	82.2
% Difference < 10%	2.0	1.5	2.1	1.4	7.0	2.0	2.0	1.1

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 DOHS ELAP Cert. No.: 1775

Date: January 15, 2011
Client: Marine Research Specialists
3140 Telegraph Road, Suite A
Ventura, CA 93003
Attn: Doug Coats

Laboratory No.: A-11011201-001
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 records attached.

Date Sampled: 01/11/11 (composite)
Date Received: 01/12/11
Temp. Received: 5.3°C
Chlorine (TRC): 0.0 mg/l
Dates Tested: 01/12/11 to 01/14/11

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:	10%	10

Quality Control: Reviewed and approved by:



Joseph A. LeMay
Laboratory Director

ABALONE LARVAL DEVELOPMENT SHORT-TERM TOXICITY TEST



Lab No.: A-11011201-001
Client/ID: Morro Bay WWTP

Date tested: 01/12/11 - 01/14/11

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-110112 (ran concurrently)

Source: The Cultured Abalone.
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)	94.9%	
Control (Dilution)	93.8%	
3.2%	94.9%	
5.6%	94.8%	
10.0%	93.5%	
18.0%	0%	*
32.0%	0%	*
* Statistically significantly less than control at P = 0.05 level		

CHRONIC TOXICITY

NOEC	10%
TUc	10

QA/QC TEST ACCEPTABILITY

Parameter	Result
Average control normality ≥ 80%	PASSED (93.8%)
%MSD < 20% relative to control	PASSED (%MSD = 6.2%)
Please see RT-110112 report for additional test acceptability criteria.	

Abalone Larval Development Test-Proportion Normal

Start Date: 1/12/2011 14:00 Test ID: 11011201a Sample ID: Morro Bay
 End Date: 1/14/2011 14:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF1-POTW
 Sample Date: 1/11/2011 09:00 Protocol: WCCH-EPA-600-R-95-136 Test Species: HR-Haliotis rufescens
 Comments:

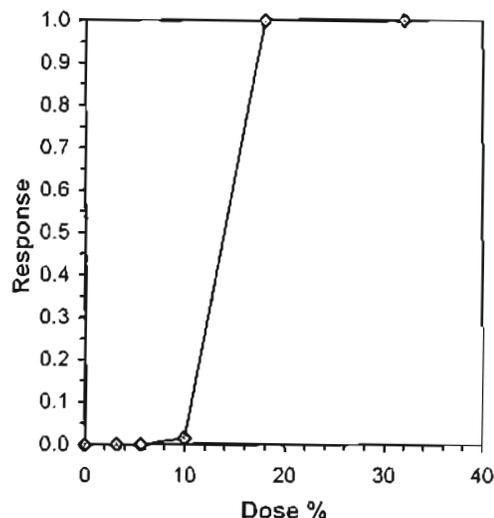
Conc-%	1	2	3	4	5
B-Control	0.9561	0.8957	0.9818	0.9646	0.9459
D-Control	0.9052	0.8974	0.9904	0.9714	0.9273
3.2	0.9730	0.9633	0.8843	0.9806	0.9459
5.6	0.9817	0.9346	0.9730	0.8783	0.9727
10	0.8760	0.9273	0.9364	0.9722	0.9646
18	0.0000	0.0000	0.0000	0.0000	0.0000
32	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-%	Mean	N-Mean	Transform: Arcsin Square Root					Rank Sum	1-Tailed Critical	Isotonic	
			Mean	Min	Max	CV%	N			Mean	N-Mean
B-Control	0.9488	1.0112	1.3510	1.2419	1.4355	5.271	5	*	0.9485	1.0000	
D-Control	0.9383	1.0000	1.3348	1.2448	1.4726	7.376	5				
3.2	0.9494	1.0118	1.3549	1.2237	1.4310	6.003	5	27.50	17.00	0.9477 0.9992	
5.6	0.9480	1.0103	1.3544	1.2144	1.4349	6.711	5	28.00	17.00	0.9475 0.9989	
10	0.9353	0.9968	1.3219	1.2110	1.4033	5.750	5	24.50	17.00	0.9342 0.9849	
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 non-normal distribution (p <= 0.05)	0.89202	0.905	-0.7349	-0.6291
Bartlett's Test indicates equal variances (p = 0.97)	0.23984	11.3449		
The control means are not significantly different (p = 0.77)	0.29837	2.30601		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	10	18	13.4164	10
Treatments vs B-Control				

Linear Interpolation (200 Resamples)				
Point	%	SD	95% CL(Exp)	Skew
IC05	10.283	0.319	8.714 10.435	-4.2667
IC10	10.690	0.123	10.248 10.833	-0.5358
IC15	11.096	0.116	10.678 11.231	-0.5358
IC20	11.502	0.109	11.109 11.629	-0.5358
IC25	11.908	0.103	11.540 12.028	-0.5358
IC40	13.126	0.082	12.832 13.222	-0.5358
IC50	13.939	0.068	13.693 14.018	-0.5358



ABALONE CHRONIC BIOASSAY



Lab No.: A-11011201-001

Client ID: MRS - Morro Bay Effluent

Start Date: 01/12/2011

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)	15.0	7.4	8.2	34	15.1	8.2	15.4	7.5	8.2	34
Control (lab)	15.1	7.6	8.2	34	14.6	8.2	15.3	7.6	8.2	34
3.2%	15.0	7.6	8.2	34	14.9	8.2	14.8	7.6	8.2	34
5.6%	14.9	7.5	8.2	34	15.2	8.2	14.6	7.8	8.2	34
10%	14.7	7.5	8.2	34	15.4	8.2	15.4	7.5	8.2	34
18%	14.9	7.6	8.2	34	15.2	8.2	14.3	7.8	8.2	34
32%	15.0	7.7	8.3	34	15.4	8.3	14.6	7.7	8.3	34

Sample as received: Chlorine: 0 mg/l; pH: 8.2; Salinity: 0 ppt; Temp: 5.3 °C; DO: 4.3 mg/l.

Initial readings: [Signature] Date/Time: 1-12-11 14:00 Final readings: [Signature] Date/Time: 1-14-11 14:00

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	18	0	100	13	C	105	12	25	5.6	101	14
2	B	109	5	14	B	108	2	26	18	0	100
3	32	0	100	15	C	103	1	27	C	102	8
4	10	106	15	16	18	0	100	28	10	105	3
5	5.6	107	2	17	3.2	107	14	29	3.2	101	2
6	3.2	108	3	18	32	0	100	30	32	0	100
7	18	0	100	19	10	103	7	31	B	105	6
8	B	103	12	20	B	109	4	32	32	0	100
9	10	102	8	21	18	0	100	33	5.6	107	3
10	C	105	11	22	32	0	100	34	3.2	105	6
11	5.6	100	7	23	5.6	108	3	35	10	109	4
12	3.2	105	4	24	C	102	3				

Microscopic examination: Analyst: [Signature] Date: 1-15-11 Time: 0900



ABALONE CHRONIC BIOASSAY

Lab No.: A-11011201-001

Client ID: MRS - Morro Bay Effluent

Start Date: 01/12/2011

RANDOMIZATION WORKSHEET

Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Notes
1	18	13	C	25	5.6	 <p>Add 1600 fertilized eggs per 200 ml test volume.</p>
2	B	14	B	26	18	
3	3.2	15	C	27	C	
4	10	16	18	28	10	
5	5.6	17	3.2	29	3.2	
6	3.2	18	3.2	30	3.2	
7	18	19	10	31	B	
8	B	20	B	32	3.2	
9	10	21	18	33	5.6	
10	C	22	3.2	34	3.2	
11	5.6	23	5.6	35	10	
12	3.2	24	C			

Analyst: *h* Date: 1-12-11 Time: 1102



***CHAIN
OF
CUSTODY***

CHAIN OF CUSTODY

Client: City of Morro Bay

Address: Wastewater Treatment Plant

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 St., 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.	11 Jan 11	0900	E	0.1 mg/l	1 (one gallon)	Abalone Chronic

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)	Seals Intact? (Yes, No, NA)	Temperature Received (°C)
Steven R. Aocherborn	Fel Ex	11 Jan 11	1430	YES	—
Fel Ex	[Signature]	1-12-11	0930	NA	5.3



***REFERENCE
TOXICANT
DATA***

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



QA/QC Batch No.: RT-110112

Date tested: 01/12/11 - 01/14/11

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: The Cultured Abalone.

Dilution water: Lab seawater.

Endpoints: NOEC, IC25 at 48 hrs.

Test volume: 200 ml.

Aeration: None.

Number of replicates: 5.

Ref. Tox. source: Mallinckrodt.

Lot No.: 8872 KCXG

RESULTS SUMMARY

SAMPLE CONCENTRATION	PERCENT NORMAL DEVELOPMENT
Control	94.0%
10 µg/l	92.5%
18 µg/l	92.8%
32 µg/l	24.9% *
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	22.6 µg/l

QA/QC TEST ACCEPTABILITY

Parameter	Result
Average control normality ≥ 80%	Yes (94.0%)
56 µg/l treatment response significantly less than control response	Yes (NOEC = 18 µg/l)
%MSD < 20% relative to control	Yes (%MSD = 7.7%)

Abalone Larval Development Test-Proportion Normal

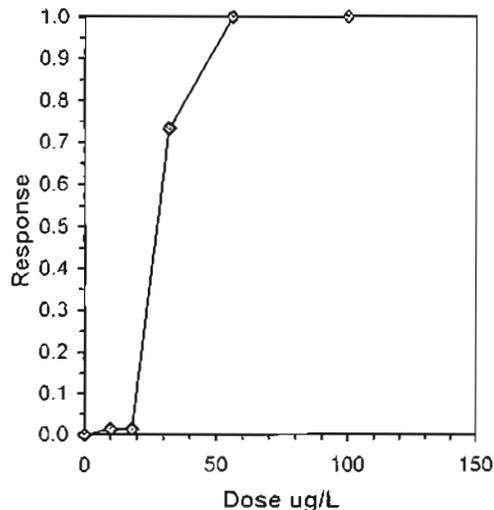
Start Date: 1/12/2011 14:00 Test ID: RT110112a Sample ID: REF-Ref Toxicant
 End Date: 1/14/2011 14:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: ZNSO-Zinc sulfate
 Sample Date: 1/12/2011 Protocol: WCCH-EPA-600-R-95-136 Test Species: HR-Haliotis rufescens
 Comments:

Conc-ug/L	1	2	3	4	5
D-Control	0.9633	0.9346	0.9304	0.9811	0.8889
10	0.9806	0.9364	0.9107	0.9196	0.8793
18	0.9709	0.9626	0.8814	0.9259	0.9018
32	0.3772	0.3204	0.2500	0.1509	0.1481
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	0.9397	1.0000	1.3316	1.2310	1.4330	5.782	5				0.9386	1.0000
10	0.9253	0.9847	1.3027	1.2160	1.4310	6.162	5	0.506	2.230	0.1274	0.9255	0.9860
18	0.9285	0.9881	1.3084	1.2191	1.3993	5.943	5	0.407	2.230	0.1274	0.9255	0.9860
*32	0.2493	0.2653	0.5161	0.3951	0.6613	23.091	5	14.278	2.230	0.1274	0.2505	0.2668
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

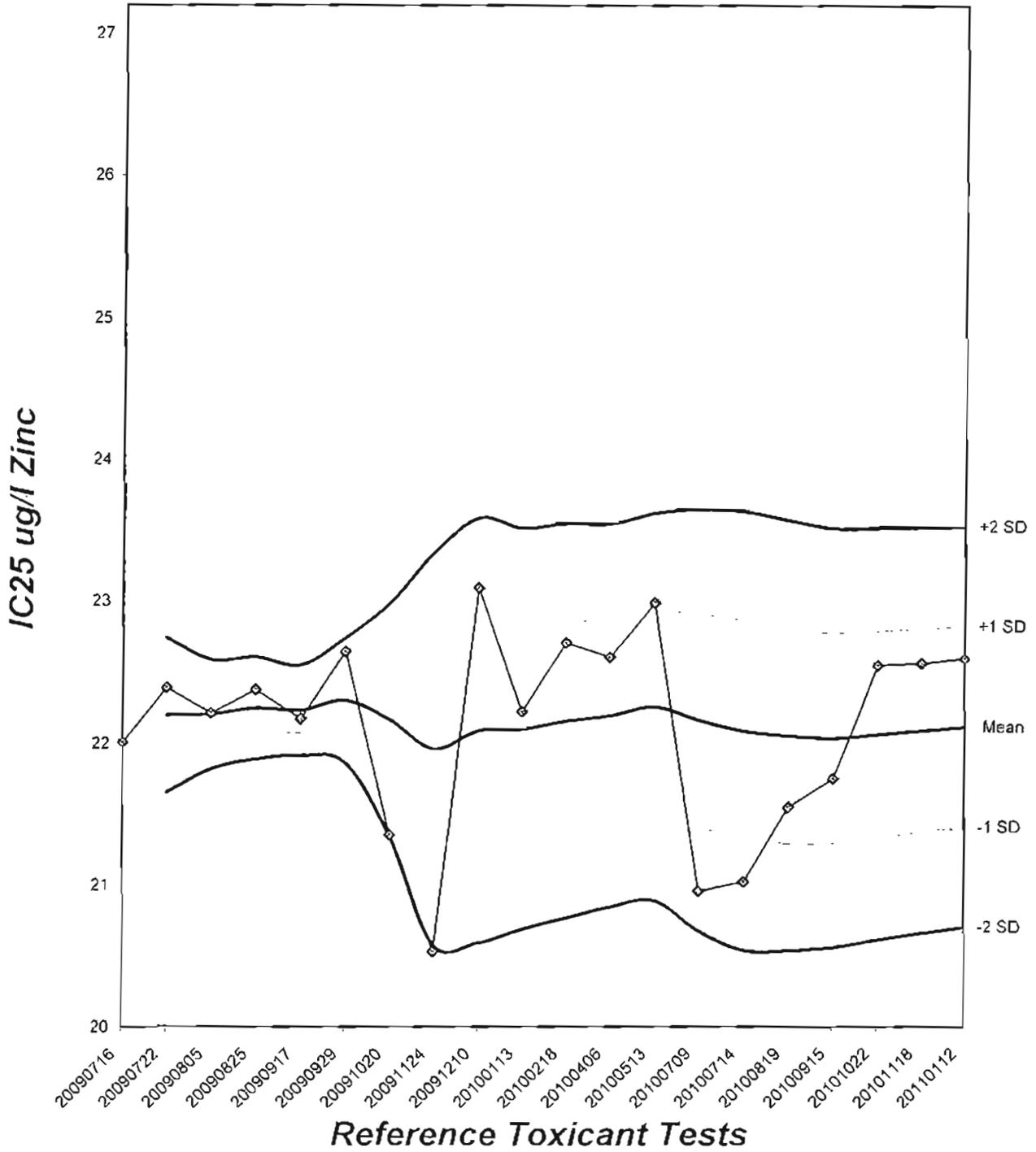
Auxiliary Tests	Statistic	Critical	Skew	Kurt						
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.95082	0.905	0.20381	-1.0786						
Bartlett's Test indicates equal variances (p = 0.78)	1.08357	11.3449								
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnell's Test	18	32	24		0.07232	0.07662	0.79695	0.00816	1.7E-10	3, 16

Linear Interpolation (200 Resamples)					
Point	ug/L	SD	95% CL(Exp)	Skew	
IC05	18.702	1.294	16.866	19.191	-6.7328
IC10	19.675	0.275	18.657	20.247	-0.5135
IC15	20.648	0.279	19.720	21.306	-0.2983
IC20	21.622	0.297	20.694	22.396	-0.0614
IC25	22.595	0.327	21.596	23.500	0.1274
IC40	25.515	0.462	24.179	26.869	0.3609
IC50	27.461	0.572	25.763	29.081	0.3908



Abalone Larval Development Laboratory Control Chart

CV% = 3.18



ABALONE CHRONIC BIOASSAY
Reference Toxicant - Zinc Sulfate



QA/QC No.: RT-110112

Start Date: 01/12/2011

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	14.2	7.5	8.2	34	15.0	8.2	15.6	7.4	8.2	34
10 µg/l Zn	14.6	7.7	8.2	34	15.1	8.2	15.7	7.4	8.2	34
18 µg/l Zn	14.7	7.7	8.2	34	15.4	8.2	15.2	7.5	8.2	34
32 µg/l Zn	14.2	7.5	8.2	34	14.8	8.2	15.5	7.5	8.2	34
56 µg/l Zn	14.6	7.5	8.2	34	14.2	8.2	15.0	7.6	8.2	34
100 µg/l Zn	14.6	7.4	8.2	34	14.8	8.2	15.6	7.4	8.2	34

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

Initial readings: [Signature] Date/Time: 1-12-11 1400 Final readings: [Signature] Date/Time: 1-12-11 1400

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	32	43	71	11	100	0	100	21	C	104	2
2	C	105	4	12	18	103	4	22	56	0	100
3	56	0	100	13	C	107	8	23	10	103	9
4	10	101	2	14	32	28	84	24	32	16	90
5	100	0	100	15	18	104	14	25	100	0	100
6	18	100	3	16	100	0	100	26	C	104	13
7	10	103	7	17	56	0	100	27	18	101	11
8	32	33	70	18	10	102	10	28	56	0	100
9	56	0	100	19	18	100	8	29	10	102	14
10	C	100	7	20	100	0	100	30	32	16	92

Microscopic examination: Analyst: [Signature] Date: 1-15-11 Time: 0900

ABALONE CHRONIC BIOASSAY
Reference Toxicant - Zinc Sulfate



QA/QC No.: RT-110112

Start Date: 01/12/11

RANDOMIZATION WORKSHEET

Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Beaker No.	Sample Conc.	Notes
1	32	11	100	21	C	Number Males used: <u>4</u> Number females used: <u>8</u> Time H ₂ O ₂ added: <u>10:00</u> Time water changed: <u>12:30</u> Time spawned: <u>1300</u> [↗] <u>1320</u> Time placed in test: <u>14:15</u> Add 1600 fertilized eggs per 200 ml.. Time glutaraldehyde added: <u>1400</u>
2	C	12	18	22	56	
3	56	13	C	23	10	
4	10	14	32	24	32	
5	100	15	18	25	100	
6	18	16	100	26	C	
7	10	17	56	27	18	
8	32	18	10	28	56	
9	56	19	18	29	10	
10	C	20	100	30	32	

Analyst: [Signature] Date: 1-12-11 Time: 1100

Test Temperature Chart

Test No: RT-110112

Date Tested: 01/12/11 to 01/14/11

Acceptable Range: 15+/- 1°C

