Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	04-9983-8389	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	11 Apr-14 15:53	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

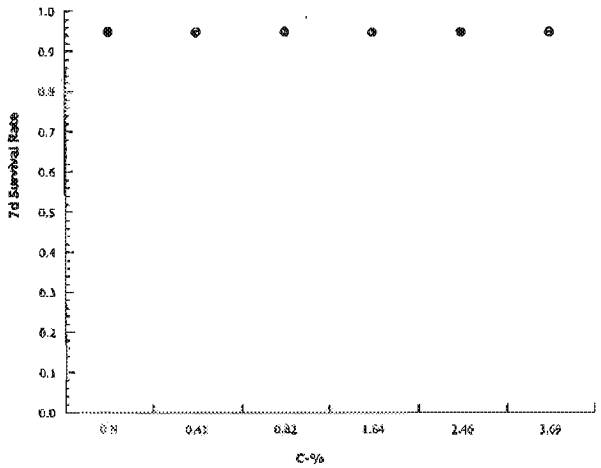
Angular (Corrected) Transformed Detail

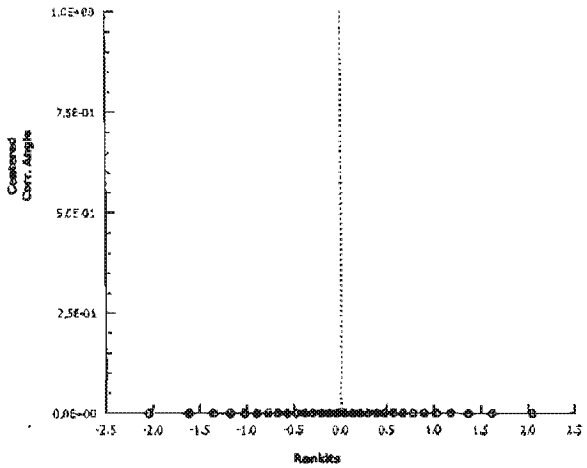
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.345	1.345	1.345	1.345	1.345
0.41		1.345	1.345	1.345	1.345	1.345
0.82		1.345	1.345	1.345	1.345	1.345
1.64		1.345	1.345	1.345	1.345	1.345
2.46		1.345	1.345	1.345	1.345	1.345
3.69		1.345	1.345	1.345	1.345	1.345

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
0.41		5/5	5/5	5/5	5/5	5/5
0.82		5/5	5/5	5/5	5/5	5/5
1.64		5/5	5/5	5/5	5/5	5/5
2.46		5/5	5/5	5/5	5/5	5/5
3.69		5/5	5/5	5/5	5/5	5/5

Graphics





Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	09-5055-2586	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	11 Apr-14 15:53	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Sample ID:	09-4051-6201	Code:	AVA0314.330tops	Client:	Avalon WWTP
Sample Date:	24 Mar-14 10:55	Material:	Sample Water	Project:	
Receive Date:	25 Mar-14 14:00	Source:	Bioassay Report		
Sample Age:	28h (10.6 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	19.5%	3.69	>3.69	NA	27.1

Dunnett Multiple Comparison Test

Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.41	-3.784	2.362	0.224	8	1.0000	CDF	Non-Significant Effect
		0.82	-3.405	2.362	0.224	8	1.0000	CDF	Non-Significant Effect
		1.64	-3.565	2.362	0.224	8	1.0000	CDF	Non-Significant Effect
		2.46	-2.61	2.362	0.224	8	0.9999	CDF	Non-Significant Effect
		3.69	-2.963	2.362	0.224	8	1.0000	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.4418668	0.08837335	5	3.915	0.0098	Significant Effect
Error	0.5417983	0.02257493	24			
Total	0.983665		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	5.952	15.09	0.3110	Equal Variances
Variances	Mod Levene Equality of Variance	1.114	4.248	0.3877	Equal Variances
Variances	Levene Equality of Variance	1.359	3.895	0.2744	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9847	0.9031	0.9318	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.07252	0.1853	1.0000	Normal Distribution
Distribution	D'Agostino Skewness	0.4517	2.576	0.6515	Normal Distribution
Distribution	D'Agostino Kurtosis	0.008265	2.576	0.9934	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.2041	9.21	0.9030	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.1702	3.878	0.9863	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1.15	0.8946	1.405	1.184	0.822	1.352	0.092	17.89%	0.0%
0.41		5	1.51	1.354	1.665	1.506	1.354	1.646	0.05599	8.29%	-31.27%
0.82		5	1.474	1.262	1.686	1.462	1.318	1.724	0.07632	11.58%	-28.14%
1.64		5	1.489	1.281	1.696	1.412	1.328	1.722	0.07473	11.22%	-29.46%
2.46		5	1.398	1.233	1.563	1.436	1.2	1.554	0.05951	9.52%	-21.57%
3.69		5	1.432	1.367	1.496	1.432	1.352	1.488	0.02328	3.64%	-24.49%

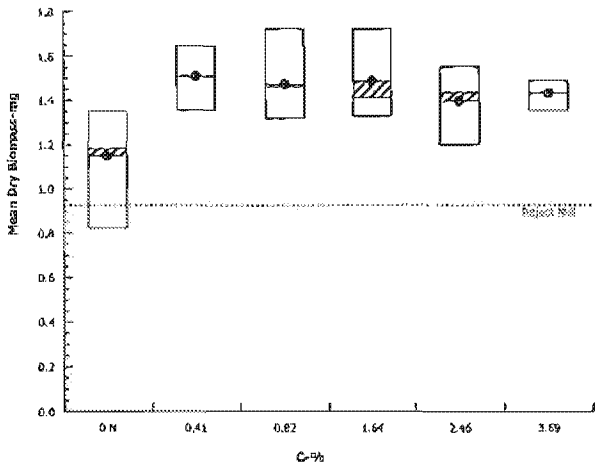
Mean Dry Biomass-mg Detail

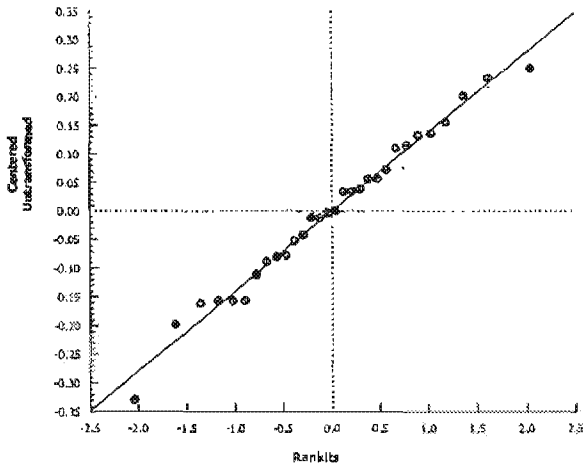
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.184	1.108	0.822	1.352	1.284
0.41		1.506	1.354	1.422	1.62	1.646
0.82		1.318	1.462	1.318	1.546	1.724
1.64		1.604	1.378	1.328	1.412	1.722
2.46		1.554	1.454	1.346	1.436	1.2
3.69		1.352	1.432	1.488	1.466	1.42

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	09-5055-2588	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	11 Apr-14 15:53	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Graphics





Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	15-8110-3042	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	11 Apr-14 15:53	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	09-4051-6201	Code:	AVA0314.330tops	Client:	Avalon WWTP
Sample Date:	24 Mar-14 10:55	Material:	Sample Water	Project:	
Receive Date:	25 Mar-14 14:00	Source:	Bioassay Report		
Sample Age:	28h (10.6 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>3.69	N/A	N/A	<27.1	NA	NA
EC10	>3.69	N/A	N/A	<27.1	NA	NA
EC15	>3.69	N/A	N/A	<27.1	NA	NA
EC20	>3.69	N/A	N/A	<27.1	NA	NA
EC25	>3.69	N/A	N/A	<27.1	NA	NA
EC40	>3.69	N/A	N/A	<27.1	NA	NA
EC50	>3.69	N/A	N/A	<27.1	NA	NA

7d Survival Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	25	25
0.41		5	1	1	1	0	0	0.0%	0.0%	25	25
0.82		5	1	1	1	0	0	0.0%	0.0%	25	25
1.64		5	1	1	1	0	0	0.0%	0.0%	25	25
2.46		5	1	1	1	0	0	0.0%	0.0%	25	25
3.69		5	1	1	1	0	0	0.0%	0.0%	25	25

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.41		1	1	1	1	1
0.82		1	1	1	1	1
1.64		1	1	1	1	1
2.46		1	1	1	1	1
3.69		1	1	1	1	1

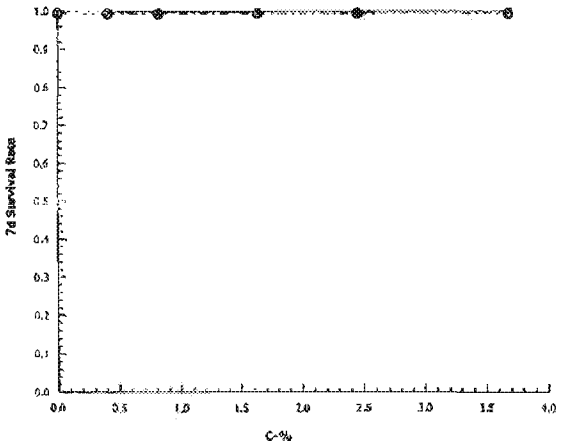
7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
0.41		5/5	5/5	5/5	5/5	5/5
0.82		5/5	5/5	5/5	5/5	5/5
1.64		5/5	5/5	5/5	5/5	5/5
2.46		5/5	5/5	5/5	5/5	5/5
3.69		5/5	5/5	5/5	5/5	5/5

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	15-8110-3042	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	11 Apr-14 15:53	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Graphics



Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	00-7093-5075	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	11 Apr-14 15:53	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	09-4051-6201	Code:	AVA0314.330tops	Client:	Avalon WWTP
Sample Date:	24 Mar-14 10:55	Material:	Sample Water	Project:	
Receive Date:	25 Mar-14 14:00	Source:	Bioassay Report		
Sample Age:	28h (10.6 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	523376	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>3.69	N/A	N/A	<27.1	NA	NA
IC10	>3.69	N/A	N/A	<27.1	NA	NA
IC15	>3.69	N/A	N/A	<27.1	NA	NA
IC20	>3.69	N/A	N/A	<27.1	NA	NA
IC25	>3.69	N/A	N/A	<27.1	NA	NA
IC40	>3.69	N/A	N/A	<27.1	NA	NA
IC50	>3.69	N/A	N/A	<27.1	NA	NA

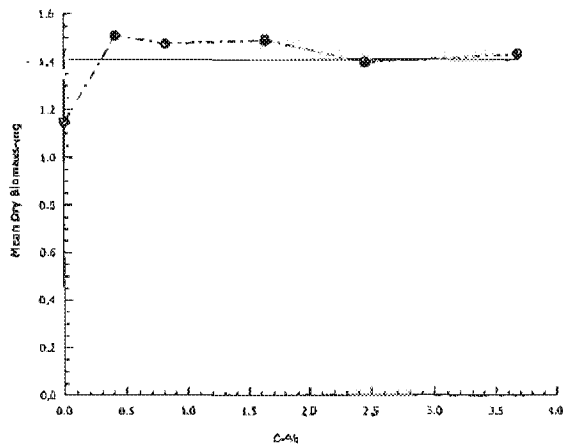
Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.15	0.822	1.352	0.092	0.2057	17.89%	0.0%
0.41		5	1.51	1.354	1.646	0.05599	0.1252	8.29%	-31.27%
0.82		5	1.474	1.318	1.724	0.07632	0.1707	11.58%	-28.14%
1.64		5	1.489	1.328	1.722	0.07473	0.1671	11.22%	-29.46%
2.46		5	1.398	1.2	1.554	0.05951	0.1331	9.52%	-21.57%
3.69		5	1.432	1.352	1.488	0.02328	0.05205	3.64%	-24.49%

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.184	1.108	0.822	1.352	1.284
0.41		1.506	1.354	1.422	1.62	1.646
0.82		1.318	1.462	1.318	1.546	1.724
1.64		1.604	1.378	1.328	1.412	1.722
2.46		1.554	1.454	1.346	1.436	1.2
3.69		1.352	1.432	1.488	1.466	1.42

Graphics



CETIS Measurement Report

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	11-8467-0870	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	25 Mar-14 14:25	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	01 Apr-14 12:25	Species:	Atherinops affinis	Brine:	Not Applicable
Duration:	6d 22h	Source:	Aquatic Biosystems, CO	Age:	

Sample ID:	09-4051-6201	Code:	AVA0314.330tops	Client:	Avalon WWTP
Sample Date:	24 Mar-14 10:55	Material:	Sample Water	Project:	
Receive Date:	25 Mar-14 14:00	Source:	Bioassay Report		
Sample Age:	28h (10.6 °C)	Station:	Eff Comp		

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	7.338	7.045	7.63	6.8	7.7	0.1238	0.3503	4.77%	0
0.41		8	7.363	6.936	7.789	6.5	8.1	0.1802	0.5097	6.92%	0
0.82		8	7.413	7.071	7.754	6.8	8	0.1445	0.4086	5.51%	0
1.64		8	7.363	7.063	7.662	6.8	7.7	0.1267	0.3583	4.87%	0
2.46		8	7.388	7.061	7.714	6.8	7.9	0.1381	0.3907	5.29%	0
3.69		8	7.3	6.9	7.7	6.4	7.8	0.169	0.4781	6.55%	0
Overall		48	7.36			6.4	8.1				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	7.588	7.558	7.617	7.5	7.6	0.0125	0.03535	0.47%	0
0.41		8	7.613	7.583	7.642	7.6	7.7	0.0125	0.03535	0.46%	0
0.82		8	7.638	7.594	7.681	7.6	7.7	0.0183	0.05175	0.68%	0
1.64		8	7.65	7.605	7.695	7.6	7.7	0.0189	0.05345	0.7%	0
2.46		8	7.663	7.619	7.706	7.6	7.7	0.0183	0.05175	0.68%	0
3.69		8	7.65	7.605	7.695	7.6	7.7	0.0189	0.05345	0.7%	0
Overall		48	7.633			7.5	7.7				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	34	34	34	34	34	0	0	0.0%	0
0.41		8	34	34	34	34	34	0	0	0.0%	0
0.82		8	34	34	34	34	34	0	0	0.0%	0
1.64		8	34	34	34	34	34	0	0	0.0%	0
2.46		8	34	34	34	34	34	0	0	0.0%	0
3.69		8	34	34	34	34	34	0	0	0.0%	0
Overall		48	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	21	21	21	21	21	0	0	0.0%	0
0.41		8	21	21	21	21	21	0	0	0.0%	0
0.82		8	21	21	21	21	21	0	0	0.0%	0
1.64		8	21	21	21	21	21	0	0	0.0%	0
2.46		8	21	21	21	21	21	0	0	0.0%	0
3.69		8	21	21	21	21	21	0	0	0.0%	0
Overall		48	21			21	21				0 (0%)

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Dissolved Oxygen-mg/L

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.7	7.6	7.6	7.5	6.9	6.8	7.5	7.1
0.41		8.1	7.7	7.7	7.5	6.5	6.9	7.4	7.1
0.82		8	7.7	7.7	7.5	6.8	6.9	7.4	7.3
1.64		7.7	7.7	7.7	7.5	6.8	6.9	7.3	7.3
2.46		7.9	7.7	7.7	7.5	6.8	6.9	7.3	7.3
3.69		7.8	7.7	7.7	7.5	6.4	6.9	7.2	7.2

pH-Units

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.6	7.6	7.6	7.6	7.5	7.6	7.6	7.6
0.41		7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.7
0.82		7.6	7.6	7.6	7.7	7.6	7.6	7.7	7.7
1.64		7.6	7.6	7.7	7.7	7.6	7.6	7.7	7.7
2.46		7.6	7.7	7.7	7.7	7.6	7.6	7.7	7.7
3.69		7.6	7.7	7.7	7.7	7.6	7.6	7.6	7.7

Salinity-ppt

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	34	34	34	34	34	34	34	34
0.41		34	34	34	34	34	34	34	34
0.82		34	34	34	34	34	34	34	34
1.64		34	34	34	34	34	34	34	34
2.46		34	34	34	34	34	34	34	34
3.69		34	34	34	34	34	34	34	34

Temperature-°C

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	21	21	21	21	21	21	21	21
0.41		21	21	21	21	21	21	21	21
0.82		21	21	21	21	21	21	21	21
1.64		21	21	21	21	21	21	21	21
2.46		21	21	21	21	21	21	21	21
3.69		21	21	21	21	21	21	21	21

aquatic bioassay & consulting laboratories, inc

April 15, 2014

Mr. David Clary
Avalon Wastewater Treatment Plant
P.O. Box 1810
Avalon, CA 90704

Dear Mr. Clary:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-TermMathods for Estimating Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/600/R-95/136.* "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

CLIENT:	Avalon Wastewater Treatment Plant
SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	28 March - 14
DATE SAMPLED:	27 March - 14
ABC LAB. NO.:	AVA0314.342

CHRONIC SEA URCHIN FERTILIZATION BIOASSAY

NOEC	=	3.69 %
TUc	=	27.10
IC25	=	>3.69 %
IC50	=	>3.69 %

Yours very truly,

Scott Johnson
Laboratory Director

ED_002551_00000729-00136

CETIS Summary Report

Report Date: 15 Apr-14 09:47 (p 1 of 1)
Test Code: AVA0314.342urc | 11-9068-0581

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	06-6710-5709	Test Type:	Fertilization	Analyst:	
Start Date:	28 Mar-14 15:05	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	25 Mar-14 15:45	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	NA	Source:	David Gutoff	Age:	

Sample ID:	01-4558-7581	Code:	AVA0314.342urc	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
17-4517-6673	Fertilization Rate	3.69	>3.69	NA	NA	27.1	Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
02-0172-2454	Fertilization Rate	EC5	>3.69	N/A	N/A	<27.1	Linear Interpolation (ICPIN)
		EC10	>3.69	N/A	N/A	<27.1	
		EC15	>3.69	N/A	N/A	<27.1	
		EC20	>3.69	N/A	N/A	<27.1	
		EC25	>3.69	N/A	N/A	<27.1	
		EC40	>3.69	N/A	N/A	<27.1	
		EC50	>3.69	N/A	N/A	<27.1	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
02-0172-2454	Fertilization Rate	Control Resp	1	0.7 - NL	Yes	Passes Acceptability Criteria
17-4517-6673	Fertilization Rate	Control Resp	1	0.7 - NL	Yes	Passes Acceptability Criteria

Fertilization Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	4	1	1	1	1	1	0	0	0.0%	0.0%
0.41		4	1	1	1	1	1	0	0	0.0%	0.0%
0.82		4	1	1	1	1	1	0	0	0.0%	0.0%
1.64		4	1	1	1	1	1	0	0	0.0%	0.0%
2.46		4	1	1	1	1	1	0	0	0.0%	0.0%
3.69		4	1	1	1	1	1	0	0	0.0%	0.0%

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1	1	1	1
0.41		1	1	1	1
0.82		1	1	1	1
1.64		1	1	1	1
2.46		1	1	1	1
3.69		1	1	1	1

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	100/100	100/100	100/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	100/100	100/100	100/100
1.64		100/100	100/100	100/100	100/100
2.46		100/100	100/100	100/100	100/100
3.69		100/100	100/100	100/100	100/100

CETIS Analytical Report

Report Date: 15 Apr-14 09:47 (p 1 of 2)
Test Code: AVA0314.342urc | 11-9068-0581

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	17-4517-6673	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 9:47	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

Sample ID:	01-4558-7581	Code:	AVA0314.342urc	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	3.69	>3.69	NA	27.1

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.41	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		0.82	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		1.64	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		2.46	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		3.69	18	10	1	6	0.8333	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	5	65540	<0.0001	Significant Effect
Error	0	0	18			
Total	0		23			

Fertilization Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	4	1	1	1	1	1	1	0	0.0%	0.0%
0.41		4	1	1	1	1	1	1	0	0.0%	0.0%
0.82		4	1	1	1	1	1	1	0	0.0%	0.0%
1.64		4	1	1	1	1	1	1	0	0.0%	0.0%
2.46		4	1	1	1	1	1	1	0	0.0%	0.0%
3.69		4	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.41		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.82		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
1.64		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
2.46		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
3.69		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1	1	1	1
0.41		1	1	1	1
0.82		1	1	1	1
1.64		1	1	1	1
2.46		1	1	1	1
3.69		1	1	1	1

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	17-4517-6873	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 9:47	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

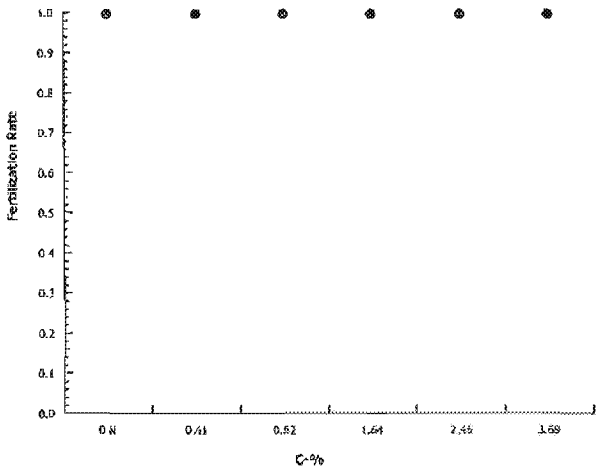
Angular (Corrected) Transformed Detail

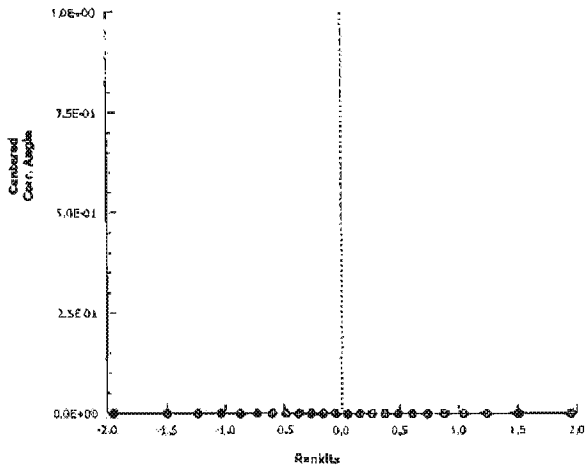
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1.521	1.521	1.521	1.521
0.41		1.521	1.521	1.521	1.521
0.82		1.521	1.521	1.521	1.521
1.64		1.521	1.521	1.521	1.521
2.46		1.521	1.521	1.521	1.521
3.69		1.521	1.521	1.521	1.521

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	100/100	100/100	100/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	100/100	100/100	100/100
1.64		100/100	100/100	100/100	100/100
2.46		100/100	100/100	100/100	100/100
3.69		100/100	100/100	100/100	100/100

Graphics





CETIS Analytical Report

Report Date: 15 Apr-14 09:47 (p 1 of 2)
Test Code: AVA0314.342urc | 11-9068-0581

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	02-0172-2454	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 9:47	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	01-4558-7581	Code:	AVA0314.342urc	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>3.69	N/A	N/A	<27.1	NA	NA
EC10	>3.69	N/A	N/A	<27.1	NA	NA
EC15	>3.69	N/A	N/A	<27.1	NA	NA
EC20	>3.69	N/A	N/A	<27.1	NA	NA
EC25	>3.69	N/A	N/A	<27.1	NA	NA
EC40	>3.69	N/A	N/A	<27.1	NA	NA
EC50	>3.69	N/A	N/A	<27.1	NA	NA

Fertilization Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	4	1	1	1	0	0	0.0%	0.0%	400	400
0.41		4	1	1	1	0	0	0.0%	0.0%	400	400
0.82		4	1	1	1	0	0	0.0%	0.0%	400	400
1.64		4	1	1	1	0	0	0.0%	0.0%	400	400
2.46		4	1	1	1	0	0	0.0%	0.0%	400	400
3.69		4	1	1	1	0	0	0.0%	0.0%	400	400

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1	1	1	1
0.41		1	1	1	1
0.82		1	1	1	1
1.64		1	1	1	1
2.46		1	1	1	1
3.69		1	1	1	1

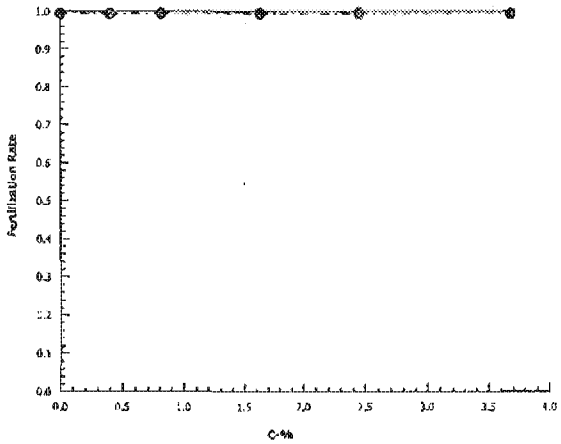
Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	100/100	100/100	100/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	100/100	100/100	100/100
1.64		100/100	100/100	100/100	100/100
2.46		100/100	100/100	100/100	100/100
3.69		100/100	100/100	100/100	100/100

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	02-0172-2454	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 9:47	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Graphics



CETIS Measurement Report

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	06-6710-5709	Test Type:	Fertilization	Analyst:	
Start Date:	28 Mar-14 15:05	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	25 Mar-14 15:45	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	NA	Source:	David Gutoff	Age:	

Sample ID:	01-4558-7581	Code:	AVA0314.342urc	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Parameter Acceptability Criteria

Parameter	Min	Max	Acceptability Limits	Overlap	Decision
Salinity-ppt	34	34	32 - 36	Yes	Results Within Limits
Temperature-°C	14.8	14.9	11 - 13	Yes	Results Above Limit

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.35	4.444	8.256	6.2	6.5	0.15	0.2121	3.34%	0
0.41		2	6.45	4.544	8.356	6.3	6.6	0.15	0.2121	3.29%	0
0.82		2	6.5	3.959	9.041	6.3	6.7	0.2	0.2828	4.35%	0
1.64		2	6.65	4.744	8.556	6.5	6.8	0.15	0.2121	3.19%	0
2.46		2	6.45	3.273	9.627	6.2	6.7	0.25	0.3536	5.48%	0
3.69		2	6.55	2.103	11	6.2	6.9	0.35	0.495	7.56%	0
Overall		12	6.492			6.2	6.9				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.41		2	8	8	8	8	8	0	0	0.0%	0
0.82		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
1.64		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
2.46		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
3.69		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
Overall		12	8.017			7.9	8.1				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
0.41		2	34	34	34	34	34	0	0	0.0%	0
0.82		2	34	34	34	34	34	0	0	0.0%	0
1.64		2	34	34	34	34	34	0	0	0.0%	0
2.46		2	34	34	34	34	34	0	0	0.0%	0
3.69		2	34	34	34	34	34	0	0	0.0%	0
Overall		12	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
0.41		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
0.82		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
1.64		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
2.46		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
3.69		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
Overall		12	14.85			14.8	14.9				0 (0%)

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	6.2	6.5
0.41		6.3	6.6
0.82		6.3	6.7
1.64		6.5	6.8
2.46		6.2	6.7
3.69		6.2	6.9

pH-Units

C-%	Control Type	1	2
0	Negative Contr	7.9	7.9
0.41		8	8
0.82		8	8.1
1.64		8	8.1
2.46		8	8.1
3.69		8	8.1

Salinity-ppt

C-%	Control Type	1	2
0	Negative Contr	34	34
0.41		34	34
0.82		34	34
1.64		34	34
2.46		34	34
3.69		34	34

Temperature-°C

C-%	Control Type	1	2
0	Negative Contr	14.9	14.8
0.41		14.9	14.8
0.82		14.9	14.8
1.64		14.9	14.8
2.46		14.9	14.8
3.69		14.9	14.8

aquatic bioassay & consulting laboratories, inc

April 15, 2014

Mr. David Clary
City of Avalon
P.O. Box 1810
Avalon, CA 90704

Dear Mr. Clary:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receving Waters to West Coast Estuarine Organisms, EPA/R-95/136.* "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

CLIENT:	Avalon Wastewater Treatment Plant
SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	28 March - 14
DATE SAMPLED:	27 March - 14
ABC LAB. NO.:	AVA0314.342

CHRONIC KELP GERMINATION AND GROWTH BIOASSAY

Germination	NOEC	=	3.69 %
	TUc	=	27.10
	EC25	=	>3.69 %
	EC50	=	>3.69 %
Tube Length	NOEC	=	3.69 %
	TUc	=	27.10
	IC25	=	3.69 %
	IC50	=	3.69 %

Yours very truly,

Scott Johnson
Laboratory Director

ED_002551_00000729-00144

CETIS Summary Report

Report Date: 15 Apr-14 10:02 (p 1 of 2)
Test Code: AVA0314.342klp | 06-4746-7283

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	15-3235-9163	Test Type:	Growth-Germination	Analyst:	
Start Date:	28 Mar-14 15:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	30 Mar-14 15:00	Species:	Macrocystis pyrifera	Brine:	Not Applicable
Duration:	48h	Source:	Aquatic Bioassay Labs Collection	Age:	

Sample ID:	09-4368-9295	Code:	AVA0314.342klp	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
14-7713-1491	Germination Rate	3.69	>3.69	NA	2.16%	27.1	Dunnett Multiple Comparison Test
13-8266-8558	Mean Length	3.69	>3.69	NA	4.59%	27.1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
01-9156-0902	Germination Rate	EC5	>3.69	N/A	N/A	<27.1	Linear Interpolation (ICPIN)
		EC10	>3.69	N/A	N/A	<27.1	
		EC15	>3.69	N/A	N/A	<27.1	
		EC20	>3.69	N/A	N/A	<27.1	
		EC25	>3.69	N/A	N/A	<27.1	
		EC40	>3.69	N/A	N/A	<27.1	
		EC50	>3.69	N/A	N/A	<27.1	
14-5561-1694	Mean Length	IC5	>3.69	N/A	N/A	<27.1	Linear Interpolation (ICPIN)
		IC10	>3.69	N/A	N/A	<27.1	
		IC15	>3.69	N/A	N/A	<27.1	
		IC20	>3.69	N/A	N/A	<27.1	
		IC25	>3.69	N/A	N/A	<27.1	
		IC40	>3.69	N/A	N/A	<27.1	
		IC50	>3.69	N/A	N/A	<27.1	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
01-9156-0902	Germination Rate	Control Resp	0.914	0.7 - NL	Yes	Passes Acceptability Criteria
14-7713-1491	Germination Rate	Control Resp	0.914	0.7 - NL	Yes	Passes Acceptability Criteria
13-8266-8558	Mean Length	Control Resp	16.28	10 - NL	Yes	Passes Acceptability Criteria
14-5561-1694	Mean Length	Control Resp	16.28	10 - NL	Yes	Passes Acceptability Criteria
14-7713-1491	Germination Rate	PMSD	0.02158	NL - 0.2	No	Passes Acceptability Criteria
13-8266-8558	Mean Length	PMSD	0.04592	NL - 0.2	No	Passes Acceptability Criteria

Germination Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	0.914	0.8998	0.9282	0.9	0.93	0.005099	0.0114	1.25%	0.0%
0.41		5	0.91	0.9012	0.9188	0.9	0.92	0.003162	0.007071	0.78%	0.44%
0.82		5	0.916	0.8972	0.9348	0.9	0.94	0.006782	0.01517	1.66%	-0.22%
1.64		5	0.918	0.8958	0.9402	0.9	0.94	0.008	0.01789	1.95%	-0.44%
2.46		5	0.92	0.9048	0.9352	0.9	0.93	0.005477	0.01225	1.33%	-0.66%
3.69		5	0.92	0.9112	0.9288	0.91	0.93	0.003162	0.007071	0.77%	-0.66%

Mean Length Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	16.28	15.54	17.02	15.5	16.9	0.2653	0.5933	3.64%	0.0%
0.41		5	16.24	15.72	16.76	15.7	16.8	0.1887	0.4219	2.6%	0.25%
0.82		5	16.08	15.32	16.84	15.2	16.8	0.2728	0.6099	3.79%	1.23%
1.64		5	16.2	15.8	16.6	15.8	16.5	0.1449	0.324	2.0%	0.49%
2.46		5	16.24	15.46	17.02	15.6	16.9	0.2821	0.6309	3.89%	0.25%
3.69		5	16.16	15.77	16.55	15.7	16.5	0.14	0.313	1.94%	0.74%

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.91	0.9	0.92	0.91	0.93
0.41		0.91	0.91	0.91	0.9	0.92
0.82		0.9	0.92	0.94	0.91	0.91
1.64		0.9	0.92	0.93	0.94	0.9
2.46		0.92	0.92	0.93	0.9	0.93
3.69		0.93	0.92	0.92	0.92	0.91

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.5	16.9	16.3	16.8	15.9
0.41		15.7	16.1	16.8	16.5	16.1
0.82		15.2	15.8	16.8	16.4	16.2
1.64		16.4	16.4	15.8	16.5	15.9
2.46		15.7	16.9	16.1	16.9	15.6
3.69		15.7	16.4	16.5	16.1	16.1

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 6
0	Negative Control	91/100	90/100	92/100	91/100	93/100
0.41		91/100	91/100	91/100	90/100	92/100
0.82		90/100	92/100	94/100	91/100	91/100
1.64		90/100	92/100	93/100	94/100	90/100
2.46		92/100	92/100	93/100	90/100	93/100
3.69		93/100	92/100	92/100	92/100	91/100

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	14-7713-1491	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 10:02	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Sample ID:	09-4368-9295	Code:	AVA0314.342klp	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	2.16%	3.69	>3.69	NA	27.1

Dunnett Multiple Comparison Test

Control vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control	0.41	0.5124	2.362	0.034	8	0.6415	CDF	Non-Significant Effect
	0.82	-0.2816	2.362	0.034	8	0.9032	CDF	Non-Significant Effect
	1.64	-0.5573	2.362	0.034	8	0.9476	CDF	Non-Significant Effect
	2.46	-0.7612	2.362	0.034	8	0.9684	CDF	Non-Significant Effect
	3.69	-0.7344	2.362	0.034	8	0.9661	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.001265273	0.0002530547	5	0.4871	0.7825	Non-Significant Effect
Error	0.01246799	0.0005194994	24			
Total	0.01373326		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	5.247	15.09	0.3864	Equal Variances
Variances	Mod Levene Equality of Variance	1.407	4.248	0.2688	Equal Variances
Variances	Levene Equality of Variance	1.645	3.895	0.1863	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9642	0.9031	0.3951	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1367	0.1853	0.1589	Normal Distribution
Distribution	D'Agostino Skewness	0.6113	2.576	0.5410	Normal Distribution
Distribution	D'Agostino Kurtosis	0.03362	2.576	0.9732	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.3748	9.21	0.8291	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.4577	3.878	0.2688	Normal Distribution

Germination Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	0.914	0.8998	0.9282	0.91	0.9	0.93	0.005099	1.25%	0.0%
0.41		5	0.91	0.9012	0.9188	0.91	0.9	0.92	0.003162	0.78%	0.44%
0.82		5	0.916	0.8972	0.9348	0.91	0.9	0.94	0.006782	1.66%	-0.22%
1.64		5	0.918	0.8958	0.9402	0.92	0.9	0.94	0.008	1.95%	-0.44%
2.46		5	0.92	0.9048	0.9352	0.92	0.9	0.93	0.005477	1.33%	-0.66%
3.69		5	0.92	0.9112	0.9288	0.92	0.91	0.93	0.003162	0.77%	-0.66%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.274	1.248	1.299	1.266	1.249	1.303	0.009194	1.61%	0.0%
0.41		5	1.266	1.251	1.282	1.266	1.249	1.284	0.005534	0.98%	0.58%
0.82		5	1.278	1.243	1.313	1.266	1.249	1.323	0.01267	2.22%	-0.32%
1.64		5	1.282	1.241	1.323	1.284	1.249	1.323	0.01471	2.57%	-0.63%
2.46		5	1.285	1.257	1.312	1.284	1.249	1.303	0.009859	1.72%	-0.86%
3.69		5	1.284	1.268	1.3	1.284	1.266	1.303	0.00584	1.02%	-0.83%

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	14-7713-1491	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 10:02	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.91	0.9	0.92	0.91	0.93
0.41		0.91	0.91	0.91	0.9	0.92
0.82		0.9	0.92	0.94	0.91	0.91
1.64		0.9	0.92	0.93	0.94	0.9
2.46		0.92	0.92	0.93	0.9	0.93
3.69		0.93	0.92	0.92	0.92	0.91

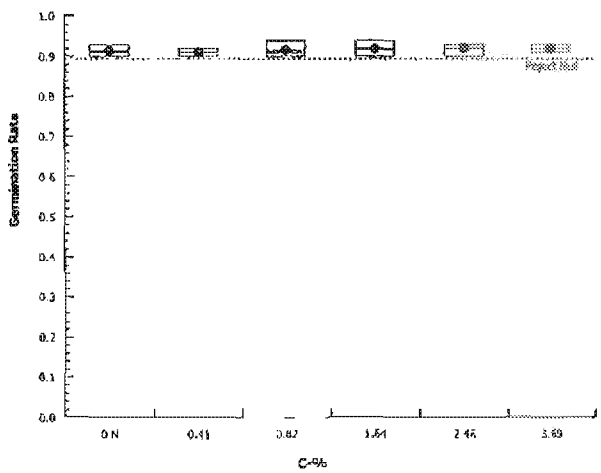
Angular (Corrected) Transformed Detail

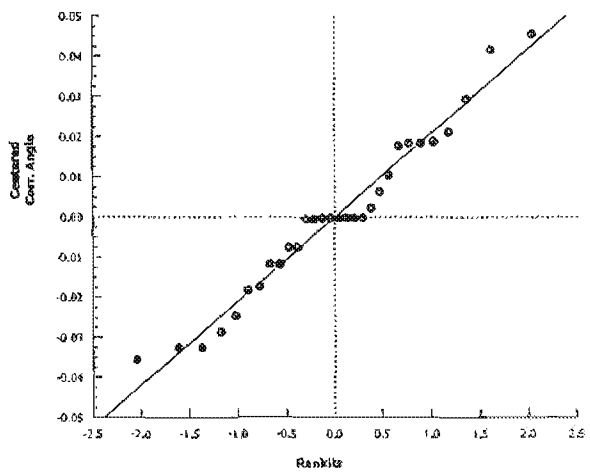
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.266	1.249	1.284	1.266	1.303
0.41		1.266	1.266	1.266	1.249	1.284
0.82		1.249	1.284	1.323	1.266	1.266
1.64		1.249	1.284	1.303	1.323	1.249
2.46		1.284	1.284	1.303	1.249	1.303
3.69		1.303	1.284	1.284	1.284	1.266

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	91/100	90/100	92/100	91/100	93/100
0.41		91/100	91/100	91/100	90/100	92/100
0.82		90/100	92/100	94/100	91/100	91/100
1.64		90/100	92/100	93/100	94/100	90/100
2.46		92/100	92/100	93/100	90/100	93/100
3.69		93/100	92/100	92/100	92/100	91/100

Graphics





Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	13-8266-8558	Endpoint:	Mean Length	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 10:02	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Sample ID:	09-4368-9295	Code:	AVA0314.342klp	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	4.59%	3.69	>3.69	NA	27.1

Dunnett Multiple Comparison Test

Control vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control	0.41	0.1264	2.362	0.748	8	0.7933	CDF	Non-Significant Effect
	0.82	0.6318	2.362	0.748	8	0.5881	CDF	Non-Significant Effect
	1.64	0.2527	2.362	0.748	8	0.7481	CDF	Non-Significant Effect
	2.46	0.1264	2.362	0.748	8	0.7933	CDF	Non-Significant Effect
	3.69	0.3791	2.362	0.748	8	0.6982	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.1279997	0.02559994	5	0.1022	0.9907	Non-Significant Effect
Error	6.011995	0.2504998	24			
Total	6.139995		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	3.467	15.09	0.6284	Equal Variances
Variances	Mod Levene Equality of Variance	1.403	4.248	0.2700	Equal Variances
Variances	Levene Equality of Variance	1.338	3.895	0.2823	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9652	0.9031	0.4184	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1031	0.1853	0.5694	Normal Distribution
Distribution	D'Agostino Skewness	0.3455	2.576	0.7297	Normal Distribution
Distribution	D'Agostino Kurtosis	1.524	2.576	0.1274	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	2.443	9.21	0.2948	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.3125	3.878	0.5756	Normal Distribution

Mean Length Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	16.28	15.54	17.02	16.3	15.5	16.9	0.2653	3.64%	0.0%
0.41		5	16.24	15.72	16.76	16.1	15.7	16.8	0.1887	2.6%	0.25%
0.82		5	16.08	15.32	16.84	16.2	15.2	16.8	0.2728	3.79%	1.23%
1.64		5	16.2	15.8	16.6	16.4	15.8	16.5	0.1449	2.0%	0.49%
2.46		5	16.24	15.46	17.02	16.1	15.6	16.9	0.2821	3.89%	0.25%
3.69		5	16.16	15.77	16.55	16.1	15.7	16.5	0.14	1.94%	0.74%

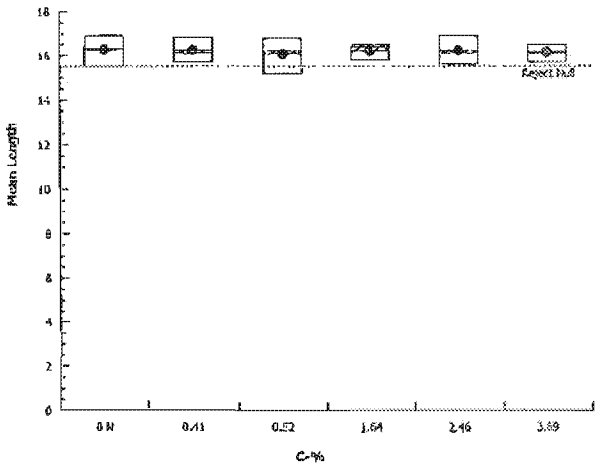
Mean Length Detail

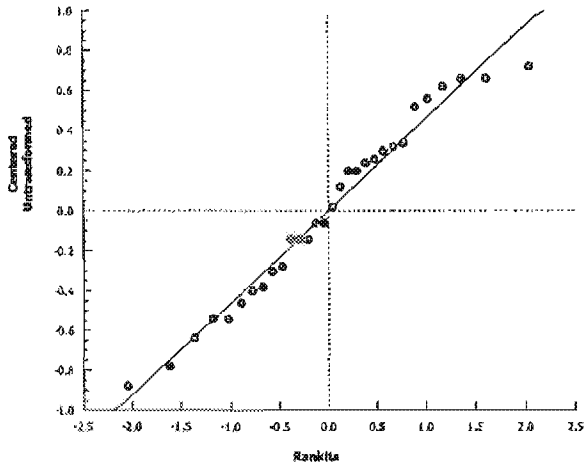
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.5	16.9	16.3	16.8	15.9
0.41		15.7	16.1	16.8	16.5	16.1
0.82		15.2	15.8	16.8	16.4	16.2
1.64		16.4	16.4	15.8	16.5	15.9
2.46		15.7	16.9	16.1	16.9	15.6
3.69		15.7	16.4	16.5	16.1	16.1

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	13-8266-8558	Endpoint:	Mean Length	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 10:02	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Graphics





Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	01-9156-0902	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 10:02	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	09-4368-9295	Code:	AVA0314.342klp	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>3.69	N/A	N/A	<27.1	NA	NA
EC10	>3.69	N/A	N/A	<27.1	NA	NA
EC15	>3.69	N/A	N/A	<27.1	NA	NA
EC20	>3.69	N/A	N/A	<27.1	NA	NA
EC25	>3.69	N/A	N/A	<27.1	NA	NA
EC40	>3.69	N/A	N/A	<27.1	NA	NA
EC50	>3.69	N/A	N/A	<27.1	NA	NA

Germination Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	0.914	0.9	0.93	0.005099	0.0114	1.25%	0.0%	457	500
0.41		5	0.91	0.9	0.92	0.003162	0.00707	0.78%	0.44%	455	500
0.82		5	0.916	0.9	0.94	0.006782	0.01517	1.66%	-0.22%	458	500
1.64		5	0.918	0.9	0.94	0.008	0.01789	1.95%	-0.44%	459	500
2.46		5	0.92	0.9	0.93	0.005477	0.01225	1.33%	-0.66%	460	500
3.69		5	0.92	0.91	0.93	0.003162	0.00707	0.77%	-0.66%	460	500

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.91	0.9	0.92	0.91	0.93
0.41		0.91	0.91	0.91	0.9	0.92
0.82		0.9	0.92	0.94	0.91	0.91
1.64		0.9	0.92	0.93	0.94	0.9
2.46		0.92	0.92	0.93	0.9	0.93
3.69		0.93	0.92	0.92	0.92	0.91

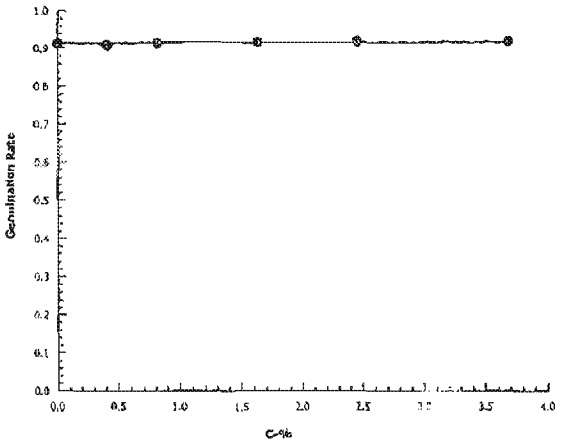
Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	91/100	90/100	92/100	91/100	93/100
0.41		91/100	91/100	91/100	90/100	92/100
0.82		90/100	92/100	94/100	91/100	91/100
1.64		90/100	92/100	93/100	94/100	90/100
2.46		92/100	92/100	93/100	90/100	93/100
3.69		93/100	92/100	92/100	92/100	91/100

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	01-9156-0902	*Endpoint:*	*Germination Rate*	*CETIS Version:*	CETISv1.8.7
Analyzed:	15 Apr-14 10:02	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Graphics



Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis-ID:	14-5561-1694	Endpoint:	Mean Length	CETIS Version:	CETISv1.8.7
Analyzed:	15 Apr-14 10:02	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	09-4368-9295	Code:	AVA0314.342klp	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	2025656	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>3.69	N/A	N/A	<27.1	NA	NA
IC10	>3.69	N/A	N/A	<27.1	NA	NA
IC15	>3.69	N/A	N/A	<27.1	NA	NA
IC20	>3.69	N/A	N/A	<27.1	NA	NA
IC25	>3.69	N/A	N/A	<27.1	NA	NA
IC40	>3.69	N/A	N/A	<27.1	NA	NA
IC50	>3.69	N/A	N/A	<27.1	NA	NA

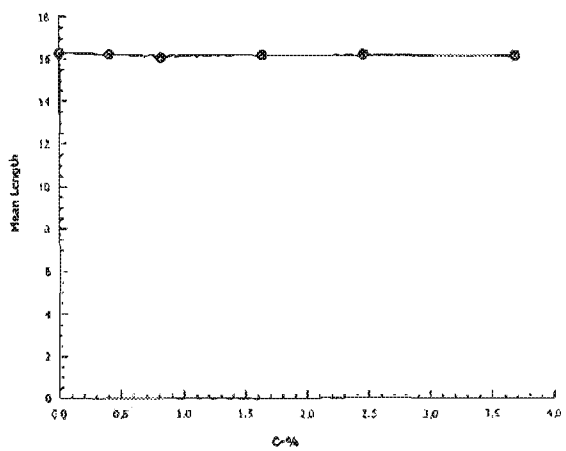
Mean Length Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	16.28	15.5	16.9	0.2653	0.5933	3.64%	0.0%
0.41		5	16.24	15.7	16.8	0.1887	0.4219	2.6%	0.25%
0.82		5	16.08	15.2	16.8	0.2728	0.6099	3.79%	1.23%
1.64		5	16.2	15.8	16.5	0.1449	0.324	2.0%	0.49%
2.46		5	16.24	15.6	16.9	0.2821	0.6309	3.89%	0.25%
3.69		5	16.16	15.7	16.5	0.14	0.3131	1.94%	0.74%

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.5	16.9	16.3	16.8	15.9
0.41		15.7	16.1	16.8	16.5	16.1
0.82		15.2	15.8	16.8	16.4	16.2
1.64		16.4	16.4	15.8	16.5	15.9
2.46		15.7	16.9	16.1	16.9	15.6
3.69		15.7	16.4	16.5	16.1	16.1

Graphics



Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	15-3235-9163	Test Type:	Growth-Germination	Analyst:	
Start Date:	28 Mar-14 15:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	30 Mar-14 15:00	Species:	Macrocystis pyrifera	Brine:	Not Applicable
Duration:	48h	Source:	Aquatic Bioassay Labs Collection	Age:	

Sample ID:	09-4368-9295	Code:	AVA0314.342klp	Client:	Avalon WWTP
Sample Date:	27 Mar-14 08:00	Material:	Sample Water	Project:	
Receive Date:	28 Mar-14 10:30	Source:	Bioassay Report		
Sample Age:	31h (6 °C)	Station:	Eff Comp		

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.35	4.444	8.256	6.2	6.5	0.15	0.2121	3.34%	0
0.41		2	6.45	4.544	8.356	6.3	6.6	0.15	0.2121	3.29%	0
0.82		2	6.5	3.959	9.041	6.3	6.7	0.2	0.2828	4.35%	0
1.64		2	6.65	4.744	8.556	6.5	6.8	0.15	0.2121	3.19%	0
2.46		2	6.45	3.273	9.627	6.2	6.7	0.25	0.3536	5.48%	0
3.69		2	6.55	2.103	11	6.2	6.9	0.35	0.495	7.56%	0
Overall		12	6.492			6.2	6.9				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.41		2	8	8	8	8	8	0	0	0.0%	0
0.82		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
1.64		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
2.46		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
3.69		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
Overall		12	8.017			7.9	8.1				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
0.41		2	34	34	34	34	34	0	0	0.0%	0
0.82		2	34	34	34	34	34	0	0	0.0%	0
1.64		2	34	34	34	34	34	0	0	0.0%	0
2.46		2	34	34	34	34	34	0	0	0.0%	0
3.69		2	34	34	34	34	34	0	0	0.0%	0
Overall		12	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
0.41		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
0.82		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
1.64		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
2.46		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
3.69		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
Overall		12	14.85			14.8	14.9				0 (0%)

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	6.2	6.5
0.41		6.3	6.6
0.82		6.3	6.7
1.64		6.5	6.8
2.46		6.2	6.7
3.69		6.2	6.9

pH-Units

C-%	Control Type	1	2
0	Negative Contr	7.9	7.9
0.41		8	8
0.82		8	8.1
1.64		8	8.1
2.46		8	8.1
3.69		8	8.1

Salinity-ppt

C-%	Control Type	1	2
0	Negative Contr	34	34
0.41		34	34
0.82		34	34
1.64		34	34
2.46		34	34
3.69		34	34

Temperature-°C

C-%	Control Type	1	2
0	Negative Contr	14.9	14.8
0.41		14.9	14.8
0.82		14.9	14.8
1.64		14.9	14.8
2.46		14.9	14.8
3.69		14.9	14.8

CHAIN OF CUSTODY RECORD

Client: Environ Strategy AWWTF

Address: 123 Pebbly Beach Rd. Avalon CA 90704

Phone Number: 310-510-0731

Project Name/Number:

Project Mgr.: Dave Clary

P.O.#: 1810

Sampled By (signature):

Analysis: Mysid Sensitive Species

Date	Time	Comp	Grab	Matrix	Sample ID	Volume/ Number	Mysid Sensitive Species	Comments
3/24/14	10:55am	✓		WW	EFF Comp	1gal / 1	1	

Relinquised By: (signature) Date: 3/24/14 Time: 11:30am

Received By: (signature) Date: 3-25-14 Time: 1400

Relinquised By: (signature) Date: 3/24/14 Time: 11:30am

Received By: (signature) Date: Time:

Temp. upon sample receipt: 12.10 °C

Aquatic Bioassay and Consulting Laboratories
29 N. Olive Street Ventura, CA 93001 Phone: (805) 643-5621 Fax: (805) 643-2930

Nitrate = 2.0.1
Ammonia ~ 2.0

CHAIN OF CUSTODY RECORD

Client: Environ Strategy AWWTF

Address: 123 Pebbly Beach Rd, Avalon, CA 90704

Phone Number: 310-510 0731

Project Name/Number: Environ Strategy AWWTF 690A

Project Mgr. David Clary

P.O. # 690A

Sampled By (signature): D. Clary

Date	Time	Comp.	Grab	Matrix	Sample ID	Volume/ Number	Analysis: Most Sensitive Species										Comments
3/26/14	09:51	X		WW	Eff Comp	1 gal.	X										

Relinquised By: (signature) D. Clary — Date: Time: 3/26/14 1500

Received By: (signature) — Date: Time: 3/27/14 [illegible]

Relinquised By: (signature) — Date: Time:

Received By: (signature) — Date: Time:

Temp. upon sample receipt: [illegible] °C

Chlorine < 0.01

Ammonia 0.0

Aquatic Bioassay and Consulting Laboratories
29 N. Olive Street Ventura, CA 93001 Phone: (805) 643-5621 Fax: (805) 643-2930

ED_002551_00000729-00158

CHAIN OF CUSTODY RECORD

Client: Environ Strategy AWWTF

Address: 123 Pebbly Beach Rd. Avalon, CA 90704

Phone Number: 310-510-0731

Project Name/Number: Environ Strategy AWWTF

Project Mgr. David Clary

P.O.# 690A

Sampled By (signature): D. Clary

Date	Time	Comp.	Grab	Matrix	Sample ID	Volume/ Number	Analysis: Most Sensitive Species										Comments
3/27/14	0800	X		WW	Eff Comp	1 gal.	X										

Relinquised By: (signature) D. Clary — Date: Time: 3/27/14 15:00

Received By: (signature) — Date: Time: 3-28-14 1070

Relinquised By: (signature) — Date: Time:

Received By: (signature) — Date: Time:

Temp. upon sample receipt: 10.0 °C

Chlorine = <0.1

Ammonia N/A = 0.0

Aquatic Bioassay and Consulting Laboratories
29 N. Olive Street Ventura, CA 93001 Phone: (805) 643-5621 Fax: (805) 643-2930

INVOICE NO. AVA0414.0323

April 28, 2014

Accounts Payable
Avalon WWTP
P.O. Box 1810
Avalon, CA 90704

SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	3 April - 14
DATE SAMPLED:	2 April - 14
ABC LAB. NO.:	AVA0414.025

CHRONIC NPDES BIOASSAYS	
Sea Urchin – (1 @ 900.00)	$900.00
TOTAL	$ 900.00

Make checks payable to: Aquatic Bioassays & Consulting Labs., Inc.
29 N. Olive St.
Ventura, CA 93001

Terms are net 30 days.

aquatic bioassay & consulting laboratories, inc

April 28, 2014

Mr. David Clary
Avalon Wastewater Treatment Plant
P.O. Box 1810
Avalon, CA 90704

Dear Mr. Clary:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-TermMathods for Estimating Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/600/R-95/136.* "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

CLIENT:	Avalon Wastewater Treatment Plant
SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	3 April - 14
DATE SAMPLED:	2 April - 14
ABC LAB. NO.:	AVA0414.025

CHRONIC SEA URCHIN FERTILIZATION BIOASSAY

NOEC	=	3.69 %
TUc	=	27.10
EC25	=	>3.69 %
EC50	=	>3.69 %

Yours very truly,

Scott Johnson
Laboratory Director

ED_002551_00000729-00160

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	10-9399-4842	Test Type:	Fertilization	Analyst:	
Start Date:	03 Apr-14 13:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	03 Apr-14 13:41	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	40m	Source:	David Gutoff	Age:	

Sample ID:	05-6746-9843	Code:	AVA0414.025	Client:	Avalon WWTP
Sample Date:	02 Apr-14 14:12	Material:	Sample Water	Project:	
Receive Date:	03 Apr-14 11:00	Source:	Bioassay Report		
Sample Age:	23h (3.9 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
18-8790-1079	Fertilization Rate	3.69	>3.69	NA	NA	27.1	Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
19-1806-8905	Fertilization Rate	EC5	>3.69	N/A	N/A	<27.1	Linear Interpolation (ICPIN)
		EC10	>3.69	N/A	N/A	<27.1	
		EC15	>3.69	N/A	N/A	<27.1	
		EC20	>3.69	N/A	N/A	<27.1	
		EC25	>3.69	N/A	N/A	<27.1	
		EC40	>3.69	N/A	N/A	<27.1	
		EC50	>3.69	N/A	N/A	<27.1	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
18-8790-1079	Fertilization Rate	Control Resp	1	0.7 - NL	Yes	Passes Acceptability Criteria
19-1806-8905	Fertilization Rate	Control Resp	1	0.7 - NL	Yes	Passes Acceptability Criteria

Fertilization Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	4	1	1	1	1	1	0	0	0.0%	0.0%
0.41		4	1	1	1	1	1	0	0	0.0%	0.0%
0.82		4	1	1	1	1	1	0	0	0.0%	0.0%
1.64		4	1	1	1	1	1	0	0	0.0%	0.0%
2.46		4	1	1	1	1	1	0	0	0.0%	0.0%
3.69		4	1	1	1	1	1	0	0	0.0%	0.0%

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1	1	1	1
0.41		1	1	1	1
0.82		1	1	1	1
1.64		1	1	1	1
2.46		1	1	1	1
3.69		1	1	1	1

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	100/100	100/100	100/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	100/100	100/100	100/100
1.64		100/100	100/100	100/100	100/100
2.46		100/100	100/100	100/100	100/100
3.69		100/100	100/100	100/100	100/100

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	18-8790-1079	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	24 Apr-14 15:04	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

Sample ID:	05-6746-9843	Code:	AVA0414.025	Client:	Avalon WWTP
Sample Date:	02 Apr-14 14:12	Material:	Sample Water	Project:	
Receive Date:	03 Apr-14 11:00	Source:	Bioassay Report		
Sample Age:	23h (3.9 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	3.69	>3.69	NA	27.1

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.41	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		0.82	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		1.64	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		2.46	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		3.69	18	10	1	6	0.8333	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	5	65540	<0.0001	Significant Effect
Error	0	0	18			
Total	0		23			

Fertilization Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	4	1	1	1	1	1	1	0	0.0%	0.0%
0.41		4	1	1	1	1	1	1	0	0.0%	0.0%
0.82		4	1	1	1	1	1	1	0	0.0%	0.0%
1.64		4	1	1	1	1	1	1	0	0.0%	0.0%
2.46		4	1	1	1	1	1	1	0	0.0%	0.0%
3.69		4	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.41		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.82		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
1.64		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
2.46		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
3.69		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1	1	1	1
0.41		1	1	1	1
0.82		1	1	1	1
1.64		1	1	1	1
2.46		1	1	1	1
3.69		1	1	1	1

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	18-8790-1079	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	24 Apr-14 15:04	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

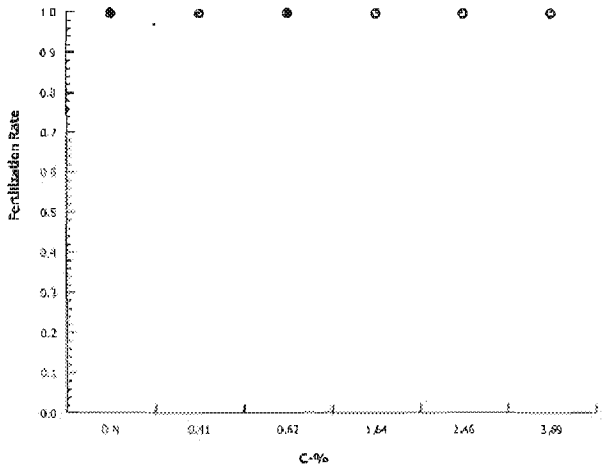
Angular (Corrected) Transformed Detail

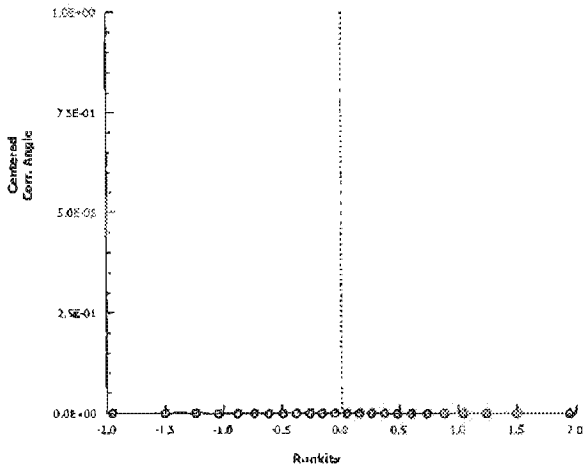
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1.521	1.521	1.521	1.521
0.41		1.521	1.521	1.521	1.521
0.82		1.521	1.521	1.521	1.521
1.64		1.521	1.521	1.521	1.521
2.46		1.521	1.521	1.521	1.521
3.69		1.521	1.521	1.521	1.521

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	100/100	100/100	100/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	100/100	100/100	100/100
1.64		100/100	100/100	100/100	100/100
2.46		100/100	100/100	100/100	100/100
3.69		100/100	100/100	100/100	100/100

Graphics





Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	19-1806-8905	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	24 Apr-14 15:04	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	05-6746-9843	Code:	AVA0414.025	Client:	Avalon WWTP
Sample Date:	02 Apr-14 14:12	Material:	Sample Water	Project:	
Receive Date:	03 Apr-14 11:00	Source:	Bioassay Report		
Sample Age:	23h (3.9 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>3.69	N/A	N/A	<27.1	NA	NA
EC10	>3.69	N/A	N/A	<27.1	NA	NA
EC15	>3.69	N/A	N/A	<27.1	NA	NA
EC20	>3.69	N/A	N/A	<27.1	NA	NA
EC25	>3.69	N/A	N/A	<27.1	NA	NA
EC40	>3.69	N/A	N/A	<27.1	NA	NA
EC50	>3.69	N/A	N/A	<27.1	NA	NA

Fertilization Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	4	1	1	1	0	0	0.0%	0.0%	400	400
0.41		4	1	1	1	0	0	0.0%	0.0%	400	400
0.82		4	1	1	1	0	0	0.0%	0.0%	400	400
1.64		4	1	1	1	0	0	0.0%	0.0%	400	400
2.46		4	1	1	1	0	0	0.0%	0.0%	400	400
3.69		4	1	1	1	0	0	0.0%	0.0%	400	400

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1	1	1	1
0.41		1	1	1	1
0.82		1	1	1	1
1.64		1	1	1	1
2.46		1	1	1	1
3.69		1	1	1	1

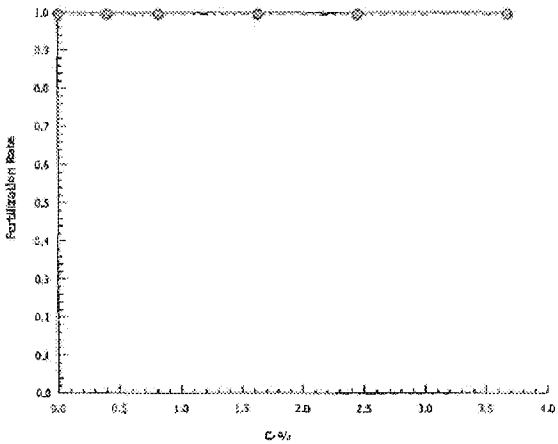
Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	100/100	100/100	100/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	100/100	100/100	100/100
1.64		100/100	100/100	100/100	100/100
2.46		100/100	100/100	100/100	100/100
3.69		100/100	100/100	100/100	100/100

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	19-1806-8905	**Endpoint:**	Fertilization Rate	**CETIS Version:**	CETISv1.8.7
Analyzed:	24 Apr-14 15:04	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	10-9399-4842	Test Type:	Fertilization	Analyst:	
Start Date:	03 Apr-14 13:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	03 Apr-14 13:41	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	40m	Source:	David Gutoff	Age:	

Sample ID:	05-6746-9843	Code:	AVA0414.025	Client:	Avalon WWTP
Sample Date:	02 Apr-14 14:12	Material:	Sample Water	Project:	
Receive Date:	03 Apr-14 11:00	Source:	Bioassay Report		
Sample Age:	23h (3.9 °C)	Station:	Eff Comp		

Parameter Acceptability Criteria

Parameter	Min	Max	Acceptability Limits	Overlap	Decision
Salinity-ppt	34	34	32 - 36	Yes	Results Within Limits
Temperature-°C	14.7	14.8	11 - 13	Yes	Results Above Limit

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.5	2.688	10.31	6.2	6.8	0.3	0.4243	6.53%	0
0.41		2	6.6	1.518	11.68	6.2	7	0.4	0.5657	8.57%	0
0.82		2	6.55	3.373	9.727	6.3	6.8	0.25	0.3536	5.4%	0
1.64		2	6.55	4.644	8.456	6.4	6.7	0.15	0.2121	3.24%	0
2.46		2	6.4	3.859	8.941	6.2	6.6	0.2	0.2828	4.42%	0
3.69		2	6.3	3.759	8.841	6.1	6.5	0.2	0.2828	4.49%	0
Overall		12	6.483			6.1	7				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.41		2	7.85	7.215	8.485	7.8	7.9	0.05	0.07071	0.9%	0
0.82		2	7.8	7.787	7.813	7.8	7.8	0	0	0.0%	0
1.64		2	7.8	7.787	7.813	7.8	7.8	0	0	0.0%	0
2.46		2	7.75	7.115	8.385	7.7	7.8	0.05001	0.07072	0.91%	0
3.69		2	7.7	7.698	7.702	7.7	7.7	0	0	0.0%	0
Overall		12	7.8			7.7	7.9				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
0.41		2	34	34	34	34	34	0	0	0.0%	0
0.82		2	34	34	34	34	34	0	0	0.0%	0
1.64		2	34	34	34	34	34	0	0	0.0%	0
2.46		2	34	34	34	34	34	0	0	0.0%	0
3.69		2	34	34	34	34	34	0	0	0.0%	0
Overall		12	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
0.41		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
0.82		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
1.64		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
2.46		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
3.69		2	14.75	14.11	15.39	14.7	14.8	0.05002	0.07075	0.48%	0
Overall		12	14.75			14.7	14.8				0 (0%)

Purple Sea Urchin Sperm Cell Fertilization Test

Aquatic Bioassay & Consulting Labs, Inc.

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	6.8	6.2
0.41		7	6.2
0.82		6.8	6.3
1.64		6.7	6.4
2.46		6.6	6.2
3.69		6.5	6.1

pH-Units

C-%	Control Type	1	2
0	Negative Contr	7.9	7.9
0.41		7.9	7.8
0.82		7.8	7.8
1.64		7.8	7.8
2.46		7.8	7.7
3.69		7.7	7.7

Salinity-ppt

C-%	Control Type	1	2
0	Negative Contr	34	34
0.41		34	34
0.82		34	34
1.64		34	34
2.46		34	34
3.69		34	34

Temperature-°C

C-%	Control Type	1	2
0	Negative Contr	14.8	14.7
0.41		14.8	14.7
0.82		14.8	14.7
1.64		14.8	14.7
2.46		14.8	14.7
3.69		14.8	14.7

CHAIN OF CUSTODY RECORD

Client: Environ Strategy AWWTF

Address: 123 Pebbly Beach Rd. Avalon, CA 90704

Phone Number: 310-510-0731

Project Name/Number:

Project Mgr.

P.O. # 1810

Sampled By (signature)

Date	Time	Comp.	Grab	Matrix	Sample ID	Volume/ Number	Chronic Toxicity (Bioassay)										Comments
4/2/14	3:15pm	✓		WW	EFF-Comp	1gal	✓										✓ Please send back Cooler and Icepacks.

Analysis

Relinquised By: (signature) Date: 4/2/14 Time: 2:30pm

Received By: (signature) Date: 4-3-14 Time: 9:07

Relinquised By: (signature) Date: Time:

Received By: (signature) Date: Time:

Temp. upon sample receipt: 3.9 °C

Chlorine = 0.1

Ammonia = 0.1

Aquatic Bioassay and Consulting Laboratories
29 N. Olive Street Ventura, CA 93001 Phone: (805) 643-5621 Fax: (805) 643-2930

INVOICE NO. AVA0414.0361

April 29, 2014

Accounts Payable
Avalon WWTP
PO BOX 1810
Avalon, CA 90704

CLIENT:	Avalon Wastewater Treatment Plant
SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	8 April - 14
DATE SAMPLED:	7 April - 14
ABC LAB. NO.:	AVA0414.063

CHRONIC NPDES BIOASSAYS	
Topsmelt - (1 @ $1,125.00)	$ 1,125.00
Kelp Germination – (1 @ 1,040.00)	1,040.00
Sea Urchin – (1 @ 900.00)	900.00
TOTAL	$ 3,065.00

Make checks payable to: Aquatic Bioassays & Consulting Labs., Inc.
29 N. Olive St.
Ventura, CA 93001

Terms are net 30 days.

aquatic bioassay & consulting laboratories, inc

April 29, 2014

Mr. David Clary
City of Avalon
P.O. Box 1810
Avalon, CA 90704

Dear Mr. Clary:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/R-95-136, 1995.* "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

CLIENT:	Avalon Wastewater Treatment Plant
SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	8 April - 14
DATE SAMPLED:	7 April - 14
ABC LAB. NO.:	AVA0414.063

CHRONIC TOSPMELT SURVIVAL & GROWTH BIOASSAY

SURVIVAL	NOEC	=	3.69 %
	TUc	=	27.10
	EC25	=	>3.69 %
	EC50	=	>3.69 %
GROWTH	NOEC	=	3.69 %
	TUc	=	27.10
	IC25	=	>3.69 %
	IC50	=	>3.69 %

Yours very truly,

Scott Johnson
Laboratory Director

ED_002551_00000729-00170

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	18-6100-5243	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	08 Apr-14 15:20	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	15 Apr-14 13:20	Species:	Atherinops affinis	Brine:	Not Applicable
Duration:	6d 22h	Source:	Aquatic Biosystems, CO	Age:	

Sample ID:	20-9257-3958	Code:	AVA0414.063tops	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	29h (12.5 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
11-0253-9629	7d Survival Rate	3.69	>3.69	NA	8.2%	27.1	Steel Many-One Rank Sum Test
00-4374-4733	Mean Dry Biomass-mg	3.69	>3.69	NA	24.6%	27.1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
06-0576-5289	7d Survival Rate	EC5	>3.69	N/A	N/A	<27.1	Linear Interpolation (ICPIN)
		EC10	>3.69	N/A	N/A	<27.1	
		EC15	>3.69	N/A	N/A	<27.1	
		EC20	>3.69	N/A	N/A	<27.1	
		EC25	>3.69	N/A	N/A	<27.1	
		EC40	>3.69	N/A	N/A	<27.1	
		EC50	>3.69	N/A	N/A	<27.1	
03-2765-8990	Mean Dry Biomass-mg	IC5	>3.69	N/A	N/A	<27.1	Linear Interpolation (ICPIN)
		IC10	>3.69	N/A	N/A	<27.1	
		IC15	>3.69	N/A	N/A	<27.1	
		IC20	>3.69	N/A	N/A	<27.1	
		IC25	>3.69	N/A	N/A	<27.1	
		IC40	>3.69	N/A	N/A	<27.1	
		IC50	>3.69	N/A	N/A	<27.1	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
06-0576-5289	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
11-0253-9629	7d Survival Rate	Control Resp	1	0.8 - NL	Yes	Passes Acceptability Criteria
00-4374-4733	Mean Dry Biomass-mg	Control Resp	1.026	0.85 - NL	Yes	Passes Acceptability Criteria
03-2765-8990	Mean Dry Biomass-mg	Control Resp	1.026	0.85 - NL	Yes	Passes Acceptability Criteria
11-0253-9629	7d Survival Rate	PMSD	0.08202	NL - 0.25	No	Passes Acceptability Criteria
00-4374-4733	Mean Dry Biomass-mg	PMSD	0.2464	NL - 0.5	No	Passes Acceptability Criteria

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	0	0	0.0%	0.0%
0.41		5	1	1	1	1	1	0	0	0.0%	0.0%
0.82		5	1	1	1	1	1	0	0	0.0%	0.0%
1.64		5	0.96	0.8489	1	0.8	1	0.04	0.08944	9.32%	4.0%
2.46		5	1	1	1	1	1	0	0	0.0%	0.0%
3.69		5	1	1	1	1	1	0	0	0.0%	0.0%

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.026	0.8404	1.212	0.814	1.2	0.06698	0.1498	14.59%	0.0%
0.41		5	1.352	1.178	1.526	1.164	1.548	0.06268	0.1402	10.36%	-31.76%
0.82		5	1.189	0.9437	1.435	0.934	1.438	0.08842	0.1977	16.63%	-15.86%
1.64		5	1.224	1.061	1.386	1.01	1.358	0.05851	0.1308	10.69%	-19.21%
2.46		5	1.196	0.9804	1.411	1.02	1.408	0.07752	0.1733	14.5%	-16.48%
3.69		5	1.392	1.133	1.651	1.18	1.728	0.09346	0.209	15.01%	-35.62%

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.41		1	1	1	1	1
0.82		1	1	1	1	1
1.64		1	1	0.8	1	1
2.46		1	1	1	1	1
3.69		1	1	1	1	1

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.814	0.948	1.058	1.112	1.2
0.41		1.302	1.548	1.4	1.348	1.164
0.82		1.302	1.21	1.062	0.934	1.438
1.64		1.266	1.276	1.01	1.208	1.358
2.46		1.046	1.408	1.34	1.02	1.164
3.69		1.28	1.432	1.18	1.34	1.728

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
0.41		5/5	5/5	5/5	5/5	5/5
0.82		5/5	5/5	5/5	5/5	5/5
1.64		5/5	5/5	4/5	5/5	5/5
2.46		5/5	5/5	5/5	5/5	5/5
3.69		5/5	5/5	5/5	5/5	5/5

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	11-0253-9629	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:18	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

Sample ID:	20-9257-3958	Code:	AVA0414.063tops	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	29h (12.5 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	8.2%	3.69	>3.69	NA	27.1

Steel Many-One Rank Sum Test

Control vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control	0.41	27.5	16	1	8	0.8333	Asymp	Non-Significant Effect
	0.82	27.5	16	1	8	0.8333	Asymp	Non-Significant Effect
	1.64	25	16	1	8	0.6353	Asymp	Non-Significant Effect
	2.46	27.5	16	1	8	0.8333	Asymp	Non-Significant Effect
	3.69	27.5	16	1	8	0.8333	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.009451317	0.001890263	5	1	0.4389	Non-Significant Effect
Error	0.04536632	0.001890263	24			
Total	0.05481764		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1	4.248	0.4457	Equal Variances
Variances	Levene Equality of Variance	7.111	3.895	0.0003	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.4063	0.9031	<0.0001	Non-normal Distribution
Distribution	Kolmogorov-Smirnov D	0.4667	0.1853	<0.0001	Non-normal Distribution
Distribution	D'Agostino Skewness	5.58	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino Kurtosis	4.912	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	55.27	9.21	<0.0001	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	7.95	3.878	<0.0001	Non-normal Distribution

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1	1	1	1	1	1	0	0.0%	0.0%
0.41		5	1	1	1	1	1	1	0	0.0%	0.0%
0.82		5	1	1	1	1	1	1	0	0.0%	0.0%
1.64		5	0.96	0.8489	1	1	0.8	1	0.04	9.32%	4.0%
2.46		5	1	1	1	1	1	1	0	0.0%	0.0%
3.69		5	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
0.41		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
0.82		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
1.64		5	1.298	1.165	1.43	1.345	1.107	1.345	0.04763	8.21%	3.54%
2.46		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
3.69		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	11-0253-9629	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:18	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.41		1	1	1	1	1
0.82		1	1	1	1	1
1.64		1	1	0.8	1	1
2.46		1	1	1	1	1
3.69		1	1	1	1	1

Angular (Corrected) Transformed Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.345	1.345	1.345	1.345	1.345
0.41		1.345	1.345	1.345	1.345	1.345
0.82		1.345	1.345	1.345	1.345	1.345
1.64		1.345	1.345	1.107	1.345	1.345
2.46		1.345	1.345	1.345	1.345	1.345
3.69		1.345	1.345	1.345	1.345	1.345

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
0.41		5/5	5/5	5/5	5/5	5/5
0.82		5/5	5/5	5/5	5/5	5/5
1.64		5/5	5/5	4/5	5/5	5/5
2.46		5/5	5/5	5/5	5/5	5/5
3.69		5/5	5/5	5/5	5/5	5/5

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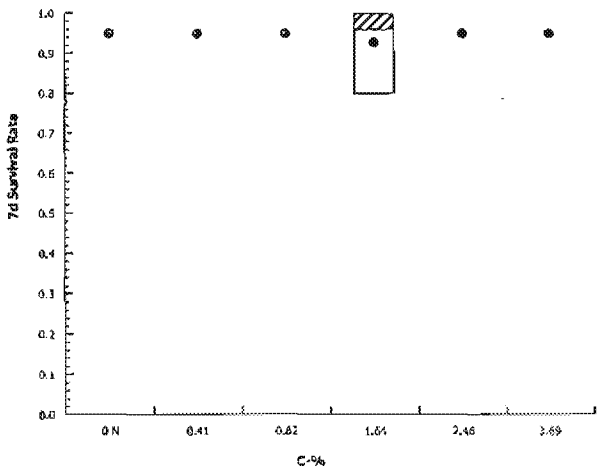
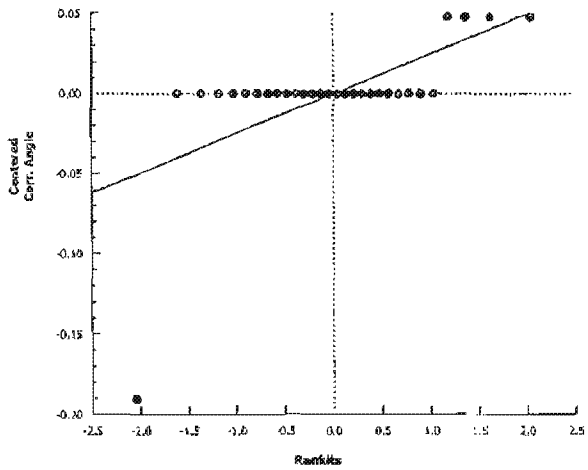




Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	00-4374-4733	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:17	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Sample ID:	20-9257-3958	Code:	AVA0414.063tops	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	29h (12.5 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	24.6%	3.69	>3.69	NA	27.1

Dunnett Multiple Comparison Test

Control vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Negative Control	0.41	-3.044	2.362	0.253	8	1.0000	CDF	Non-Significant Effect
	0.82	-1.52	2.362	0.253	8	0.9965	CDF	Non-Significant Effect
	1.64	-1.842	2.362	0.253	8	0.9988	CDF	Non-Significant Effect
	2.46	-1.58	2.362	0.253	8	0.9971	CDF	Non-Significant Effect
	3.69	-3.414	2.362	0.253	8	1.0000	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.4278378	0.08556757	5	2.985	0.0311	Significant Effect
Error	0.6880096	0.02866707	24			
Total	1.115847		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	1.315	15.09	0.9334	Equal Variances
Variances	Mod Levene Equality of Variance	0.4677	4.248	0.7953	Equal Variances
Variances	Levene Equality of Variance	0.4454	3.895	0.8123	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9747	0.9031	0.6752	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.07287	0.1853	1.0000	Normal Distribution
Distribution	D'Agostino Skewness	0.4603	2.576	0.6453	Normal Distribution
Distribution	D'Agostino Kurtosis	0.8482	2.576	0.3963	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.9314	9.21	0.6277	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.2365	3.878	0.8157	Normal Distribution

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	5	1.026	0.8404	1.212	1.058	0.814	1.2	0.06698	14.59%	0.0%
0.41		5	1.352	1.178	1.526	1.348	1.164	1.548	0.06268	10.36%	-31.76%
0.82		5	1.189	0.9437	1.435	1.21	0.934	1.438	0.08842	16.63%	-15.86%
1.64		5	1.224	1.061	1.386	1.266	1.01	1.358	0.05851	10.69%	-19.21%
2.46		5	1.196	0.9804	1.411	1.164	1.02	1.408	0.07752	14.5%	-16.48%
3.69		5	1.392	1.133	1.651	1.34	1.18	1.728	0.09346	15.01%	-35.62%

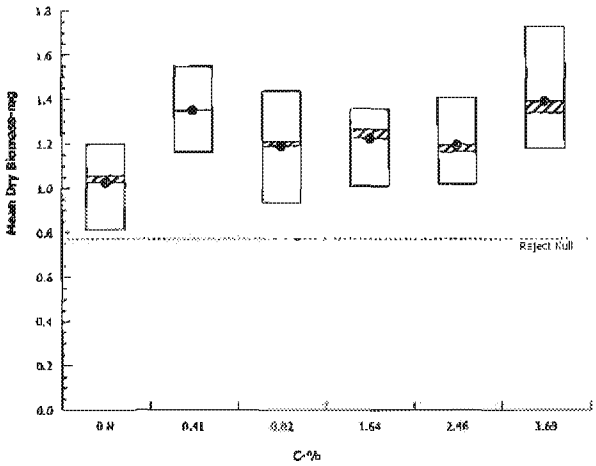
Mean Dry Biomass-mg Detail

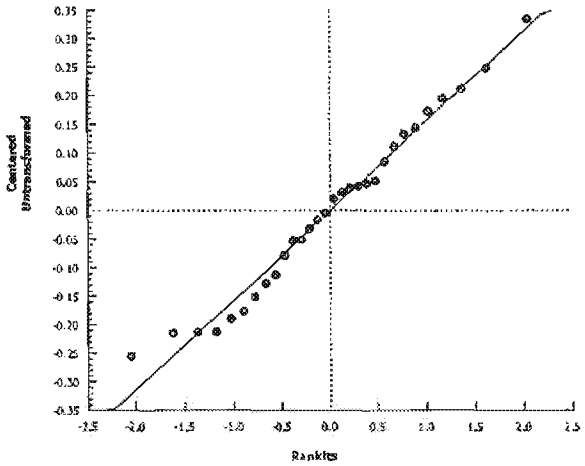
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.814	0.948	1.058	1.112	1.2
0.41		1.302	1.548	1.4	1.348	1.164
0.82		1.302	1.21	1.062	0.934	1.438
1.64		1.266	1.276	1.01	1.208	1.358
2.46		1.046	1.408	1.34	1.02	1.164
3.69		1.28	1.432	1.18	1.34	1.728

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	00-4374-4733	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:17	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Graphics





Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	06-0576-5289	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:18	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	20-9257-3958	Code:	AVA0414.063tops	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	29h (12.5 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>3.69	N/A	N/A	<27.1	NA	NA
EC10	>3.69	N/A	N/A	<27.1	NA	NA
EC15	>3.69	N/A	N/A	<27.1	NA	NA
EC20	>3.69	N/A	N/A	<27.1	NA	NA
EC25	>3.69	N/A	N/A	<27.1	NA	NA
EC40	>3.69	N/A	N/A	<27.1	NA	NA
EC50	>3.69	N/A	N/A	<27.1	NA	NA

7d Survival Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	5	1	1	1	0	0	0.0%	0.0%	25	25
0.41		5	1	1	1	0	0	0.0%	0.0%	25	25
0.82		5	1	1	1	0	0	0.0%	0.0%	25	25
1.64		5	0.96	0.8	1	0.04	0.08944	9.32%	4.0%	24	25
2.46		5	1	1	1	0	0	0.0%	0.0%	25	25
3.69		5	1	1	1	0	0	0.0%	0.0%	25	25

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	1	1	1
0.41		1	1	1	1	1
0.82		1	1	1	1	1
1.64		1	1	0.8	1	1
2.46		1	1	1	1	1
3.69		1	1	1	1	1

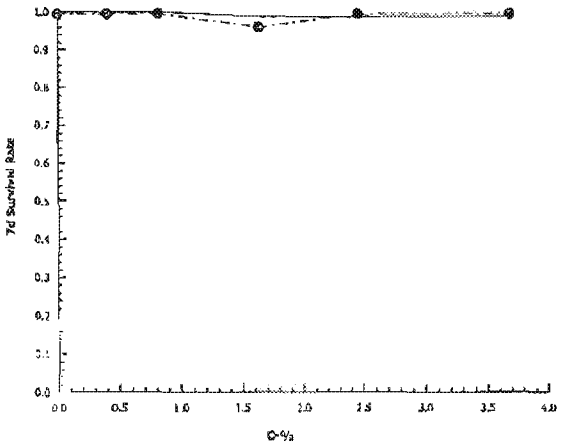
7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	5/5	5/5	5/5
0.41		5/5	5/5	5/5	5/5	5/5
0.82		5/5	5/5	5/5	5/5	5/5
1.64		5/5	5/5	4/5	5/5	5/5
2.46		5/5	5/5	5/5	5/5	5/5
3.69		5/5	5/5	5/5	5/5	5/5

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	06-0576-5289	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:18	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Graphics



Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	03-2765-8990	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:18	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	20-9257-3958	Code:	AVA0414.063tops	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	29h (12.5 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1140711	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>3.69	N/A	N/A	<27.1	NA	NA
IC10	>3.69	N/A	N/A	<27.1	NA	NA
IC15	>3.69	N/A	N/A	<27.1	NA	NA
IC20	>3.69	N/A	N/A	<27.1	NA	NA
IC25	>3.69	N/A	N/A	<27.1	NA	NA
IC40	>3.69	N/A	N/A	<27.1	NA	NA
IC50	>3.69	N/A	N/A	<27.1	NA	NA

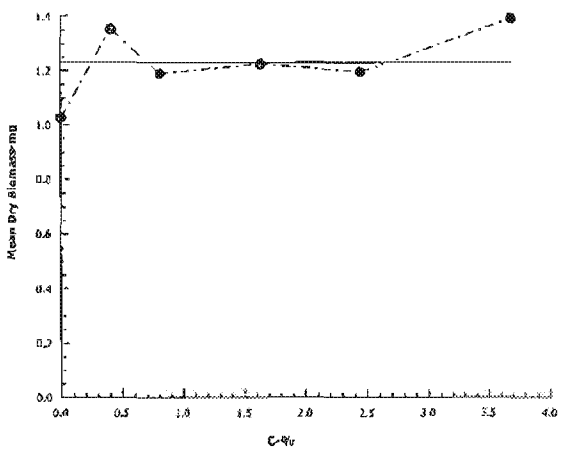
Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.026	0.814	1.2	0.06698	0.1498	14.59%	0.0%
0.41		5	1.352	1.164	1.548	0.06268	0.1402	10.36%	-31.76%
0.82		5	1.189	0.934	1.438	0.08842	0.1977	16.63%	-15.86%
1.64		5	1.224	1.01	1.358	0.05851	0.1308	10.69%	-19.21%
2.46		5	1.196	1.02	1.408	0.07752	0.1733	14.5%	-16.48%
3.69		5	1.392	1.18	1.728	0.09346	0.209	15.01%	-35.62%

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.814	0.948	1.058	1.112	1.2
0.41		1.302	1.548	1.4	1.348	1.164
0.82		1.302	1.21	1.062	0.934	1.438
1.64		1.266	1.276	1.01	1.208	1.358
2.46		1.046	1.408	1.34	1.02	1.164
3.69		1.28	1.432	1.18	1.34	1.728

Graphics



Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	18-6100-5243	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	08 Apr-14 15:20	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	15 Apr-14 13:20	Species:	Atherinops affinis	Brine:	Not Applicable
Duration:	6d 22h	Source:	Aquatic Biosystems, CO	Age:	

Sample ID:	20-9257-3958	Code:	AVA0414.063tops	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	29h (12.5 °C)	Station:	Eff Comp		

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	6.55	6.179	6.921	5.8	7	0.157	0.444	6.78%	0
0.41		8	6.288	6.033	6.542	6	6.8	0.1076	0.3044	4.84%	0
0.82		8	6.463	6.144	6.781	6	7.1	0.1349	0.3815	5.9%	0
1.64		8	6.463	6.17	6.755	6.1	7	0.1238	0.3503	5.42%	0
2.46		8	6.5	6.184	6.816	6	7.1	0.1336	0.378	5.82%	0
3.69		8	6.45	6.178	6.722	6	6.9	0.115	0.3251	5.04%	0
Overall		48	6.452			5.8	7.1				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	7.425	7.351	7.499	7.3	7.6	0.03134	0.08864	1.19%	0
0.41		8	7.525	7.418	7.632	7.3	7.7	0.04532	0.1282	1.7%	0
0.82		8	7.55	7.461	7.639	7.4	7.7	0.0378	0.1069	1.42%	0
1.64		8	7.575	7.468	7.682	7.4	7.7	0.04532	0.1282	1.69%	0
2.46		8	7.575	7.468	7.682	7.4	7.7	0.04532	0.1282	1.69%	0
3.69		8	7.55	7.432	7.668	7.3	7.7	0.05	0.1414	1.87%	0
Overall		48	7.533			7.3	7.7				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	34	34	34	34	34	0	0	0.0%	0
0.41		8	34	34	34	34	34	0	0	0.0%	0
0.82		8	34	34	34	34	34	0	0	0.0%	0
1.64		8	34	34	34	34	34	0	0	0.0%	0
2.46		8	34	34	34	34	34	0	0	0.0%	0
3.69		8	34	34	34	34	34	0	0	0.0%	0
Overall		48	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	8	21	21	21	21	21	0	0	0.0%	0
0.41		8	21	21	21	21	21	0	0	0.0%	0
0.82		8	21	21	21	21	21	0	0	0.0%	0
1.64		8	21	21	21	21	21	0	0	0.0%	0
2.46		8	21	21	21	21	21	0	0	0.0%	0
3.69		8	21	21	21	21	21	0	0	0.0%	0
Overall		48	21			21	21				0 (0%)

Pacific Topsmelt 7-d Survival and Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Dissolved Oxygen-mg/L

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	6.6	6.7	6.3	7	7	6.9	5.8	6.1
0.41		6.5	6.6	6	6.1	6.1	6.8	6.2	6
0.82		6.5	7.1	6.1	6.6	6.1	6.8	6.5	6
1.64		6.5	7	6.1	6.7	6.1	6.8	6.4	6.1
2.46		6.5	7.1	6	6.7	6.2	6.9	6.4	6.2
3.69		6.5	6.9	6	6.5	6.2	6.9	6.4	6.2

pH-Units

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	7.4	7.4	7.6	7.3	7.4	7.5	7.4	7.4
0.41		7.7	7.6	7.6	7.3	7.4	7.6	7.5	7.5
0.82		7.7	7.6	7.6	7.4	7.4	7.6	7.5	7.6
1.64		7.7	7.6	7.6	7.4	7.4	7.7	7.5	7.7
2.46		7.7	7.6	7.6	7.4	7.4	7.7	7.5	7.7
3.69		7.6	7.6	7.6	7.3	7.4	7.7	7.5	7.7

Salinity-ppt

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	34	34	34	34	34	34	34	34
0.41		34	34	34	34	34	34	34	34
0.82		34	34	34	34	34	34	34	34
1.64		34	34	34	34	34	34	34	34
2.46		34	34	34	34	34	34	34	34
3.69		34	34	34	34	34	34	34	34

Temperature-°C

C-%	Control Type	1	2	3	4	5	6	7	8
0	Negative Contr	21	21	21	21	21	21	21	21
0.41		21	21	21	21	21	21	21	21
0.82		21	21	21	21	21	21	21	21
1.64		21	21	21	21	21	21	21	21
2.46		21	21	21	21	21	21	21	21
3.69		21	21	21	21	21	21	21	21

aquatic bioassay & consulting laboratories, inc

April 29, 2014

Mr. David Clary
Avalon Wastewater Treatment Plant
P.O. Box 1810
Avalon, CA 90704

Dear Mr. Clary:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-TermMathods for Estimating Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/600/R-95/136.* "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

CLIENT:	Avalon Wastewater Treatment Plant
SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	8 April - 14
DATE SAMPLED:	7 April - 14
ABC LAB. NO.:	AVA0414.063

CHRONIC SEA URCHIN FERTILIZATION BIOASSAY

NOEC	=	3.69 %
TUc	=	27.10
IC25	=	>3.69 %
IC50	=	>3.69 %

Yours very truly,

Scott Johnson
Laboratory Director

ED_002551_00000729-00182

CETIS Summary Report

Report Date: 29 Apr-14 12:31 (p 1 of 1)
Test Code: AVA0414.063urc | 03-7576-5708

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	08-2451-5178	Test Type:	Fertilization	Analyst:	
Start Date:	08 Apr-14 16:31	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	08 Apr-14 17:11	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	40m	Source:	David Gutoff	Age:	

Sample ID:	18-6930-6272	Code:	AVA0414.063urc	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	31h (12.5 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
05-0554-0036	Fertilization Rate	3.69	>3.69	NA	NA	27.1	Steel Many-One Rank Sum Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
18-9512-1824	Fertilization Rate	EC5	>3.69	N/A	N/A	<27.1	Linear Interpolation (ICPIN)
		EC10	>3.69	N/A	N/A	<27.1	
		EC15	>3.69	N/A	N/A	<27.1	
		EC20	>3.69	N/A	N/A	<27.1	
		EC25	>3.69	N/A	N/A	<27.1	
		EC40	>3.69	N/A	N/A	<27.1	
		EC50	>3.69	N/A	N/A	<27.1	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
05-0554-0036	Fertilization Rate	Control Resp	1	0.7 - NL	Yes	Passes Acceptability Criteria
18-9512-1824	Fertilization Rate	Control Resp	1	0.7 - NL	Yes	Passes Acceptability Criteria

Fertilization Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	4	1	1	1	1	1	0	0	0.0%	0.0%
0.41		4	1	1	1	1	1	0	0	0.0%	0.0%
0.82		4	1	1	1	1	1	0	0	0.0%	0.0%
1.64		4	1	1	1	1	1	0	0	0.0%	0.0%
2.46		4	1	1	1	1	1	0	0	0.0%	0.0%
3.69		4	1	1	1	1	1	0	0	0.0%	0.0%

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1	1	1	1
0.41		1	1	1	1
0.82		1	1	1	1
1.64		1	1	1	1
2.46		1	1	1	1
3.69		1	1	1	1

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	100/100	100/100	100/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	100/100	100/100	100/100
1.64		100/100	100/100	100/100	100/100
2.46		100/100	100/100	100/100	100/100
3.69		100/100	100/100	100/100	100/100

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	05-0554-0036	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:29	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

Sample ID:	18-6930-6272	Code:	AVA0414.063urc	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	31h (12.5 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	3.69	>3.69	NA	27.1

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Negative Control		0.41	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		0.82	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		1.64	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		2.46	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		3.69	18	10	1	6	0.8333	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0	0	5	65540	<0.0001	Significant Effect
Error	0	0	18			
Total	0		23			

Fertilization Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	4	1	1	1	1	1	1	0	0.0%	0.0%
0.41		4	1	1	1	1	1	1	0	0.0%	0.0%
0.82		4	1	1	1	1	1	1	0	0.0%	0.0%
1.64		4	1	1	1	1	1	1	0	0.0%	0.0%
2.46		4	1	1	1	1	1	1	0	0.0%	0.0%
3.69		4	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.41		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
0.82		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
1.64		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
2.46		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%
3.69		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	0.0%

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1	1	1	1
0.41		1	1	1	1
0.82		1	1	1	1
1.64		1	1	1	1
2.46		1	1	1	1
3.69		1	1	1	1

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	05-0554-0036	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:29	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

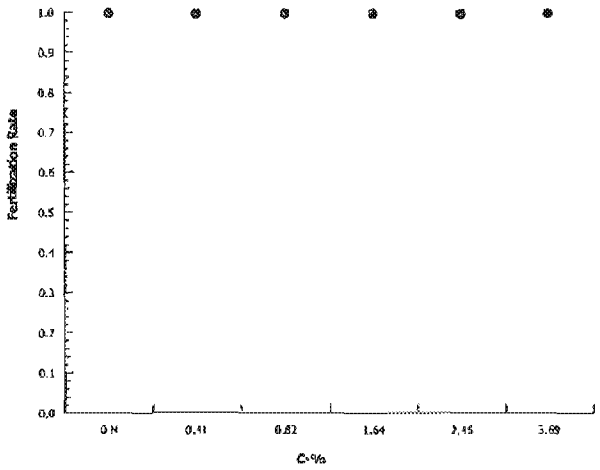
Angular (Corrected) Transformed Detail

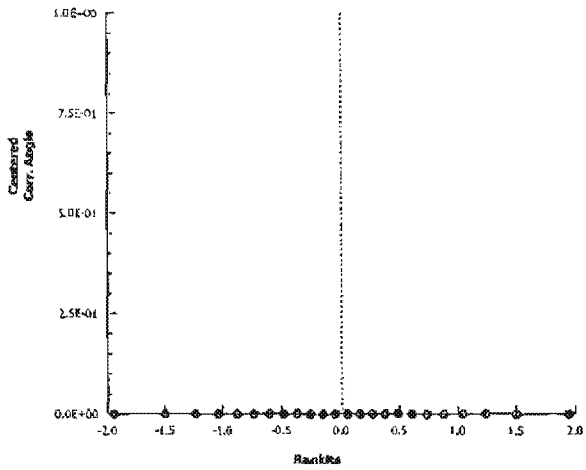
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1.521	1.521	1.521	1.521
0.41		1.521	1.521	1.521	1.521
0.82		1.521	1.521	1.521	1.521
1.64		1.521	1.521	1.521	1.521
2.46		1.521	1.521	1.521	1.521
3.69		1.521	1.521	1.521	1.521

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	100/100	100/100	100/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	100/100	100/100	100/100
1.64		100/100	100/100	100/100	100/100
2.46		100/100	100/100	100/100	100/100
3.69		100/100	100/100	100/100	100/100

Graphics





Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	18-9512-1824	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:29	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	18-6930-6272	Code:	AVA0414.063urc	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	31h (12.5 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	0	280	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>3.69	N/A	N/A	<27.1	NA	NA
EC10	>3.69	N/A	N/A	<27.1	NA	NA
EC15	>3.69	N/A	N/A	<27.1	NA	NA
EC20	>3.69	N/A	N/A	<27.1	NA	NA
EC25	>3.69	N/A	N/A	<27.1	NA	NA
EC40	>3.69	N/A	N/A	<27.1	NA	NA
EC50	>3.69	N/A	N/A	<27.1	NA	NA

Fertilization Rate Summary

			Calculated Variate(A/B)								
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	Negative Control	4	1	1	1	0	0	0.0%	0.0%	400	400
0.41		4	1	1	1	0	0	0.0%	0.0%	400	400
0.82		4	1	1	1	0	0	0.0%	0.0%	400	400
1.64		4	1	1	1	0	0	0.0%	0.0%	400	400
2.46		4	1	1	1	0	0	0.0%	0.0%	400	400
3.69		4	1	1	1	0	0	0.0%	0.0%	400	400

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1	1	1	1
0.41		1	1	1	1
0.82		1	1	1	1
1.64		1	1	1	1
2.46		1	1	1	1
3.69		1	1	1	1

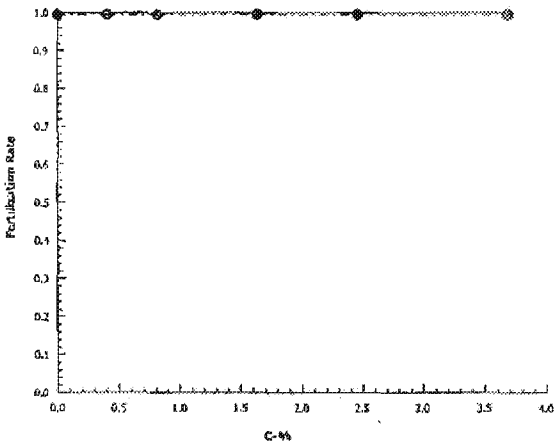
Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	100/100	100/100	100/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	100/100	100/100	100/100
1.64		100/100	100/100	100/100	100/100
2.46		100/100	100/100	100/100	100/100
3.69		100/100	100/100	100/100	100/100

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Analysis ID:	18-9512-1824	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 12:29	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Graphics



Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	08-2451-5178	Test Type:	Fertilization	Analyst:	
Start Date:	08 Apr-14 16:31	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	08 Apr-14 17:11	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	40m	Source:	David Gutoff	Age:	

Sample ID:	18-6930-6272	Code:	AVA0414.063urc	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	31h (12.5 °C)	Station:	Eff Comp		

Parameter Acceptability Criteria

Parameter	Min	Max	Acceptability Limits	Overlap	Decision
Salinity-ppt	34	34	32 - 36	Yes	Results Within Limits
Temperature-°C	14.8	14.9	11 - 13	Yes	Results Above Limit

Dissolved Oxygen-mg/L

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	6.4	1.318	11.48	6	6.8	0.4	0.5657	8.84%	0
0.41		2	6.5	2.688	10.31	6.2	6.8	0.3	0.4243	6.53%	0
0.82		2	6.7	4.159	9.241	6.5	6.9	0.2	0.2828	4.22%	0
1.64		2	6.15	5.515	6.785	6.1	6.2	0.05001	0.07072	1.15%	0
2.46		2	6.4	5.129	7.671	6.3	6.5	0.1	0.1414	2.21%	0
3.69		2	6.55	4.644	8.456	6.4	6.7	0.15	0.2121	3.24%	0
Overall		12	6.45			6	6.9				0 (0%)

pH-Units

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.41		2	7.95	7.315	8.585	7.9	8	0.04999	0.0707	0.89%	0
0.82		2	8	8	8	8	8	0	0	0.0%	0
1.64		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
2.46		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
3.69		2	8.05	7.415	8.685	8	8.1	0.05001	0.07073	0.88%	0
Overall		12	8			7.9	8.1				0 (0%)

Salinity-ppt

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	34	34	34	34	34	0	0	0.0%	0
0.41		2	34	34	34	34	34	0	0	0.0%	0
0.82		2	34	34	34	34	34	0	0	0.0%	0
1.64		2	34	34	34	34	34	0	0	0.0%	0
2.46		2	34	34	34	34	34	0	0	0.0%	0
3.69		2	34	34	34	34	34	0	0	0.0%	0
Overall		12	34			34	34				0 (0%)

Temperature-°C

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	QA Count
0	Negative Contr	2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
0.41		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
0.82		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
1.64		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
2.46		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
3.69		2	14.85	14.21	15.49	14.8	14.9	0.05004	0.07077	0.48%	0
Overall		12	14.85			14.8	14.9				0 (0%)

Purple Sea Urchin Sperm Cell Fertilization Test — Aquatic Bioassay & Consulting Labs, Inc.

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	6.8	6
0.41		6.8	6.2
0.82		6.9	6.5
1.64		6.2	6.1
2.46		6.5	6.3
3.69		6.7	6.4

pH-Units

C-%	Control Type	1	2
0	Negative Contr	7.9	7.9
0.41		7.9	8
0.82		8	8
1.64		8.1	8
2.46		8.1	8
3.69		8.1	8

Salinity-ppt

C-%	Control Type	1	2
0	Negative Contr	34	34
0.41		34	34
0.82		34	34
1.64		34	34
2.46		34	34
3.69		34	34

Temperature-°C

C-%	Control Type	1	2
0	Negative Contr	14.8	14.9
0.41		14.8	14.9
0.82		14.8	14.9
1.64		14.8	14.9
2.46		14.8	14.9
3.69		14.8	14.9

aquatic bioassay & consulting laboratories, inc

April 29, 2014

Mr. David Clary
City of Avalon
P.O. Box 1810
Avalon, CA 90704

Dear Mr. Clary:

We are pleased to present the enclosed bioassay report. The test was conducted under guidelines prescribed in *Short-Term Methods for Measuring the Chronic Toxicity of Effluents and Receving Waters to West Coast Estuarine Organisms, EPA/R-95/136.* "All acceptability criteria were met and the concentration-response was normal. This is a valid test." Results were as follows:

CLIENT:	Avalon Wastewater Treatment Plant
SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	8 April - 14
DATE SAMPLED:	7 April - 14
ABC LAB. NO.:	AVA0414.063

CHRONIC KELP GERMINATION AND GROWTH BIOASSAY

Germination	NOEC	=	3.69 %
	TUc	=	27.10
	EC25	=	>3.69 %
	EC50	=	>3.69 %
Tube Length	NOEC	=	3.69 %
	TUc	=	27.10
	IC25	=	3.69 %
	IC50	=	3.69 %

Yours very truly,

Scott Johnson
Laboratory Director

ED_002551_00000729-00190

CETIS Summary Report

Macrocystis Germination and Germ Tube Growth Test — Aquatic Bioassay & Consulting Labs, Inc.

Batch ID:	10-5654-3619	Test Type:	Growth-Germination	Analyst:	
Start Date:	08 Apr-14 16:31	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	10 Apr-14 16:30	Species:	Macrocystis pyrifera	Brine:	Not Applicable
Duration:	48h	Source:	Aquatic Bioassay Labs Collection	Age:	

Sample ID:	17-2221-5836	Code:	AVA0414.063klp	Client:	Avalon WWTP
Sample Date:	07 Apr-14 10:00	Material:	Sample Water	Project:	
Receive Date:	08 Apr-14 11:30	Source:	Bioassay Report		
Sample Age:	31h (12.5 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-5025-8404	Germination Rate	3.69	>3.69	NA	2.24%	27.1	Dunnett Multiple Comparison Test
01-8364-2132	Mean Length	3.69	>3.69	NA	5.08%	27.1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
16-7358-6777	Germination Rate	EC5	>3.69	N/A	N/A	<27.1	Linear Interpolation (ICPIN)
		EC10	>3.69	N/A	N/A	<27.1	
		EC15	>3.69	N/A	N/A	<27.1	
		EC20	>3.69	N/A	N/A	<27.1	
		EC25	>3.69	N/A	N/A	<27.1	
		EC40	>3.69	N/A	N/A	<27.1	
		EC50	>3.69	N/A	N/A	<27.1	
10-5572-5955	Mean Length	IC5	>3.69	N/A	N/A	<27.1	Linear Interpolation (ICPIN)
		IC10	>3.69	N/A	N/A	<27.1	
		IC15	>3.69	N/A	N/A	<27.1	
		IC20	>3.69	N/A	N/A	<27.1	
		IC25	>3.69	N/A	N/A	<27.1	
		IC40	>3.69	N/A	N/A	<27.1	
		IC50	>3.69	N/A	N/A	<27.1	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
15-5025-8404	Germination Rate	Control Resp	0.92	0.7 - NL	Yes	Passes Acceptability Criteria
16-7358-6777	Germination Rate	Control Resp	0.92	0.7 - NL	Yes	Passes Acceptability Criteria
01-8364-2132	Mean Length	Control Resp	15.78	10 - NL	Yes	Passes Acceptability Criteria
10-5572-5955	Mean Length	Control Resp	15.78	10 - NL	Yes	Passes Acceptability Criteria
15-5025-8404	Germination Rate	PMSD	0.0224	NL - 0.2	No	Passes Acceptability Criteria
01-8364-2132	Mean Length	PMSD	0.05075	NL - 0.2	No	Passes Acceptability Criteria

Germination Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	0.92	0.9112	0.9288	0.91	0.93	0.003162	0.007071	0.77%	0.0%
0.41		5	0.904	0.8754	0.9326	0.88	0.93	0.0103	0.02302	2.55%	1.74%
0.82		5	0.914	0.8998	0.9282	0.9	0.93	0.005099	0.0114	1.25%	0.65%
1.64		5	0.914	0.8973	0.9307	0.9	0.93	0.006	0.01342	1.47%	0.65%
2.46		5	0.902	0.8964	0.9076	0.9	0.91	0.002	0.004472	0.5%	1.96%
3.69		5	0.91	0.8904	0.9296	0.89	0.93	0.007071	0.01581	1.74%	1.09%

Mean Length Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	15.78	15.22	16.34	15.2	16.4	0.201	0.4494	2.85%	0.0%
0.41		5	15.76	15.15	16.37	15.2	16.5	0.2182	0.4879	3.1%	0.13%
0.82		5	15.42	14.76	16.08	14.6	15.9	0.2375	0.531	3.44%	2.28%
1.64		5	16.06	15.45	16.67	15.4	16.5	0.2205	0.493	3.07%	-1.77%
2.46		5	15.6	14.75	16.45	14.6	16.5	0.305	0.6819	4.37%	1.14%
3.69		5	15.6	14.93	16.27	14.8	16.1	0.2429	0.5431	3.48%	1.14%