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	0.92	0.93	0.92	0.92	0.91
0.41		0.88	0.92	0.88	0.93	0.91
0.82		0.93	0.9	0.92	0.91	0.91
1.64		0.9	0.92	0.9	0.93	0.92
2.46		0.9	0.91	0.9	0.9	0.9
3.69		0.91	0.89	0.93	0.9	0.92

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.6	15.2	16	16.4	15.7
0.41		15.5	15.7	16.5	15.9	15.2
0.82		14.6	15.9	15.6	15.2	15.8
1.64		15.4	16.5	15.7	16.2	16.5
2.46		14.6	15.5	16.5	15.8	15.6
3.69		14.8	15.3	16	16.1	15.8

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	92/100	92/100	91/100
0.41		88/100	92/100	88/100	93/100	91/100
0.82		93/100	90/100	92/100	91/100	91/100
1.64		90/100	92/100	90/100	93/100	92/100
2.46		90/100	91/100	90/100	90/100	90/100
3.69		91/100	89/100	93/100	90/100	92/100

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

Analysis ID:	15-5025-8404	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 14:35	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

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		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	2.24%	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	1.748	2.362	0.036	8	0.1530	CDF	Non-Significant Effect
	0.82	0.6904	2.362	0.036	8	0.5614	CDF	Non-Significant Effect
	1.64	0.679	2.362	0.036	8	0.5666	CDF	Non-Significant Effect
	2.46	2.074	2.362	0.036	8	0.0869	CDF	Non-Significant Effect
	3.69	1.126	2.362	0.036	8	0.3652	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.003419908	0.0006839815	5	1.164	0.3555	Non-Significant Effect
Error	0.0141049	0.000587704	24			
Total	0.0175248		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	9.756	15.09	0.0825	Equal Variances
Variances	Mod Levene Equality of Variance	3.529	4.248	0.0213	Equal Variances
Variances	Levene Equality of Variance	3.928	3.895	0.0096	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.9768	0.9031	0.7362	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1052	0.1853	0.5338	Normal Distribution
Distribution	D'Agostino Skewness	0.01556	2.576	0.9876	Normal Distribution
Distribution	D'Agostino Kurtosis	0.3863	2.576	0.6993	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.1495	9.21	0.9280	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.293	3.878	0.6332	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	0.92	0.9112	0.9288	0.92	0.91	0.93	0.003162	0.77%	0.0%
0.41		5	0.904	0.8754	0.9326	0.91	0.88	0.93	0.0103	2.55%	1.74%
0.82		5	0.914	0.8998	0.9282	0.91	0.9	0.93	0.005099	1.25%	0.65%
1.64		5	0.914	0.8973	0.9307	0.92	0.9	0.93	0.006	1.47%	0.65%
2.46		5	0.902	0.8964	0.9076	0.9	0.9	0.91	0.001999	0.5%	1.96%
3.69		5	0.91	0.8904	0.9296	0.91	0.89	0.93	0.007071	1.74%	1.09%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.284	1.268	1.3	1.284	1.266	1.303	0.00584	1.02%	0.0%
0.41		5	1.257	1.209	1.306	1.266	1.217	1.303	0.0175	3.11%	2.09%
0.82		5	1.274	1.248	1.299	1.266	1.249	1.303	0.009194	1.61%	0.82%
1.64		5	1.274	1.244	1.304	1.284	1.249	1.303	0.0107	1.88%	0.81%
2.46		5	1.252	1.243	1.262	1.249	1.249	1.266	0.003411	0.61%	2.48%
3.69		5	1.267	1.233	1.301	1.266	1.233	1.303	0.01242	2.19%	1.34%

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

Analysis ID:	15-5025-8404	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 14:35	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	0.92	0.93	0.92	0.92	0.91
0.41		0.88	0.92	0.88	0.93	0.91
0.82		0.93	0.9	0.92	0.91	0.91
1.64		0.9	0.92	0.9	0.93	0.92
2.46		0.9	0.91	0.9	0.9	0.9
3.69		0.91	0.89	0.93	0.9	0.92

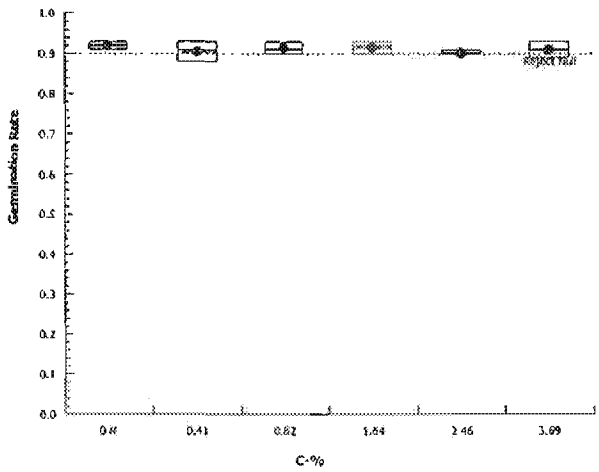
Angular (Corrected) Transformed Detail

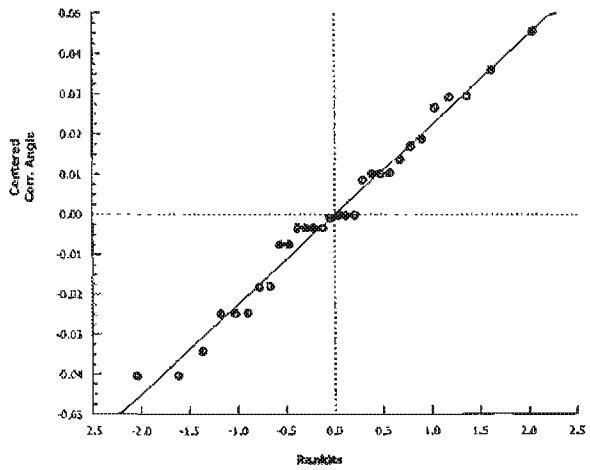
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.284	1.303	1.284	1.284	1.266
0.41		1.217	1.284	1.217	1.303	1.266
0.82		1.303	1.249	1.284	1.266	1.266
1.64		1.249	1.284	1.249	1.303	1.284
2.46		1.249	1.266	1.249	1.249	1.249
3.69		1.266	1.233	1.303	1.249	1.284

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	92/100	92/100	91/100
0.41		88/100	92/100	88/100	93/100	91/100
0.82		93/100	90/100	92/100	91/100	91/100
1.64		90/100	92/100	90/100	93/100	92/100
2.46		90/100	91/100	90/100	90/100	90/100
3.69		91/100	89/100	93/100	90/100	92/100

Graphics





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

Analysis ID:	01-8364-2132	Endpoint:	Mean Length	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 14:35	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

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		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	5.08%	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	0.05898	2.362	0.801	8	0.8153	CDF	Non-Significant Effect
	0.82	1.062	2.362	0.801	8	0.3928	CDF	Non-Significant Effect
	1.64	-0.8257	2.362	0.801	8	0.9732	CDF	Non-Significant Effect
	2.46	0.5308	2.362	0.801	8	0.6334	CDF	Non-Significant Effect
	3.69	0.5308	2.362	0.801	8	0.6334	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.189666	0.2379332	5	0.8276	0.5426	Non-Significant Effect
Error	6.899999	0.2875	24			
Total	8.089665		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	0.8123	15.09	0.9762	Equal Variances
Variances	Mod Levene Equality of Variance	0.1011	4.248	0.9906	Equal Variances
Variances	Levene Equality of Variance	0.1142	3.895	0.9881	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9763	0.9031	0.7221	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1129	0.1853	0.4134	Normal Distribution
Distribution	D'Agostino Skewness	0.702	2.576	0.4827	Normal Distribution
Distribution	D'Agostino Kurtosis	0.7427	2.576	0.4577	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	1.044	9.21	0.5932	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.2874	3.878	0.6503	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	15.78	15.22	16.34	15.7	15.2	16.4	0.201	2.85%	0.0%
0.41		5	15.76	15.15	16.37	15.7	15.2	16.5	0.2182	3.1%	0.13%
0.82		5	15.42	14.76	16.08	15.6	14.6	15.9	0.2375	3.44%	2.28%
1.64		5	16.06	15.45	16.67	16.2	15.4	16.5	0.2205	3.07%	-1.77%
2.46		5	15.6	14.75	16.45	15.6	14.6	16.5	0.305	4.37%	1.14%
3.69		5	15.6	14.93	16.27	15.8	14.8	16.1	0.2429	3.48%	1.14%

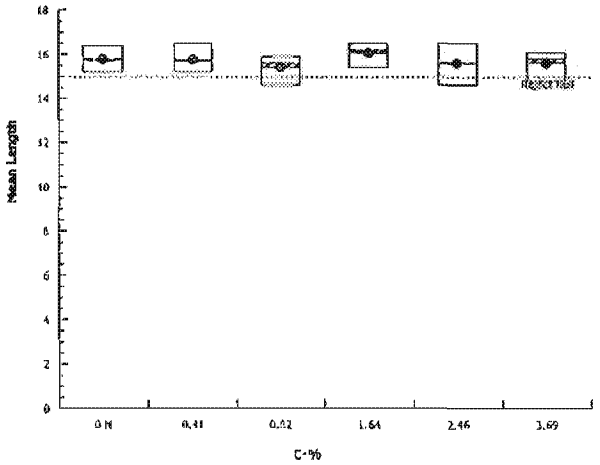
Mean Length Detail

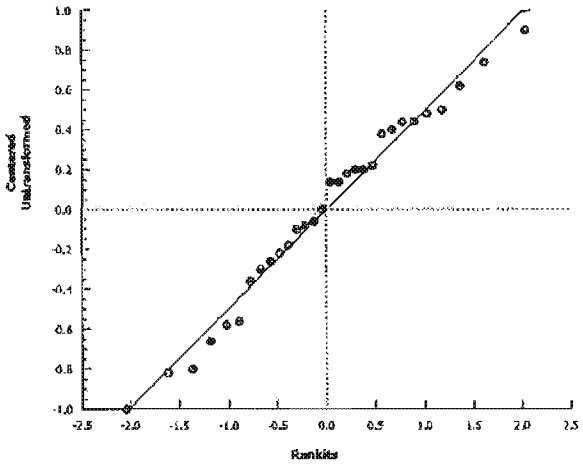
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.6	15.2	16	16.4	15.7
0.41		15.5	15.7	16.5	15.9	15.2
0.82		14.6	15.9	15.6	15.2	15.8
1.64		15.4	16.5	15.7	16.2	16.5
2.46		14.6	15.5	16.5	15.8	15.6
3.69		14.8	15.3	16	16.1	15.8

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

Analysis ID:	01-8364-2132	Endpoint:	Mean Length	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 14:35	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Graphics





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

Analysis ID:	16-7358-6777	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 14:35	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

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		

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	0.92	0.91	0.93	0.003162	0.00707	0.77%	0.0%	460	500
0.41		5	0.904	0.88	0.93	0.0103	0.02302	2.55%	1.74%	452	500
0.82		5	0.914	0.9	0.93	0.005099	0.0114	1.25%	0.65%	457	500
1.64		5	0.914	0.9	0.93	0.006	0.01342	1.47%	0.65%	457	500
2.46		5	0.902	0.9	0.91	0.001999	0.00447	0.5%	1.96%	451	500
3.69		5	0.91	0.89	0.93	0.007071	0.01581	1.74%	1.09%	455	500

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.92	0.93	0.92	0.92	0.91
0.41		0.88	0.92	0.88	0.93	0.91
0.82		0.93	0.9	0.92	0.91	0.91
1.64		0.9	0.92	0.9	0.93	0.92
2.46		0.9	0.91	0.9	0.9	0.9
3.69		0.91	0.89	0.93	0.9	0.92

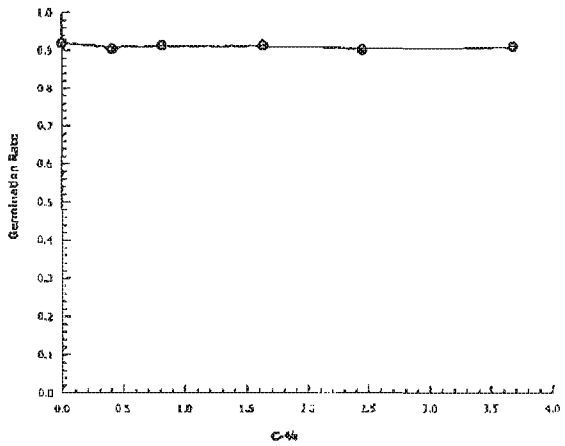
Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	92/100	92/100	91/100
0.41		88/100	92/100	88/100	93/100	91/100
0.82		93/100	90/100	92/100	91/100	91/100
1.64		90/100	92/100	90/100	93/100	92/100
2.46		90/100	91/100	90/100	90/100	90/100
3.69		91/100	89/100	93/100	90/100	92/100

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

Analysis ID:	16-7358-6777	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 14:35	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Graphics



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

Analysis ID:	10-5572-5955	Endpoint:	Mean Length	CETIS Version:	CETISv1.8.7
Analyzed:	29 Apr-14 14:35	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

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		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1954941	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

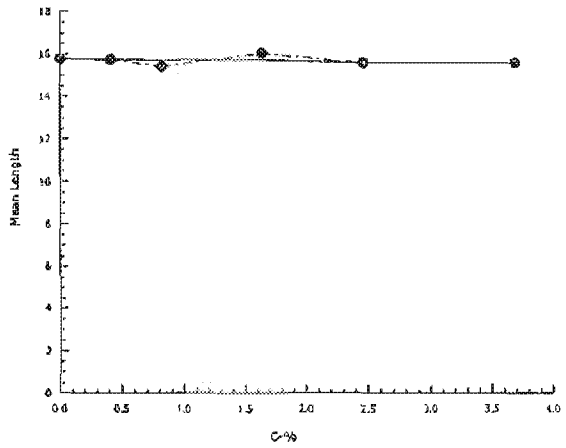
Mean Length Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	15.78	15.2	16.4	0.201	0.4494	2.85%	0.0%
0.41		5	15.76	15.2	16.5	0.2182	0.4878	3.1%	0.13%
0.82		5	15.42	14.6	15.9	0.2375	0.531	3.44%	2.28%
1.64		5	16.06	15.4	16.5	0.2205	0.493	3.07%	-1.77%
2.46		5	15.6	14.6	16.5	0.305	0.6819	4.37%	1.14%
3.69		5	15.6	14.8	16.1	0.2429	0.5431	3.48%	1.14%

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15.6	15.2	16	16.4	15.7
0.41		15.5	15.7	16.5	15.9	15.2
0.82		14.6	15.9	15.6	15.2	15.8
1.64		15.4	16.5	15.7	16.2	16.5
2.46		14.6	15.5	16.5	15.8	15.6
3.69		14.8	15.3	16	16.1	15.8

Graphics



CETIS Measurement 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		

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%)

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

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	6.8	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

CHAIN OF CUSTODY RECORD

Client: Environ Strategy-AWWTF

Project Name/Number: Avalon WWTF

Address: Pa Box 1810, 123 Pebbly Beach Rd, Avalon, CA 90704

Project Mgr.: David Clary

P.O. #: 690A

Phone Number: 3105100731

Sampled By (signature): D. Clary

Date	Time	Comp	Grab	Matrix	Sample ID	Volume/ Number	Analysis: Most Sensitive Species										Comments
4/7/14	1000	X		WW	Eff Comp	1 gal	X										

Relinquised By: (signature) D. Clary — Date: Time: 4/7/14 2:45pm

Received By: (signature) — Date: Time: 4-8-14 1100

Relinquised By: (signature) — Date: Time:

Received By: (signature) — Date: Time:

Temp. upon sample receipt: 12.5 °C

CHLORINE = <0.1

AMMONIA = 0.0

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

CHAIN OF CUSTODY RECORD

Client:	Project Name/Number:
Environ Strategy - Avon TF	Avalon WWTF
Address PO Box 1810 123 Pebbly Beach Rd. Avalon, CA 90704	Project Mgr. David Clary P.O. # 690A
Phone Number: 310-510-0731	Sampled By (signature)

Date	Time	Comp	Grab	Matrix	Sample ID	Volume/ Number	Analysis: Most sensitive species	Comments
4/8/14	10:00am	X		WW	Eff comp	1gal	X	

Relinquised By: (signature) — Date: 4/8/14 Time: 12:00pm

Received By: (signature) — Date: 4-9-14 Time: 1030

Relinquised By: (signature) — Date: Time:

Received By: (signature) — Date: Time:

Temp. upon sample receipt: 9.8 °C

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

Chlorine < 0.1
Ammonia 0.0

INVOICE NO. AVA0514.0422

May 16, 2014

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

SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	7 May - 14
DATE SAMPLED:	6 May - 14
ABC LAB. NO.:	AVA0514.058

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

May 16, 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:	7 May - 14
DATE SAMPLED:	6 May - 14
ABC LAB. NO.:	AVA0514.058

CHRONIC SEA URCHIN FERTILIZATION BIOASSAY

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

Yours very truly,

Scott Johnson
Laboratory Director

29 north olive st. ventura, ca 93001 (805) 643 5621 www.aquabio.org

CETIS Summary Report

Report Date: 16 May-14 10:54 (p 1 of 1)
Test Code: AVA0514.058 | 10-2834-8316

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

Batch ID:	07-4367-6760	Test Type:	Fertilization	Analyst:	
Start Date:	07 May-14 17:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	07 May-14 17:41	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	40m	Source:	David Gutoff	Age:	

Sample ID:	17-8331-9375	Code:	AVA0514.058	Client:	Avalon WWTP
Sample Date:	06 May-14 07:24	Material:	Sample Water	Project:	690A-AWWTP
Receive Date:	07 May-14 11:45	Source:	Bioassay Report		
Sample Age:	34h (3.1 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
08-9489-1889	Fertilization Rate	3.69	>3.69	NA	3.13%	27.1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
03-9531-9335	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
03-9531-9335	Fertilization Rate	Control Resp	0.9825	0.7 - NL	Yes	Passes Acceptability Criteria
08-9489-1889	Fertilization Rate	Control Resp	0.9825	0.7 - NL	Yes	Passes Acceptability Criteria
08-9489-1889	Fertilization Rate	PMSD	0.03135	NL - 0.25	No	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	0.9825	0.9625	1	0.97	1	0.006291	0.01258	1.28%	0.0%
0.41		4	1	1	1	1	1	0	0	0.0%	-1.78%
0.82		4	0.99	0.977	1	0.98	1	0.004083	0.008166	0.82%	-0.76%
1.64		4	0.98	0.941	1	0.95	1	0.01225	0.02449	2.5%	0.25%
2.46		4	0.97	0.9475	0.9925	0.96	0.99	0.007071	0.01414	1.46%	1.27%
3.69		4	0.9875	0.9636	1	0.97	1	0.0075	0.015	1.52%	-0.51%

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	0.98	0.98	0.97	1
0.41		1	1	1	1
0.82		1	0.99	0.98	0.99
1.64		1	0.95	0.97	1
2.46		0.97	0.96	0.99	0.96
3.69		1	0.98	0.97	1

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	98/100	98/100	97/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	99/100	98/100	99/100
1.64		100/100	95/100	97/100	100/100
2.46		97/100	96/100	99/100	96/100
3.69		100/100	98/100	97/100	100/100

CETIS Analytical Report

Report Date: 16 May-14 10:54 (p 1 of 2)
Test Code: AVA0514.058 | 10-2834-8316

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

Analysis ID:	08-9489-1889	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	16 May-14 10:53	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Sample ID:	17-8331-9375	Code:	AVA0514.058	Client:	Avalon WWTP
Sample Date:	06 May-14 07:24	Material:	Sample Water	Project:	690A-AWWTP
Receive Date:	07 May-14 11:45	Source:	Bioassay Report		
Sample Age:	34h (3.1 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	3.13%	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	-1.958	2.407	0.095	6	0.9990	CDF	Non-Significant Effect
		0.82	-0.7356	2.407	0.095	6	0.9656	CDF	Non-Significant Effect
		1.64	-0.05254	2.407	0.095	6	0.8483	CDF	Non-Significant Effect
		2.46	1.075	2.407	0.095	6	0.3890	CDF	Non-Significant Effect
		3.69	-0.5844	2.407	0.095	6	0.9504	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.03106721	0.006213443	5	2.011	0.1257	Non-Significant Effect
Error	0.05561345	0.003089636	18			
Total	0.08668067		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	3.288	4.248	0.0277	Equal Variances
Variances	Levene Equality of Variance	5.521	4.248	0.0030	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.9364	0.884	0.1358	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.2083	0.2056	0.0084	Non-normal Distribution
Distribution	D'Agostino Skewness	0.2273	2.576	0.8202	Normal Distribution
Distribution	D'Agostino Kurtosis	0.7108	2.576	0.4772	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.5569	9.21	0.7570	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.7297	3.878	0.0569	Normal Distribution

Fertilization Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	4	0.9825	0.9625	1	0.98	0.97	1	0.006291	1.28%	0.0%
0.41		4	1	1	1	1	1	1	0	0.0%	-1.78%
0.82		4	0.99	0.977	1	0.99	0.98	1	0.004083	0.82%	-0.76%
1.64		4	0.98	0.941	1	0.985	0.95	1	0.01225	2.5%	0.25%
2.46		4	0.97	0.9475	0.9925	0.965	0.96	0.99	0.007071	1.46%	1.27%
3.69		4	0.9875	0.9636	1	0.99	0.97	1	0.0075	1.52%	-0.51%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	4	1.444	1.359	1.529	1.429	1.397	1.521	0.02675	3.71%	0.0%
0.41		4	1.521	1.52	1.521	1.521	1.521	1.521	0	0.0%	-5.33%
0.82		4	1.473	1.413	1.533	1.471	1.429	1.521	0.01879	2.55%	-2.0%
1.64		4	1.446	1.304	1.587	1.459	1.345	1.521	0.04449	6.15%	-0.14%
2.46		4	1.402	1.325	1.478	1.383	1.369	1.471	0.02391	3.41%	2.93%
3.69		4	1.467	1.365	1.568	1.475	1.397	1.521	0.03185	4.34%	-1.59%

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

Analysis ID:	08-9489-1889	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	16 May-14 10:53	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	0.98	0.98	0.97	1
0.41		1	1	1	1
0.82		1	0.99	0.98	0.99
1.64		1	0.95	0.97	1
2.46		0.97	0.96	0.99	0.96
3.69		1	0.98	0.97	1

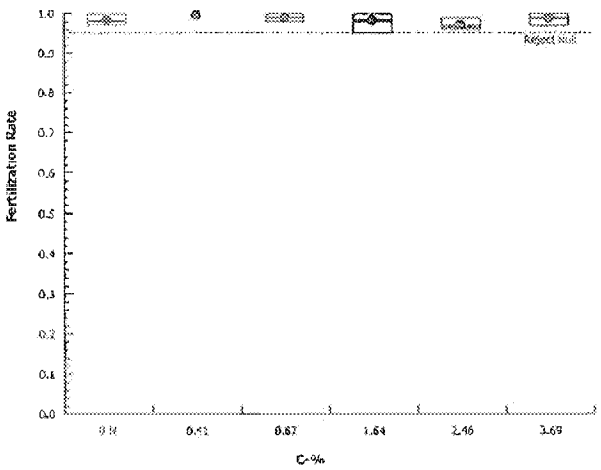
Angular (Corrected) Transformed Detail

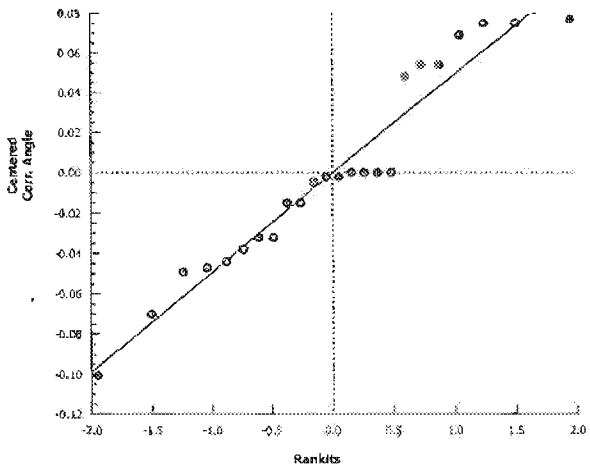
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1.429	1.429	1.397	1.521
0.41		1.521	1.521	1.521	1.521
0.82		1.521	1.471	1.429	1.471
1.64		1.521	1.345	1.397	1.521
2.46		1.397	1.369	1.471	1.369
3.69		1.521	1.429	1.397	1.521

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	98/100	98/100	97/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	99/100	98/100	99/100
1.64		100/100	95/100	97/100	100/100
2.46		97/100	96/100	99/100	96/100
3.69		100/100	98/100	97/100	100/100

Graphics





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

Analysis ID:	03-9531-9335	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	16 May-14 10:53	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	17-8331-9375	Code:	AVA0514.058	Client:	Avalon WWTP
Sample Date:	06 May-14 07:24	Material:	Sample Water	Project:	690A-AWWTP
Receive Date:	07 May-14 11:45	Source:	Bioassay Report		
Sample Age:	34h (3.1 °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	0.9825	0.97	1	0.006291	0.01258	1.28%	0.0%	393	400
0.41		4	1	1	1	0	0	0.0%	-1.78%	400	400
0.82		4	0.99	0.98	1	0.004083	0.008166	0.82%	-0.76%	396	400
1.64		4	0.98	0.95	1	0.01225	0.02449	2.5%	0.25%	392	400
2.46		4	0.97	0.96	0.99	0.007071	0.01414	1.46%	1.27%	388	400
3.69		4	0.9875	0.97	1	0.0075	0.015	1.52%	-0.51%	395	400

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	0.98	0.98	0.97	1
0.41		1	1	1	1
0.82		1	0.99	0.98	0.99
1.64		1	0.95	0.97	1
2.46		0.97	0.96	0.99	0.96
3.69		1	0.98	0.97	1

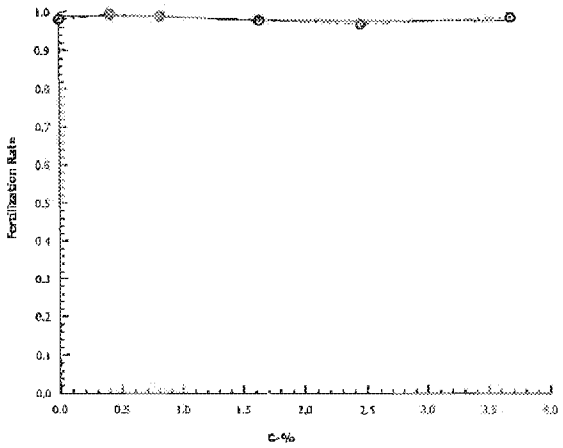
Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	98/100	98/100	97/100	100/100
0.41		100/100	100/100	100/100	100/100
0.82		100/100	99/100	98/100	99/100
1.64		100/100	95/100	97/100	100/100
2.46		97/100	96/100	99/100	96/100
3.69		100/100	98/100	97/100	100/100

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

Analysis ID:	03-9531-9335	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	16 May-14 10:53	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Graphics



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

Batch ID:	07-4367-6760	Test Type:	Fertilization	Analyst:	
Start Date:	07 May-14 17:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	07 May-14 17:41	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	40m	Source:	David Gutoff	Age:	

Sample ID:	17-8331-9375	Code:	AVA0514.058	Client:	Avalon WWTP
Sample Date:	06 May-14 07:24	Material:	Sample Water	Project:	690A-AWWTP
Receive Date:	07 May-14 11:45	Source:	Bioassay Report		
Sample Age:	34h (3.1 °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	14.5	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	6.65	4.744	8.556	6.5	6.8	0.15	0.2121	3.19%	0
0.41		2	6.55	5.915	7.185	6.5	6.6	0.04999	0.0707	1.08%	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	3.473	9.827	6.4	6.9	0.25	0.3536	5.32%	0
2.46		2	6.7	5.429	7.971	6.6	6.8	0.09999	0.1414	2.11%	0
3.69		2	6.7	6.683	6.717	6.7	6.7	0	0	0.0%	0
Overall		12	6.625			6.3	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	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.82		2	7.85	7.215	8.485	7.8	7.9	0.05	0.07071	0.9%	0
1.64		2	7.9	6.629	9.171	7.8	8	0.1	0.1414	1.79%	0
2.46		2	7.9	6.629	9.171	7.8	8	0.1	0.1414	1.79%	0
3.69		2	7.9	6.629	9.171	7.8	8	0.1	0.1414	1.79%	0
Overall		12	7.892			7.8	8				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	14.7	12.16	17.24	14.5	14.9	0.2	0.2829	1.92%	0
0.41		2	14.7	12.16	17.24	14.5	14.9	0.2	0.2829	1.92%	0
0.82		2	14.7	12.16	17.24	14.5	14.9	0.2	0.2829	1.92%	0
1.64		2	14.7	12.16	17.24	14.5	14.9	0.2	0.2829	1.92%	0
2.46		2	14.7	12.16	17.24	14.5	14.9	0.2	0.2829	1.92%	0
3.69		2	14.7	12.16	17.24	14.5	14.9	0.2	0.2829	1.92%	0
Overall		12	14.7			14.5	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	6.5
0.41		6.6	6.5
0.82		6.7	6.3
1.64		6.9	6.4
2.46		6.8	6.6
3.69		6.7	6.7

pH-Units

C-%	Control Type	1	2
0	Negative Contr	7.9	7.9
0.41		7.9	7.9
0.82		7.8	7.9
1.64		7.8	8
2.46		7.8	8
3.69		7.8	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	14.5	14.9
0.41		14.5	14.9
0.82		14.5	14.9
1.64		14.5	14.9
2.46		14.5	14.9
3.69		14.5	14.9

CHAIN OF CUSTODY RECORD

Client:	Project Name/Number:
Avalon WWTF-ES	690A - AWWTF
Address: 123 Pebbly Beach Rd x1810, Avalon, CA 90704	Project Mgr. David Clary
	P.O. # 690A
Phone Number: 310 510 0731	Sampled By (signature) D. Clary

Date	Time	Comp.	Grab	Matrix	Sample ID	Volume/ Number	Chronic Toxicity										Comments
5-6-14	0724	X		WW	Eff Comp	1L	X										

Relinquised By: (signature) D. Clary — Date: Time: 5/6/14 0724

Received By: (signature) [illegible] — Date: Time: 5-7-14 1145

Relinquised By: (signature) — Date: Time:

Received By: (signature) — Date: Time:

Temp. upon sample receipt: 3.1 °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. AVA0614.0494

June 5, 2014

Accounts Payable
Avalon WWTP
PO BOX 1810
Avalon, CA 90704

CLIENT:	Avalon Wastewater Treatment Plant
SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	13 May - 14
DATE SAMPLED:	12 May - 14
ABC LAB. NO.:	AVA0514.169

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

June 5, 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:	13 May - 14
DATE SAMPLED:	12 May - 14
ABC LAB. NO.:	AVA0514.169

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

29 north olive st. ventura, ca 93001 (805) 643 5621 www.aquabio.org

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

Batch ID:	01-8624-4902	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	13 May-14 15:00	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	20 May-14 13:00	Species:	Atherinops affinis	Brine:	Not Applicable
Duration:	6d 22h	Source:	Aquatic Biosystems, CO	Age:	

Sample ID:	07-7798-2214	Code:	AVA0514.169tops	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
12-4658-3878	7d Survival Rate	3.69	>3.69	NA	9.1%	27.1	Steel Many-One Rank Sum Test
12-6179-5174	Mean Dry Biomass-mg	3.69	>3.69	NA	32.2%	27.1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
10-6714-7014	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	
01-0789-1023	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
10-6714-7014	7d Survival Rate	Control Resp	0.96	0.8 - NL	Yes	Passes Acceptability Criteria
12-4658-3878	7d Survival Rate	Control Resp	0.96	0.8 - NL	Yes	Passes Acceptability Criteria
01-0789-1023	Mean Dry Biomass-mg	Control Resp	1.473	0.85 - NL	Yes	Passes Acceptability Criteria
12-6179-5174	Mean Dry Biomass-mg	Control Resp	1.473	0.85 - NL	Yes	Passes Acceptability Criteria
12-4658-3878	7d Survival Rate	PMSD	0.09104	NL - 0.25	No	Passes Acceptability Criteria
12-6179-5174	Mean Dry Biomass-mg	PMSD	0.3223	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	0.96	0.8489	1	0.8	1	0.04	0.08944	9.32%	0.0%
0.41		5	1	1	1	1	1	0	0	0.0%	-4.17%
0.82		5	1	1	1	1	1	0	0	0.0%	-4.17%
1.64		5	1	1	1	1	1	0	0	0.0%	-4.17%
2.46		5	1	1	1	1	1	0	0	0.0%	-4.17%
3.69		5	0.96	0.8489	1	0.8	1	0.04	0.08944	9.32%	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	1.473	0.8942	2.052	1.008	2.216	0.2085	0.4663	31.65%	0.0%
0.41		5	1.93	1.732	2.127	1.754	2.142	0.07124	0.1593	8.26%	-30.98%
0.82		5	1.743	1.429	2.058	1.446	2.11	0.1132	0.2532	14.53%	-18.33%
1.64		5	2.122	1.74	2.503	1.886	2.638	0.1375	0.3075	14.49%	-44.01%
2.46		5	2.084	1.67	2.498	1.59	2.46	0.1491	0.3334	16.0%	-41.49%
3.69		5	2.21	1.83	2.59	1.916	2.682	0.1368	0.306	13.85%	-49.99%

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	0.8	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	0.8

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.208	1.342	1.008	1.592	2.216
0.41		1.982	1.982	1.754	1.788	2.142
0.82		1.446	1.754	2.11	1.58	1.826
1.64		2.15	1.886	2.638	1.906	2.028
2.46		1.946	2.46	2.154	2.272	1.59
3.69		1.916	2.682	2.294	2.186	1.97

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	4/5	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	4/5

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

Analysis ID:	12-4658-3878	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 May-14 14:06	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes

Sample ID:	07-7798-2214	Code:	AVA0514.169tops	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	9.1%	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	30	16	1	8	0.9446	Asymp	Non-Significant Effect
	0.82	30	16	1	8	0.9446	Asymp	Non-Significant Effect
	1.64	30	16	1	8	0.9446	Asymp	Non-Significant Effect
	2.46	30	16	1	8	0.9446	Asymp	Non-Significant Effect
	3.69	27.5	16	2	8	0.8333	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01512211	0.003024421	5	0.8	0.5606	Non-Significant Effect
Error	0.09073264	0.003780527	24			
Total	0.1058547		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	0.8	4.248	0.5640	Equal Variances
Variances	Levene Equality of Variance	5.689	3.895	0.0013	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.5454	0.9031	<0.0001	Non-normal Distribution
Distribution	Kolmogorov-Smirnov D	0.4333	0.1853	<0.0001	Non-normal Distribution
Distribution	D'Agostino Skewness	4.626	2.576	<0.0001	Non-normal Distribution
Distribution	D'Agostino Kurtosis	3.762	2.576	0.0002	Non-normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	35.55	9.21	<0.0001	Non-normal Distribution
Distribution	Anderson-Darling A2 Normality	5.866	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	0.96	0.8489	1	1	0.8	1	0.04	9.32%	0.0%
0.41		5	1	1	1	1	1	1	0	0.0%	-4.17%
0.82		5	1	1	1	1	1	1	0	0.0%	-4.17%
1.64		5	1	1	1	1	1	1	0	0.0%	-4.17%
2.46		5	1	1	1	1	1	1	0	0.0%	-4.17%
3.69		5	0.96	0.8489	1	1	0.8	1	0.04	9.32%	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	1.298	1.165	1.43	1.345	1.107	1.345	0.04763	8.21%	0.0%
0.41		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	-3.67%
0.82		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	-3.67%
1.64		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	-3.67%
2.46		5	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	-3.67%
3.69		5	1.298	1.165	1.43	1.345	1.107	1.345	0.04763	8.21%	0.0%

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

Analysis ID:	12-4658-3878	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 May-14 14:06	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	0.8	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	0.8

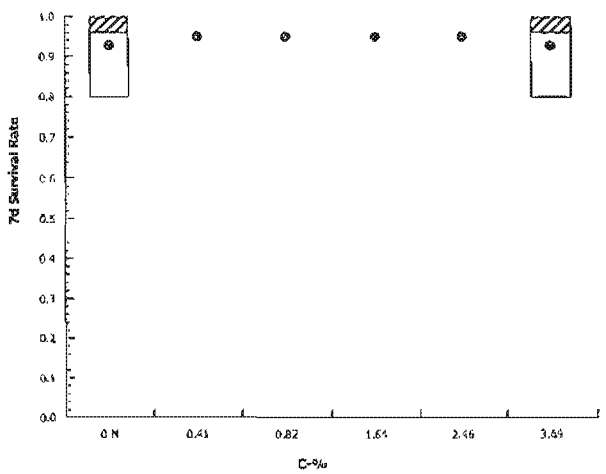
Angular (Corrected) Transformed Detail

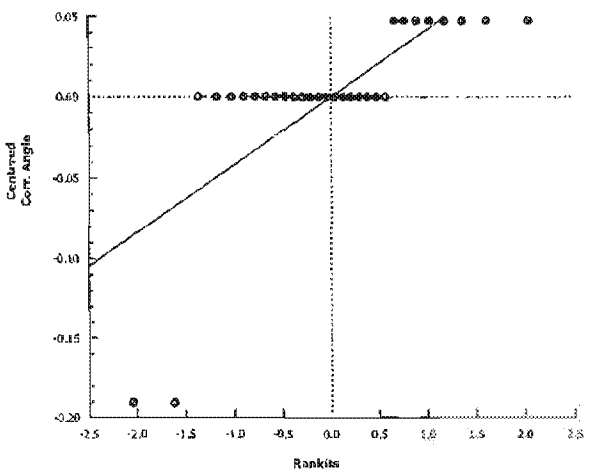
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.345	1.345	1.107	1.345	1.345
0.41		1.345	1.345	1.345	1.345	1.345
0.82		1.345	1.345	1.345	1.345	1.345
1.64		1.345	1.345	1.345	1.345	1.345
2.46		1.345	1.345	1.345	1.345	1.345
3.69		1.345	1.345	1.345	1.345	1.107

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	4/5	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	4/5

Graphics





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

Analysis ID:	12-6179-5174	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	29 May-14 14:06	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Sample ID:	07-7798-2214	Code:	AVA0514.169tops	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	32.2%	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	-2.27	2.362	0.475	8	0.9997	CDF	Non-Significant Effect
	0.82	-1.343	2.362	0.475	8	0.9939	CDF	Non-Significant Effect
	1.64	-3.225	2.362	0.475	8	1.0000	CDF	Non-Significant Effect
	2.46	-3.04	2.362	0.475	8	1.0000	CDF	Non-Significant Effect
	3.69	-3.663	2.362	0.475	8	1.0000	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.911151	0.3822303	5	3.783	0.0115	Significant Effect
Error	2.425167	0.1010486	24			
Total	4.336318		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	4.075	15.09	0.5387	Equal Variances
Variances	Mod Levene Equality of Variance	0.653	4.248	0.6631	Equal Variances
Variances	Levene Equality of Variance	0.8188	3.895	0.5483	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9614	0.9031	0.3361	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1185	0.1853	0.3380	Normal Distribution
Distribution	D'Agostino Skewness	1.552	2.576	0.1207	Normal Distribution
Distribution	D'Agostino Kurtosis	0.6282	2.576	0.5299	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	2.803	9.21	0.2462	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.4769	3.878	0.2418	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	1.473	0.8942	2.052	1.342	1.008	2.216	0.2085	31.65%	0.0%
0.41		5	1.93	1.732	2.127	1.982	1.754	2.142	0.07124	8.26%	-30.98%
0.82		5	1.743	1.429	2.058	1.754	1.446	2.11	0.1132	14.53%	-18.33%
1.64		5	2.122	1.74	2.503	2.028	1.886	2.638	0.1375	14.49%	-44.01%
2.46		5	2.084	1.67	2.498	2.154	1.59	2.46	0.1491	16.0%	-41.49%
3.69		5	2.21	1.83	2.59	2.186	1.916	2.682	0.1368	13.85%	-49.99%

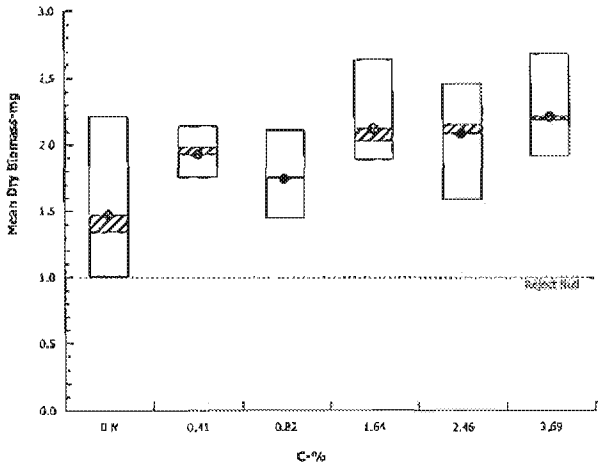
Mean Dry Biomass-mg Detail

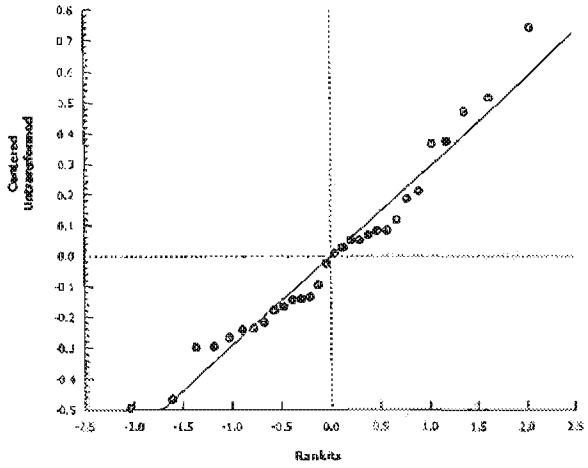
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.208	1.342	1.008	1.592	2.216
0.41		1.982	1.982	1.754	1.788	2.142
0.82		1.446	1.754	2.11	1.58	1.826
1.64		2.15	1.886	2.638	1.906	2.028
2.46		1.946	2.46	2.154	2.272	1.59
3.69		1.916	2.682	2.294	2.186	1.97

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

Analysis ID:	12-6179-5174	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	29 May-14 14:06	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Graphics





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

Analysis ID:	10-6714-7014	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 May-14 14:06	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	07-7798-2214	Code:	AVA0514.169tops	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °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	0.96	0.8	1	0.04	0.08944	9.32%	0.0%	24	25
0.41		5	1	1	1	0	0	0.0%	-4.17%	25	25
0.82		5	1	1	1	0	0	0.0%	-4.17%	25	25
1.64		5	1	1	1	0	0	0.0%	-4.17%	25	25
2.46		5	1	1	1	0	0	0.0%	-4.17%	25	25
3.69		5	0.96	0.8	1	0.04	0.08944	9.32%	0.0%	24	25

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1	1	0.8	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	0.8

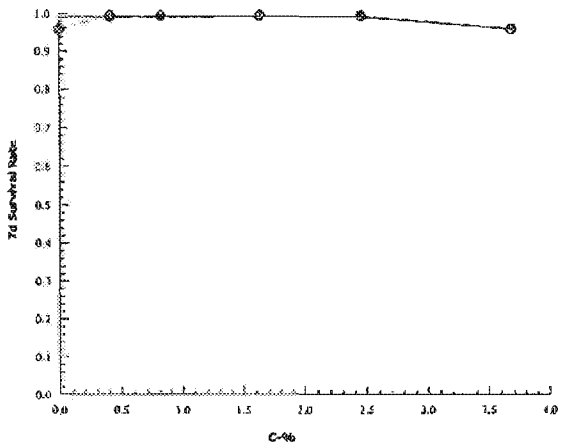
7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	5/5	5/5	4/5	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	4/5

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

Analysis ID:	10-6714-7014	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.8.7
Analyzed:	29 May-14 14:06	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Graphics



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

Analysis ID:	01-0789-1023	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	29 May-14 14:06	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	07-7798-2214	Code:	AVA0514.169tops	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	1770548	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

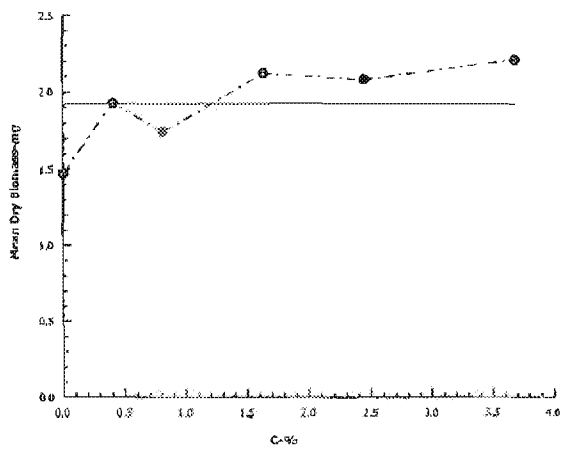
Mean Dry Biomass-mg Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	1.473	1.008	2.216	0.2085	0.4663	31.65%	0.0%
0.41		5	1.93	1.754	2.142	0.07124	0.1593	8.26%	-30.98%
0.82		5	1.743	1.446	2.11	0.1132	0.2532	14.53%	-18.33%
1.64		5	2.122	1.886	2.638	0.1375	0.3075	14.49%	-44.01%
2.46		5	2.084	1.59	2.46	0.1491	0.3334	16.0%	-41.49%
3.69		5	2.21	1.916	2.682	0.1368	0.306	13.85%	-49.99%

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.208	1.342	1.008	1.592	2.216
0.41		1.982	1.982	1.754	1.788	2.142
0.82		1.446	1.754	2.11	1.58	1.826
1.64		2.15	1.886	2.638	1.906	2.028
2.46		1.946	2.46	2.154	2.272	1.59
3.69		1.916	2.682	2.294	2.186	1.97

Graphics



CETIS Measurement Report

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

Batch ID:	01-8624-4902	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	13 May-14 15:00	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	20 May-14 13:00	Species:	Atherinops affinis	Brine:	Not Applicable
Duration:	6d 22h	Source:	Aquatic Biosystems, CO	Age:	

Sample ID:	07-7798-2214	Code:	AVA0514.169tops	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °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	6.3	6.004	6.596	5.8	7	0.1254	0.3546	5.63%	0
0.41		8	6.038	5.609	6.466	5.2	6.9	0.1812	0.5125	8.49%	0
0.82		8	6.05	5.614	6.486	5.4	6.9	0.1842	0.521	8.61%	0
1.64		8	5.988	5.436	6.539	4.8	6.8	0.2333	0.66	11.02%	0
2.46		8	5.963	5.473	6.452	5.2	6.8	0.207	0.5854	9.82%	0
3.69		8	5.9	5.389	6.411	5.2	6.8	0.2163	0.6118	10.37%	0
Overall		48	6.04			4.8	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	8	7.575	7.516	7.634	7.5	7.7	0.025	0.07071	0.93%	0
0.41		8	7.538	7.449	7.626	7.4	7.7	0.0375	0.1061	1.41%	0
0.82		8	7.538	7.429	7.646	7.4	7.7	0.04605	0.1302	1.73%	0
1.64		8	7.55	7.45	7.65	7.4	7.7	0.04226	0.1195	1.58%	0
2.46		8	7.513	7.408	7.617	7.4	7.7	0.04407	0.1246	1.66%	0
3.69		8	7.5	7.391	7.609	7.3	7.7	0.04629	0.1309	1.75%	0
Overall		48	7.535			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	7	6.4	6.3	6.1	6.1	6.5	6.2	5.8
0.41		6.9	6.3	6.1	5.2	5.6	6.1	6.3	5.8
0.82		6.9	6.5	5.4	5.5	5.6	6.1	6.2	6.2
1.64		6.8	6.4	4.8	5.5	5.6	6	6.2	6.6
2.46		6.8	6.5	5.2	5.4	5.4	6	6.4	6
3.69		6.8	6.4	5.6	5.3	5.4	6	6.5	5.2

pH-Units

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

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

June 5, 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:	13 May - 14
DATE SAMPLED:	12 May - 14
ABC LAB. NO.:	AVA0514.169

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_00000729-00227

CETIS Summary Report

Report Date: 04 Jun-14 14:40 (p 1 of 1)
Test Code: AVA0514.169urc | 05-8220-0524

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

Batch ID:	14-6439-5381	Test Type:	Fertilization	Analyst:	
Start Date:	13 May-14 15:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	13 May-14 15:41	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	40m	Source:	David Gutoff	Age:	

Sample ID:	06-5865-6027	Code:	AVA0514.169urc	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
06-0502-0244	Fertilization Rate	3.69	>3.69	NA	5.45%	27.1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
08-4466-4100	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
06-0502-0244	Fertilization Rate	Control Resp	0.9375	0.7 - NL	Yes	Passes Acceptability Criteria
08-4466-4100	Fertilization Rate	Control Resp	0.9375	0.7 - NL	Yes	Passes Acceptability Criteria
06-0502-0244	Fertilization Rate	PMSD	0.05451	NL - 0.25	No	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	0.9375	0.9223	0.9527	0.93	0.95	0.004787	0.009574	1.02%	0.0%
0.41		4	0.9825	0.9449	1	0.95	1	0.01181	0.02363	2.41%	-4.8%
0.82		4	0.955	0.9073	1	0.91	0.97	0.015	0.03	3.14%	-1.87%
1.64		4	0.955	0.9458	0.9642	0.95	0.96	0.002887	0.005775	0.6%	-1.87%
2.46		4	0.9575	0.9247	0.9903	0.93	0.98	0.01031	0.02062	2.15%	-2.13%
3.69		4	0.975	0.9474	1	0.95	0.99	0.00866	0.01732	1.78%	-4.0%

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	0.93	0.95	0.94	0.93
0.41		0.98	1	1	0.95
0.82		0.91	0.97	0.97	0.97
1.64		0.95	0.96	0.96	0.95
2.46		0.98	0.93	0.96	0.96
3.69		0.98	0.99	0.98	0.95

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	93/100	95/100	94/100	93/100
0.41		98/100	100/100	100/100	95/100
0.82		91/100	97/100	97/100	97/100
1.64		95/100	96/100	96/100	95/100
2.46		98/100	93/100	96/100	96/100
3.69		98/100	99/100	98/100	95/100

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

Analysis ID:	06-0502-0244	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:40	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Sample ID:	06-5865-6027	Code:	AVA0514.169urc	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	5.45%	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	-3.552	2.407	0.092	6	1.0000	CDF	Non-Significant Effect
	0.82	-1.192	2.407	0.092	6	0.9899	CDF	Non-Significant Effect
	1.64	-1.016	2.407	0.092	6	0.9835	CDF	Non-Significant Effect
	2.46	-1.288	2.407	0.092	6	0.9923	CDF	Non-Significant Effect
	3.69	-2.62	2.407	0.092	6	0.9999	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.04648826	0.009297651	5	3.207	0.0304	Significant Effect
Error	0.05219167	0.002899537	18			
Total	0.09867992		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	9.354	15.09	0.0957	Equal Variances
Variances	Mod Levene Equality of Variance	0.9952	4.248	0.4483	Equal Variances
Variances	Levene Equality of Variance	2.238	4.248	0.0950	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9253	0.884	0.0767	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.163	0.2056	0.0986	Normal Distribution
Distribution	D'Agostino Skewness	1.692	2.576	0.0906	Normal Distribution
Distribution	D'Agostino Kurtosis	0.5949	2.576	0.5519	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	3.218	9.21	0.2001	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.7136	3.878	0.0625	Normal Distribution

Fertilization Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Control	4	0.9375	0.9223	0.9527	0.935	0.93	0.95	0.004787	1.02%	0.0%
0.41		4	0.9825	0.9449	1	0.99	0.95	1	0.01181	2.41%	-4.8%
0.82		4	0.955	0.9073	1	0.97	0.91	0.97	0.015	3.14%	-1.87%
1.64		4	0.955	0.9458	0.9642	0.955	0.95	0.96	0.002887	0.6%	-1.87%
2.46		4	0.9575	0.9247	0.9903	0.96	0.93	0.98	0.01031	2.15%	-2.13%
3.69		4	0.975	0.9474	1	0.98	0.95	0.99	0.00866	1.78%	-4.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	4	1.319	1.287	1.351	1.313	1.303	1.345	0.01008	1.53%	0.0%
0.41		4	1.454	1.32	1.588	1.475	1.345	1.521	0.0422	5.81%	-10.26%
0.82		4	1.364	1.26	1.468	1.397	1.266	1.397	0.03265	4.79%	-3.44%
1.64		4	1.357	1.335	1.38	1.357	1.345	1.369	0.006973	1.03%	-2.93%
2.46		4	1.368	1.286	1.45	1.369	1.303	1.429	0.02571	3.76%	-3.72%
3.69		4	1.418	1.335	1.502	1.429	1.345	1.471	0.02629	3.71%	-7.57%

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

Analysis ID:	06-0502-0244	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:40	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	0.93	0.95	0.94	0.93
0.41		0.98	1	1	0.95
0.82		0.91	0.97	0.97	0.97
1.64		0.95	0.96	0.96	0.95
2.46		0.98	0.93	0.96	0.96
3.69		0.98	0.99	0.98	0.95

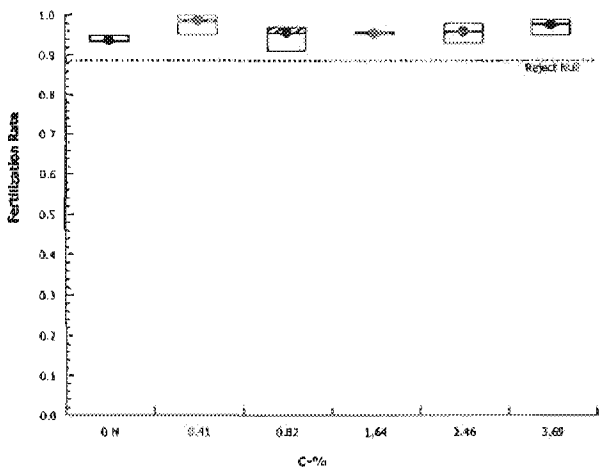
Angular (Corrected) Transformed Detail

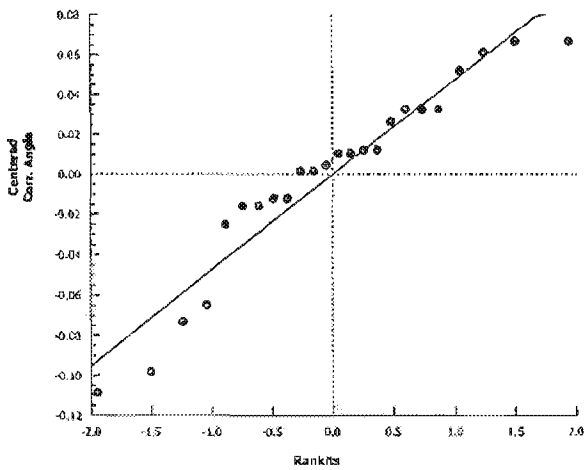
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	1.303	1.345	1.323	1.303
0.41		1.429	1.521	1.521	1.345
0.82		1.266	1.397	1.397	1.397
1.64		1.345	1.369	1.369	1.345
2.46		1.429	1.303	1.369	1.369
3.69		1.429	1.471	1.429	1.345

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	93/100	95/100	94/100	93/100
0.41		98/100	100/100	100/100	95/100
0.82		91/100	97/100	97/100	97/100
1.64		95/100	96/100	96/100	95/100
2.46		98/100	93/100	96/100	96/100
3.69		98/100	99/100	98/100	95/100

Graphics





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

Analysis ID:	08-4466-4100	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:40	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	06-5865-6027	Code:	AVA0514.169urc	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °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	0.9375	0.93	0.95	0.004787	0.009574	1.02%	0.0%	375	400
0.41		4	0.9825	0.95	1	0.01181	0.02363	2.41%	-4.8%	393	400
0.82		4	0.955	0.91	0.97	0.015	0.03	3.14%	-1.87%	382	400
1.64		4	0.955	0.95	0.96	0.002887	0.005775	0.6%	-1.87%	382	400
2.46		4	0.9575	0.93	0.98	0.01031	0.02062	2.15%	-2.13%	383	400
3.69		4	0.975	0.95	0.99	0.00866	0.01732	1.78%	-4.0%	390	400

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	0.93	0.95	0.94	0.93
0.41		0.98	1	1	0.95
0.82		0.91	0.97	0.97	0.97
1.64		0.95	0.96	0.96	0.95
2.46		0.98	0.93	0.96	0.96
3.69		0.98	0.99	0.98	0.95

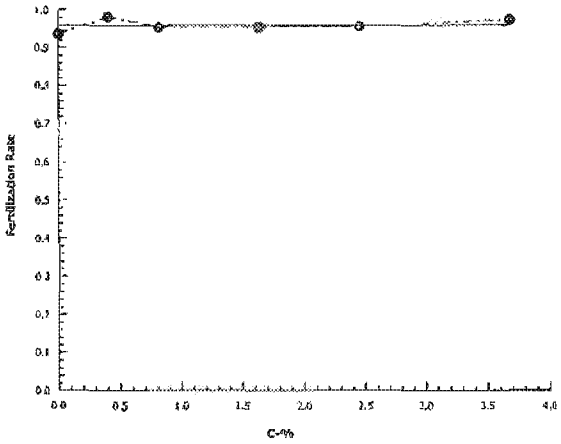
Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	93/100	95/100	94/100	93/100
0.41		98/100	100/100	100/100	95/100
0.82		91/100	97/100	97/100	97/100
1.64		95/100	96/100	96/100	95/100
2.46		98/100	93/100	96/100	96/100
3.69		98/100	99/100	98/100	95/100

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

Analysis ID:	08-4466-4100	Endpoint:	Fertilization Rate	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:40	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:	14-6439-5381	Test Type:	Fertilization	Analyst:	
Start Date:	13 May-14 15:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	13 May-14 15:41	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	40m	Source:	David Gutoff	Age:	

Sample ID:	06-5865-6027	Code:	AVA0514.169urc	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °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	6.4	1.318	11.48	6	6.8	0.4	0.5657	8.84%	0
0.41		2	6.45	3.273	9.627	6.2	6.7	0.25	0.3536	5.48%	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	2.103	11	6.2	6.9	0.35	0.495	7.56%	0
2.46		2	6.65	2.203	11.1	6.3	7	0.35	0.495	7.44%	0
3.69		2	6.5	2.688	10.31	6.2	6.8	0.3	0.4243	6.53%	0
Overall		12	6.517			6	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	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.82		2	7.95	7.315	8.585	7.9	8	0.04999	0.0707	0.89%	0
1.64		2	7.95	7.315	8.585	7.9	8	0.04999	0.0707	0.89%	0
2.46		2	7.95	7.315	8.585	7.9	8	0.04999	0.0707	0.89%	0
3.69		2	7.95	7.315	8.585	7.9	8	0.04999	0.0707	0.89%	0
Overall		12	7.933			7.9	8				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
0.41		6.7	6.2
0.82		6.8	6.3
1.64		6.9	6.2
2.46		7	6.3
3.69		6.8	6.2

pH-Units

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

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	14.7	14.8
0.41		14.7	14.8
0.82		14.7	14.8
1.64		14.7	14.8
2.46		14.7	14.8
3.69		14.7	14.8

aquatic bioassay & consulting laboratories, inc

June 5, 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:	13 May - 14
DATE SAMPLED:	12 May - 14
ABC LAB. NO.:	AVA0514.169

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_00000729-00235

CETIS Summary Report

Report Date: 04 Jun-14 14:48 (p 1 of 2)
Test Code: AVA0514.169klp | 10-4458-5820

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

Batch ID:	18-9718-8285	Test Type:	Growth-Germination	Analyst:	
Start Date:	13 May-14 15:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	15 May-14 15:01	Species:	Macrocystis pyrifera	Brine:	Not Applicable
Duration:	48h	Source:	Aquatic Bioassay Labs Collection	Age:	

Sample ID:	08-9732-3643	Code:	AVA0514.169klp	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
06-6380-3858	Germination Rate	3.69	>3.69	NA	2.34%	27.1	Dunnett Multiple Comparison Test
11-2166-3357	Mean Length	3.69	>3.69	NA	3.61%	27.1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
00-2135-3170	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	
11-9964-0699	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
00-2135-3170	Germination Rate	Control Resp	0.912	0.7 - NL	Yes	Passes Acceptability Criteria
06-6380-3858	Germination Rate	Control Resp	0.912	0.7 - NL	Yes	Passes Acceptability Criteria
11-2166-3357	Mean Length	Control Resp	15.44	10 - NL	Yes	Passes Acceptability Criteria
11-9964-0699	Mean Length	Control Resp	15.44	10 - NL	Yes	Passes Acceptability Criteria
06-6380-3858	Germination Rate	PMSD	0.02336	NL - 0.2	No	Passes Acceptability Criteria
11-2166-3357	Mean Length	PMSD	0.03611	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	0.912	0.8851	0.9389	0.88	0.93	0.009695	0.02168	2.38%	0.0%
0.41		5	0.91	0.8976	0.9224	0.9	0.92	0.004472	0.01	1.1%	0.22%
0.82		5	0.912	0.8984	0.9256	0.9	0.93	0.004899	0.01095	1.2%	0.0%
1.64		5	0.906	0.8803	0.9317	0.88	0.93	0.009274	0.02074	2.29%	0.66%
2.46		5	0.91	0.9012	0.9188	0.9	0.92	0.003162	0.007071	0.78%	0.22%
3.69		5	0.922	0.9116	0.9324	0.91	0.93	0.003742	0.008367	0.91%	-1.1%

Mean Length Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	15.44	15.13	15.75	15	15.6	0.1122	0.251	1.63%	0.0%
0.41		5	15.66	14.92	16.4	14.7	16.2	0.2657	0.5941	3.79%	-1.43%
0.82		5	15.64	15.45	15.83	15.4	15.8	0.06782	0.1517	0.97%	-1.3%
1.64		5	15.72	15.44	16	15.4	16	0.102	0.228	1.45%	-1.81%
2.46		5	15.58	15.05	16.11	15.2	16.3	0.1908	0.4266	2.74%	-0.91%
3.69		5	15.56	15.06	16.06	15	16	0.1806	0.4037	2.6%	-0.78%

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	0.92	0.93	0.9	0.93	0.88
0.41		0.92	0.9	0.92	0.91	0.9
0.82		0.93	0.91	0.9	0.91	0.91
1.64		0.88	0.92	0.89	0.91	0.93
2.46		0.91	0.91	0.92	0.91	0.9
3.69		0.93	0.93	0.92	0.91	0.92

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15	15.5	15.6	15.6	15.5
0.41		15.5	16	14.7	16.2	15.9
0.82		15.4	15.7	15.8	15.6	15.7
1.64		15.8	16	15.6	15.8	15.4
2.46		15.2	15.6	15.4	16.3	15.4
3.69		15	16	15.7	15.3	15.8

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	90/100	93/100	88/100
0.41		92/100	90/100	92/100	91/100	90/100
0.82		93/100	91/100	90/100	91/100	91/100
1.64		88/100	92/100	89/100	91/100	93/100
2.46		91/100	91/100	92/100	91/100	90/100
3.69		93/100	93/100	92/100	91/100	92/100

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

Analysis ID:	06-6380-3858	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:47	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Sample ID:	08-9732-3643	Code:	AVA0514.169klp	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	2.34%	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	0.3023	2.362	0.037	8	0.7290	CDF	Non-Significant Effect
	0.82	0.07347	2.362	0.037	8	0.8107	CDF	Non-Significant Effect
	1.64	0.6725	2.362	0.037	8	0.5696	CDF	Non-Significant Effect
	2.46	0.3134	2.362	0.037	8	0.7247	CDF	Non-Significant Effect
	3.69	-1.062	2.362	0.037	8	0.9860	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.002205227	0.0004410454	5	0.7037	0.6262	Non-Significant Effect
Error	0.01504301	0.000626792	24			
Total	0.01724823		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	7.438	15.09	0.1901	Equal Variances
Variances	Mod Levene Equality of Variance	2.615	4.248	0.0603	Equal Variances
Variances	Levene Equality of Variance	3.194	3.895	0.0238	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9742	0.9031	0.6591	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1301	0.1853	0.2126	Normal Distribution
Distribution	D'Agostino Skewness	0.7324	2.576	0.4639	Normal Distribution
Distribution	D'Agostino Kurtosis	0.1864	2.576	0.8521	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	0.5711	9.21	0.7516	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.3633	3.878	0.4452	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	0.912	0.8851	0.9389	0.92	0.88	0.93	0.009695	2.38%	0.0%
0.41		5	0.91	0.8976	0.9224	0.91	0.9	0.92	0.004472	1.1%	0.22%
0.82		5	0.912	0.8984	0.9256	0.91	0.9	0.93	0.004898	1.2%	0.0%
1.64		5	0.906	0.8803	0.9317	0.91	0.88	0.93	0.009273	2.29%	0.66%
2.46		5	0.91	0.9012	0.9188	0.91	0.9	0.92	0.003162	0.78%	0.22%
3.69		5	0.922	0.9116	0.9324	0.92	0.91	0.93	0.003741	0.91%	-1.1%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Negative Contr	5	1.271	1.225	1.318	1.284	1.217	1.303	0.01675	2.95%	0.0%
0.41		5	1.266	1.245	1.288	1.266	1.249	1.284	0.007825	1.38%	0.38%
0.82		5	1.27	1.245	1.295	1.266	1.249	1.303	0.008876	1.56%	0.09%
1.64		5	1.261	1.216	1.305	1.266	1.217	1.303	0.0159	2.82%	0.84%
2.46		5	1.266	1.251	1.282	1.266	1.249	1.284	0.005534	0.98%	0.39%
3.69		5	1.288	1.269	1.307	1.284	1.266	1.303	0.006938	1.2%	-1.32%

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

Analysis ID:	06-6380-3858	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:47	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	0.92	0.93	0.9	0.93	0.88
0.41		0.92	0.9	0.92	0.91	0.9
0.82		0.93	0.91	0.9	0.91	0.91
1.64		0.88	0.92	0.89	0.91	0.93
2.46		0.91	0.91	0.92	0.91	0.9
3.69		0.93	0.93	0.92	0.91	0.92

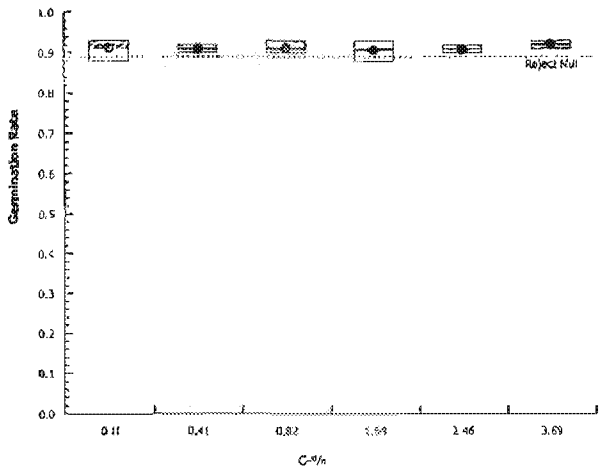
Angular (Corrected) Transformed Detail

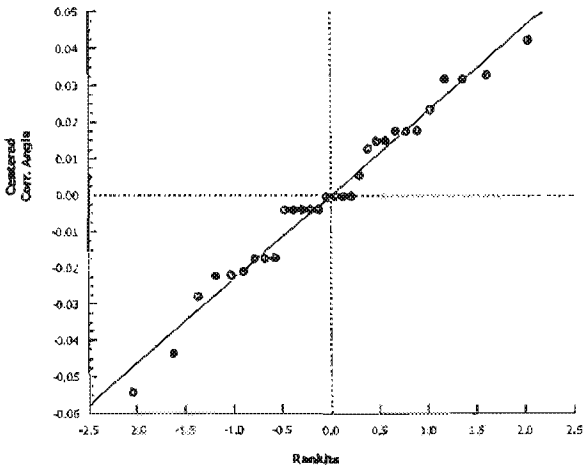
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	1.284	1.303	1.249	1.303	1.217
0.41		1.284	1.249	1.284	1.266	1.249
0.82		1.303	1.266	1.249	1.266	1.266
1.64		1.217	1.284	1.233	1.266	1.303
2.46		1.266	1.266	1.284	1.266	1.249
3.69		1.303	1.303	1.284	1.266	1.284

Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	90/100	93/100	88/100
0.41		92/100	90/100	92/100	91/100	90/100
0.82		93/100	91/100	90/100	91/100	91/100
1.64		88/100	92/100	89/100	91/100	93/100
2.46		91/100	91/100	92/100	91/100	90/100
3.69		93/100	93/100	92/100	91/100	92/100

Graphics





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

Analysis ID:	11-2166-3357	Endpoint:	Mean Length	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:47	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Sample ID:	08-9732-3643	Code:	AVA0514.169klp	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	3.61%	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	-0.9319	2.362	0.558	8	0.9799	CDF	Non-Significant Effect
		0.82	-0.8472	2.362	0.558	8	0.9747	CDF	Non-Significant Effect
		1.64	-1.186	2.362	0.558	8	0.9902	CDF	Non-Significant Effect
		2.46	-0.593	2.362	0.558	8	0.9519	CDF	Non-Significant Effect
		3.69	-0.5083	2.362	0.558	8	0.9412	CDF	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.2359999	0.04719998	5	0.3388	0.8843	Non-Significant Effect
Error	3.344001	0.1393334	24			
Total	3.580001		29			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	8.119	15.09	0.1498	Equal Variances
Variances	Mod Levene Equality of Variance	0.8908	4.248	0.5077	Equal Variances
Variances	Levene Equality of Variance	1.867	3.895	0.1377	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.972	0.9031	0.5961	Normal Distribution
Distribution	Kolmogorov-Smirnov D	0.1368	0.1853	0.1583	Normal Distribution
Distribution	D'Agostino Skewness	1.274	2.576	0.2027	Normal Distribution
Distribution	D'Agostino Kurtosis	1.459	2.576	0.1445	Normal Distribution
Distribution	D'Agostino-Pearson K2 Omnibus	3.752	9.21	0.1532	Normal Distribution
Distribution	Anderson-Darling A2 Normality	0.3978	3.878	0.3715	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	15.44	15.13	15.75	15.5	15	15.6	0.1123	1.63%	0.0%
0.41		5	15.66	14.92	16.4	15.9	14.7	16.2	0.2657	3.79%	-1.43%
0.82		5	15.64	15.45	15.83	15.7	15.4	15.8	0.06782	0.97%	-1.3%
1.64		5	15.72	15.44	16	15.8	15.4	16	0.102	1.45%	-1.81%
2.46		5	15.58	15.05	16.11	15.4	15.2	16.3	0.1908	2.74%	-0.91%
3.69		5	15.56	15.06	16.06	15.7	15	16	0.1806	2.6%	-0.78%

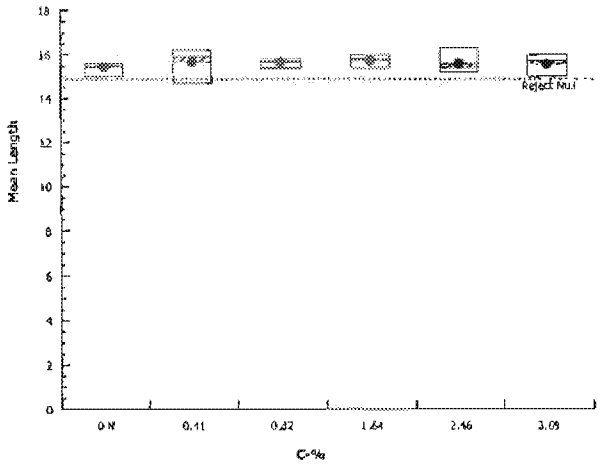
Mean Length Detail

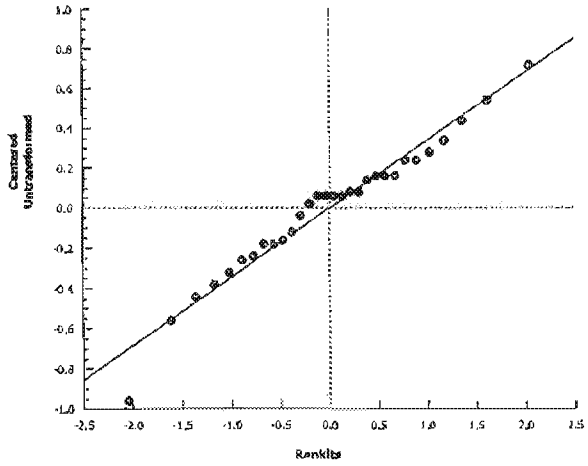
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15	15.5	15.6	15.6	15.5
0.41		15.5	16	14.7	16.2	15.9
0.82		15.4	15.7	15.8	15.6	15.7
1.64		15.8	16	15.6	15.8	15.4
2.46		15.2	15.6	15.4	16.3	15.4
3.69		15	16	15.7	15.3	15.8

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

Analysis ID:	11-2166-3357	Endpoint:	Mean Length	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:47	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes

Graphics





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

Analysis ID:	00-2135-3170	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:47	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	08-9732-3643	Code:	AVA0514.169klp	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °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	0.912	0.88	0.93	0.009695	0.02168	2.38%	0.0%	456	500
0.41		5	0.91	0.9	0.92	0.004472	0.009999	1.1%	0.22%	455	500
0.82		5	0.912	0.9	0.93	0.004898	0.01095	1.2%	0.0%	456	500
1.64		5	0.906	0.88	0.93	0.009273	0.02074	2.29%	0.66%	453	500
2.46		5	0.91	0.9	0.92	0.003162	0.00707	0.78%	0.22%	455	500
3.69		5	0.922	0.91	0.93	0.003741	0.008365	0.91%	-1.1%	461	500

Germination Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	0.92	0.93	0.9	0.93	0.88
0.41		0.92	0.9	0.92	0.91	0.9
0.82		0.93	0.91	0.9	0.91	0.91
1.64		0.88	0.92	0.89	0.91	0.93
2.46		0.91	0.91	0.92	0.91	0.9
3.69		0.93	0.93	0.92	0.91	0.92

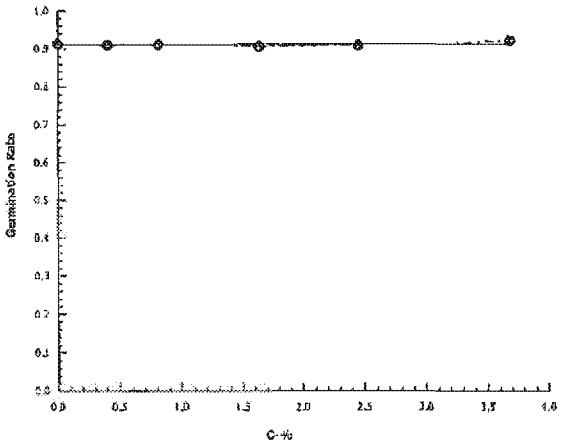
Germination Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	92/100	93/100	90/100	93/100	88/100
0.41		92/100	90/100	92/100	91/100	90/100
0.82		93/100	91/100	90/100	91/100	91/100
1.64		88/100	92/100	89/100	91/100	93/100
2.46		91/100	91/100	92/100	91/100	90/100
3.69		93/100	93/100	92/100	91/100	92/100

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

Analysis ID:	00-2135-3170	Endpoint:	Germination Rate	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:47	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Graphics



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

Analysis ID:	11-9964-0699	Endpoint:	Mean Length	CETIS Version:	CETISv1.8.7
Analyzed:	04 Jun-14 14:47	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes

Sample ID:	08-9732-3643	Code:	AVA0514.169klp	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °C)	Station:	Eff Comp		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	246270	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

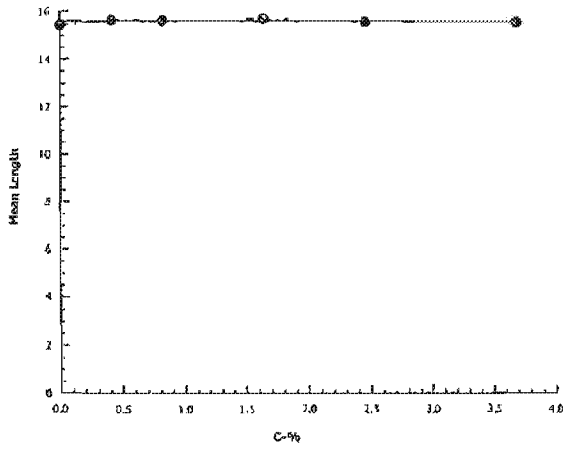
Mean Length Summary

			Calculated Variate						
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Negative Control	5	15.44	15	15.6	0.1123	0.251	1.63%	0.0%
0.41		5	15.66	14.7	16.2	0.2657	0.5941	3.79%	-1.43%
0.82		5	15.64	15.4	15.8	0.06782	0.1516	0.97%	-1.3%
1.64		5	15.72	15.4	16	0.102	0.228	1.45%	-1.81%
2.46		5	15.58	15.2	16.3	0.1908	0.4266	2.74%	-0.91%
3.69		5	15.56	15	16	0.1806	0.4037	2.6%	-0.78%

Mean Length Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Negative Control	15	15.5	15.6	15.6	15.5
0.41		15.5	16	14.7	16.2	15.9
0.82		15.4	15.7	15.8	15.6	15.7
1.64		15.8	16	15.6	15.8	15.4
2.46		15.2	15.6	15.4	16.3	15.4
3.69		15	16	15.7	15.3	15.8

Graphics



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

Batch ID:	18-9718-8285	Test Type:	Growth-Germination	Analyst:	
Start Date:	13 May-14 15:01	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	15 May-14 15:01	Species:	Macrocystis pyrifera	Brine:	Not Applicable
Duration:	48h	Source:	Aquatic Bioassay Labs Collection	Age:	

Sample ID:	08-9732-3643	Code:	AVA0514.169klp	Client:	Avalon WWTP
Sample Date:	12 May-14 09:55	Material:	Sample Water	Project:	
Receive Date:	13 May-14 10:15	Source:	Bioassay Report		
Sample Age:	29h (1.7 °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	6.4	1.318	11.48	6	6.8	0.4	0.5657	8.84%	0
0.41		2	6.45	3.273	9.627	6.2	6.7	0.25	0.3536	5.48%	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	2.103	11	6.2	6.9	0.35	0.495	7.56%	0
2.46		2	6.65	2.203	11.1	6.3	7	0.35	0.495	7.44%	0
3.69		2	6.5	2.688	10.31	6.2	6.8	0.3	0.4243	6.53%	0
Overall		12	6.517			6	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	7.9	7.884	7.916	7.9	7.9	0	0	0.0%	0
0.82		2	7.95	7.315	8.585	7.9	8	0.04999	0.0707	0.89%	0
1.64		2	7.95	7.315	8.585	7.9	8	0.04999	0.0707	0.89%	0
2.46		2	7.95	7.315	8.585	7.9	8	0.04999	0.0707	0.89%	0
3.69		2	7.95	7.315	8.585	7.9	8	0.04999	0.0707	0.89%	0
Overall		12	7.933			7.9	8				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%)

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

Dissolved Oxygen-mg/L

C-%	Control Type	1	2
0	Negative Contr	6.8	6
0.41		6.7	6.2
0.82		6.8	6.3
1.64		6.9	6.2
2.46		7	6.3
3.69		6.8	6.2

pH-Units

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

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	14.7	14.8
0.41		14.7	14.8
0.82		14.7	14.8
1.64		14.7	14.8
2.46		14.7	14.8
3.69		14.7	14.8

CHAIN OF CUSTODY RECORD

Client: Environ Strategy AWWTF

Project Name/Number:

Address: 123 Pebbly Beach rd. Avalon, CA 90704

Project Mgr.: Dave Clary

P.O. #: 1810

Phone Number: 310-510-0731

Sampled By (signature): [signature]

Analysis: Mysid sensitive species

Date	Time	Comp	Grab	Matrix	Sample ID	Volume/ Number	Comments
5/12/14	0955	✓		WW	EFF-Comp	1 gal	Please return Ice packs
	↓						
	~~0910~~						
	~~0910~~						
	~~0910~~						
	~~0910~~						
	~~0910~~						
	~~0910~~						

Relinquised By: (signature) [signature] Date: Time: 5/12/14

Received By: (signature) [signature] Date: Time: 5/13/14 1095

Relinquised By: (signature) [signature] Date: Time: 5/12/14

Received By: (signature) Date: Time:

Temp. upon sample receipt: 1.7 °C

Chlorine = <0.1

Ammonia = 0.0

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

CHAIN OF CUSTODY RECORD

Client: Environ Strategy AWWTF

Address: 123 Pebbly Beach Rd Avalon, CA 90704

Phone Number: 310 510 0731

Project Name/Number: 690A - 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
5/13/14	11:00	X		WW	Eff Comp	1L	✓										

Relinquised By: (signature) D Clary — Date: Time: 5/13/14 2:00pm

Received By: (signature) [illegible] — Date: Time: 5/14/14 1145

Relinquised By: (signature) — Date: Time:

Received By: (signature) — Date: Time:

Temp. upon sample receipt: 1.5 °C

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

Nitrate = <0.1

Ammonia = 0.1

CHAIN OF CUSTODY RECORD

Client: Environ Strategy AWWTF

Address: 123 Pebbly Beach Rd, Avalon, CA 90704

Phone Number: 310 510 0731

Project Name/Number: AWWTF 690A

Project Mgr.: David Clary

P.O.#: 690 A

Sampled By (signature): D Clay

Analysis: Most Sensitive Species

dclay@environstrategy.com

Date	Time	Comp.	Grab	Matrix	Sample ID	Volume/ Number	Comments
5/16/14	0807	X		WW	Eff Comp	1L	
					SAMPLE RECEIVED WITHIN HOLDING TIME. 5-19-14		

Relinquished By: (signature) D. Clay — Date: Time: 5/16/14 1400

Received By: (signature) — Date: Time: 5-19-14

Relinquished By: (signature) — Date: Time:

Received By: (signature) — Date: Time:

Temp. upon sample receipt: 10.4 °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. AVA0914.0744

September 4, 2014

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

SAMPLE I.D.:	Effluent Comp
DATE RECEIVED:	12 Aug - 14
DATE SAMPLED:	11 Aug - 14
ABC LAB. NO.:	AVA0814.141

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

September 4, 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:	12 Aug - 14
DATE SAMPLED:	11 Aug - 14
ABC LAB. NO.:	AVA0814.141

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_00000729-00251

CETIS Summary Report

Report Date: 03 Sep-14 16:00 (p 1 of 1)
Test Code: AVA0814.141 | 13-0760-4157

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

Batch ID:	05-8147-3242	Test Type:	Fertilization	Analyst:	
Start Date:	12 Aug-14 15:32	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Laboratory Seawater
Ending Date:	14 Aug-14 16:12	Species:	Strongylocentrotus purpuratus	Brine:	Not Applicable
Duration:	49h	Source:	David Gutoff	Age:	

Sample ID:	12-3785-1056	Code:	AVA0814.141	Client:	Avalon WWTP
Sample Date:	11 Aug-14 13:00	Material:	Sample Water	Project:	
Receive Date:	12 Aug-14 09:45	Source:	Bioassay Report		
Sample Age:	27h (4.3 °C)	Station:	Eff-Comp		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
17-5323-5449	Fertilization Rate	3.69	>3.69	NA	9.84%	27.1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
17-6417-5717	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
17-5323-5449	Fertilization Rate	Control Resp	0.9175	0.7 - NL	Yes	Passes Acceptability Criteria
17-6417-5717	Fertilization Rate	Control Resp	0.9175	0.7 - NL	Yes	Passes Acceptability Criteria
17-5323-5449	Fertilization Rate	PMSD	0.09842	NL - 0.25	No	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	0.9175	0.9023	0.9327	0.91	0.93	0.004786	0.009573	1.04%	0.0%
0.41		4	0.9725	0.9216	1	0.94	1	0.01601	0.03202	3.29%	-6.0%
0.82		4	0.9875	0.9477	1	0.95	1	0.0125	0.025	2.53%	-7.63%
1.64		4	0.97	0.9134	1	0.93	1	0.0178	0.03559	3.67%	-5.72%
2.46		4	0.99	0.9582	1	0.96	1	0.01	0.02	2.02%	-7.9%
3.69		4	0.935	0.9145	0.9555	0.92	0.95	0.006455	0.01291	1.38%	-1.91%

Fertilization Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	0.91	0.91	0.93	0.92
0.41		1	0.94	1	0.95
0.82		1	1	1	0.95
1.64		1	1	0.93	0.95
2.46		1	1	1	0.96
3.69		0.95	0.94	0.92	0.93

Fertilization Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Negative Control	91/100	91/100	93/100	92/100
0.41		100/100	94/100	100/100	95/100
0.82		100/100	100/100	100/100	95/100
1.64		100/100	100/100	93/100	95/100
2.46		100/100	100/100	100/100	96/100
3.69		95/100	94/100	92/100	93/100