#487

August 29, 1995

California Regional Water Quality Control Board
Central Valley Region
3614 East Ashlan Avenue
Fresno, CA 93726

Atten: Mr. Bert E. Van Voris - Supervising Engineer

RE: Provision E.1. of Order No. 95-031,
NPDES No. CA 0082295 for Texaco
Exploration and Production Inc. (TEPI)
and the Cawelo Water District (CWD)

Kern River

Gentlemen:

The Discharger (TEPI and CWD) has completed four separate weeks of Chronic Toxicity Testing as required by the subject Provision E.1. to determine compliance with Receiving Water Limitations C.2.h. and C.2.i. As the subject permit describes, limitations C.2.h. and C.2.i. are site specific and apply when there is TEPI produced water discharge to Poso Creek at Sampling Station 3 and surface waters in Poso Creek leave the CWD at Sampling Station 5. The CWD plans on minimal discharge to Poso Creek for recharge as every effort will be made to blend and use the TEPI produced water for irrigation. Actual test results and associated documentation from Aquatic Bioassay and Consulting Laboratories, Inc. (ABC) in Ventura are enclosed. Geochemical analysis by Oilwell Research, Inc. in Bakersfield are also enclosed. As requested by Mr. Kevin Long, floppy discs of the toxicity test data in the State Board format are also enclosed. Since the Produced Water Reclamation Project covered by the subject permit is not scheduled to be on-line until December 1, 1995, water samples for the toxicity testing were taken from TEPI's existing Beardsley Canal discharge covered by order No. 92-106, NPDES No. CA 0078352. The dilution water was ABC's standard lab dilution water in all cases.

The enclosed table summarizes the percent NOEC (no observed effect concentration) for the CWD discharge (TEPI effluent) by week, species and affect. In May we also tested the Poso Creek surface water itself and the results are also shown on the enclosed table. We can compare the May CWD sample (Tex 0551303) and the Poso Creek sample (Tex 0551302) to the same concurrent laboratory controls to judge the response of the test organisms, i.e., survival, growth, and reproduction. Results of this comparison show remarkable consistency between the CWD and Poso Creek samples. For example, when compared to controls the growth NOEC for the fathead minnow for both the CWD and Poso Creek is 100%. Similarly, the survival NOEC of the water flea for both CWD and Poso Creek samples is 100%. There is some variation in the survival of the fathead minnow NOEC - 32% for CWD and 100% for Poso Creek. However, comparison of the more sensitive species, water flea, on reproductive toxicity suggests that the CWD, which has a NOEC of 18%, reflects better water quality than the Poso Creek NOEC of 10%. The results of the other sampling data generally fall within the variation of responses seen in the May sampling results.

Under the receiving water permit conditions C.2. we therefore believe the discharge of TEPI produced water will not cause unacceptable degradation to the Poso Creek aquatic communities/populations or produce detrimental life responses.

For your information, a recent detailed analysis of our Beardsley discharge is also enclosed. The analysis itself indicates that chemical constituents known to affect toxicity are at levels well below those anticipated to create toxicity (e.g., no ionic imbalance, low salinity and TDS, neutral pH, low ammonia, low metals and no volatile or extractable organics). The analysis is very representative of TEPI's Beardsley discharge over the past few years.

Questions or comments may be directed to Texaco's Dave Wright at (805) 392-2248 or Cawelo's John Jones at (805) 393-6072. We are also available to meet with Board staff in Fresno to discuss this letter and the enclosed test results.

Very truly yours,

Dean A. Bears
Assistant Division Manager-Facilities
Texaco Exploration and Production Inc.
Bakersfield Division

John L. Jones
Manager
Cawelo Water District

DEW/bjs
Enclosures
75dew.doc

cc: Mr. Dana Munn - North Kern Water Storage District

NOEC (%)

CWD DISCHARGE (TEPI EFFLUENT TO BEARDSLEY CANAL)

	SURVIVAL					GROWTH					REPRODUCTION				
WEEK OF	3/13	5/15	6/26	7/24	AVERAGE	3/13	5/15	6/26	7/24	AVERAGE	3/13	5/15	6/26	7/24	AVERAGE
MINNOW	18	32	32	32	29	18	100	18	32	42	—	—	—	—	—
WATER FLEA	32	100	100	100	83	—	—	—	—	—	10	18	10	18	14
ALGAE	—	—	—	—	—	100	100	100	100	100	—	—	—	—	—
					56					71					14

POSO CREEK SURFACE WATER*

	SURVIVAL					GROWTH					REPRODUCTION				
WEEK OF	3/13	5/15	6/26	7/24	AVERAGE	3/13	5/15	6/26	7/24	AVERAGE	3/13	5/15	6/26	7/24	AVERAGE
MINNOW		100					100					—			
WATER FLEA		100					—					10			
ALGAE		—					100					—			

*At sampling station 4

AQUATIC
BIOASSAY &
CONSULTING
LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

March 30, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	Effluent
DATE RECEIVED:	14 March -95
ABC LAB. NO.:	TEX0350674

CHRONIC FATHEAD LARVAE SURVIVAL & GROWTH BIOASSAY

SURVIVAL	NOEC	=	18.00 %
	TUc	=	5.56
	IC25	=	28.46 %
	IC50	=	62.59 %
GROWTH	NOEC	=	18.00 %
	TUc	=	5.56
	IC25	=	26.75 %
	IC50	=	74.04 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Larval Fish Survival and Growth Test

Start Date:	14 Mar-95	Test ID:	TEX0350674	Sample ID:	CA0082295
End Date:	21 Mar-95	Protocol ID:	EPAM 87	Sample Type:	EFF2 Industrial
Sample Date:	14 Mar-95	Analyst Name:	F. Marcelino	Test Species:	PP Pimephales promelas
Comments:	Effluent			Response:	Survival

Conc-%	1	2	3	4
N Control	1.000	1.000	1.000	1.000
10	1.000	0.700	1.000	0.600
18	1.000	1.000	0.800	0.900
32	0.800	0.900	0.900	0.700
56	0.700	0.600	0.700	0.800
100	0.000	0.200	0.300	0.100

			Arcsin Squareroot Transformed Data					Rank				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	1.000	1.000	1.412	1.412	1.412	0.00	4				0	40
10	0.825	0.825	1.175	0.886	1.412	23.54	4	14.0	10.0		7	40
18	0.925	0.925	1.295	1.107	1.412	11.35	4	14.0	10.0		3	40
32	0.825	0.825	1.149	0.991	1.249	10.86	4	*10.0	10.0		7	40
56	0.700	0.700	0.994	0.886	1.107	9.09	4	*10.0	10.0		12	40
100	0.150	0.150	0.381	0.159	0.580	47.73	4	*10.0	10.0		34	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.964	0.884	-0.199	-0.499
Equality of variances cannnot be confirmed				

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	18	32	24	5.5556

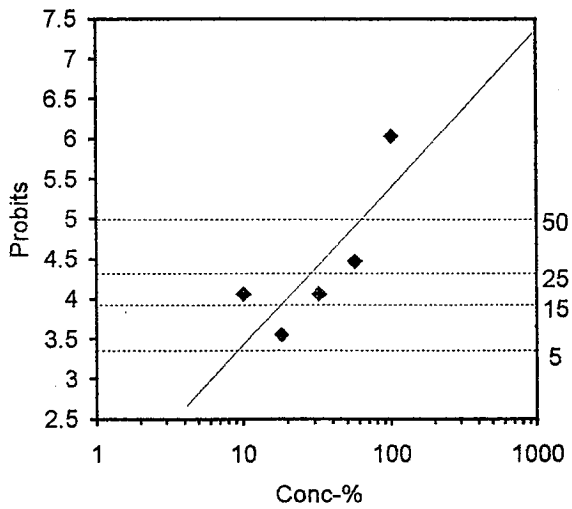
Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	1.9707	0.9004	-0.895	4.836
Intercept	1.4597	1.4653	-3.204	6.1229
TSCR	0	0.3064	-0.975	0.9753

Warning: significant heterogeneity
Slope not significantly different from zero

Point	Probits	%	95% Fiducial Limits	
EC1	2.674	4.13	#N/A	#N/A
EC5	3.355	9.16	#N/A	#N/A
EC10	3.718	14.00	#N/A	#N/A
EC15	3.964	18.65	#N/A	#N/A
EC25	4.326	28.46	#N/A	#N/A
EC40	4.747	46.55	#N/A	#N/A
EC50	5.000	62.59	#N/A	#N/A
EC60	5.253	84.15	#N/A	#N/A
EC75	5.674	137.64	#N/A	#N/A
EC85	6.036	210.10	#N/A	#N/A
EC90	6.282	279.77	#N/A	#N/A
EC95	6.645	427.72	#N/A	#N/A
EC99	7.326	948.35	#N/A	#N/A

Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.000	24.652	11.345	1.796	0.5074	4



LOEC - lowest observed effect concentration

Larval Fish Survival and Growth Test

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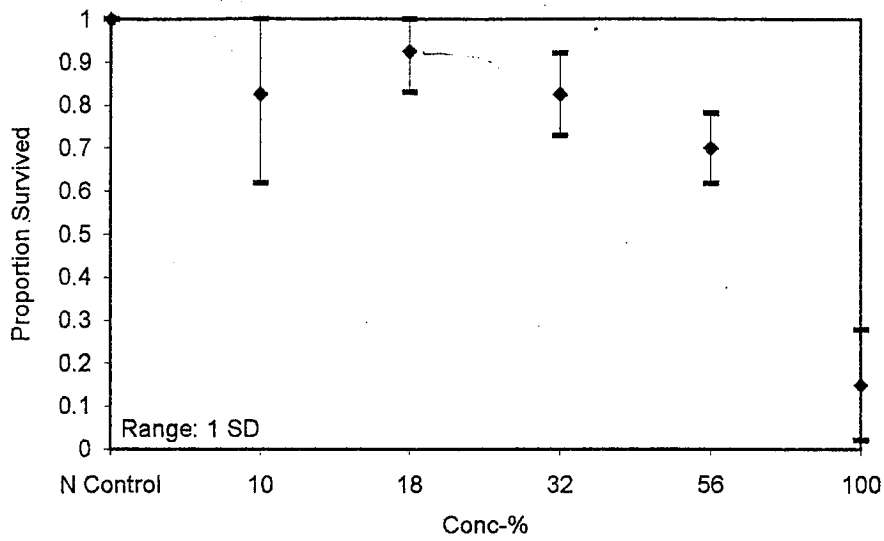
End Date:	21 Mar-95	Protocol ID:	EPAM 87	Sample Type:	EFF2 Industrial
Sample Date:	14 Mar-95	Analyst Name:	F. Marcelino	Test Species:	PP Pimephales promelas
Comments:	Effluent			Response:	Survival

TEX0350674-EFF2 Industrial



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End Date:	21 Mar-95	Protocol ID:	EPAM 87	Sample Type:	EFF2 Industrial
Sample Date:	14 Mar-95	Analyst Name:	F. Marcelino	Test Species:	PP Pimephales promelas
Comments:	Effluent			Response:	Survival

Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.35	24.80	25.50	0.28	1.10	8
10		25.16	24.80	25.50	0.26	1.00	8
18		25.24	25.00	25.50	0.26	1.00	8
32		25.23	24.80	25.50	0.30	1.20	8
56		25.19	24.80	25.50	0.28	1.10	8
100		25.19	24.80	25.50	0.28	1.10	8
N Control	pH	7.95	7.90	8.00	0.05	0.70	8
10		7.91	7.60	8.10	0.15	1.80	8
18		7.86	7.60	8.00	0.13	1.70	8
32		7.75	7.50	8.00	0.16	2.10	8
56		7.64	7.30	8.10	0.24	3.10	8
100		7.49	7.20	8.30	0.35	4.70	8
N Control	Final D.O.-mg/L	7.93	7.70	8.30	0.18	2.30	8
10		8.05	8.00	8.30	0.11	1.30	8
18		7.93	7.70	8.00	0.12	1.50	8
32		7.91	7.70	8.10	0.16	2.00	8
56		7.94	7.70	8.00	0.11	1.30	8
100		7.94	7.70	8.00	0.11	1.30	8
N Control	Hardness-mg/L	83.38	81.00	85.00	2.00	2.40	8
10							
18							
32							
56							
100		92.88	92.00	94.00	0.84	0.90	8
N Control	Conductivity-umh	120	114	128	5	4	8
10		256	226	287	18	7	8
18		301	288	319	9	3	8
32		417	406	446	13	3	8
56		629	592	696	30	5	8
100		975	950	1004	16	2	8
N Control	Alkalinity-mg/L	65.38	61.00	68.00	3.20	4.90	8
10							
18							
32							
56							
100		226.63	218.00	231.00	4.72	2.10	8

Larval Fish Survival and Growth Test

Start Date:	14 Mar-95	Test ID:	TEX0350674	Sample ID:	CA0082295
End Date:	21 Mar-95	Protocol ID:	EPAM 87	Sample Type:	EFF2 Industrial
Sample Date:	14 Mar-95	Analyst Name:	F. Marcelino	Test Species:	PP Pimephales promelas
Comments:	Effluent			Response:	Growth-Weight

Conc-%	1	2	3	4
N Control	0.360	0.390	0.350	0.410
10	0.350	0.300	0.330	0.360
18	0.320	0.390	0.230	0.230
32	0.210	0.340	0.320	0.240
56	0.270	0.220	0.210	0.260
100	0.000	0.140	0.110	0.210

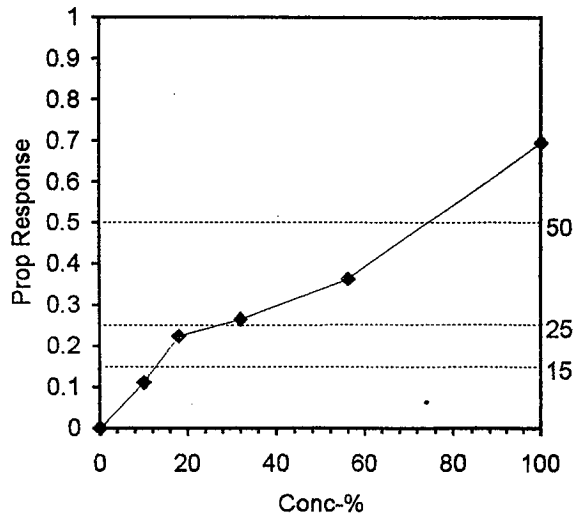
			Untransformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.378	1.000	0.378	0.350	0.410	7.29	4					
10	0.335	0.887	0.335	0.300	0.360	7.90	4	1.044	2.410	0.098		
18	0.293	0.775	0.293	0.230	0.390	26.54	4	2.089	2.410	0.098		
32	0.278	0.735	0.278	0.210	0.340	22.48	4	*2.457	2.410	0.098		
56	0.240	0.636	0.240	0.210	0.270	12.27	4	*3.379	2.410	0.098		
100	0.115	0.305	0.115	0.000	0.210	75.97	4	*6.450	2.410	0.098		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.979	0.884	-0.087	0.137
Bartlett's Test indicates equality of variance (p = 0.1945)	7.371	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	18	32	24	5.5556	0.1021	0.033	0.0033	9.9545	2.7729	5, 18

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	0.3775		
10	0.3350	0.1126	0.1126
18	0.2925	0.2252	0.2252
32	0.2775	0.2649	0.2649
56	0.2400	0.3642	0.3642
100	0.1150	0.6954	0.6954

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL (Exp)		Skew
IC1*	0.888	1.483	0.339	2.777	5.697
IC5*	4.441	2.078	1.694	12.327	1.580
IC10*	8.882	2.985	3.388	21.711	1.402
IC15	12.659	5.653	5.481	39.283	1.554
IC25	26.750	11.652	6.453	73.550	0.177
IC40	60.752	8.482	11.736	78.696	-1.822
IC50	74.040	-	-	-	-

Larval Fish Survival and Growth Test

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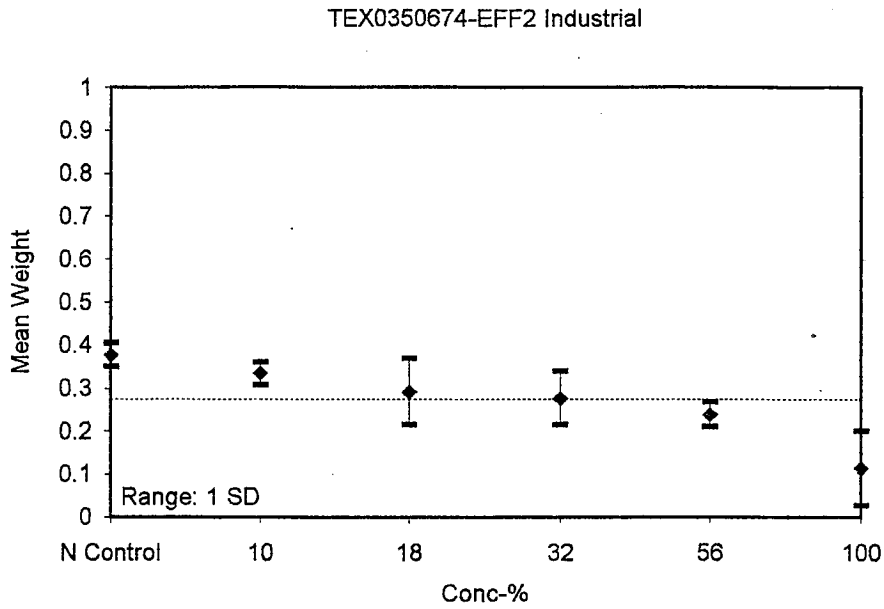
Sample Date:	14 Mar-95	Analyst Name:	F. Marcelino	Test Species:	PP Pimephales promelas
Comments:	Effluent			Response:	Growth-Weight



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Dear Mr. Wright:

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CLIENT:	TEXACO
SAMPLE I.D.:	Effluent
DATE RECEIVED:	16 March -95
ABC LAB. NO.:	TEX0350691

CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY

NOEC =	100.00 %
TUc =	1.00
IC25 =	>100.00 %
IC50 =	>100.00 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Phytoplankton Growth Test

Start Date:	16 Mar-95	Test ID:	TEX0350691	Sample ID:	CA0082295
End Date:	20 Mar-95	Protocol ID:	EPAF 89	Sample Type:	EFF2 Industrial
Sample Date:	16 Mar-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	Effluent			Response:	Cell Density

Conc-%	1	2	3
N Control	497.0	419.0	412.0
10	609.0	567.0	675.0
18	1064.0	924.0	858.0
32	828.0	874.0	962.0
56	662.0	735.0	758.0
100	497.0	622.0	567.0

			Log (1+X) Transformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	442.7	1.000	2.645	2.616	2.697	1.70	3					
10	617.0	1.394	2.790	2.754	2.830	1.36	3	-4.302	2.500	0.084		
18	948.7	2.143	2.976	2.934	3.027	1.59	3	-9.843	2.500	0.084		
32	888.0	2.006	2.948	2.919	2.984	1.12	3	-9.016	2.500	0.084		
56	718.3	1.623	2.856	2.822	2.880	1.08	3	-6.279	2.500	0.084		
100	562.0	1.270	2.749	2.697	2.794	1.78	3	-3.075	2.500	0.084		

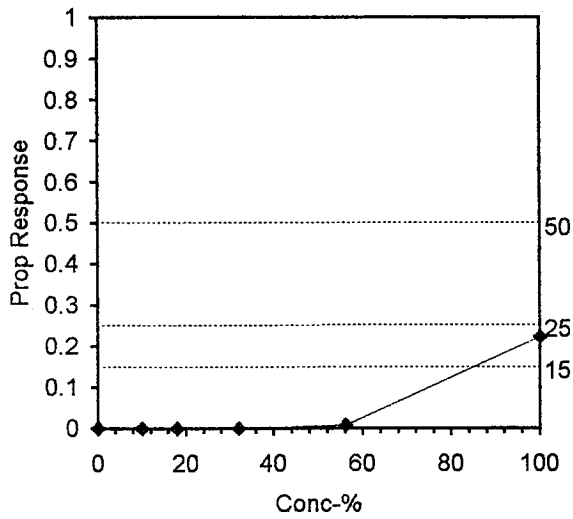
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.926	0.858	0.219	-1.371
Bartlett's Test indicates equality of variance (p = 0.9874)	0.612	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	100	>100		1	80.526	0.0469	0.0017	27.74	3.1059	5, 12

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	724.1		
10	724.1	-0.3938	0.0000
18	724.1	-1.1431	0.0000
32	724.1	-1.0060	0.0000
56	718.3	-0.6227	0.0079
100	562.0	-0.2696	0.2238

Point	Estimate	SD	95% CL (Exp)		Skew
IC1	56.420	9.567	9.857	60.573	-0.111
IC5	64.571	7.330	19.765	71.745	-1.218
IC10	74.761	6.721	32.150	85.710	-1.088
IC15	84.951	6.720	45.062	99.675	-0.758
IC25	>100	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Linear Interpolation(ICp) with 80 bootstrap resamples



Phytoplankton Growth Test

Start Date:	16 Mar-95	Test ID:	TEX0350691	Sample ID:	CA0082295
End Date:	20 Mar-95	Protocol ID:	EPAF 89	Sample Type:	EFF2 Industrial
Sample Date:	16 Mar-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	Effluent			Response:	Cell Density

	Measured	Water Quality Summary					
Conc-%	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.50	25.50	25.50			1
10		25.50	25.50	25.50			1
18		25.40	25.40	25.40			1
32		25.50	25.50	25.50			1
56		25.50	25.50	25.50			1
100		25.50	25.50	25.50			1
N Control	pH	8.00	8.00	8.00			1
10		7.90	7.90	7.90			1
18		7.90	7.90	7.90			1
32		7.80	7.80	7.80			1
56		7.60	7.60	7.60			1
100		7.40	7.40	7.40			1
N Control	Hardness-mg/L	84.00	84.00	84.00			1
10							
18							
32							
56							
100		92.00	92.00	92.00			1
N Control	Alkalinity-mg/L	66.00	66.00	66.00			1
10							
18							
32							
56							
100		218.00	218.00	218.00			1

Phytoplankton Growth Test

Start Date:	16 Mar-95	Test ID:	TEX0350691	Sample ID:	CA0082295
End Date:	20 Mar-95	Protocol ID:	EPAF 89	Sample Type:	EFF2 Industrial
Sample Date:	16 Mar-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
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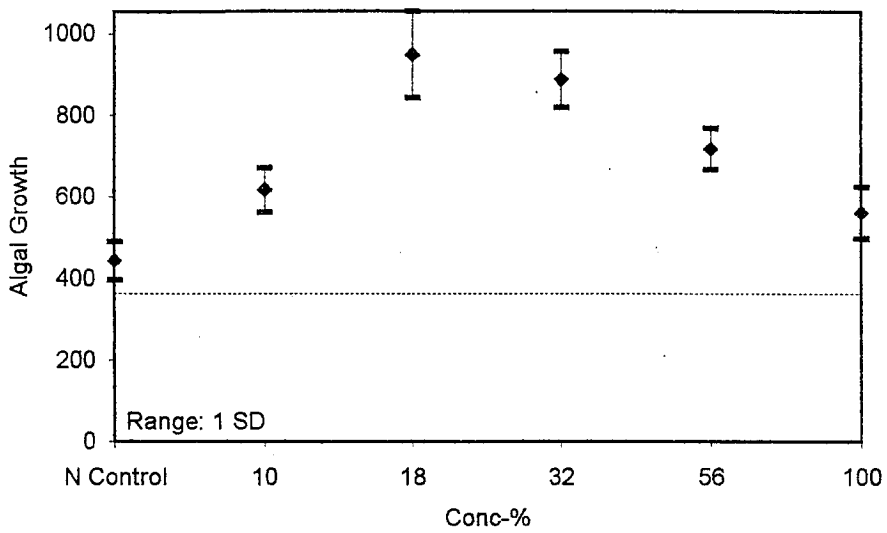
TEX0350691-EFF2 Industrial



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DATE RECEIVED:	14 March -95
ABC LAB. NO.:	TEX0350674

CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY

SURVIVAL	NOEC =	32.00 %
	TUc =	3.13
	IC25 =	38.23 %
	IC50 =	>100.00 %
REPRODUCTION	NOEC =	10.00 %
	TUc =	10
	IC25 =	13.60 %
	IC50 =	29.20 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Ceriodaphnia Survival and Reproduction Test

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End Date:	21 Mar-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	14 Mar-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	Effluent			Response:	Survival

Conc-%	Alive	Dead	Total	Fisher P
N Control	10	0	10	
10	9	1	10	0.5000
18	9	1	10	0.5000
32	8	2	10	0.2368
56	6	4	10	0.0433
100	6	4	10	0.0433

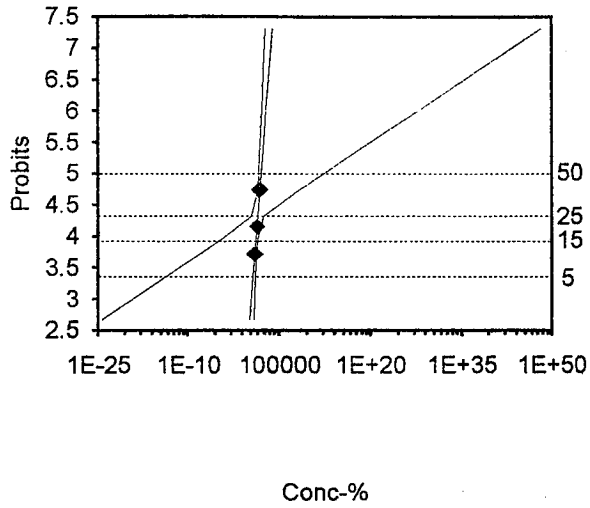
Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	32	56	42.332	3.125

Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	1.246	0.603	0.0642	2.4279
Intercept	2.3538	0.9782	0.4365	4.2711
TSCR	0	0.4433	-0.869	0.8689

Point	Probits	%	95% Fiducial Limits	
EC1	2.674	1.81	0.00	8.80
EC5	3.355	6.36	0.00	17.91
EC10	3.718	12.45	0.00	27.69
EC15	3.964	19.58	0.00	40.88
EC25	4.326	38.23	3.41	352.74
EC40	4.747	83.25	39.94	######
EC50	5.000	132.96	58.03	######
EC60	5.253	212.34	78.50	######
EC75	5.674	462.41	123.24	######
EC85	6.036	902.62	177.95	######
EC90	6.282	######	227.07	######
EC95	6.645	######	324.46	######
EC99	7.326	######	628.64	######

Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.000	0.564	11.345	2.124	0.8026	2



Ceriodaphnia Survival and Reproduction Test

Start Date:	14 Mar-95	Test ID:	TEX0350674	Sample ID:	CA0082295
End Date:	21 Mar-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	14 Mar-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	Effluent			Response:	Reproduction

Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.35	24.80	25.50	0.28	1.10	8
10		25.16	24.80	25.50	0.26	1.00	8
18		25.24	25.00	25.50	0.26	1.00	8
32		25.23	24.80	25.50	0.30	1.20	8
56		25.19	24.80	25.50	0.28	1.10	8
100		25.19	24.80	25.50	0.28	1.10	8
N Control	pH	7.95	7.90	8.00	0.05	0.70	8
10		7.91	7.60	8.10	0.15	1.80	8
18		7.86	7.60	8.00	0.13	1.70	8
32		7.75	7.50	8.00	0.16	2.10	8
56		7.64	7.30	8.10	0.24	3.10	8
100		7.49	7.20	8.30	0.35	4.70	8
N Control	Final D.O.-mg/L	7.81	7.00	8.30	0.38	4.80	8
10		8.05	8.00	8.30	0.11	1.30	8
18		7.93	7.70	8.00	0.12	1.50	8
32		7.91	7.70	8.10	0.16	2.00	8
56		7.94	7.70	8.00	0.11	1.30	8
100		7.94	7.70	8.00	0.11	1.30	8
N Control	Hardness-mg/L	83.38	81.00	85.00	2.00	2.40	8
10							
18							
32							
56							
100		92.88	92.00	94.00	0.84	0.90	8
N Control	Conductivity-umh	120	114	128	5	4	8
10		256	226	287	18	7	8
18		301	288	319	9	3	8
32		417	406	446	13	3	8
56		629	592	696	30	5	8
100		975	950	1004	16	2	8
N Control	Alkalinity-mg/L	65.38	61.00	68.00	3.20	4.90	8
10							
18							
32							
56							
100		226.63	218.00	231.00	4.72	2.10	8

Ceriodaphnia Survival and Reproduction Test

Start Date:	14 Mar-95	Test ID:	TEX0350674	Sample ID:	CA0082295
End Date:	21 Mar-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	14 Mar-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	Effluent			Response:	Reproduction

Conc-%	1	2	3	4	5	6	7	8	9	10
N Control	19.00	18.00	16.00	14.00	16.00	17.00	16.00	15.00	18.00	15.00
10	14.00	15.00	13.00	14.00	15.00	15.00	17.00	13.00	16.00	18.00
18	10.00	6.00	3.00	11.00	22.00	14.00	7.00	6.00	4.00	7.00
32	8.00	2.00	5.00	7.00	12.00	9.00	9.00	12.00	8.00	8.00
56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00

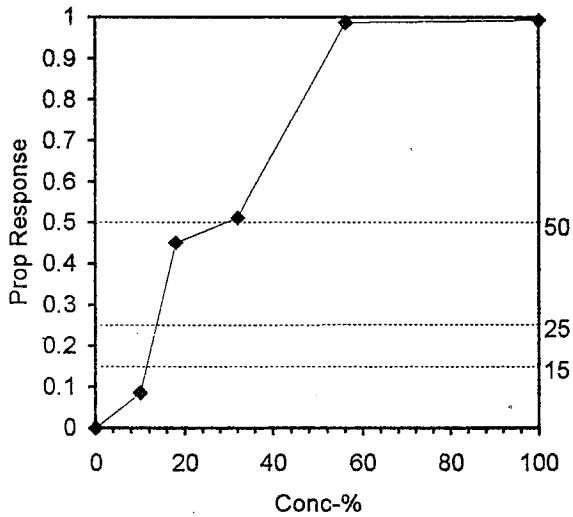
			Untransformed Data					Rank				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	16.40	1.000	16.40	14.00	19.00	9.62	10					
10	15.00	0.915	15.00	13.00	18.00	10.89	10	81.0	75.0			
18	9.00	0.549	9.00	3.00	22.00	62.64	10	*65.5	75.0			
32	8.00	0.488	8.00	2.00	12.00	37.27	10	*55.0	75.0			
56	0.20	0.012	0.20	0.00	1.00	210.82	10	*55.0	75.0			
100	0.10	0.006	0.10	0.00	1.00	316.23	10	*55.0	75.0			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
D'Agostino's D Test indicates non-normal distribution (p <= 0.010)	0.234	0.2673, 0.2873	1.7227	9.531
Bartlett's test indicates unequal variances (p = 8.07E-15)	75.297	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	10	18	13.416	10

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	16.40		
10	15.00	0.0854	0.0854
18	9.00	0.4512	0.4512
32	8.00	0.5122	0.5122
56	0.20	0.9878	0.9878
100	0.10	0.9939	0.9939

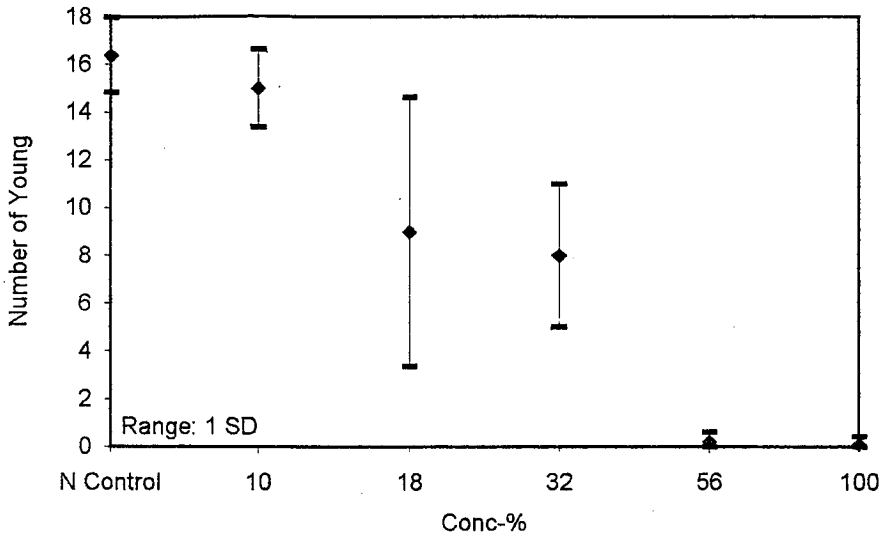
Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1*	1.171	-	-	-	-
IC5*	5.857	-	-	-	-
IC10	10.320	-	-	-	-
IC15	11.413	-	-	-	-
IC25	13.600	-	-	-	-
IC40	16.880	-	-	-	-
IC50	29.200	-	-	-	-

Ceriodaphnia Survival and Reproduction Test					
Start Date:	14 Mar-95	Test ID:	TEX0350674	Sample ID:	CA0082295
End Date:	21 Mar-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	14 Mar-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	Effluent			Response:	Reproduction

TEX0350674-EFF2 Industrial



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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC CERIODAPHNIA SURVIVAL AND REPRODUCTION BIOASSAY

DATE:	14 March -95
STANDARD TOXICANT:	Sodium Chloride
ENDPOINT:	SURVIVAL
NOEC =	0.56 g/l
IC25 =	0.45 g/l
IC50 =	0.79 g/l
ENDPOINT:	REPRODUCTION
NOEC =	<0.56 g/l
IC25 =	0.23 g/l
IC50 =	0.46 g/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Ceriodaphnia Survival and Reproduction Test

Start Date:	14 Mar-95	Test ID:	CER-50	Sample ID:	CA0000000
End Date:	21 Mar-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	14 Mar-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	Alive	Dead	Total	Fisher P
N Control	8	2	10	
0.56	5	5	10	0.1749
1	3	7	10	0.0349
1.8	2	8	10	0.0115
3.2	0	10	10	0.0004

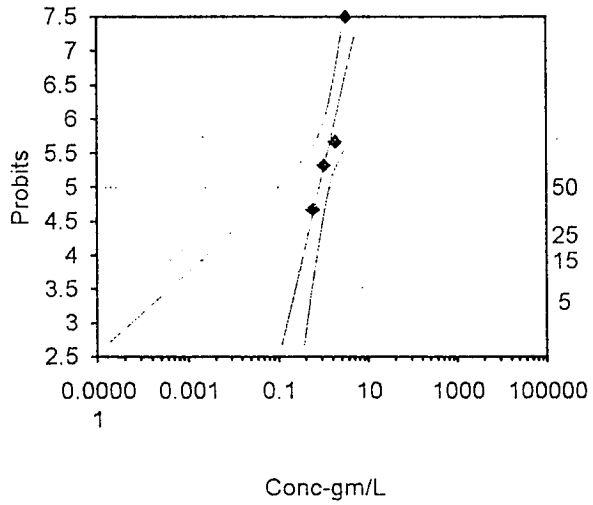
Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	0.56	1	0.7483	

Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	2.7632	1.1057	0.596	4.9304
Intercept	5.2798	0.3307	4.6317	5.928
TSCR	0.2048	0.1263	-0.043	0.4523

Point	Probits	gm/L	95% Fiducial Limits	
EC1	2.674	0.11	0.00	0.36
EC5	3.355	0.20	0.00	0.50
EC10	3.718	0.27	0.00	0.60
EC15	3.964	0.33	0.00	0.69
EC25	4.326	0.45	0.01	0.84
EC40	4.747	0.64	0.04	1.09
EC50	5.000	0.79	0.10	1.33
EC60	5.253	0.98	0.23	1.72
EC75	5.674	1.39	0.67	3.66
EC85	6.036	1.88	1.10	10.63
EC90	6.282	2.30	1.37	24.74
EC95	6.645	3.12	1.76	92.85
EC99	7.326	5.50	2.59	#######

Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.200	0.762	9.210	-0.101	0.3619	3



Ceriodaphnia Survival and Reproduction Test

Start Date:	14 Mar-95	Test ID:	CER-50	Sample ID:	CA0000000
End Date:	21 Mar-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	14 Mar-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.35	24.80	25.50	0.28	1.10	8
0.56		24.90	24.80	25.00	0.11	0.40	8
1		24.90	24.80	25.00	0.11	0.40	8
1.8		24.99	24.80	25.50	0.23	0.90	8
3.2		24.94	24.80	25.00	0.09	0.40	8
N Control	pH	7.95	7.90	8.00	0.05	0.70	8
0.56		7.90	7.90	7.90	0.00	0.00	8
1		7.90	7.90	7.90	0.00	0.00	8
1.8		7.85	7.80	7.90	0.05	0.70	8
3.2		7.76	7.70	7.90	0.07	1.00	8
N Control	Final D.O.-mg/L	7.93	7.70	8.30	0.18	2.30	8
0.56		7.99	7.90	8.20	0.10	1.20	8
1		7.94	7.80	8.00	0.09	1.20	8
1.8		7.93	7.80	8.10	0.09	1.10	8
3.2		7.90	7.80	8.10	0.11	1.40	8
N Control	Hardness-mg/L	83.38	81.00	85.00	2.00	2.40	8
0.56							
1							
1.8							
3.2							
N Control	Conductivity-umh	120.25	114.00	128.00	4.71	3.90	8
0.56							
1							
1.8							
3.2							
N Control	Alkalinity-mg/L	65.38	61.00	68.00	3.20	4.90	8
0.56							
1							
1.8							
3.2							

Ceriodaphnia Survival and Reproduction Test

Start Date:	14 Mar-95	Test ID:	CER-50	Sample ID:	CA0000000
End Date:	21 Mar-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	14 Mar-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Reproduction

Conc-gm/L	1	2	3	4	5	6	7	8	9	10
N Control	6.00	17.00	15.00	17.00	8.00	15.00	16.00	16.00	14.00	10.00
0.56	3.00	4.00	4.00	6.00	13.00	8.00	0.00	7.00	1.00	6.00
1	0.00	2.00	2.00	2.00	2.00	0.00	0.00	0.00	2.00	0.00
1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

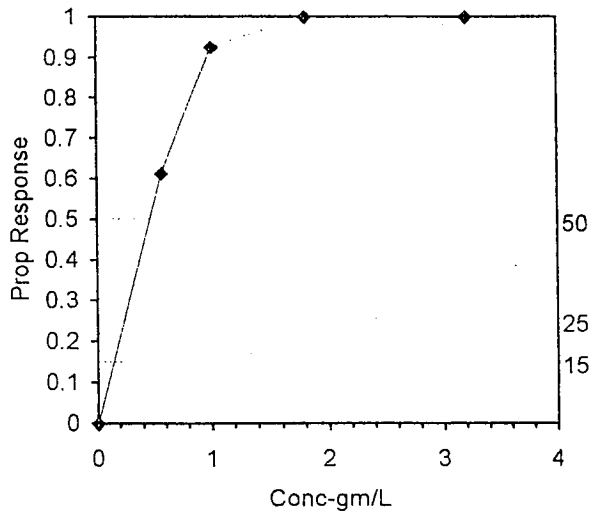
			Untransformed Data					Rank				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	13.40	1.000	13.40	6.00	17.00	29.48	10					
0.56	5.20	0.388	5.20	0.00	13.00	71.84	10	*61.5	79.0			
1	1.00	0.075	1.00	0.00	2.00	105.41	10	*55.0	79.0			
1.8	0.00	0.000										
3.2	0.00	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.010)	0.662	0.900	-1.932	3.0444
Bartlett's test indicates unequal variances (p = 0.0017)	12.738	9.210		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	<0.56	0.56		

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	13.40		
0.56	5.20	0.6119	0.6119
1	1.00	0.9254	0.9254
1.8	0.00	1.0000	1.0000
3.2	0.00	1.0000	1.0000

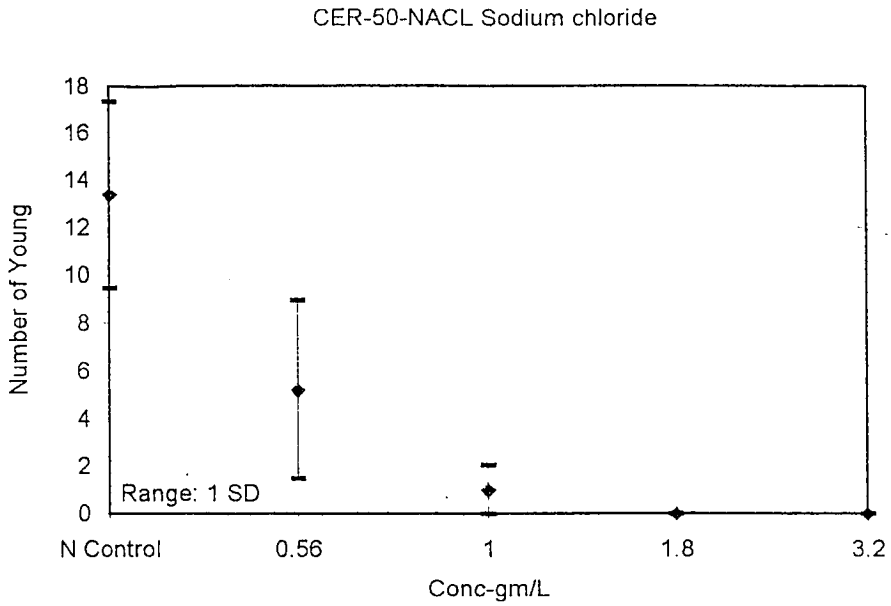
Linear Interpolation(ICp) with
80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1*	0.0092	0.0050	0.0079	0.0213	4.597
IC5*	0.0458	0.0251	0.0397	0.1067	4.597
IC10*	0.0915	0.0502	0.0794	0.2134	4.597
IC15*	0.1373	0.0678	0.1190	0.3201	3.911
IC25*	0.2288	0.0892	0.1984	0.5323	2.590
IC40*	0.3660	0.0973	0.3174	0.6519	1.974
IC50*	0.4576	0.0946	0.3968	0.7187	1.716

Ceriodaphnia Survival and Reproduction Test

Start Date:	14 Mar-95	Test ID:	CER-50	Sample ID:	CA0000000
End Date:	21 Mar-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	14 Mar-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Reproduction



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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC FATHEAD MINNOW SURVIVAL AND GROWTH BIOASSAY

DATE: 14 March -95

STANDARD TOXICANT: Sodium Chloride

ENDPOINT: SURVIVAL

NOEC = <0.56 g/l

IC25 = 0.05 g/l
IC50 = 0.34 g/l

ENDPOINT: GROWTH

NOEC = <0.56 g/l

IC25 = 0.42 g/l
IC50 = 6.06 g/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Larval Fish Survival and Growth Test

Start Date:	14 Mar-95	Test ID:	FHD-31	Sample ID:	CA0000000
End Date:	21 Mar-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	14 Mar-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	1	2	3	4
N Control	1.000	1.000	1.000	1.000
0.56	0.400	0.500	0.300	0.500
1	0.100	0.200	0.700	0.200
1.8	0.100	0.200	0.500	0.300
3.2	0.200	0.200	0.500	0.300
5.6	0.300	0.500	0.100	0.300
10	0.000	0.000	0.000	0.000

			Arcsin Squareroot Transformed Data					Rank				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	1.000	1.000	1.412	1.412	1.412	0.00	4				0	40
0.56	0.425	0.425	0.709	0.580	0.785	13.87	4	*10.0	10.0		23	40
1	0.300	0.300	0.560	0.322	0.991	52.69	4	*10.0	10.0		28	40
1.8	0.275	0.275	0.538	0.322	0.785	36.46	4	*10.0	10.0		29	40
3.2	0.300	0.300	0.573	0.464	0.785	26.48	4	*10.0	10.0		28	40
5.6	0.300	0.300	0.567	0.322	0.785	33.51	4	*10.0	10.0		28	40
10	0.000	0.000									40	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.933	0.884	0.8363	1.1806
Equality of variances cannnot be confirmed				

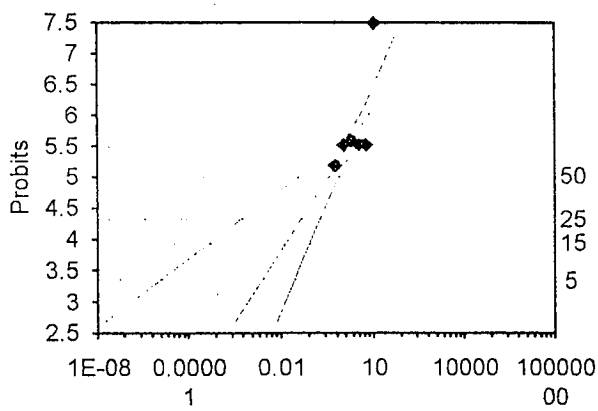
Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	<0.56	0.56		

Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	0.7751	0.2103	0.363	1.1873
Intercept	5.3661	0.1105	5.1494	5.5827
TSCR	0	4.3295	-8.486	8.4858

Point	Probits	gm/L	95% Fiducial Limits	
EC1	2.674	0.00	0.00	0.01
EC5	3.355	0.00	0.00	0.03
EC10	3.718	0.01	0.00	0.06
EC15	3.964	0.02	0.00	0.09
EC25	4.326	0.05	0.00	0.18
EC40	4.747	0.16	0.01	0.43
EC50	5.000	0.34	0.04	0.72
EC60	5.253	0.72	0.17	1.27
EC75	5.674	2.50	1.44	5.01
EC85	6.036	7.33	3.95	36.73
EC90	6.282	15.17	6.75	163.85
EC95	6.645	44.64	14.21	######
EC99	7.326	338.01	54.95	######

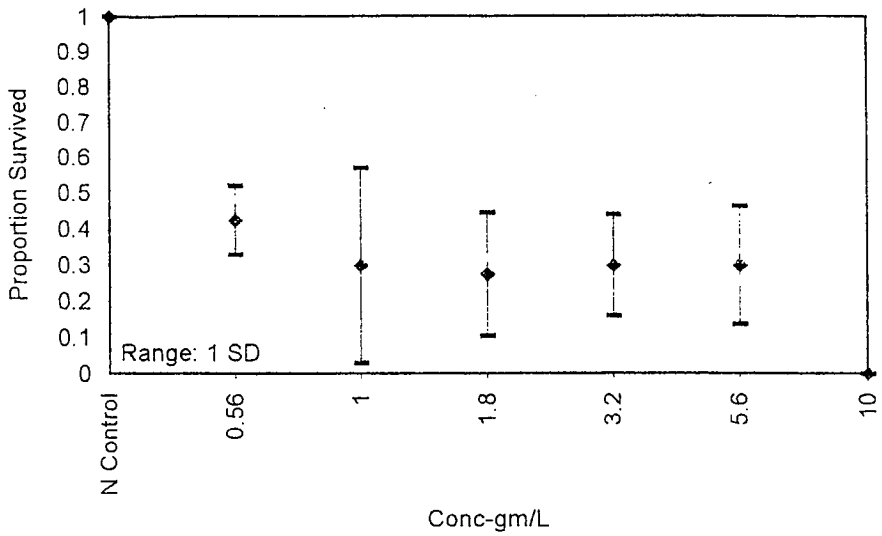
Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.000	11.530	13.277	-0.472	1.2901	3



Larval Fish Survival and Growth Test

Start Date:	14 Mar-95	Test ID:	FHD-31	Sample ID:	CA0000000
End Date:	21 Mar-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	14 Mar-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

FHD-31-NACL Sodium chloride



Larval Fish Survival and Growth Test

Start Date:	14 Mar-95	Test ID:	FHD-31	Sample ID:	CA0000000
End Date:	21 Mar-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	14 Mar-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.35	24.80	25.50	0.28	1.10	8
0.56		24.90	24.80	25.00	0.11	0.40	8
1		24.93	24.80	25.00	0.10	0.40	8
1.8		24.99	24.80	25.50	0.23	0.90	8
3.2		24.94	24.80	25.00	0.09	0.40	8
5.6		24.90	24.80	25.00	0.11	0.40	8
10		25.00	25.00	25.00			1
N Control	pH	7.95	7.90	8.00	0.05	0.70	8
0.56		7.90	7.90	7.90	0.00	0.00	8
1		7.90	7.90	7.90	0.00	0.00	8
1.8		7.85	7.80	7.90	0.05	0.70	8
3.2		7.76	7.70	7.90	0.07	1.00	8
5.6		7.66	7.60	7.80	0.07	1.00	8
10		7.70	7.70	7.70			1
N Control	Final D.O.-mg/L	7.93	7.70	8.30	0.18	2.30	8
0.56		7.99	7.90	8.20	0.10	1.20	8
1		7.94	7.80	8.00	0.09	1.20	8
1.8		7.93	7.80	8.10	0.09	1.10	8
3.2		7.89	7.80	8.10	0.10	1.30	8
5.6		7.86	7.70	8.00	0.09	1.20	8
10		7.80	7.80	7.80			1
N Control	Hardness-mg/L	83.38	81.00	85.00	2.00	2.40	8
0.56							
1							
1.8							
3.2							
5.6							
10							
N Control	Conductivity-umh	120.25	114.00	128.00	4.71	3.90	8
0.56							
1							
1.8							
3.2							
5.6							
10							
N Control	Alkalinity-mg/L	65.38	61.00	68.00	3.20	4.90	8
0.56							
1							
1.8							
3.2							
5.6							
10							

Larval Fish Survival and Growth Test

Start Date:	14 Mar-95	Test ID:	FHD-31	Sample ID:	CA0000000
End Date:	21 Mar-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	14 Mar-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Growth-Weight

Conc-gm/L	1	2	3	4
N Control	0.360	0.390	0.350	0.410
0.56	0.240	0.280	0.220	0.270
1	0.190	0.110	0.250	0.150
1.8	0.370	0.100	0.130	0.220
3.2	0.240	0.190	0.210	0.280
5.6	0.190	0.250	0.300	0.190
10	0.000	0.000	0.000	0.000

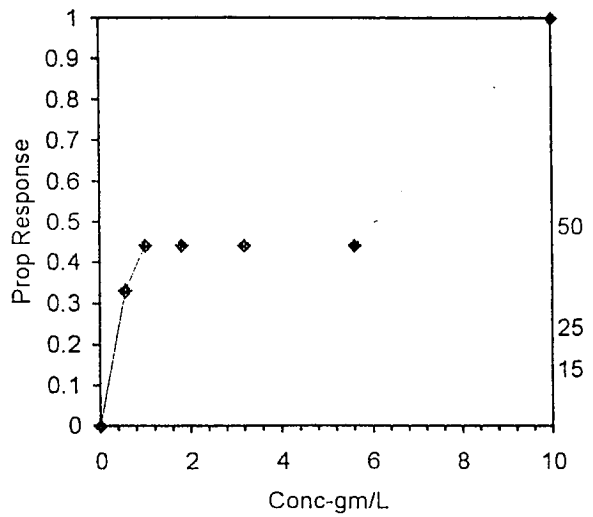
			Untransformed Data					t				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.378	1.000	0.378	0.350	0.410	7.29	4					
0.56	0.253	0.669	0.253	0.220	0.280	10.91	4	*2.514	2.290	0.114		
1	0.175	0.464	0.175	0.110	0.250	34.13	4	*4.072	2.290	0.114		
1.8	0.205	0.543	0.205	0.100	0.370	59.14	4	*3.469	2.290	0.114		
3.2	0.230	0.609										
5.6	0.233	0.616										
10	0.000	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.931	0.844	0.934	2.3244
Bartlett's Test indicates equality of variance (p = 0.0488)	7.871	11.345		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	<0.56	0.56			0.1179	0.0319	0.0049	6.4398	3.4903	3, 12

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	0.3775		
0.56	0.2525	0.3311	0.3311
1	0.2106	0.5364	0.4421
1.8	0.2106	0.4570	0.4421
3.2	0.2106	0.3907	0.4421
5.6	0.2106	0.3841	0.4421
10	0.0000	1.0000	1.0000

Linear Interpolation(ICp) with
80 bootstrap resamples

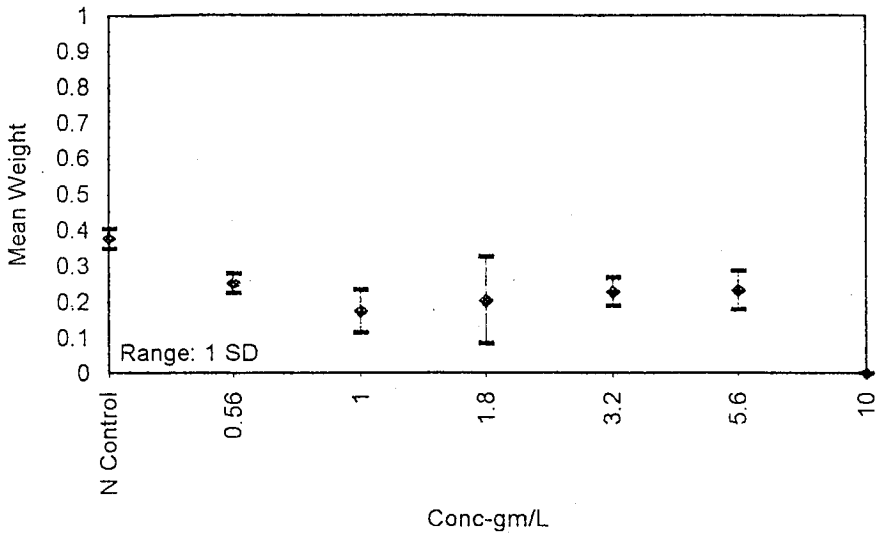


Point	Estimate	SD	95% CL (Exp)		Skew
IC1*	0.0169	0.0019	0.0116	0.0229	0.094
IC5*	0.0846	0.0096	0.0581	0.1147	0.094
IC10*	0.1691	0.0191	0.1162	0.2294	0.094
IC15*	0.2537	0.0287	0.1744	0.3440	0.094
IC25*	0.4228	0.0478	0.2906	0.5734	0.094
IC40	0.8332	1.4133	0.3709	8.9597	2.675
IC50	6.0570	1.2429	0.0000	6.9155	-3.424

Larval Fish Survival and Growth Test

Start Date:	14 Mar-95	Test ID:	FHD-31	Sample ID:	CA0000000
End Date:	21 Mar-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	14 Mar-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Growth-Weight

FHD-31-NACL Sodium chloride



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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC SELENASTRUM GROWTH BIOASSAY

DATE: 16 March -95

STANDARD TOXICANT: Zinc Chloride

NOEC =	180.00	ug/l
IC25 =	263.61	ug/l
IC50 =	369.67	ug/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Phytoplankton Growth Test

Start Date:	16 Mar-95	Test ID:	SEL-20	Sample ID:	CA0000000
End Date:	20 Mar-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	16 Mar-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

Conc-µg/L	1	2	3
N Control	497.0	419.0	412.0
180	564.0	578.0	602.0
320	299.0	314.0	280.0
560	95.0	104.0	90.0
1000	80.0	66.0	66.0

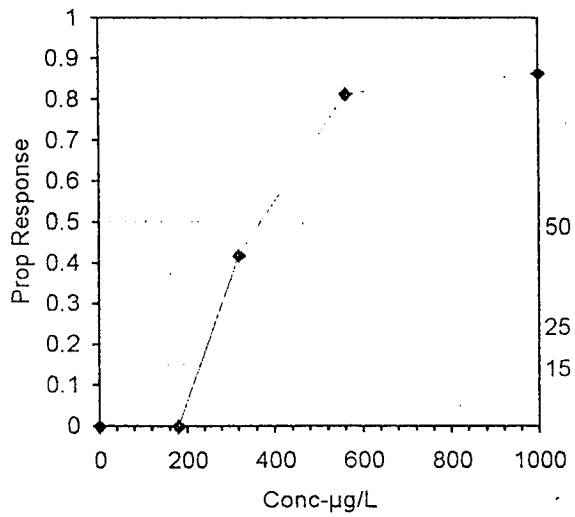
			Log (1+X) Transformed Data					t				
Conc-µg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	442.7	1.000	2.645	2.616	2.697	1.70	3					
180	581.3	1.313	2.765	2.752	2.780	0.52	3	-4.193	2.470	0.070		
320	297.7	0.672	2.475	2.449	2.498	1.01	3	*5.990	2.470	0.070		
560	96.3	0.218	1.988	1.959	2.021	1.58	3	*23.080	2.470	0.070		
1000	70.7	0.160	1.854	1.826	1.908	2.57	3	*27.779	2.470	0.070		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.872	0.835	0.7642	-0.693
Bartlett's Test indicates equality of variance (p = 0.6291)	2.587	13.277		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	180	320	240		69.128	0.4896	0.0012	401.65	3.478	4, 10

		Prop Response	
Conc-µg/L	Iso	N-Mean	N-Iso
N Control	512.0		
180	512.0	-0.3133	0.0000
320	297.7	0.3276	0.4186
560	96.3	0.7824	0.8118
1000	70.7	0.8404	0.8620

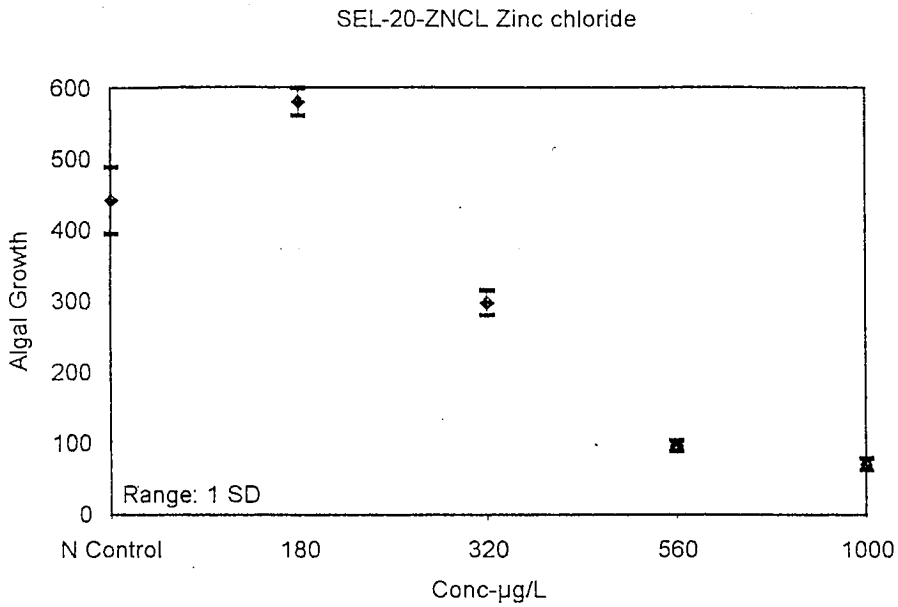
Linear Interpolation(ICp) with
80 bootstrap resamples



Point	Estimate	SD	95% CL (Exp)		Skew
IC1	183.34	0.17	182.77	184.10	0.009
IC5	196.72	0.85	193.85	200.51	0.009
IC10	213.44	1.70	207.70	221.02	0.009
IC15	230.16	2.55	221.54	241.53	0.009
IC25	263.61	4.25	249.24	282.55	0.009
IC40	313.77	7.51	290.78	352.93	0.388
IC50	369.67	10.83	325.60	409.22	-0.399

Phytoplankton Growth Test

Start Date:	16 Mar-95	Test ID:	SEL-20	Sample ID:	CA0000000
End Date:	20 Mar-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	16 Mar-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density



Phytoplankton Growth Test

Start Date:	16 Mar-95	Test ID:	SEL-20	Sample ID:	CA0000000
End Date:	20 Mar-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	16 Mar-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

	Measured	Water Quality Summary					
Conc-µg/L	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.50	25.50	25.50			1
180		25.30	25.30	25.30			1
320		25.30	25.30	25.30			1
560		25.20	25.20	25.20			1
1000		25.30	25.30	25.30			1
N Control	pH	8.10	8.10	8.10			1
180		8.10	8.10	8.10			1
320		8.10	8.10	8.10			1
560		8.10	8.10	8.10			1
1000		8.10	8.10	8.10			1
N Control	Hardness-mg/L	88.00	88.00	88.00			1
180							
320							
560							
1000							
N Control	Alkalinity-mg/L	72.00	72.00	72.00			1
180							
320							
560							
1000							

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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CC: WKM
T-J Sun
ECJ
J. Hall

May 25, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Discharge
DATE RECEIVED:	16 May -95
ABC LAB. NO.:	TEX0551303

CHRONIC FATHEAD LARVAE SURVIVAL & GROWTH BIOASSAY

SURVIVAL	NOEC	=	32.00 %
	TUc	=	3.13
	IC25	=	50.80 %
	IC50	=	64.54 %
GROWTH	NOEC	=	100.00 %
	TUc	=	1.00
	IC25	=	100.00 %
	IC50	=	>100.00 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	TEX0551303	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Survival

Conc-%	1	2	3	4
N Control	0.700	0.700	1.000	1.000
10	1.000	0.900	0.700	0.800
18	0.700	0.900	1.000	0.900
32	0.900	0.900	0.900	0.800
56	0.600	0.700	0.500	0.400
100	0.100	0.100	0.200	0.000

			Arcsin Squareroot Transformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.850	1.000	1.202	0.991	1.412	20.22	4				6	40
10	0.850	1.000	1.190	0.991	1.412	15.28	4	0.102	2.410	0.279	6	40
18	0.875	1.029	1.225	0.991	1.412	14.20	4	-0.205	2.410	0.279	5	40
32	0.875	1.029	1.214	1.107	1.249	5.85	4	-0.104	2.410	0.279	5	40
56	0.550	0.647	0.837	0.685	0.991	15.74	4	*3.156	2.410	0.279	18	40
100	0.100	0.118	0.316	0.159	0.464	39.37	4	*7.659	2.410	0.279	36	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.934	0.884	-0.082	-1.051
Bartlett's Test indicates equality of variance (p = 0.5471)	4.016	15.086		

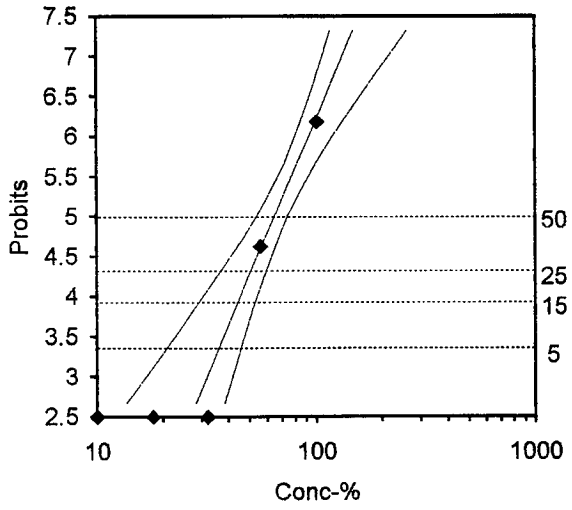
Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	32	56	42.332	3.125	0.2448	0.5335	0.0267	19.97	2.7729	5, 18

Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	6.4851	1.4215	3.6991	9.2712
Intercept	-6.7372	2.6315	-11.89	-1.579
TSCR	0.1344	0.029	0.0776	0.1912

Point	Probits	%	95% Fiducial Limits	
EC1	2.674	28.26	13.68	38.24
EC5	3.355	35.99	20.75	45.62
EC10	3.718	40.95	25.87	50.22
EC15	3.964	44.67	29.96	53.67
EC25	4.326	50.80	37.09	59.42
EC40	4.747	58.99	47.06	67.59
EC50	5.000	64.54	53.75	73.79
EC60	5.253	70.62	60.64	81.54
EC75	5.674	82.01	71.77	99.42
EC85	6.036	93.26	80.87	120.92
EC90	6.282	101.74	87.01	139.13
EC95	6.645	115.74	96.38	172.36
EC99	7.326	147.43	115.58	260.16

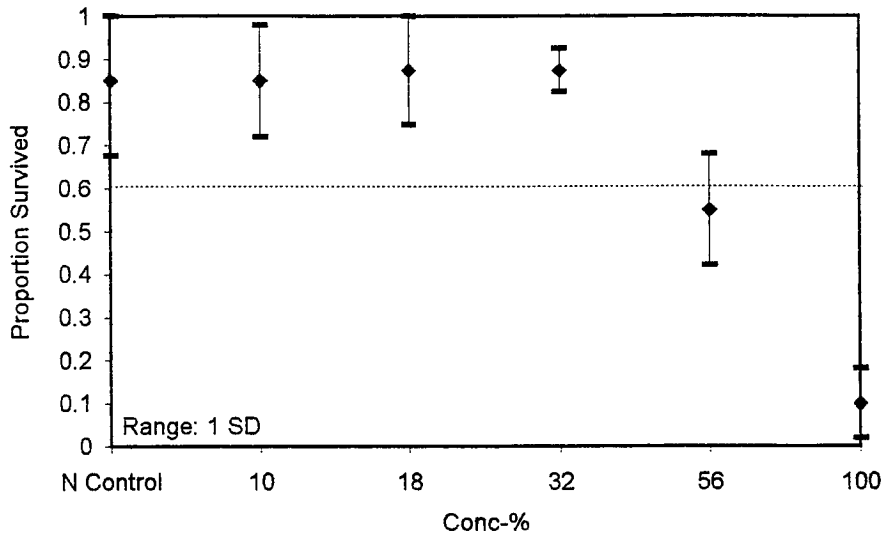
Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.150	0.458	11.345	1.810	0.1542	4



Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	TEX0551303	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Survival

TEX0551303-EFF1 POTW



Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	TEX0551303	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Growth-Weight

Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.41	25.00	25.50	0.18	0.70	8
10		25.00	24.80	25.50	0.23	0.90	8
18		25.03	24.80	25.50	0.22	0.90	8
32		24.98	24.80	25.50	0.24	1.00	8
56		24.99	24.80	25.50	0.23	0.90	8
100		24.96	24.80	25.50	0.24	1.00	8
N Control	pH	7.93	7.90	8.00	0.05	0.60	8
10		7.93	7.80	8.10	0.10	1.30	8
18		7.90	7.70	8.30	0.19	2.30	8
32		7.83	7.60	8.30	0.22	2.80	8
56		7.76	7.50	8.50	0.32	4.10	8
100		7.69	7.40	8.70	0.42	5.50	8
N Control	Final D.O.-mg/L	7.85	7.80	7.90	0.05	0.70	8
10		7.75	7.60	7.90	0.11	1.40	8
18		7.63	7.50	7.80	0.09	1.20	8
32		7.65	7.30	8.00	0.20	2.60	8
56		7.64	7.50	7.90	0.12	1.60	8
100		7.60	7.40	7.80	0.15	2.00	8
N Control	Hardness-mg/L	86.25	82.00	89.00	2.38	2.80	8
10							
18							
32							
56							
100		96.38	90.00	105.00	5.85	6.10	8
N Control	Alkalinity-mg/L	70.75	66.00	75.00	2.96	4.20	8
10							
18							
32							
56							
100		244.00	234.00	250.00	8.28	3.40	8

Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	TEX0551303	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Growth-Weight

Conc-%	1	2	3	4
N Control	0.260	0.220	0.280	0.270
10	0.310	0.310	0.290	0.240
18	0.260	0.310	0.270	0.260
32	0.270	0.260	0.290	0.260
56	0.320	0.280	0.310	0.330
100	0.260	0.330	0.250	0.000

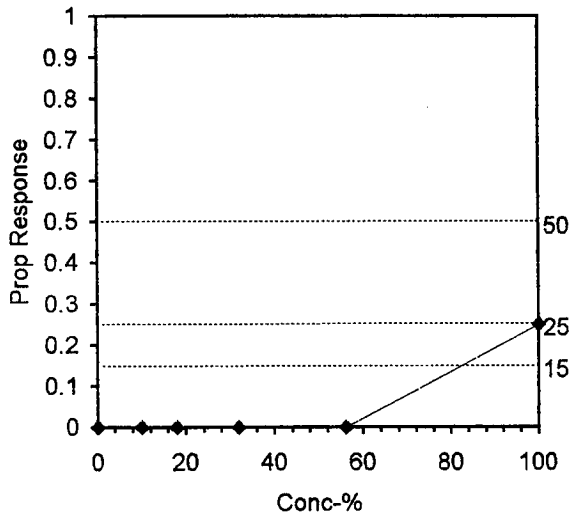
			Untransformed Data					Rank				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	0.258	1.000	0.258	0.220	0.280	10.21	4					
10	0.288	1.117	0.288	0.240	0.310	11.49	4	23.0	10.0			
18	0.275	1.068	0.275	0.260	0.310	8.66	4	19.5	10.0			
32	0.270	1.049	0.270	0.260	0.290	5.24	4	19.5	10.0			
56	0.310	1.204	0.310	0.280	0.330	6.97	4	25.5	10.0			
100	0.210	0.816	0.210	0.000	0.330	68.79	4	16.5	10.0			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.010)	0.771	0.884	-2.031	9.2002
Bartlett's test indicates unequal variances (p = 0.0004)	22.496	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	0.2800		
10	0.2800	-0.1165	0.0000
18	0.2800	-0.0680	0.0000
32	0.2800	-0.0485	0.0000
56	0.2800	-0.2039	0.0000
100	0.2100	0.1845	0.2500

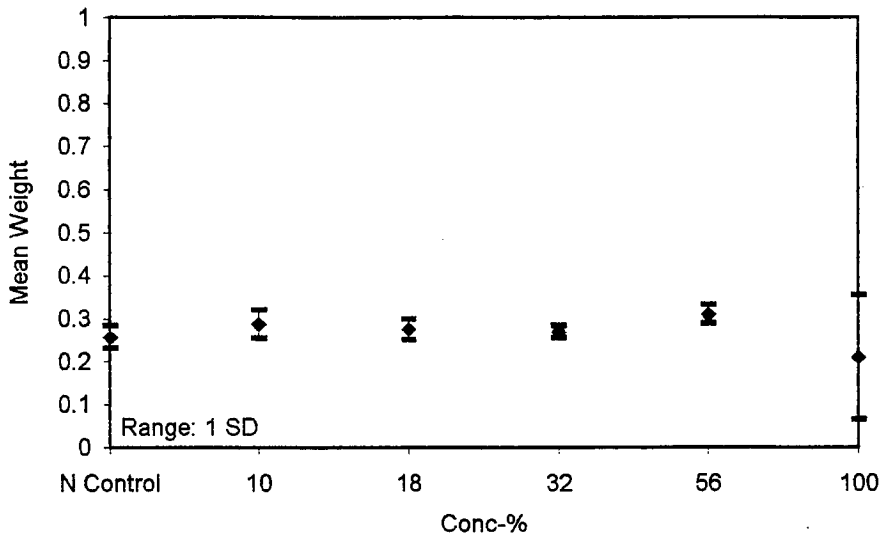
Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL (Exp)		Skew
IC1	57.76	-	-	-	-
IC5	64.80	-	-	-	-
IC10	73.60	-	-	-	-
IC15	82.40	-	-	-	-
IC25	100.00	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Larval Fish Survival and Growth Test					
Start Date:	16 May-95	Test ID:	TEX0551303	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Growth-Weight

TEX0551303-EFF1 POTW



AQUATIC
BIOASSAY &
CONSULTING
LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

May 25, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Discharge
DATE RECEIVED:	16 May -95
ABC LAB. NO.:	TEX0551303

CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY

SURVIVAL	NOEC =	100.00 %
	TUc =	1.00
	IC25 =	87.63 %
	IC50 =	>100.00 %
REPRODUCTION	NOEC =	18.00 %
	TUc =	5.56
	IC25 =	19.54 %
	IC50 =	25.70 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Ceriodaphnia Survival and Reproduction Test

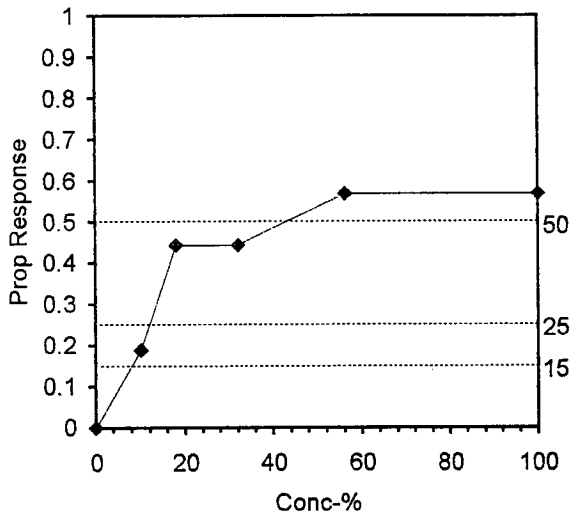
Start Date:	16 May-95	Test ID:	TEX0511303	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	EFF1 POTW
Sample Date:	15 May-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Survival

Conc-%	Alive	Dead	Total	Fisher P
N Control	9	1	10	
10	8	2	10	0.5000
18	10	0	10	0.5000
32	9	1	10	0.7632
56	10	0	10	0.5000
100	6	4	10	0.1517

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	0.9200		
10	0.9200	0.1111	0.0000
18	0.9200	-0.1111	0.0000
32	0.9200	0.0000	0.0000
56	0.9200	-0.1111	0.0000
100	0.6000	0.3333	0.3478

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1	57.265	-	-	-	-
IC5	62.325	-	-	-	-
IC10	68.650	-	-	-	-
IC15	74.975	-	-	-	-
IC25	87.625	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Ceriodaphnia Survival and Reproduction Test

Start Date:	16 May-95	Test ID:	TEX0511303	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	EFF1 POTW
Sample Date:	15 May-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Survival

	Measured	Water Quality Summary					
Conc-%	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.41	25.00	25.50	0.18	0.70	8
10		25.00	24.80	25.50	0.23	0.90	8
18		25.03	24.80	25.50	0.22	0.90	8
32		24.98	24.80	25.50	0.24	1.00	8
56		24.99	24.80	25.50	0.23	0.90	8
100		24.96	24.80	25.50	0.24	1.00	8
N Control	pH	7.93	7.90	8.00	0.05	0.60	8
10		7.93	7.80	8.10	0.10	1.30	8
18		7.90	7.70	8.30	0.19	2.30	8
32		7.83	7.60	8.30	0.22	2.80	8
56		7.76	7.50	8.50	0.32	4.10	8
100		7.69	7.40	8.70	0.42	5.50	8
N Control	Final D.O.-mg/L	7.85	7.80	7.90	0.05	0.70	8
10		7.75	7.60	7.90	0.11	1.40	8
18		7.63	7.50	7.80	0.09	1.20	8
32		7.65	7.30	8.00	0.20	2.60	8
56		7.64	7.50	7.90	0.12	1.60	8
100		7.60	7.40	7.80	0.15	2.00	8
N Control	Hardness-mg/L	86.25	82.00	89.00	2.38	2.80	8
10							
18							
32							
56							
100		96.38	90.00	105.00	5.85	6.10	8
N Control	Conductivity-umh	137.13	128.00	145.00	6.11	4.50	8
10		226.00	215.00	266.00	16.51	7.30	8
18		290.00	279.00	335.00	18.53	6.40	8
32		392.50	367.00	453.00	26.07	6.60	8
56		574.88	542.00	658.00	36.73	6.40	8
100		941.13	888.00	######	36.73	3.90	8
N Control	Alkalinity-mg/L	70.75	66.00	75.00	2.96	4.20	8
10							
18							
32							
56							
100		244.00	234.00	250.00	8.28	3.40	8

Ceriodaphnia Survival and Reproduction Test

Start Date:	16 May-95	Test ID:	TEX0511303	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	EFF1 POTW
Sample Date:	15 May-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Reproduction

Conc-%	1	2	3	4	5	6	7	8	9	10
N Control	18.00	22.00	16.00	20.00	23.00	20.00	19.00	8.00	15.00	15.00
10	19.00	17.00	17.00	19.00	18.00	20.00	3.00	16.00	17.00	5.00
18	5.00	23.00	20.00	17.00	19.00	17.00	7.00	5.00	24.00	6.00
32	3.00	7.00	0.00	5.00	2.00	4.00	5.00	9.00	4.00	4.00
56	6.00	0.00	2.00	2.00	0.00	2.00	1.00	0.00	2.00	1.00
100	0.00	0.00	0.00	1.00	0.00	0.00	2.00	0.00	2.00	1.00

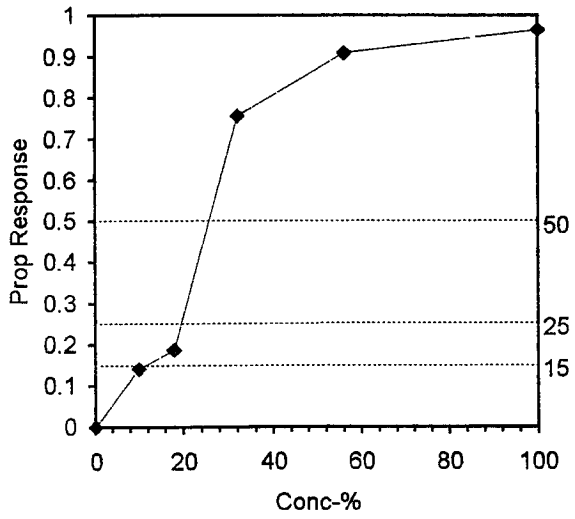
			Untransformed Data					Rank				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	17.60	1.000	17.60	8.00	23.00	24.72	10					
10	15.10	0.858	15.10	3.00	20.00	39.67	10	93.0	75.0			
18	14.30	0.813	14.30	5.00	24.00	53.87	10	95.0	75.0			
32	4.30	0.244	4.30	0.00	9.00	58.06	10	*56.0	75.0			
56	1.60	0.091	1.60	0.00	6.00	111.02	10	*55.0	75.0			
100	0.60	0.034	0.60	0.00	2.00	140.55	10	*55.0	75.0			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
D'Agostino's D Test indicates non-normal distribution (p <= 0.010)	0.264	0.2673, 0.2873	-0.793	1.1749
Bartlett's test indicates unequal variances (p = 4.40E-08)	42.627	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	18	32	24	5.5556

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	17.60		
10	15.10	0.1420	0.1420
18	14.30	0.1875	0.1875
32	4.30	0.7557	0.7557
56	1.60	0.9091	0.9091
100	0.60	0.9659	0.9659

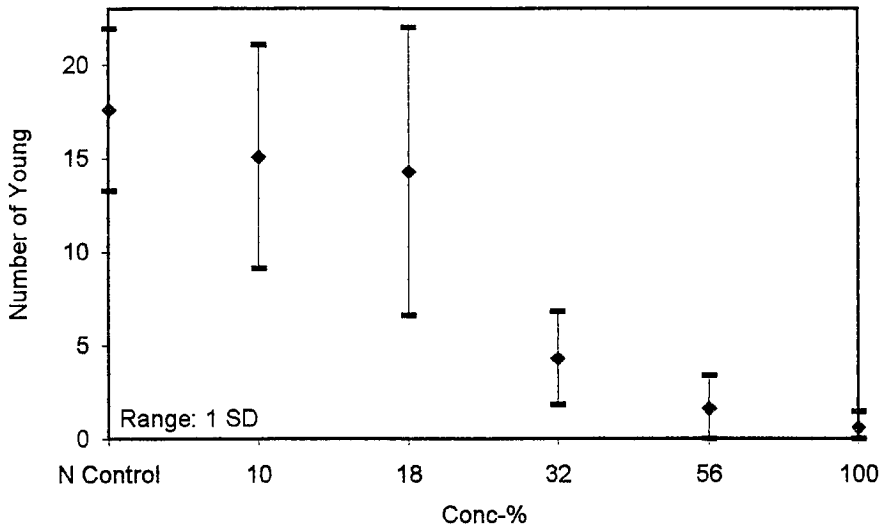
Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1*	0.704	5.920	0.280	18.323	2.334
IC5*	3.520	-	-	-	-
IC10*	7.040	-	-	-	-
IC15	11.400	-	-	-	-
IC25	19.540	-	-	-	-
IC40	23.236	-	-	-	-
IC50	25.700	-	-	-	-

Ceriodaphnia Survival and Reproduction Test					
Start Date:	16 May-95	Test ID:	TEX0511303	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	EFF1 POTW
Sample Date:	15 May-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Reproduction

TEX0511303-EFF1 POTW



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May 25, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Discharge
DATE RECEIVED:	18 May -95
ABC LAB. NO.:	TEX0551356

CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY

NOEC =	100.00 %
TUc =	1.00
IC25 =	>100.00 %
IC50 =	>100.00 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Phytoplankton Growth Test

Start Date:	19 May-95	Test ID:	TEX0551356	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	18 May-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Discharge			Response:	Cell Density

Conc-%	1	2	3
N Control	640.0	655.0	555.0
10	551.0	563.0	485.0
18	708.0	658.0	640.0
32	757.0	627.0	522.0
56	718.0	700.0	784.0
100	647.0	756.0	512.0

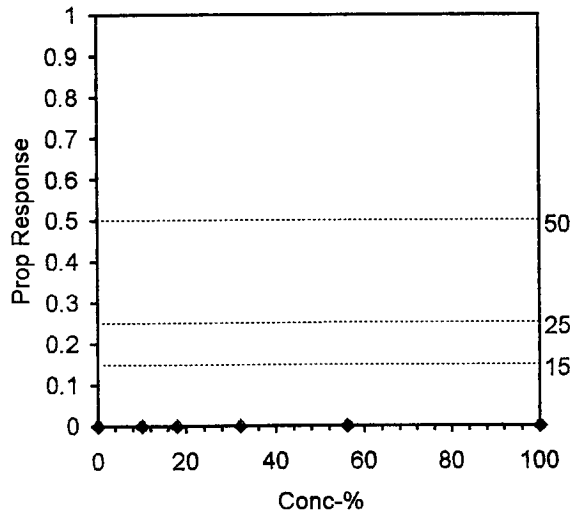
			Log (1+X) Transformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	616.7	1.000	2.790	2.745	2.817	1.39	3					
10	533.0	0.864	2.727	2.687	2.751	1.28	3	1.423	2.500	0.111		
18	668.7	1.084	2.825	2.807	2.851	0.80	3	-0.810	2.500	0.111		
32	635.3	1.030	2.799	2.719	2.880	2.88	3	-0.206	2.500	0.111		
56	734.0	1.190	2.866	2.846	2.895	0.90	3	-1.720	2.500	0.111		
100	638.3	1.035	2.800	2.710	2.879	3.04	3	-0.241	2.500	0.111		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.956	0.858	-0.217	0.2412
Bartlett's Test indicates equality of variance (p = 0.3962)	5.164	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	100	>100		1	143.53	0.0063	0.0029	2.1352	3.1059	5, 12

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	637.7		
10	637.7	0.1357	0.0000
18	637.7	-0.0843	0.0000
32	637.7	-0.0303	0.0000
56	637.7	-0.1903	0.0000
100	637.7	-0.0351	0.0000

Linear Interpolation(ICp) with 80 bootstrap resamples

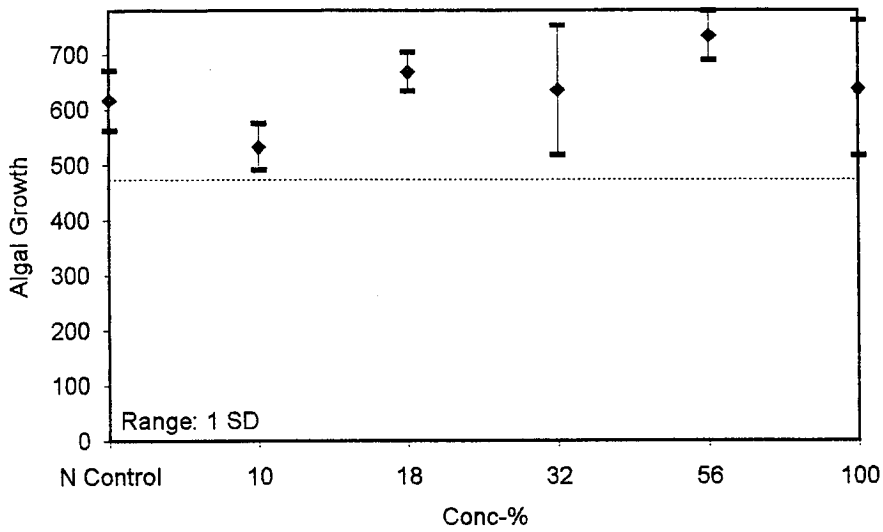


Point	Estimate	SD	95% CL (Exp)		Skew
IC1	>100	-	-	-	-
IC5	>100	-	-	-	-
IC10	>100	-	-	-	-
IC15	>100	-	-	-	-
IC25	>100	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Phytoplankton Growth Test

Start Date:	19 May-95	Test ID:	TEX0551356	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	18 May-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Discharge			Response:	Cell Density

TEX0551356-EFF1 POTW



Phytoplankton Growth Test

Start Date:	19 May-95	Test ID:	TEX0551356	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	18 May-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Discharge			Response:	Cell Density

	Measured	Water Quality Summary					
Conc-%	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.00	25.00	25.00			1
10		25.00	25.00	25.00			1
18		25.00	25.00	25.00			1
32		24.80	24.80	24.80			1
56		24.80	24.80	24.80			1
100		24.80	24.80	24.80			1
N Control	pH	8.00	8.00	8.00			1
10		7.90	7.90	7.90			1
18		7.80	7.80	7.80			1
32		7.70	7.70	7.70			1
56		7.60	7.60	7.60			1
100		7.50	7.50	7.50			1
N Control	Hardness-mg/L	82.00	82.00	82.00			1
10							
18							
32							
56							
100		90.00	90.00	90.00			1
N Control	Alkalinity-mg/L	66.00	66.00	66.00			1
10							
18							
32							
56							
100		234.00	234.00	234.00			1

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May 25, 1995

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P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Poso Creek
DATE RECEIVED:	16 May -95
ABC LAB. NO.:	TEX0551302

CHRONIC FATHEAD LARVAE SURVIVAL & GROWTH BIOASSAY

SURVIVAL	NOEC	=	100.00 %
	TUc	=	1.00
	IC25	=	>100.00 %
	IC50	=	>100.00 %
GROWTH	NOEC	=	100.00 %
	TUc	=	1.00
	IC25	=	>100.00 %
	IC50	=	>100.00 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	TEX0551302	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Poso Creek			Response:	Survival

Conc-%	1	2	3	4
N Control	0.700	0.700	1.000	1.000
10	1.000	0.900	0.600	0.900
18	0.900	0.900	0.900	1.000
32	0.900	1.000	0.800	0.900
56	0.800	0.600	1.000	1.000
100	0.900	1.000	1.000	0.800

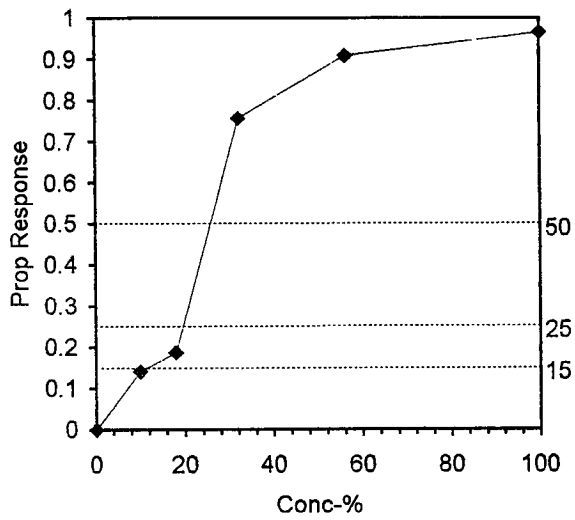
			Arcsin Squareroot Transformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.850	1.000	1.202	0.991	1.412	20.22	4					
10	0.850	1.000	1.199	0.886	1.412	18.54	4	0.019	2.410	0.325		
18	0.925	1.088	1.290	1.249	1.412	6.32	4	-0.655	2.410	0.325		
32	0.900	1.059	1.254	1.107	1.412	9.93	4	-0.391	2.410	0.325		
56	0.850	1.000	1.204	0.886	1.412	21.28	4	-0.020	2.410	0.325		
100	0.925	1.088	1.295	1.107	1.412	11.35	4	-0.694	2.410	0.325		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.928	0.884	-0.368	-0.882
Bartlett's Test indicates equality of variance (p = 0.4843)	4.467	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	100	>100		1	0.2919	0.0081	0.0363	0.2233	2.7729	5, 18

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	0.8833		
10	0.8833	0.0000	0.0000
18	0.8833	-0.0882	0.0000
32	0.8833	-0.0588	0.0000
56	0.8833	0.0000	0.0000
100	0.8833	-0.0882	0.0000

Linear Interpolation(ICp) with 80 bootstrap resamples

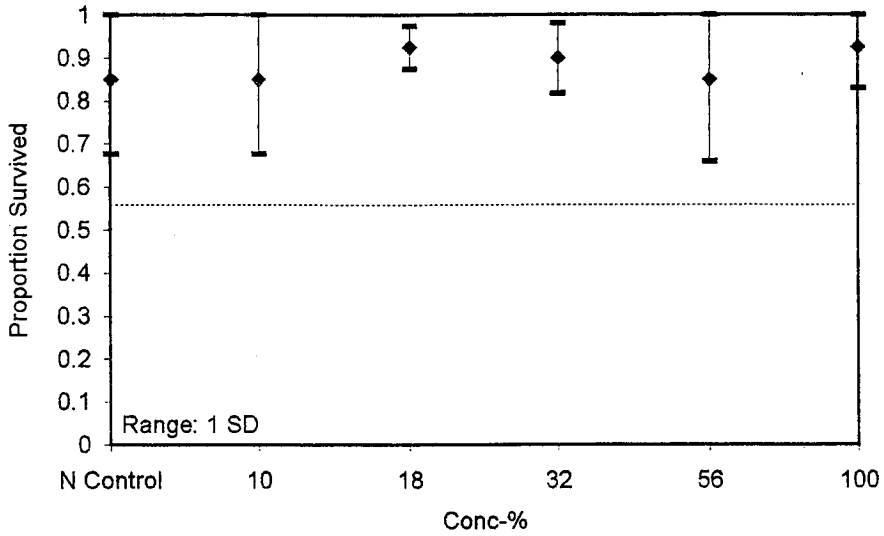


Point	Estimate	SD	95% CL (Exp)		Skew
IC1	>100	-	-	-	-
IC5	>100	-	-	-	-
IC10	>100	-	-	-	-
IC15	>100	-	-	-	-
IC25	>100	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	TEX0551302	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Poso Creek			Response:	Survival

TEX0551302-EFF1 POTW



Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	TEX0551302	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Poso Creek			Response:	Survival

Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.41	25.00	25.50	0.18	0.70	8
10		24.99	24.80	25.10	0.08	0.30	8
18		25.03	24.80	25.50	0.22	0.90	8
32		24.98	24.80	25.50	0.24	1.00	8
56		24.99	24.80	25.50	0.25	1.00	8
100		25.08	24.80	25.50	0.30	1.20	8
N Control	pH	7.93	7.90	8.00	0.05	0.60	8
10		7.99	7.90	8.00	0.04	0.40	8
18		8.00	7.90	8.10	0.05	0.70	8
32		7.99	7.90	8.00	0.04	0.40	8
56		7.99	7.90	8.00	0.04	0.40	8
100		8.00	7.90	8.10	0.05	0.70	8
N Control	Final D.O.-mg/L	7.85	7.80	7.90	0.05	0.70	8
10		7.68	7.50	7.90	0.14	1.80	8
18		7.61	7.50	7.90	0.14	1.80	8
32		7.65	7.40	7.90	0.14	1.80	8
56		7.64	7.40	8.00	0.18	2.30	8
100		7.64	7.50	8.00	0.17	2.20	8
N Control	Hardness-mg/L	86.25	82.00	89.00	2.38	2.80	8
10							
18							
32							
56							
100		86.25	67.00	98.00	13.95	16.20	8
N Control	Alkalinity-mg/L	70.75	66.00	75.00	2.96	4.20	8
10							
18							
32							
56							
100		88.75	80.00	94.00	5.95	6.70	8

Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	TEX0551302	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Poso Creek			Response:	Growth-Weight

Conc-%	1	2	3	4
N Control	0.260	0.220	0.280	0.270
10	0.400	0.260	0.270	0.250
18	0.260	0.260	0.270	0.270
32	0.270	0.300	0.250	0.290
56	0.270	0.260	0.290	0.290
100	0.330	0.330	0.300	0.280

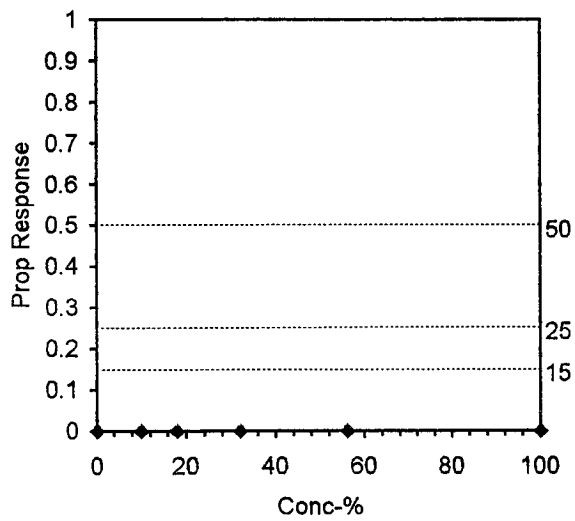
			Untransformed Data					Rank				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	0.258	1.000	0.258	0.220	0.280	10.21	4					
10	0.295	1.146	0.295	0.250	0.400	23.89	4	19.0	10.0			
18	0.265	1.029	0.265	0.260	0.270	2.18	4	18.0	10.0			
32	0.278	1.078	0.278	0.250	0.300	7.99	4	21.5	10.0			
56	0.278	1.078	0.278	0.260	0.290	5.41	4	22.0	10.0			
100	0.310	1.204	0.310	0.280	0.330	7.90	4	25.5	10.0			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.010)	0.859	0.884	1.625	5.4807
Bartlett's test indicates unequal variances (p = 0.0087)	15.434	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	100	>100		1

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	0.2804		
10	0.2804	-0.1456	0.0000
18	0.2804	-0.0291	0.0000
32	0.2804	-0.0777	0.0000
56	0.2804	-0.0777	0.0000
100	0.2804	-0.2039	0.0000

Linear Interpolation(ICp) with 80 bootstrap resamples

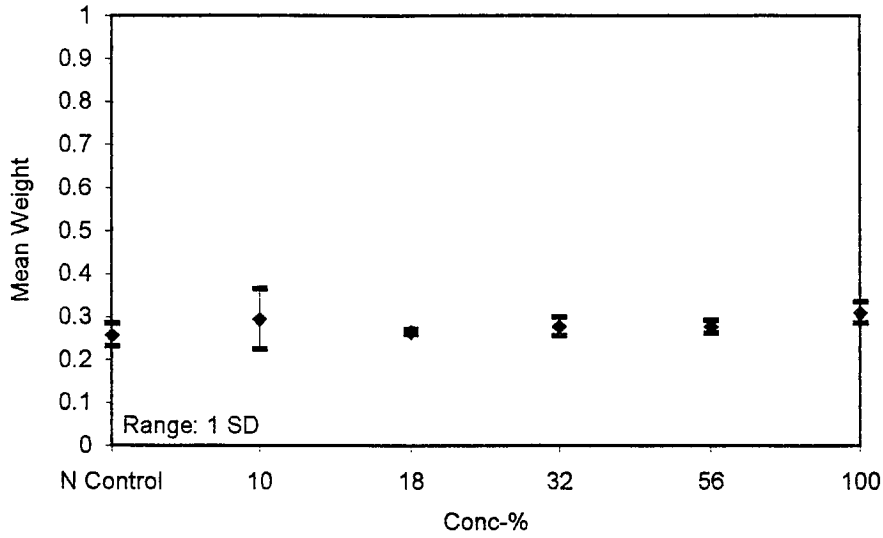


Point	Estimate	SD	95% CL (Exp)		Skew
IC1	>100	-	-	-	-
IC5	>100	-	-	-	-
IC10	>100	-	-	-	-
IC15	>100	-	-	-	-
IC25	>100	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	TEX0551302	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Poso Creek			Response:	Growth-Weight

TEX0551302-EFF1 POTW



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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

May 25, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Poso Creek
DATE RECEIVED:	18 May -95
ABC LAB. NO.:	TEX0551355

CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY

NOEC =	100.00 %
TUc =	1.00
IC25 =	>100.00 %
IC50 =	>100.00 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Phytoplankton Growth Test

Start Date:	19 May-95	Test ID:	TEX0551355	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	18 May-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Poso Creek			Response:	Cell Density

Conc-%	1	2	3
N Control	640.0	655.0	555.0
10	491.0	484.0	357.0
18	580.0	537.0	500.0
32	643.0	617.0	562.0
56	719.0	705.0	663.0
100	778.0	777.0	712.0

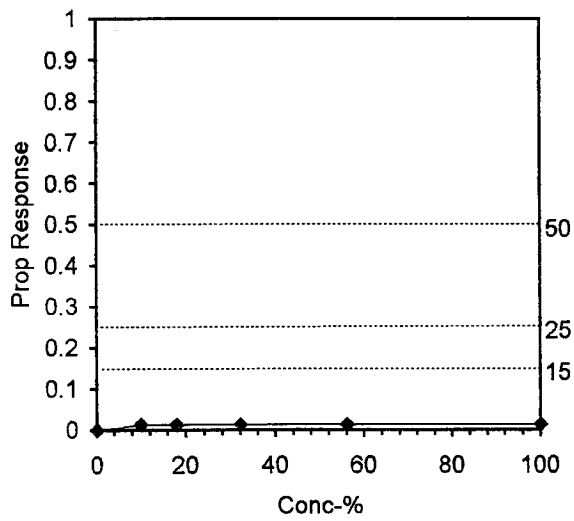
			Log (1+X) Transformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	616.7	1.000	2.790	2.745	2.817	1.39	3					
10	444.0	0.720	2.644	2.554	2.692	2.95	3	*4.299	2.500	0.085		
18	539.0	0.874	2.732	2.700	2.764	1.18	3	1.711	2.500	0.085		
32	607.3	0.985	2.783	2.751	2.809	1.07	3	0.181	2.500	0.085		
56	695.7	1.128	2.843	2.822	2.857	0.65	3	-1.568	2.500	0.085		
100	755.7	1.225	2.879	2.853	2.892	0.77	3	-2.623	2.500	0.085		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.928	0.858	-0.999	1.0829
Bartlett's Test indicates equality of variance (p = 0.4257)	4.920	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	100	>100		1	113.26	0.0208	0.0017	12.043	3.1059	5, 12

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	616.7		
10	608.3	0.2800	0.0135
18	608.3	0.1259	0.0135
32	608.3	0.0151	0.0135
56	608.3	-0.1281	0.0135
100	608.3	-0.2254	0.0135

Linear Interpolation(ICp) with 80 bootstrap resamples

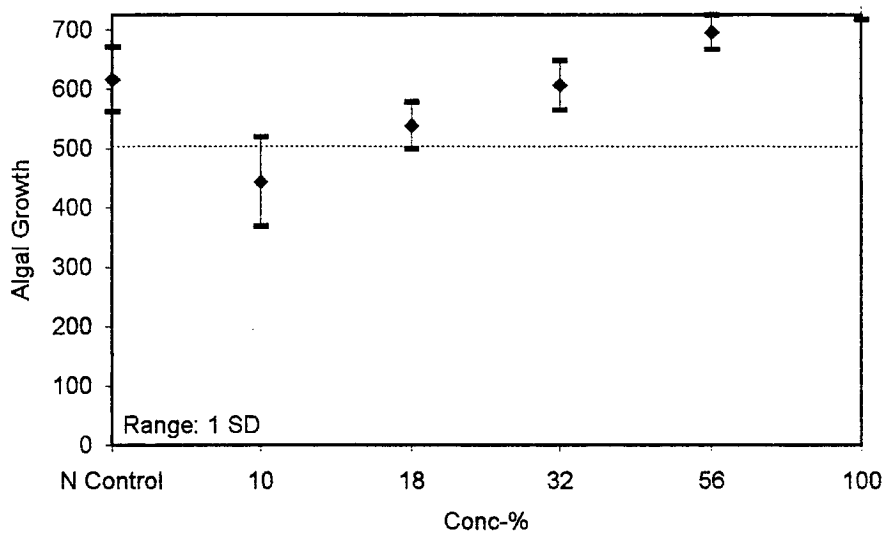


Point	Estimate	SD	95% CL (Exp)		Skew
IC1*	7.4000	-	-	-	-
IC5	>100	-	-	-	-
IC10	>100	-	-	-	-
IC15	>100	-	-	-	-
IC25	>100	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Phytoplankton Growth Test

Start Date:	19 May-95	Test ID:	TEX0551355	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	18 May-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Poso Creek			Response:	Cell Density

TEX0551355-EFF1 POTW



Phytoplankton Growth Test

Start Date:	19 May-95	Test ID:	TEX0551355	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	18 May-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Poso Creek			Response:	Cell Density

	Measured	Water Quality Summary					
Conc-%	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.00	25.00	25.00			1
10		24.80	24.80	24.80			1
18		24.80	24.80	24.80			1
32		24.80	24.80	24.80			1
56		24.80	24.80	24.80			1
100		24.80	24.80	24.80			1
N Control	pH	8.00	8.00	8.00			1
10		8.00	8.00	8.00			1
18		8.00	8.00	8.00			1
32		8.00	8.00	8.00			1
56		8.00	8.00	8.00			1
100		8.00	8.00	8.00			1
N Control	Hardness-mg/L	82.00	82.00	82.00			1
10							
18							
32							
56							
100		98.00	98.00	98.00			1
N Control	Alkalinity-mg/L	66.00	66.00	66.00			1
10							
18							
32							
56							
100		92.00	92.00	92.00			1

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May 25, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Poso Creek
DATE RECEIVED:	16 May -95
ABC LAB. NO.:	TEX0551302

CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY

SURVIVAL	NOEC =	100.00 %
	TUc =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %
REPRODUCTION	NOEC =	10.00 %
	TUc =	10
	IC25 =	11.93 %
	IC50 =	42.91 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Ceriodaphnia Survival and Reproduction Test

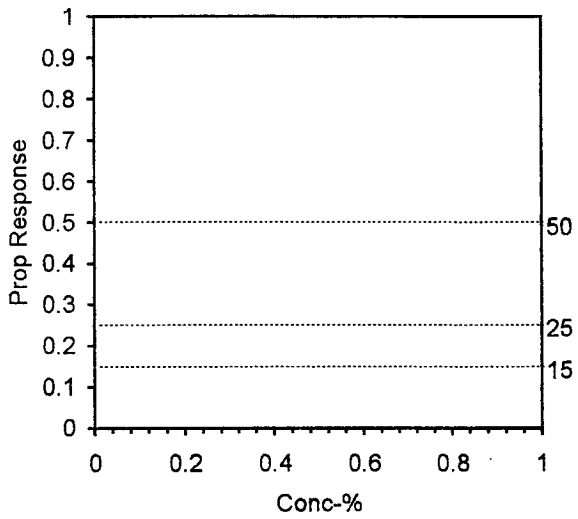
Start Date:	16 May-95	Test ID:	TEX0511302	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	EFF1 POTW
Sample Date:	15 May-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Poso Creek			Response:	Survival

Conc-%	Alive	Dead	Total	Fisher P
N Control	9	1	10	
10	8	2	10	0.5000
18	7	3	10	0.2910
32	8	2	10	0.5000
56	7	3	10	0.2910
100	10	0	10	0.5000

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	0.9000		
10	0.8000	0.1111	0.1111
18	0.8000	0.2222	0.1111
32	0.8000	0.1111	0.1111
56	0.8000	0.2222	0.1111
100	0.8000	-0.1111	0.1111

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1*	0.9000	-	-	-	-
IC5*	4.5000	-	-	-	-
IC10*	9.0000	-	-	-	-
IC15	>100	-	-	-	-
IC25	>100	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Ceriodaphnia Survival and Reproduction Test

Start Date:	16 May-95	Test ID:	TEX0511302	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	EFF1 POTW
Sample Date:	15 May-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Poso Creek			Response:	Survival

	Measured	Water Quality Summary					
Conc-%	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.41	25.00	25.50	0.18	0.70	8
10		24.99	24.80	25.10	0.08	0.30	8
18		25.03	24.80	25.50	0.22	0.90	8
32		24.98	24.80	25.50	0.24	1.00	8
56		24.93	24.80	25.20	0.15	0.60	8
100		25.08	24.80	25.50	0.30	1.20	8
N Control	pH	7.93	7.90	8.00	0.05	0.60	8
10		7.99	7.90	8.00	0.04	0.40	8
18		8.00	7.90	8.10	0.05	0.70	8
32		7.99	7.90	8.00	0.04	0.40	8
56		7.99	7.90	8.00	0.04	0.40	8
100		8.00	7.90	8.10	0.05	0.70	8
N Control	Final D.O.-mg/L	7.85	7.80	7.90	0.05	0.70	8
10		7.68	7.50	7.90	0.14	1.80	8
18		7.61	7.50	7.90	0.14	1.80	8
32		7.65	7.40	7.90	0.14	1.80	8
56		7.64	7.40	8.00	0.18	2.30	8
100		7.64	7.50	8.00	0.17	2.20	8
N Control	Hardness-mg/L	86.25	82.00	89.00	2.38	2.80	8
10							
18							
32							
56							
100		88.75	67.00	98.00	14.05	15.80	8
N Control	Conductivity-umh	136.75	128.00	145.00	5.78	4.20	8
10		143.38	140.00	149.00	3.85	2.70	8
18		150.75	130.00	157.00	8.58	5.70	8
32		154.25	141.00	160.00	5.99	3.90	8
56		159.38	147.00	168.00	7.71	4.80	8
100		185.50	161.00	208.00	14.27	7.70	8
N Control	Alkalinity-mg/L	70.75	66.00	75.00	2.96	4.20	8
10							
18							
32							
56							
100		88.75	80.00	94.00	5.95	6.70	8

Ceriodaphnia Survival and Reproduction Test

Start Date:	16 May-95	Test ID:	TEX0511302	Sample ID:	CA0082295	
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	EFF1 POTW	
Sample Date:	15 May-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia	
Comments:	C. Poso Creek			Response:	Reproduction	

Conc-%	1	2	3	4	5	6	7	8	9	10
N Control	17.00	19.00	15.00	21.00	17.00	18.00	11.00	21.00	21.00	15.00
10	1.00	16.00	5.00	16.00	14.00	15.00	22.00	20.00	18.00	15.00
18	6.00	18.00	6.00	5.00	0.00	19.00	13.00	13.00	4.00	2.00
32	5.00	16.00	8.00	6.00	5.00	17.00	11.00	29.00	9.00	3.00
56	5.00	5.00	5.00	2.00	3.00	11.00	7.00	8.00	10.00	3.00
100	3.00	15.00	9.00	4.00	3.00	13.00	7.00	10.00	21.00	7.00

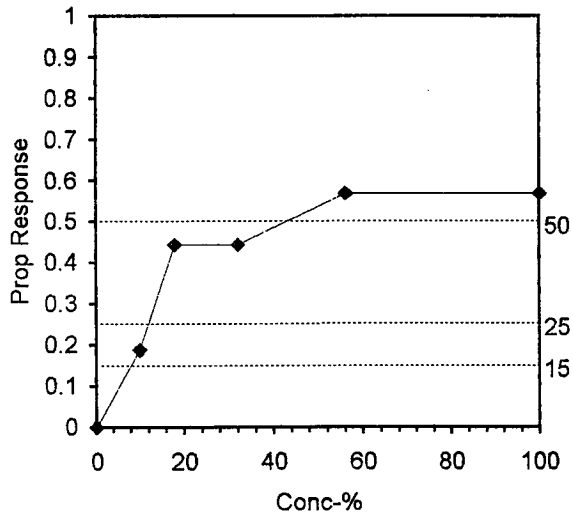
			Untransformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	17.50	1.000	17.50	11.00	21.00	18.52	10					
10	14.20	0.811	14.20	1.00	22.00	45.49	10	1.273	2.287	5.927		
18	8.60	0.491	8.60	0.00	19.00	77.56	10	*3.434	2.287	5.927		
32	10.90	0.623	10.90	3.00	29.00	72.30	10	*2.546	2.287	5.927		
56	5.90	0.337	5.90	2.00	11.00	51.44	10	*4.475	2.287	5.927		
100	9.20	0.526	9.20	3.00	21.00	62.92	10	*3.202	2.287	5.927		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
D'Agostino's D Test indicates normal distribution (p > 0.010)	0.276	0.2673, 0.2873	0.5247	1.1177
Bartlett's Test indicates equality of variance (p = 0.0404)	11.617	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	10	18	13.416	10	6.1689	174.99	33.591	5.2095	2.3861	5, 54

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	17.50		
10	14.20	0.1886	0.1886
18	9.75	0.5086	0.4429
32	9.75	0.3771	0.4429
56	7.55	0.6629	0.5686
100	7.55	0.4743	0.5686

Linear Interpolation(ICp) with 80 bootstrap resamples

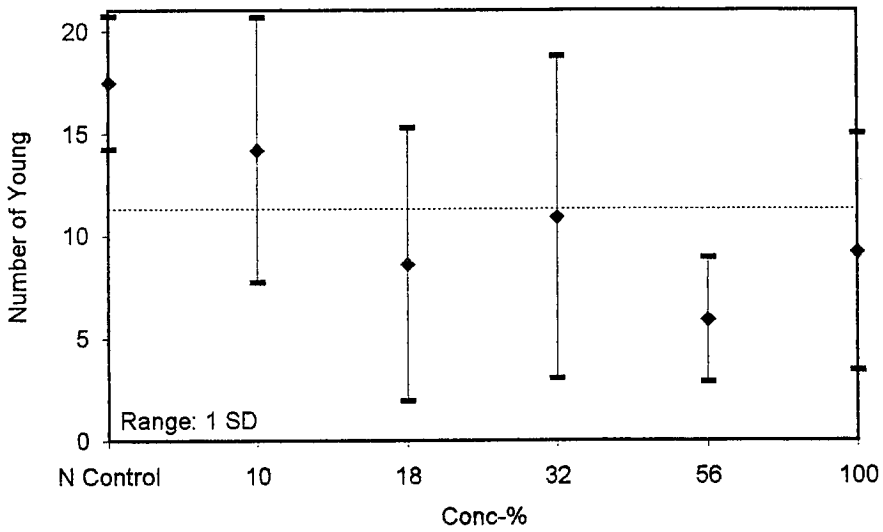


Point	Estimate	SD	95% CL		Skew
IC1*	0.530	-	-	-	-
IC5*	2.652	-	-	-	-
IC10*	5.303	-	-	-	-
IC15*	7.955	-	-	-	-
IC25	11.933	-	-	-	-
IC40	16.652	-	-	-	-
IC50	42.909	-	-	-	-

Ceriodaphnia Survival and Reproduction Test

Start Date:	16 May-95	Test ID:	TEX0511302	Sample ID:	CA0082295
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	EFF1 POTW
Sample Date:	15 May-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Poso Creek			Response:	Reproduction

TEX0511302-EFF1 POTW



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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC FATHEAD MINNOW SURVIVAL AND GROWTH BIOASSAY

DATE: 16 May -95

STANDARD TOXICANT: Sodium Chloride

ENDPOINT: SURVIVAL

NOEC = 5.60 g/l

IC25 = 1.73 g/l
IC50 = 3.55 g/l

ENDPOINT: GROWTH

NOEC = 5.60 g/l

IC25 = 6.53 g/l
IC50 = 7.68 g/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	FHD-41	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	1	2	3	4
N Control	0.700	0.700	1.000	1.000
0.56	1.000	1.000	0.600	1.000
1	0.900	0.800	0.400	0.900
1.8	0.700	0.500	0.100	0.200
3.2	0.600	0.900	0.500	0.600
5.6	0.400	0.200	0.800	0.500
10	0.000	0.000	0.000	0.000

			Arcsin Squareroot Transformed Data					t				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.850	1.000	1.202	0.991	1.412	20.22	4				6	40
0.56	0.900	1.059	1.281	0.886	1.412	20.54	4	-0.430	2.410	0.443	4	40
1	0.750	0.882	1.072	0.685	1.249	24.90	4	0.703	2.410	0.443	10	40
1.8	0.375	0.441	0.640	0.322	0.991	47.43	4	*3.055	2.410	0.443	25	40
3.2	0.650	0.765	0.952	0.785	1.249	21.42	4	1.361	2.410	0.443	14	40
5.6	0.475	0.559	0.760	0.464	1.107	35.19	4	2.403	2.410	0.443	21	40
10	0.000	0.000									40	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.945	0.884	-0.223	-1.102
Bartlett's Test indicates equality of variance (p = 0.9940)	0.444	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	5.6	10			0.4117	0.2498	0.0675	3.7015	2.7729	5, 18

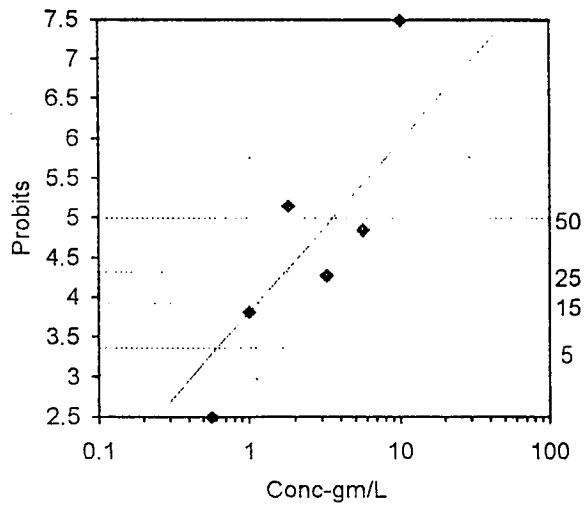
Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	2.1543	1.2141	-1.217	5.5251
Intercept	3.8152	0.8095	1.5675	6.0628
TSCR	0.1369	0.1358	-0.24	0.514

Warning: significant heterogeneity
Slope not significantly different from zero

Point	Probits	gm/L	95% Fiducial Limits	
EC1	2.674	0.295	#N/A	#N/A
EC5	3.355	0.612	#N/A	#N/A
EC10	3.718	0.902	#N/A	#N/A
EC15	3.964	1.172	#N/A	#N/A
EC25	4.326	1.725	#N/A	#N/A
EC40	4.747	2.706	#N/A	#N/A
EC50	5.000	3.548	#N/A	#N/A
EC60	5.253	4.651	#N/A	#N/A
EC75	5.674	7.296	#N/A	#N/A
EC85	6.036	10.742	#N/A	#N/A
EC90	6.282	13.960	#N/A	#N/A
EC95	6.645	20.584	#N/A	#N/A
EC99	7.326	42.645	#N/A	#N/A

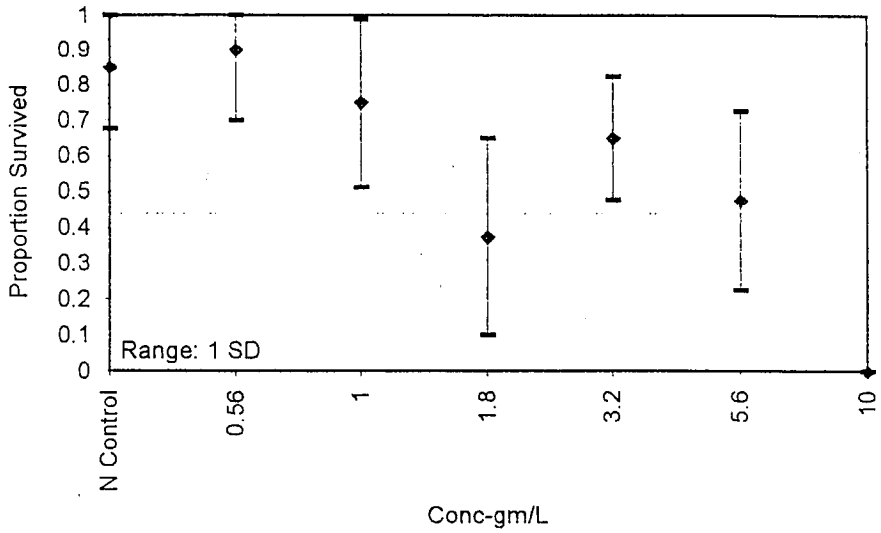
Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.150	32.291	13.277	0.550	0.4642	4



Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	FHD-41	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

FHD-41-NACL Sodium chloride



Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	FHD-41	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.41	25.00	25.50	0.18	0.70	8
0.56		24.90	24.80	25.20	0.15	0.60	8
1		24.88	24.80	25.00	0.10	0.40	8
1.8		24.88	24.80	25.00	0.10	0.40	8
3.2		24.88	24.80	25.00	0.10	0.40	8
5.6		24.85	24.80	25.00	0.09	0.40	8
10		24.80	24.80	24.80	0.00	0.00	2
N Control	pH	7.93	7.90	8.00	0.05	0.60	8
0.56		7.90	7.90	7.90	0.00	0.00	8
1		7.90	7.90	7.90	0.00	0.00	8
1.8		7.90	7.90	7.90	0.00	0.00	8
3.2		7.84	7.80	7.90	0.05	0.70	8
5.6		7.80	7.80	7.80	0.00	0.00	8
10		7.80	7.80	7.80	0.00	0.00	2
N Control	Final D.O.-mg/L	7.85	7.80	7.90	0.05	0.70	8
0.56		7.74	7.60	8.00	0.14	1.80	8
1		7.71	7.50	7.90	0.16	2.10	8
1.8		7.70	7.50	7.90	0.14	1.80	8
3.2		7.71	7.60	7.90	0.08	1.10	8
5.6		7.71	7.60	7.80	0.08	1.10	8
10		7.70	7.70	7.70	0.00	0.00	2
N Control	Hardness-mg/L	86.25	82.00	89.00	2.38	2.80	8
0.56							
1							
1.8							
3.2							
5.6							
10							
N Control	Conductivity-umh	137.13	128.00	145.00	6.11	4.50	8
0.56							
1							
1.8							
3.2							
5.6							
10							
N Control	Alkalinity-mg/L	70.75	66.00	75.00	2.96	4.20	8
0.56							
1							
1.8							
3.2							
5.6							
10							

Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	FHD-41	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Growth-Weight

Conc-gm/L	1	2	3	4
N Control	0.260	0.220	0.280	0.270
0.56	0.240	0.310	0.310	0.260
1	0.270	0.260	0.270	0.260
1.8	0.210	0.290	0.290	0.270
3.2	0.250	0.310	0.230	0.360
5.6	0.220	0.270	0.280	0.260
10	0.000	0.000	0.000	0.000

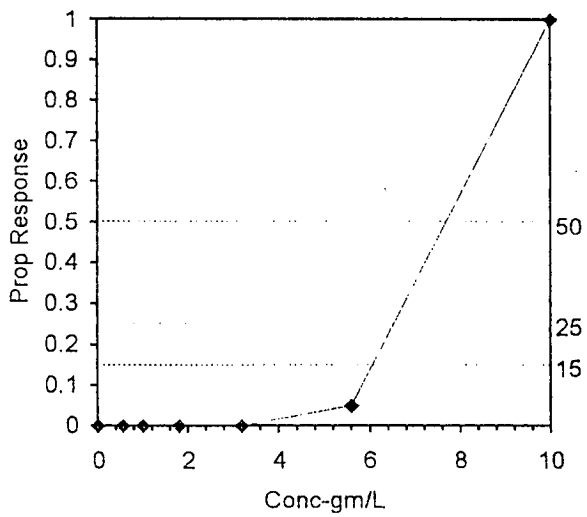
			Untransformed Data					t				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.258	1.000	0.258	0.220	0.280	10.21	4					
0.56	0.280	1.087	0.280	0.240	0.310	12.71	4	-0.894	2.410	0.061		
1	0.265	1.029	0.265	0.260	0.270	2.18	4	-0.298	2.410	0.061		
1.8	0.265	1.029	0.265	0.210	0.290	14.29	4	-0.298	2.410	0.061		
3.2	0.288	1.117	0.288	0.230	0.360	20.55	4	-1.191	2.410	0.061		
5.6	0.258	1.000	0.258	0.220	0.280	10.21	4	0.000	2.410	0.061		
10	0.000	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.940	0.884	-0.125	-0.019
Bartlett's Test indicates equality of variance (p = 0.0790)	9.870	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	5.6	10			0.0628	0.0006	0.0013	0.4791	2.7729	5, 18

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	0.2710		
0.56	0.2710	-0.0874	0.0000
1	0.2710	-0.0291	0.0000
1.8	0.2710	-0.0291	0.0000
3.2	0.2710	-0.1165	0.0000
5.6	0.2575	0.0000	0.0498
10	0.0000	1.0000	1.0000

Linear Interpolation(ICp) with
80 bootstrap resamples

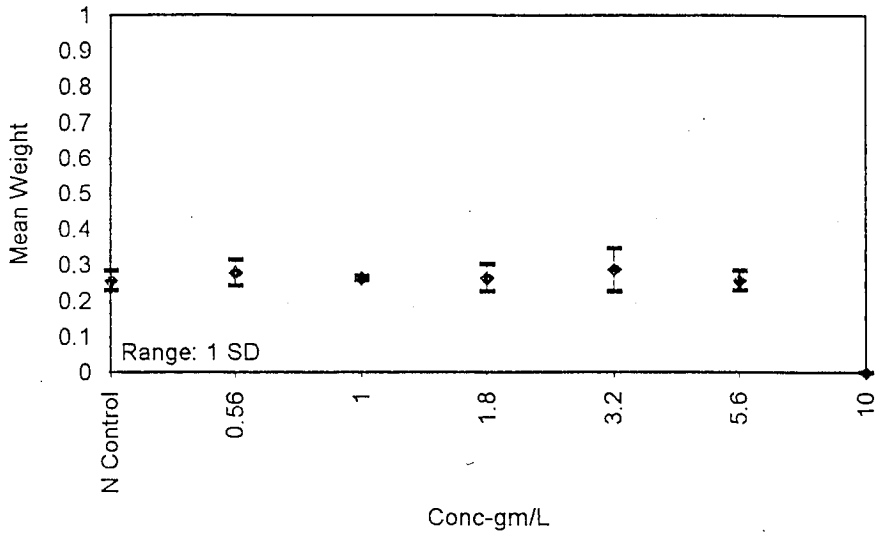


Point	Estimate	SD	95% CL (Exp)		Skew
IC1	3.6818	1.6558	0.0000	6.8213	0.040
IC5	5.6009	1.6670	0.0000	5.9515	-0.801
IC10	5.8324	1.0010	0.4430	6.1646	-2.697
IC15	6.0639	0.6258	3.6094	6.3776	-4.706
IC25	6.5270	0.2276	5.3937	6.8038	-1.589
IC40	7.2216	0.1821	6.3149	7.4430	-1.589
IC50	7.6847	0.1517	6.9291	7.8692	-1.589

Larval Fish Survival and Growth Test

Start Date:	16 May-95	Test ID:	FHD-41	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Growth-Weight

FHD-41-NACL Sodium chloride



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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC CERIODAPHNIA SURVIVAL AND REPRODUCTION BIOASSAY

DATE:	16 May -95
STANDARD TOXICANT:	Sodium Chloride
ENDPOINT:	SURVIVAL
NOEC =	1.80 g/l
IC25 =	1.47 g/l
IC50 =	1.99 g/l
ENDPOINT:	REPRODUCTION
NOEC =	0.56 g/l
IC25 =	0.85 g/l
IC50 =	1.18 g/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Ceriodaphnia Survival and Reproduction Test

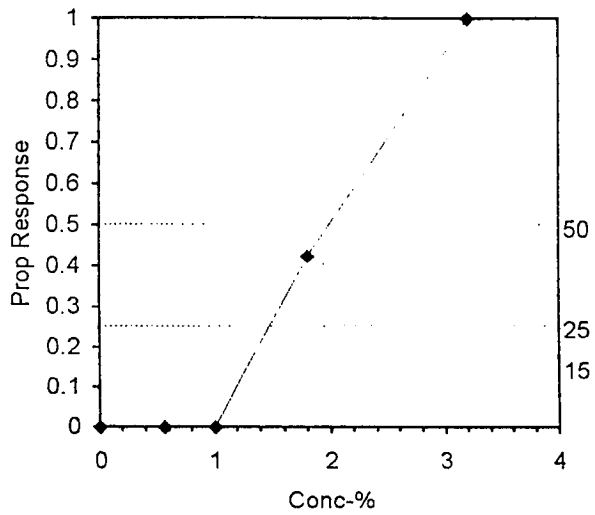
Start Date:	16 May-95	Test ID:	CER-61	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	Alive	Dead	Total	Fisher P
N Control	8	2	10	
0.56	9	1	10	0.5000
1	9	1	10	0.5000
1.8	5	5	10	0.1749
3.2	0	10	10	0.0004

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	1.8	3.2	2.4	

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	0.8667		
0.56	0.8667	-0.1250	0.0000
1	0.8667	-0.1250	0.0000
1.8	0.5000	0.3750	0.4231
3.2	0.0000	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1	1.0189	0.2607	0.5696	1.8140	0.488
IC5	1.0945	0.2494	0.6080	1.8700	0.390
IC10	1.1891	0.2568	0.6561	1.9400	0.273
IC15	1.2836	0.2645	0.7041	2.0100	0.076
IC25	1.4727	0.2846	0.8002	2.1500	-0.272
IC40	1.7564	0.2906	1.0767	2.3600	-0.303
IC50	1.9867	0.2898	1.3993	2.5000	-0.673

Ceriodaphnia Survival and Reproduction Test

Start Date:	16 May-95	Test ID:	CER-61	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	Measured Parameters	Water Quality Summary					
		Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.41	25.00	25.50	0.18	0.70	8
0.56		24.90	24.80	25.20	0.15	0.60	8
1		24.88	24.80	25.00	0.10	0.40	8
1.8		24.88	24.80	25.00	0.10	0.40	8
3.2		24.85	24.80	25.00	0.09	0.40	8
N Control	pH	7.93	7.90	8.00	0.05	0.60	8
0.56		7.90	7.90	7.90	0.00	0.00	8
1		7.90	7.90	7.90	0.00	0.00	8
1.8		7.90	7.90	7.90	0.00	0.00	8
3.2		7.84	7.80	7.90	0.05	0.70	8
N Control	Final D.O.-mg/L	7.85	7.80	7.90	0.05	0.70	8
0.56		7.63	7.00	8.00	0.28	3.70	8
1		7.71	7.50	7.90	0.16	2.10	8
1.8		7.70	7.50	7.90	0.14	1.80	8
3.2		7.68	7.60	7.70	0.05	0.60	8
N Control	Hardness-mg/L	86.25	82.00	89.00	2.38	2.80	8
0.56							
1							
1.8							
3.2							
N Control	Conductivity-umh	137.13	128.00	145.00	6.11	4.50	8
0.56							
1							
1.8							
3.2							
N Control	Alkalinity-mg/L	70.75	66.00	75.00	2.96	4.20	8
0.56							
1							
1.8							
3.2							

Ceriodaphnia Survival and Reproduction Test

Start Date:	16 May-95	Test ID:	CER-61	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Reproduction

Conc-gm/L	1	2	3	4	5	6	7	8	9	10
N Control	4.00	17.00	28.00	16.00	14.00	16.00	16.00	15.00	16.00	5.00
0.56	2.00	12.00	18.00	29.00	15.00	13.00	10.00	16.00	15.00	17.00
1	2.00	5.00	12.00	14.00	14.00	4.00	11.00	12.00	13.00	5.00
1.8	2.00	2.00	0.00	0.00	2.00	0.00	0.00	0.00	2.00	0.00
3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

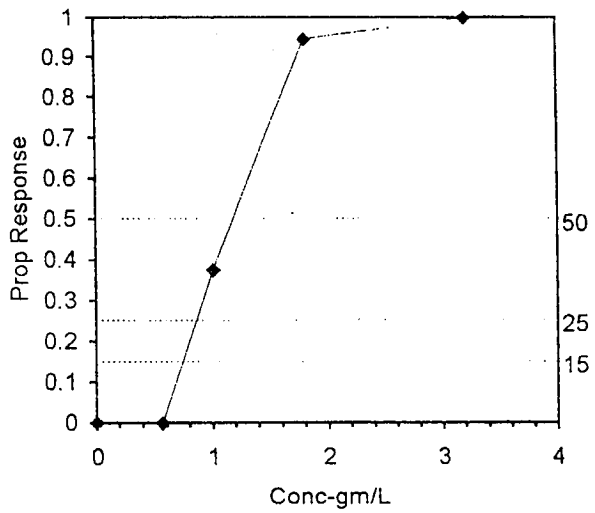
			Untransformed Data					Rank				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	14.70	1.000	14.70	4.00	28.00	45.24	10					
0.56	14.70	1.000	14.70	2.00	29.00	46.26	10	101.5	77.0			
1	9.20	0.626	9.20	2.00	14.00	50.41	10	*71.5	77.0			
1.8	0.80	0.054	0.80	0.00	2.00	129.10	10	*55.0	77.0			
3.2	0.00	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.010)	0.734	0.919	-1.945	3.3387
Bartlett's test indicates unequal variances (p = 5.26E-05)	22.448	11.345		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	0.56	1	0.7483	

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	14.70		
0.56	14.70	0.0000	0.0000
1	9.20	0.3741	0.3741
1.8	0.80	0.9456	0.9456
3.2	0.00	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples

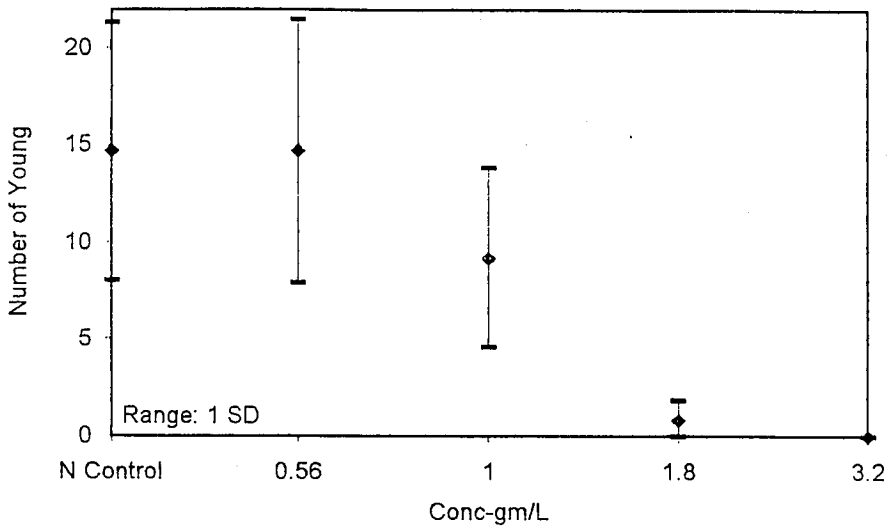


Point	Estimate	SD	95% CL		Skew
IC1	0.5718	0.2534	0.0306	0.5799	-0.202
IC5	0.6188	0.1843	0.1532	0.6593	-0.852
IC10	0.6776	0.1341	0.3064	0.7586	-1.297
IC15	0.7364	0.1115	0.4597	0.8579	-1.369
IC25	0.8540	0.1126	0.6716	1.0322	-1.118
IC40	1.0362	0.1220	0.7790	1.2021	-1.242
IC50	1.1762	0.1298	0.8338	1.3154	-1.515

Ceriodaphnia Survival and Reproduction Test

Start Date:	16 May-95	Test ID:	CER-61	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	16 May-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Reproduction

CER-61-NACL Sodium chloride



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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC SELENASTRUM GROWTH BIOASSAY

DATE: 19 May -95

STANDARD TOXICANT: Zinc Chloride

NOEC =	180.00	ug/l
IC25 =	217.71	ug/l
IC50 =	359.82	ug/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Phytoplankton Growth Test

Start Date:	19 May-95	Test ID:	SEL-26	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	19 May-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

Conc-µg/L	1	2	3
N Control	640.0	615.0	555.0
180	499.5	448.0	523.0
320	466.0	362.0	223.0
560	61.0	55.0	55.0
1000	27.0	23.0	29.0

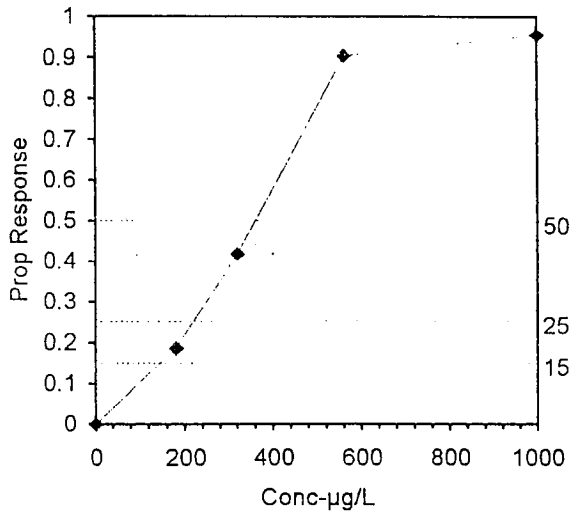
			Log (1+X) Transformed Data					t				
Conc-µg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	603.3	1.000	2.781	2.745	2.807	1.15	3					
180	490.2	0.812	2.690	2.652	2.719	1.28	3	1.389	2.470	0.160		
320	350.3	0.581	2.526	2.350	2.669	6.42	3	*3.913	2.470	0.160		
560	57.0	0.094	1.763	1.748	1.792	1.45	3	*15.676	2.470	0.160		
1000	26.3	0.044	1.435	1.380	1.477	3.46	3	*20.730	2.470	0.160		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.882	0.835	-0.719	3.778
Bartlett's Test indicates equality of variance (p = 0.0658)	8.818	13.277		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	180	320	240		193.68	1.0897	0.0063	172.39	3.478	4, 10

		Prop Response	
Conc-µg/L	Iso	N-Mean	N-Iso
N Control	603.3		
180	490.2	0.1876	0.1876
320	350.3	0.4193	0.4193
560	57.0	0.9055	0.9055
1000	26.3	0.9564	0.9564

Linear Interpolation(ICp) with 80 bootstrap resamples

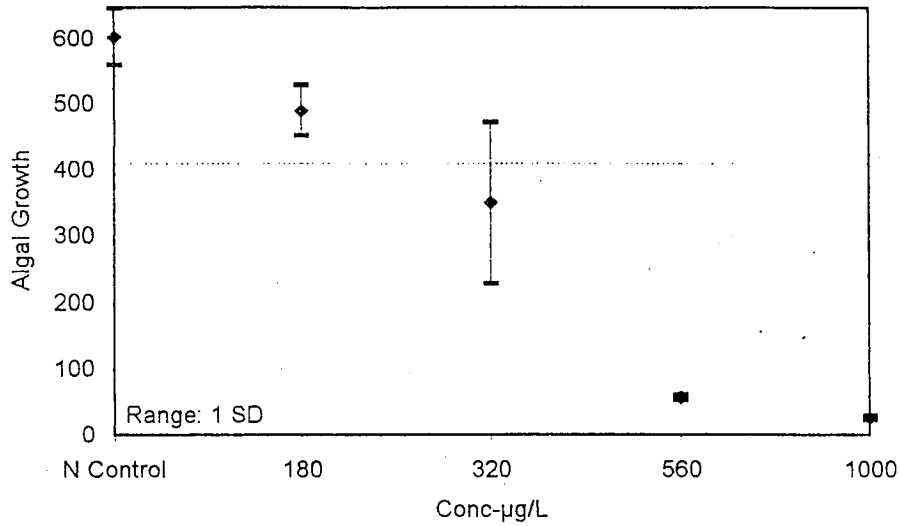


Point	Estimate	SD	95% CL (Exp)		Skew
IC1*	9.60	3.59	5.56	26.37	2.771
IC5*	47.98	17.95	27.79	131.87	2.771
IC10*	95.96	28.66	55.59	263.06	1.159
IC15*	143.95	32.36	83.38	278.11	1.291
IC25	217.71	39.03	159.22	449.32	1.304
IC40	308.32	38.92	179.89	462.27	0.012
IC50	359.82	39.81	189.63	480.70	-0.626

Phytoplankton Growth Test

Start Date:	19 May-95	Test ID:	SEL-26	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	19 May-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

SEL-26-ZNCL Zinc chloride



Phytoplankton Growth Test

Start Date:	19 May-95	Test ID:	SEL-26	Sample ID:	CA0000000
End Date:	23 May-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	19 May-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

Conc-µg/L	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.50	25.50	25.50			1
180		25.30	25.30	25.30			1
320		25.30	25.30	25.30			1
560		25.20	25.20	25.20			1
1000		25.20	25.20	25.20			1
N Control	pH	8.00	8.00	8.00			1
180		8.00	8.00	8.00			1
320		8.10	8.10	8.10			1
560		8.10	8.10	8.10			1
1000		8.10	8.10	8.10			1
N Control	Hardness-mg/L	88.00	88.00	88.00			1
180							
320							
560							
1000							
N Control	Alkalinity-mg/L	77.00	77.00	77.00			1
180							
320							
560							
1000							

AQUATIC
BIOASSAY &
CONSULTING
LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

cc: WKM (EPTD-Bellaire)
TJ Sun (Beacon)
ECJ
J. Hall (PRL)

July 11, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Discharge
DATE RECEIVED:	29 June -95
ABC LAB. NO.:	TEX0651643

CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY

NOEC =	100.00 %
TUc =	1.00
IC25 =	67.92 %
IC50 =	>100.00 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Phytoplankton Growth Test

Start Date:	29 Jun-95	Test ID:	TEX0651643	Sample ID:	CA0082295
End Date:	03 Jul-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	29 Jun-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Discharge			Response:	Cell Density

Conc-%	1	2	3
N Control	548.0	474.0	501.0
10	1146.0	1074.0	1077.0
18	1269.0	1102.0	1139.0
32	966.0	881.0	897.0
56	653.0	804.0	819.0
100	548.0	493.0	521.0

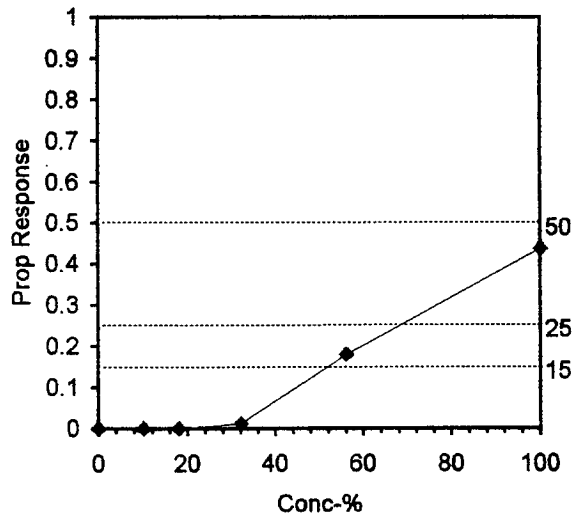
			Log (1+X) Transformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	507.7	1.000	2.706	2.677	2.740	1.17	3					
10	1099.0	2.165	3.041	3.031	3.060	0.52	3	-12.747	2.500	0.066		
18	1170.0	2.305	3.068	3.043	3.104	1.04	3	-13.757	2.500	0.066		
32	914.7	1.802	2.961	2.945	2.985	0.72	3	-9.715	2.500	0.066		
56	758.7	1.494	2.878	2.816	2.914	1.90	3	-6.562	2.500	0.066		
100	520.7	1.026	2.717	2.694	2.740	0.84	3	-0.431	2.500	0.066		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.932	0.858	-0.419	-0.042
Bartlett's Test indicates equality of variance (p = 0.6653)	3.225	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	100	>100		1	74.084	0.0741	0.001	71.264	3.1059	5, 12

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	925.6		
10	925.6	-1.1648	0.0000
18	925.6	-1.3047	0.0000
32	914.7	-0.8017	0.0118
56	758.7	-0.4944	0.1803
100	520.7	-0.0256	0.4375

Linear Interpolation(ICp) with 80 bootstrap resamples

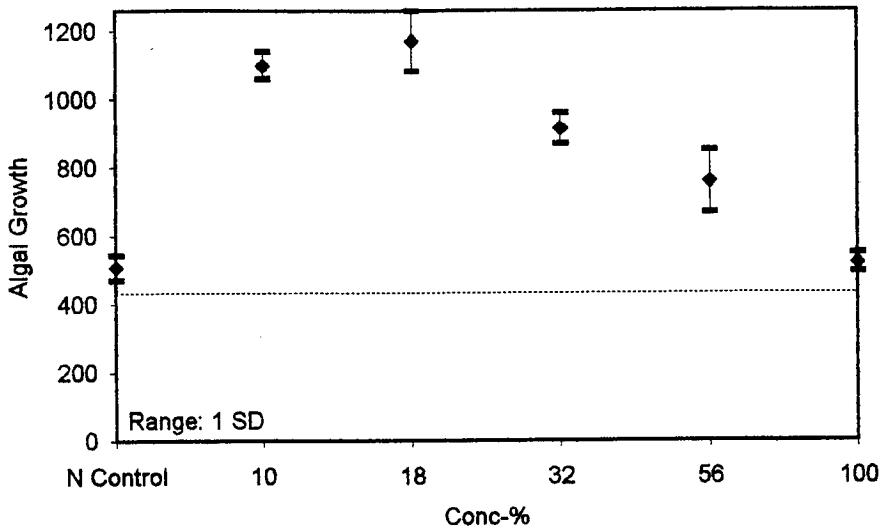


Point	Estimate	SD	95% CL (Exp)		Skew
IC1	29.900	4.699	9.702	38.733	0.088
IC5	37.444	2.981	20.572	48.411	-0.190
IC10	44.564	4.111	31.635	64.793	1.113
IC15	51.684	4.812	34.400	72.743	0.601
IC25	67.924	6.544	34.948	84.623	-1.002
IC40	93.591	-	-	-	-
IC50	>100	-	-	-	-

Phytoplankton Growth Test

Start Date:	29 Jun-95	Test ID:	TEX0651643	Sample ID:	CA0082295
End Date:	03 Jul-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	29 Jun-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Discharge			Response:	Cell Density

TEX0651643-EFF1 POTW



Phytoplankton Growth Test

Start Date:	29 Jun-95	Test ID:	TEX0651643	Sample ID:	CA0082295
End Date:	03 Jul-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	29 Jun-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Discharge			Response:	Cell Density

	Measured	Water Quality Summary					
Conc-%	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.80	25.80	25.80			1
10		25.50	25.50	25.50			1
18		25.60	25.60	25.60			1
32		25.60	25.60	25.60			1
56		25.50	25.50	25.50			1
100		25.50	25.50	25.50			1
N Control	pH	7.90	7.90	7.90			1
10		7.80	7.80	7.80			1
18		7.70	7.70	7.70			1
32		7.70	7.70	7.70			1
56		7.70	7.70	7.70			1
100		7.70	7.70	7.70			1
N Control	Hardness-mg/L	86.00	86.00	86.00			1
10							
18							
32							
56							
100		91.00	91.00	91.00			1
N Control	Alkalinity-mg/L	72.00	72.00	72.00			1
10							
18							
32							
56							
100		220.00	220.00	220.00			1

REVISED

cc: WKM (EPTD - Bellair
T-J Sun (Bermu
ECJ
J. Hall (PRL)

ret to DEW

AQUATIC BIOASSAY & CONSULTING LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

July 11, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfeild, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Discharge
DATE RECEIVED:	27 June -95
ABC LAB. NO.:	TEX0651632

CHRONIC FATHEAD LARVAE SURVIVAL & GROWTH BIOASSAY

SURVIVAL	NOEC =	32.00 %
	TUc =	3.13
	IC25 =	30.35 %
	IC50 =	36.64 %
GROWTH	NOEC =	18.00 %
	TUc =	5.56
	IC25 =	22.05 %
	IC50 =	39.67 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Larval Fish Survival and Growth Test

Start Date:	27 Jun-95	Test ID:	TEX0651632	Sample ID:	CA0082295
End Date:	04 Jul-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Survival

Conc-%	1	2	3	4
N Control	0.700	1.000	0.600	0.900
10	0.900	0.500	0.700	0.800
18	0.900	0.600	1.000	0.600
32	0.700	0.600	0.400	0.400
56	0.100	0.100	0.000	0.000
100	0.000	0.000	0.000	0.000

			Arcsin Squareroot Transformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.800	1.000	1.135	0.886	1.412	21.13	4				8	40
10	0.725	0.906	1.033	0.785	1.249	18.97	4	0.720	2.360	0.332	11	40
18	0.775	0.969	1.108	0.886	1.412	23.92	4	0.187	2.360	0.332	9	40
32	0.525	0.656	0.812	0.685	0.991	18.82	4	2.293	2.360	0.332	19	40
56	0.050	0.063	0.240	0.159	0.322	39.16	4	*6.350	2.360	0.332	38	40
100	0.000	0.000									40	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.938	0.868	0.1128	-1.193
Bartlett's Test indicates equality of variance (p = 0.5637)	2.965	13.277		

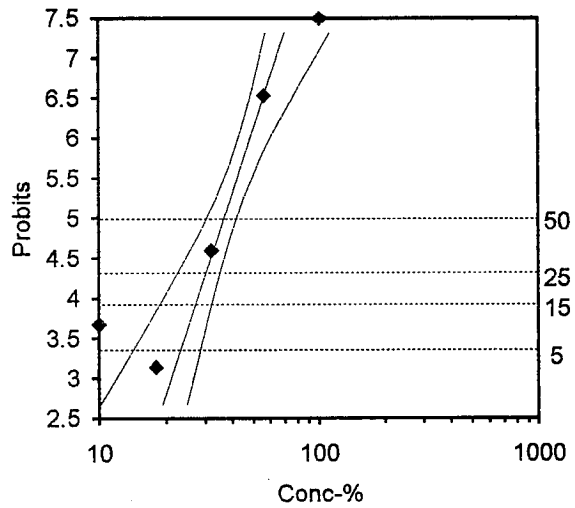
Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	32	56	42.332	3.125	0.3182	0.5533	0.0397	13.949	3.0556	4, 15

Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	8.2576	1.8831	4.5666	11.948
Intercept	-7.914	3.0283	-13.85	-1.979
TSCR	0.2323	0.0394	0.1549	0.3096

Point	Probits	%	95% Fiducial Limits	
EC1	2.674	19.15	10.12	24.79
EC5	3.355	23.16	14.17	28.48
EC10	3.718	25.63	16.92	30.73
EC15	3.964	27.44	19.04	32.39
EC25	4.326	30.35	22.60	35.12
EC40	4.747	34.14	27.36	38.91
EC50	5.000	36.64	30.47	41.68
EC60	5.253	39.32	33.65	45.03
EC75	5.674	44.22	38.79	52.40
EC85	6.036	48.91	42.92	60.93
EC90	6.282	52.37	45.63	67.99
EC95	6.645	57.96	49.63	80.53
EC99	7.326	70.08	57.44	111.88

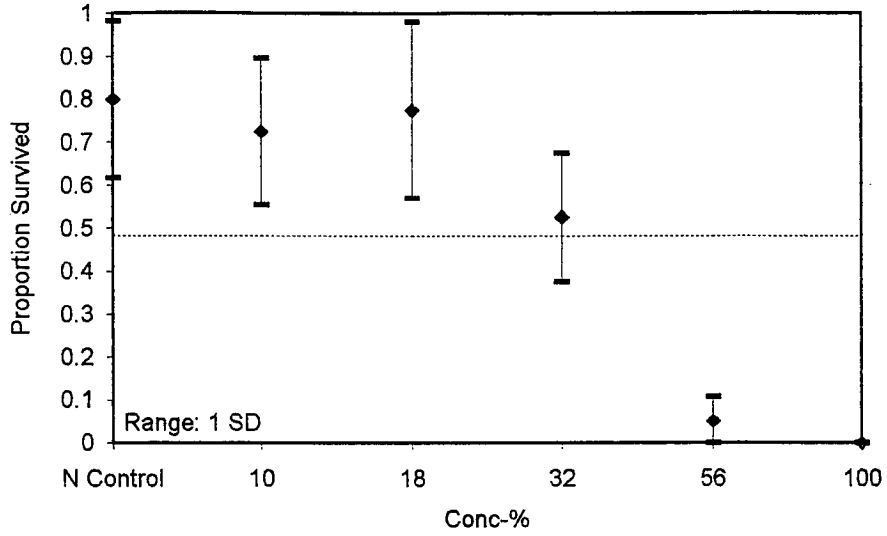
Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.200	0.444	11.345	1.564	0.1211	6



Larval Fish Survival and Growth Test

Start Date:	27 Jun-95	Test ID:	TEX0651632	Sample ID:	CA0082295
End Date:	04 Jul-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Survival

TEX0651632-EFF1 POTW



Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.53	24.80	25.80	0.37	1.40	8
10		22.54	2.80	25.80	7.98	35.40	8
18		25.41	25.00	25.80	0.34	1.30	8
32		25.46	25.00	25.80	0.35	1.40	8
56		25.39	24.80	25.80	0.41	1.60	8
100		25.35	24.80	25.80	0.38	1.50	8
N Control	pH	7.90	7.80	8.00	0.05	0.70	8
10		7.88	7.80	8.10	0.12	1.50	8
18		7.89	7.70	8.14	0.15	1.80	8
32		7.89	7.70	8.00	0.14	1.70	8
56		7.88	7.70	8.20	0.18	2.30	8
100		7.80	7.50	8.30	0.25	3.20	8
N Control	Final D.O.-mg/L	8.26	7.80	8.50	0.21	2.50	8
10		7.99	7.50	8.30	0.28	3.40	8
18		7.96	7.40	8.40	0.31	3.90	8
32		7.95	7.30	8.40	0.34	4.30	8
56		7.94	7.30	8.30	0.31	3.90	8
100		7.90	7.30	8.30	0.32	4.00	8
N Control	Hardness-mg/L	83.00	80.00	86.00	3.21	3.90	8
10							
18							
32							
56							
100		96.50	91.00	104.00	6.07	6.30	8
N Control	Alkalinity-mg/L	68.75	60.00	72.00	5.42	7.90	8
10							
18							
32							
56							
100		220.50	207.00	235.00	10.60	4.80	8

Larval Fish Survival and Growth Test

Start Date:	27 Jun-95	Test ID:	TEX0651632	Sample ID:	CA0082295
End Date:	04 Jul-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Growth-Weight

Conc-%	1	2	3	4
N Control	0.520	0.440	0.420	0.400
10	0.390	0.320	0.350	0.410
18	0.240	0.430	0.330	0.390
32	0.330	0.200	0.450	0.220
56	0.160	0.070	0.000	0.000
100	0.000	0.000	0.000	0.000

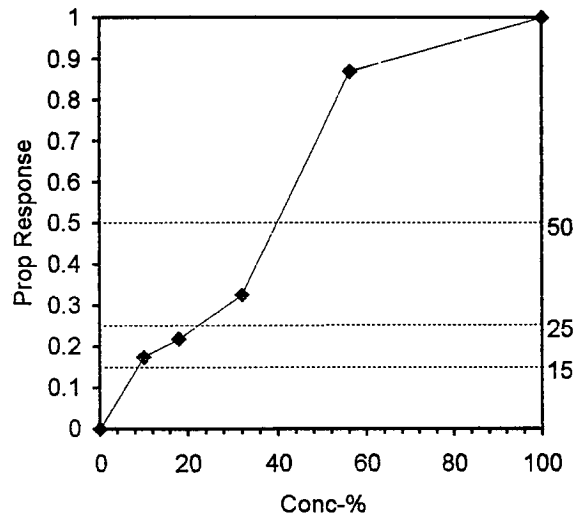
			Untransformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.445	1.000	0.445	0.400	0.520	11.82	4					
10	0.368	0.826	0.368	0.320	0.410	10.97	4	1.401	2.290	0.127		
18	0.348	0.781	0.348	0.240	0.430	23.77	4	1.762	2.290	0.127		
32	0.300	0.674	0.300	0.200	0.450	38.39	4	*2.621	2.290	0.127		
56	0.058	0.129										
100	0.000	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.975	0.844	0.3494	-0.068
Bartlett's Test indicates equality of variance (p = 0.3531)	3.261	11.345		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	18	32	24	5.5556	0.1319	0.0146	0.0061	2.3826	3.4903	3, 12

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	0.4450		
10	0.3675	0.1742	0.1742
18	0.3475	0.2191	0.2191
32	0.3000	0.3258	0.3258
56	0.0575	0.8708	0.8708
100	0.0000	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples

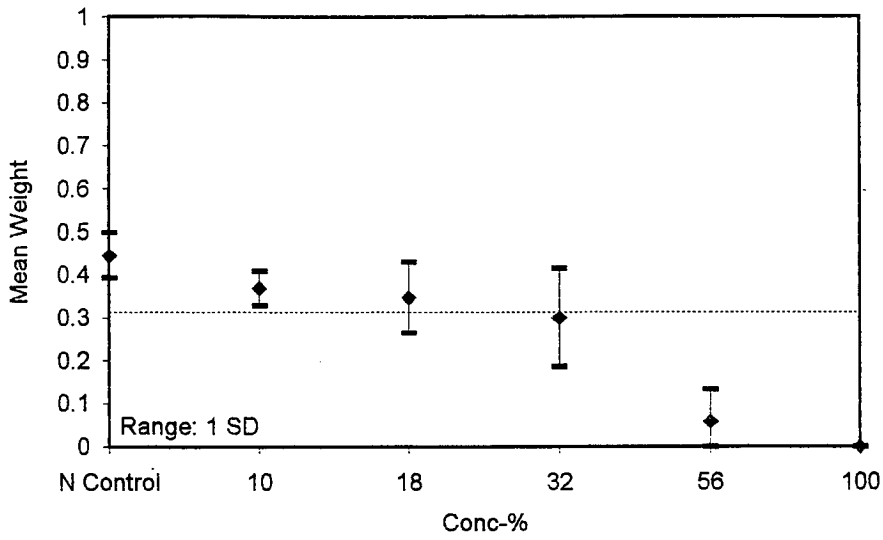


Point	Estimate	SD	95% CL (Exp)		Skew
IC1*	0.574	0.470	0.175	1.926	4.591
IC5*	2.871	1.849	0.877	9.631	2.586
IC10*	5.742	5.064	1.755	27.843	2.431
IC15*	8.613	6.629	2.632	32.820	0.616
IC25	22.053	8.562	0.000	42.882	-0.446
IC40	35.266	4.450	18.970	44.339	-1.491
IC50	39.670	3.226	28.637	51.737	0.376

Larval Fish Survival and Growth Test

Start Date:	27 Jun-95	Test ID:	TEX0651632	Sample ID:	CA0082295
End Date:	04 Jul-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Growth-Weight

TEX0651632-EFF1 POTW



Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.53	24.80	25.80	0.37	1.40	8
10		22.54	2.80	25.80	7.98	35.40	8
18		25.41	25.00	25.80	0.34	1.30	8
32		25.46	25.00	25.80	0.35	1.40	8
56		25.39	24.80	25.80	0.41	1.60	8
100		25.35	24.80	25.80	0.38	1.50	8
N Control	pH	7.90	7.80	8.00	0.05	0.70	8
10		7.88	7.80	8.10	0.12	1.50	8
18		7.89	7.70	8.14	0.15	1.80	8
32		7.89	7.70	8.00	0.14	1.70	8
56		7.88	7.70	8.20	0.18	2.30	8
100		7.80	7.50	8.30	0.25	3.20	8
N Control	Final D.O.-mg/L	8.26	7.80	8.50	0.21	2.50	8
10		7.99	7.50	8.30	0.28	3.40	8
18		7.96	7.40	8.40	0.31	3.90	8
32		7.95	7.30	8.40	0.34	4.30	8
56		7.94	7.30	8.30	0.31	3.90	8
100		7.90	7.30	8.30	0.32	4.00	8
N Control	Hardness-mg/L	83.00	80.00	86.00	3.21	3.90	8
10							
18							
32							
56							
100		96.50	91.00	104.00	6.07	6.30	8
N Control	Alkalinity-mg/L	68.75	60.00	72.00	5.42	7.90	8
10							
18							
32							
56							
100		220.50	207.00	235.00	10.60	4.80	8

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CLIENT:	TEXACO
SAMPLE I.D.:	C. Discharge
DATE RECEIVED:	27 June -95
ABC LAB. NO.:	TEX0651632

CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY

SURVIVAL	NOEC =	100.00 %
	TUc =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %
REPRODUCTION	NOEC =	10.00 %
	TUc =	10.00
	IC25 =	12.34 %
	IC50 =	16.23 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Ceriodaphnia Survival and Reproduction Test

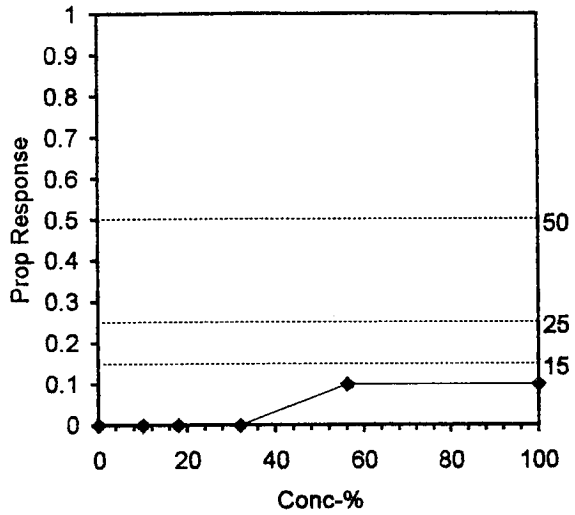
Start Date:	27 Jun-95	Test ID:	TEX0651632	Sample ID:	CA0082295
End Date:	04 Jul-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	27 Jun-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Survival

Conc-%	Alive	Dead	Total	Fisher P
N Control	10	0	10	
10	10	0	10	1.0000
18	10	0	10	1.0000
32	10	0	10	1.0000
56	8	2	10	0.2368
100	10	0	10	1.0000

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	1.000		
10	1.000	0.0000	0.0000
18	1.000	0.0000	0.0000
32	1.000	0.0000	0.0000
56	0.900	0.2000	0.1000
100	0.900	0.0000	0.1000

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1	34.400	-	-	-	-
IC5	44.000	-	-	-	-
IC10	>100	-	-	-	-
IC15	>100	-	-	-	-
IC25	>100	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Ceriodaphnia Survival and Reproduction Test

Start Date:	27 Jun-95	Test ID:	TEX0651632	Sample ID:	CA0082295
End Date:	04 Jul-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	27 Jun-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Survival

Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.53	24.80	25.80	0.37	1.40	8
10		25.41	24.70	25.80	0.38	1.50	8
18		25.41	25.00	25.80	0.34	1.30	8
32		25.46	25.00	25.80	0.35	1.40	8
56		25.50	24.80	25.80	0.40	1.60	8
100		25.35	24.80	25.80	0.38	1.50	8
N Control	pH	7.90	7.80	8.00	0.05	0.70	8
10		7.88	7.80	8.10	0.12	1.50	8
18		7.89	7.70	8.10	0.14	1.70	8
32		7.89	7.70	8.00	0.14	1.70	8
56		7.95	7.70	8.60	0.32	4.00	8
100		7.80	7.50	8.30	0.25	3.20	8
N Control	Final D.O.-mg/L	8.26	7.80	8.50	0.21	2.50	8
10		7.99	7.50	8.30	0.28	3.40	8
18		7.73	7.30	8.00	0.28	3.60	8
32		7.95	7.30	8.40	0.34	4.30	8
56		7.94	7.30	8.30	0.31	3.90	8
100		7.90	7.30	8.30	0.32	4.00	8
N Control	Hardness-mg/L	83.00	80.00	86.00	3.21	3.90	8
10							
18							
32							
56							
100		96.50	91.00	104.00	6.07	6.30	8
N Control	Conductivity-umh	143.75	132.00	164.00	12.82	8.90	8
10		230.50	184.00	279.00	29.24	12.70	8
18		289.63	264.00	325.00	17.90	6.20	8
32		385.25	361.00	439.00	24.55	6.40	8
56		570.00	541.00	621.00	23.37	4.10	8
100		882.63	852.00	913.00	20.39	2.30	8
N Control	Alkalinity-mg/L	68.75	60.00	72.00	5.42	7.90	8
10							
18							
32							
56							
100		220.50	207.00	235.00	10.60	4.80	8

Ceriodaphnia Survival and Reproduction Test

Start Date:	27 Jun-95	Test ID:	TEX0651632	Sample ID:	CA0082295
End Date:	04 Jul-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	27 Jun-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Reproduction

Conc-%	1	2	3	4	5	6	7	8	9	10
N Control	19.00	22.00	21.00	22.00	17.00	23.00	20.00	31.00	25.00	20.00
10	27.00	19.00	25.00	0.00	20.00	18.00	23.00	21.00	21.00	24.00
18	7.00	6.00	1.00	16.00	14.00	4.00	5.00	10.00	16.00	6.00
32	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00
56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

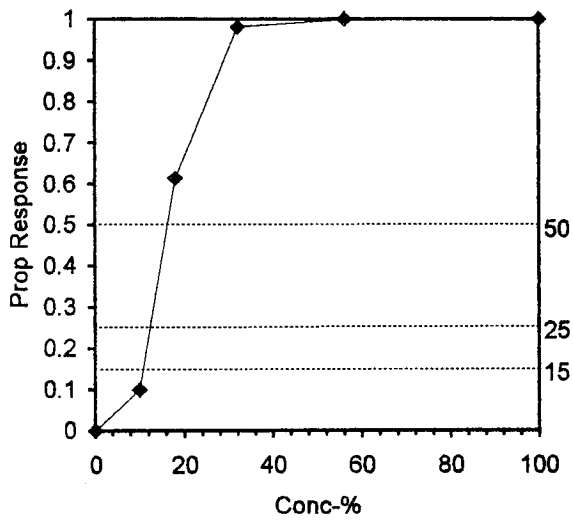
			Untransformed Data					Rank				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	22.00	1.000	22.00	17.00	31.00	17.54	10					
10	19.80	0.900	19.80	0.00	27.00	37.85	10	102.5	77.0			
18	8.50	0.386	8.50	1.00	16.00	61.82	10	*55.0	77.0			
32	0.40	0.018	0.40	0.00	3.00	241.52	10	*55.0	77.0			
56	0.00	0.000										
100	0.00	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.010)	0.490	0.919	-4.336	22.022
Bartlett's test indicates unequal variances (p = 1.71E-05)	24.786	11.345		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	10	18	13.416	10

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	22.00		
10	19.80	0.1000	0.1000
18	8.50	0.6136	0.6136
32	0.40	0.9818	0.9818
56	0.00	1.0000	1.0000
100	0.00	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples

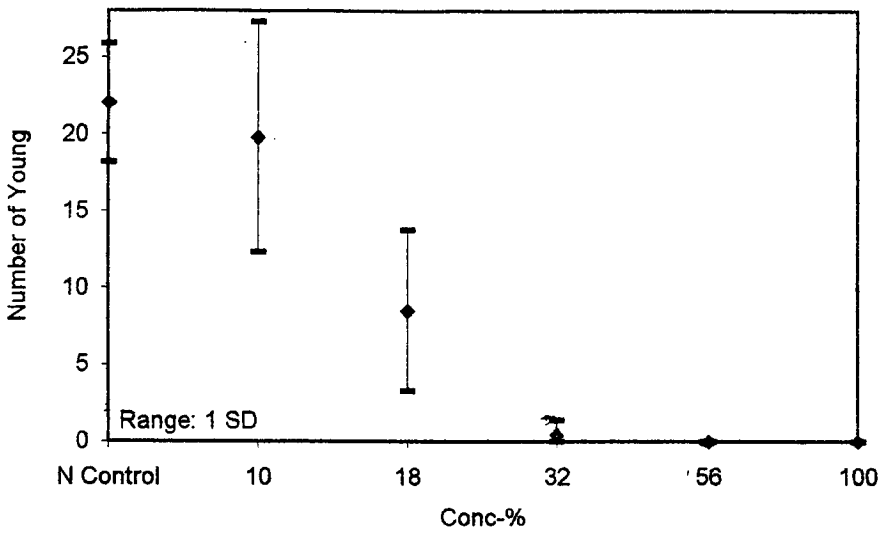


Point	Estimate	SD	95% CL		Skew
IC1*	1.000	3.730	0.278	10.145	1.401
IC5*	5.000	3.562	1.392	10.723	0.251
IC10	10.000	3.035	2.785	11.446	-0.496
IC15	10.779	2.497	4.177	12.169	-1.051
IC25	12.336	1.716	6.962	13.615	-1.238
IC40	14.673	1.119	11.752	16.014	-0.517
IC50	16.230	0.911	14.426	17.734	0.314

Ceriodaphnia Survival and Reproduction Test

Start Date:	27 Jun-95	Test ID:	TEX0651632	Sample ID:	CA0082295
End Date:	04 Jul-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	27 Jun-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Reproduction

TEX0651632-EFF2 Industrial



CHAIN OF CUSTODY RECORD

QC LEVEL

CLIENT: TEXACO E&P	PROJECT NAME/NUMBER: CALICO DISCHARGE
ADDRESS: 5546 CHINA Grade Loop 93308 P.O. Box 5197X Bakersfield, CA 93388	PROJECT MGR: D.E. WRIGHT
	P.O. #
PHONE: 805-392-2248	SAMPLED BY: (Signature) D.E. Wright

REQUIRED ANALYSIS: Uranium Bicarbonate

DATE	TIME	COMP.	GRAB	MATRIX	SAMPLE I.D. NO.	(VOLUME/ NUMBER)		REMARK (TAT)
6-30-95	1:15 PM			Water	1	1 gal.	X	
6-30-95	1:17 PM			Water	2	1 gal.	X	

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
D.E. Wright	6-30-95	2:15 PM			7/1/95		AR

CHAIN OF CUSTODY RECORD

QC LEVEL

CLIENT: TEXACO E&P	PROJECT NAME/NUMBER: CAMELO DISCHARGE
ADDRESS: 5546 CHINA Grade Loop 93308 P.O. Box 5197X Bakersfield, CA. 93388	PROJECT MGR: D.E. WRIGHT
	P.O. #
PHONE: 805-392-2248	SAMPLED BY: (Signature) C.E. Wright

REQUIRED ANALYSIS: Chemical Bioassay

DATE	TIME	COMP.	GRAB	MATRIX	SAMPLE I.D. NO.	(VOLUME/ NUMBER)		REMARK (TAT)
6-28-95	2:43PM			Water	1	1 gal.	X	
6-28-95	2:45PM			Water	2	1 gal.	X	

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
C.E. Wright	6-28-95	5:15PM			6/29/95	1030	[illegible]

CHAIN OF CUSTODY RECORD

QC LEVEL

CLIENT: TEXACO E&P	PROJECT NAME/NUMBER: CAWELO Discharge
ADDRESS: 1546 CAIMA Grade Loop 93308 P.O. Box 5197X Bakersfield, CA. 93388	PROJECT MGR: D.E. WRIGHT
	P.O. #
PHONE: 805-392-2248	SAMPLED BY: (Signature) D. E. Wright

REQUIRED ANALYSIS: Chronic Bioassay

DATE	TIME	COMP.	GRAB	MATRIX	SAMPLE I.D. NO.	(VOLUME/NUMBER)	Chronic Bioassay										REMARKS (TAT)
6-26-95	1:55 PM			Water	1	1 gal.	X										
6-26-95	1:56 PM			Water	2	1 gal.	X										

RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)
D. E. Wright	6-26-95	2:15 PM			6/27/95	1030	[signature]

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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC SELENASTRUM GROWTH BIOASSAY

DATE: 29 June -95

STANDARD TOXICANT: Zinc Chloride

NOEC =	180.00	ug/l
IC25 =	185.38	ug/l
IC50 =	241.14	ug/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Phytoplankton Growth Test

Start Date:	29 Jun-95	Test ID:	SEL-30	Sample ID:	CA0000000
End Date:	03 Jul-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	29 Jun-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

Conc-µg/L	1	2	3
N Control	548.0	474.0	501.0
100	503.0	443.0	480.0
180	316.0	424.0	439.0
320	77.0	59.0	87.0
560	24.0	12.0	30.0

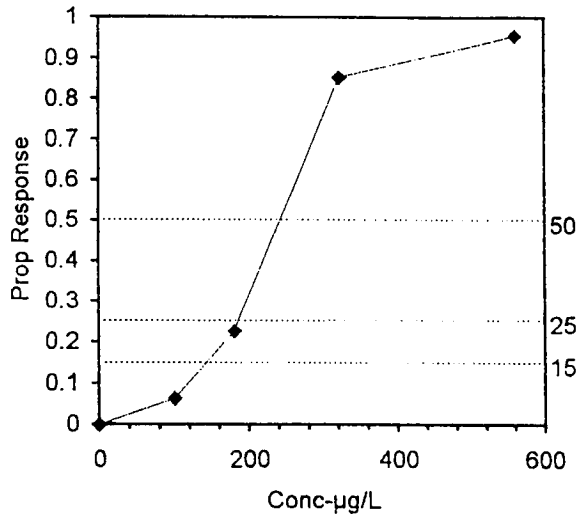
			Log (1+X) Transformed Data					t				
Conc-µg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	507.7	1.000	2.706	2.677	2.740	1.17	3					
100	475.3	0.936	2.677	2.647	2.702	1.04	3	0.335	2.470	0.209		
180	393.0	0.774	2.591	2.501	2.643	3.02	3	1.355	2.470	0.209		
320	74.3	0.146	1.872	1.778	1.944	4.54	3	*9.851	2.470	0.209		
560	22.0	0.043	1.334	1.114	1.491	14.73	3	*16.195	2.470	0.209		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.931	0.835	-0.923	2.1315
Bartlett's Test indicates equality of variance (p = 0.0991)	7.801	13.277		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	180	320	240		201.35	1.1153	0.0108	103.7	3.478	4, 10

		Prop Response	
Conc-µg/L	Iso	N-Mean	N-Iso
N Control	507.7		
100	475.3	0.0637	0.0637
180	393.0	0.2259	0.2259
320	74.3	0.8536	0.8536
560	22.0	0.9567	0.9567

Linear Interpolation(ICp) with 80 bootstrap resamples

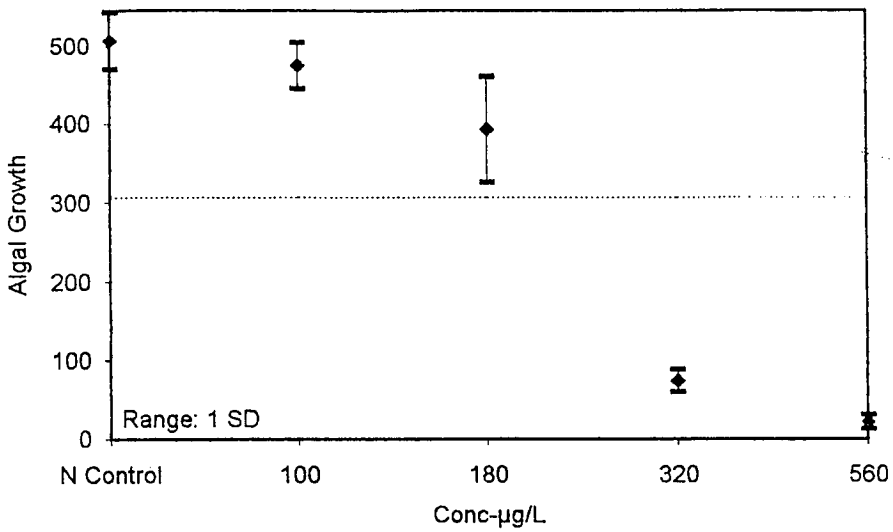


Point	Estimate	SD	95% CL (Exp)		Skew
IC1*	15.70	29.69	0.00	193.96	2.014
IC5*	78.51	22.75	0.00	162.94	-0.429
IC10	117.91	18.59	28.66	193.43	-0.788
IC15	142.57	21.27	67.60	231.77	0.156
IC25	185.38	16.60	105.08	225.07	-1.279
IC40	218.84	13.43	150.47	249.53	-1.586
IC50	241.14	10.64	187.76	267.40	-1.541

Phytoplankton Growth Test

Start Date:	29 Jun-95	Test ID:	SEL-30	Sample ID:	CA0000000
End Date:	03 Jul-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	29 Jun-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

SEL-30-ZNCL Zinc chloride



	Measured	Water Quality Summary					
Conc-µg/L	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.80	25.80	25.80			1
100		25.20	25.20	25.20			1
180		25.20	25.20	25.20			1
320		25.50	25.50	25.50			1
560		25.50	25.50	25.50			1
N Control	pH	7.90	7.90	7.90			1
100		7.90	7.90	7.90			1
180		7.90	7.90	7.90			1
320		7.90	7.90	7.90			1
560		7.90	7.90	7.90			1
N Control	Hardness-mg/L	86.00	86.00	86.00			1
100							
180							
320							
560							
N Control	Alkalinity-mg/L	72.00	72.00	72.00			1
100							
180							
320							
560							

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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC FATHEAD MINNOW SURVIVAL AND GROWTH BIOASSAY

DATE: 27 June -95

STANDARD TOXICANT: Sodium Chloride

ENDPOINT: SURVIVAL

NOEC = 1.80 g/l

IC25 = 2.26 g/l
IC50 = 3.19 g/l

ENDPOINT: GROWTH

NOEC = 1.80 g/l

IC25 = 2.14 g/l
IC50 = 2.91 g/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Larval Fish Survival and Growth Test

Start Date:	27 Jun-95	Test ID:	FHD-47	Sample ID:	CA0000000
End Date:	04 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	1	2	3	4
N Control	0.700	1.000	0.600	0.900
0.56	0.800	0.400	0.800	0.700
1	0.600	0.700	0.600	0.500
1.8	0.800	0.800	0.600	0.700
3.2	0.500	0.400	0.000	0.100
5.6	0.300	0.000	0.200	0.100
10	0.000	0.000	0.000	0.000

			Arcsin Squareroot Transformed Data					t				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.800	1.000	1.135	0.886	1.412	21.13	4				8	40
0.56	0.675	0.844	0.973	0.685	1.107	20.52	4	1.154	2.410	0.338	13	40
1	0.600	0.750	0.887	0.785	0.991	9.47	4	1.763	2.410	0.338	16	40
1.8	0.725	0.906	1.023	0.886	1.107	10.40	4	0.796	2.410	0.338	11	40
3.2	0.250	0.313	0.488	0.159	0.785	60.73	4	*4.609	2.410	0.338	30	40
5.6	0.150	0.188	0.381	0.159	0.580	47.73	4	*5.369	2.410	0.338	34	40
10	0.000	0.000									40	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.970	0.884	-0.215	-0.798
Bartlett's Test indicates equality of variance (p = 0.3927)	5.194	15.086		

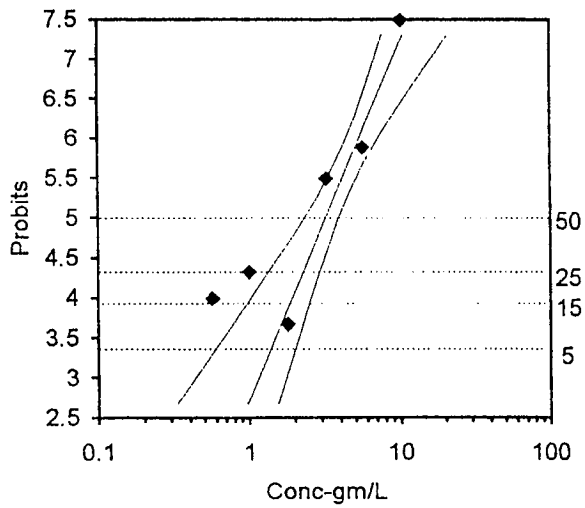
Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	1.8	3.2	2.4		0.3225	0.3767	0.0394	9.5608	2.7729	5, 18

Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	4.5107	0.9609	2.6272	6.3941
Intercept	2.7264	0.6057	1.5391	3.9137
TSCR	0.2884	0.0427	0.2047	0.3722

Point	Probits	gm/L	95% Fiducial Limits	
EC1	2.674	0.973	0.328	1.549
EC5	3.355	1.378	0.591	1.997
EC10	3.718	1.659	0.807	2.292
EC15	3.964	1.881	0.994	2.520
EC25	4.326	2.262	1.348	2.908
EC40	4.747	2.805	1.902	3.468
EC50	5.000	3.192	2.320	3.891
EC60	5.253	3.633	2.796	4.416
EC75	5.674	4.504	3.673	5.659
EC85	6.036	5.418	4.455	7.299
EC90	6.282	6.140	4.997	8.811
EC95	6.645	7.391	5.840	11.814
EC99	7.326	10.466	7.652	20.943

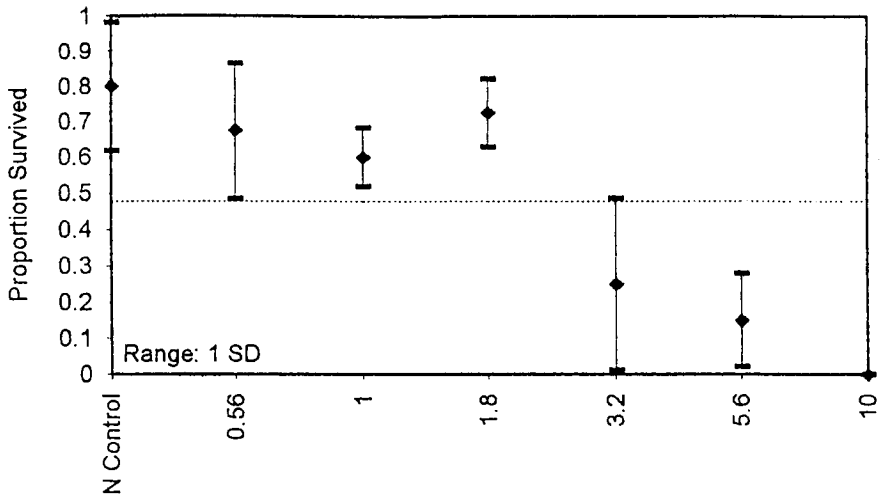
Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.200	7.814	13.277	0.504	0.2217	7



Larval Fish Survival and Growth Test

Start Date:	27 Jun-95	Test ID:	FHD-47	Sample ID:	CA0000000
End Date:	04 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

FHD-47-NACL Sodium chloride



Conc-gm/L	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.53	24.80	25.80	0.37	1.40	8
0.56		24.80	24.20	25.80	0.52	2.10	8
1		24.79	24.20	25.80	0.49	2.00	8
1.8		24.78	24.20	25.80	0.50	2.00	8
3.2		24.76	24.20	25.80	0.50	2.00	8
5.6		24.76	24.20	25.80	0.50	2.00	8
10		24.75	24.50	25.00	0.35	1.40	2
N Control	pH	7.90	7.80	8.00	0.05	0.70	8
0.56		7.84	7.70	8.10	0.15	1.90	8
1		7.84	7.70	8.10	0.15	1.90	8
1.8		7.85	7.80	8.00	0.09	1.20	8
3.2		7.88	7.80	8.00	0.09	1.10	8
5.6		7.93	7.90	8.00	0.05	0.60	8
10		8.00	8.00	8.00	0.00	0.00	2
N Control	Final D.O.-mg/L	8.24	7.80	8.50	0.23	2.70	8
0.56		8.01	7.60	8.30	0.20	2.50	8
1		7.99	7.40	8.30	0.26	3.20	8
1.8		8.01	7.60	8.30	0.21	2.60	8
3.2		8.04	7.40	8.20	0.27	3.30	8
5.6		7.96	7.30	8.20	0.28	3.50	8
10		7.65	7.30	8.00	0.50	6.50	2
N Control	Hardness-mg/L	83.00	80.00	86.00	3.21	3.90	8
0.56							
1							
1.8							
3.2							
5.6							
10							
N Control	Conductivity-umh	143.75	132.00	164.00	12.82	8.90	8
0.56							
1							

Larval Fish Survival and Growth Test

Start Date:	27 Jun-95	Test ID:	FHD-47	Sample ID:	CA0000000
End Date:	04 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

1.8								
3.2								
5.6								
10								
N Control		Alkalinity-mg/L	68.75	60.00	72.00	5.42	7.90	8
0.56								
1								
1.8								
3.2								
5.6								
10								

Larval Fish Survival and Growth Test

Start Date:	27 Jun-95	Test ID:	FHD-47	Sample ID:	CA0000000
End Date:	04 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Growth-Weight

Conc-gm/L	1	2	3	4
N Control	0.520	0.440	0.420	0.400
0.56	0.500	0.400	0.440	0.590
1	0.560	0.400	0.410	0.560
1.8	0.430	0.400	0.400	0.390
3.2	0.250	0.370	0.000	0.140
5.6	0.260	0.000	0.200	0.070
10	0.000	0.000	0.000	0.000

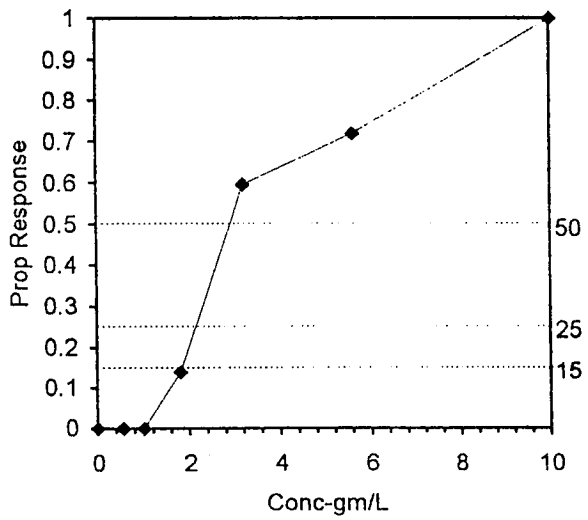
			Untransformed Data					t				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.445	1.000	0.445	0.400	0.520	11.82	4					
0.56	0.483	1.084	0.483	0.400	0.590	17.12	4	-0.792	2.290	0.108		
1	0.483	1.084	0.483	0.400	0.560	18.57	4	-0.792	2.290	0.108		
1.8	0.405	0.910	0.405	0.390	0.430	4.28	4	0.845	2.290	0.108		
3.2	0.190	0.427										
5.6	0.133	0.298										
10	0.000	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.937	0.844	0.3285	-0.87
Bartlett's Test indicates equality of variance (p = 0.1247)	5.745	11.345		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	1.8	3.2			0.1122	0.0055	0.0045	1.2223	3.4903	3, 12

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	0.4700		
0.56	0.4700	-0.0843	0.0000
1	0.4700	-0.0843	0.0000
1.8	0.4050	0.0899	0.1383
3.2	0.1900	0.5730	0.5957
5.6	0.1325	0.7022	0.7181
10	0.0000	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL (Exp)		Skew
IC1	1.0578	0.3709	0.0000	1.1785	-0.933
IC5	1.2892	0.4169	0.0000	2.0203	-0.841
IC10	1.5785	0.4444	0.0000	2.1021	-0.996
IC15	1.8358	0.3380	0.5127	2.1647	-1.001
IC25	2.1419	0.1663	1.6892	2.5686	0.164
IC40	2.6009	0.2049	2.1396	3.2084	0.233
IC50	2.9070	0.6278	2.3338	7.3028	3.522

	Measured	Water Quality Summary					
Conc-gm/L	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.53	24.80	25.80	0.37	1.40	8
0.56		24.80	24.20	25.80	0.52	2.10	8
1		24.79	24.20	25.80	0.49	2.00	8
1.8		24.78	24.20	25.80	0.50	2.00	8
3.2		24.76	24.20	25.80	0.50	2.00	8
5.6		24.76	24.20	25.80	0.50	2.00	8
10		24.75	24.50	25.00	0.35	1.40	2
N Control	pH	7.90	7.80	8.00	0.05	0.70	8
0.56		7.84	7.70	8.10	0.15	1.90	8
1		7.84	7.70	8.10	0.15	1.90	8
1.8		7.85	7.80	8.00	0.09	1.20	8

Larval Fish Survival and Growth Test

Start Date:	27 Jun-95	Test ID:	FHD-47	Sample ID:	CA0000000		
End Date:	04 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride		
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas		
Comments:	Standard Toxicant			Response:	Growth-Weight		

3.2		7.88	7.80	8.00	0.09	1.10	8
5.6		7.93	7.90	8.00	0.05	0.60	8
10		8.00	8.00	8.00	0.00	0.00	2
N Control	Final D.O.-mg/L	8.24	7.80	8.50	0.23	2.70	8
0.56		8.01	7.60	8.30	0.20	2.50	8
1		7.99	7.40	8.30	0.26	3.20	8
1.8		8.01	7.60	8.30	0.21	2.60	8
3.2		8.04	7.40	8.20	0.27	3.30	8
5.6		7.96	7.30	8.20	0.28	3.50	8
10		7.65	7.30	8.00	0.50	6.50	2
N Control	Hardness-mg/L	83.00	80.00	86.00	3.21	3.90	8
0.56							
1							
1.8							
3.2							
5.6							
10							
N Control	Conductivity-umh	143.75	132.00	164.00	12.82	8.90	8
0.56							
1							
1.8							
3.2							
5.6							
10							
N Control	Alkalinity-mg/L	68.75	60.00	72.00	5.42	7.90	8
0.56							
1							
1.8							
3.2							
5.6							
10							

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LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC CERIODAPHNIA SURVIVAL AND REPRODUCTION BIOASSAY

DATE:	27 June -95
STANDARD TOXICANT:	Sodium Chloride
ENDPOINT:	SURVIVAL
NOEC =	1.00 g/l
IC25 =	1.40 g/l
IC50 =	1.80 g/l
ENDPOINT:	REPRODUCTION
NOEC =	0.56 g/l
IC25 =	0.52 g/l
IC50 =	0.87 g/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Ceriodaphnia Survival and Reproduction Test

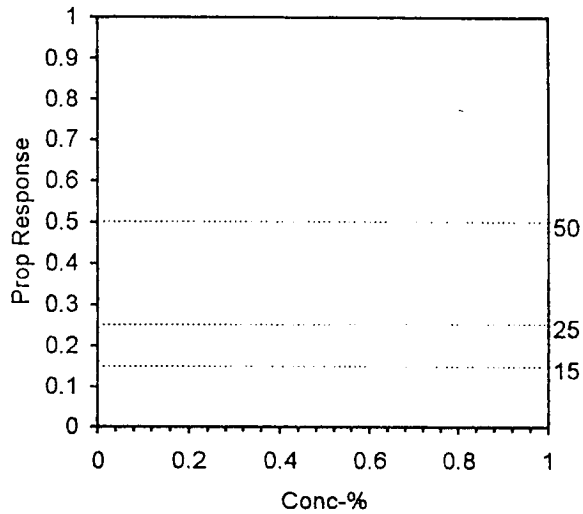
Start Date:	27 Jun-95	Test ID:	CER-69	Sample ID:	CA0000000
End Date:	04 Jul-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	Alive	Dead	Total	Fisher P
N Control	10	0	10	
0.56	10	0	10	1.0000
1	10	0	10	1.0000
1.8	5	5	10	0.0163
3.2	0	10	10	0.0000

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	1	1.8	1.3416	

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	1.000		
0.56	1.000	0.0000	0.0000
1	1.000	0.0000	0.0000
1.8	0.500	0.5000	0.5000
3.2	0.000	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1	1.0160	0.0061	1.0080	1.0267	0.314
IC5	1.0800	0.0305	1.0400	1.1333	0.314
IC10	1.1600	0.0610	1.0800	1.2667	0.314
IC15	1.2400	0.0916	1.1200	1.4000	0.314
IC25	1.4000	0.1526	1.2000	1.6667	0.314
IC40	1.6400	0.2171	1.3200	2.0000	0.147
IC50	1.8000	0.2523	1.4000	2.2000	0.009

	Measured	Water Quality Summary					
Conc-gm/L	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.53	24.80	25.80	0.37	1.40	8
0.56		24.79	24.20	25.80	0.52	2.10	8
1		24.79	24.20	25.80	0.49	2.00	8
1.8		24.90	24.40	25.80	0.45	1.80	8
3.2		24.76	24.20	25.80	0.50	2.00	8
N Control	pH	7.90	7.80	8.00	0.05	0.70	8
0.56		7.88	7.70	8.10	0.18	2.20	8
1		7.83	7.70	8.00	0.13	1.60	8
1.8		7.83	7.80	8.00	0.07	0.90	8
3.2		7.88	7.80	8.00	0.09	1.10	8
N Control	Final D.O.-mg/L	8.24	7.80	8.50	0.23	2.70	8
0.56		8.01	7.60	8.30	0.20	2.50	8
1		7.99	7.40	8.30	0.26	3.20	8
1.8		8.01	7.60	8.30	0.21	2.60	8
3.2		8.04	7.40	8.20	0.27	3.30	8
N Control	Hardness-mg/L	83.00	80.00	86.00	3.21	3.90	8
0.56							
1							
1.8							
3.2							
N Control	Conductivity-umh	143.75	132.00	164.00	12.82	8.90	8
0.56							
1							
1.8							
3.2							

Ceriodaphnia Survival and Reproduction Test

Start Date:	27 Jun-95	Test ID:	CER-69	Sample ID:	CA0000000
End Date:	04 Jul-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Survival

N Control	Alkalinity-mg/L	68.75	60.00	72.00	5.42	7.90	8
0.56							
1							
1.8							
3.2							

Ceriodaphnia Survival and Reproduction Test

Start Date:	27 Jun-95	Test ID:	CER-69	Sample ID:	CA0000000
End Date:	04 Jul-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Reproduction

Conc-gm/L	1	2	3	4	5	6	7	8	9	10
N Control	15.00	17.00	22.00	26.00	15.00	19.00	19.00	16.00	10.00	24.00
0.56	14.00	7.00	7.00	8.00	15.00	5.00	14.00	21.00	23.00	20.00
1	0.00	6.00	8.00	0.00	9.00	4.00	8.00	6.00	12.00	21.00
1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

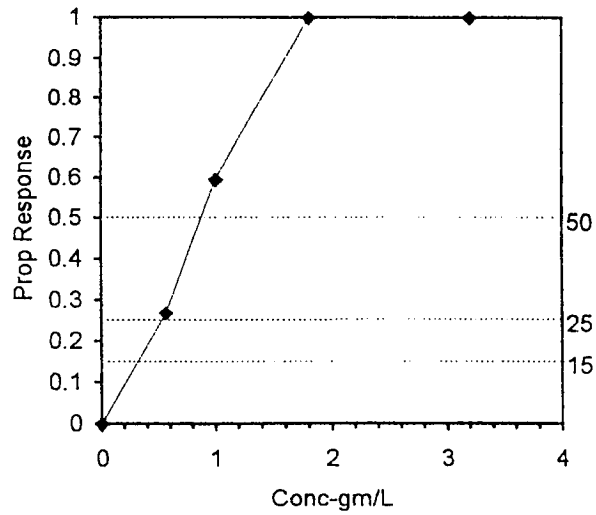
			Untransformed Data					Rank				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	18.30	1.000	18.30	10.00	26.00	26.02	10					
0.56	13.40	0.732	13.40	5.00	23.00	48.39	10	81.0	79.0			
1	7.40	0.404	7.40	0.00	21.00	82.37	10	*63.0	79.0			
1.8	0.00	0.000										
3.2	0.00	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.010)	0.738	0.900	-1.05	-0.446
Bartlett's Test indicates equality of variance (p = 0.6505)	0.860	9.210		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	0.56	1	0.7483	

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	18.30		
0.56	13.40	0.2678	0.2678
1	7.40	0.5956	0.5956
1.8	0.00	1.0000	1.0000
3.2	0.00	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples

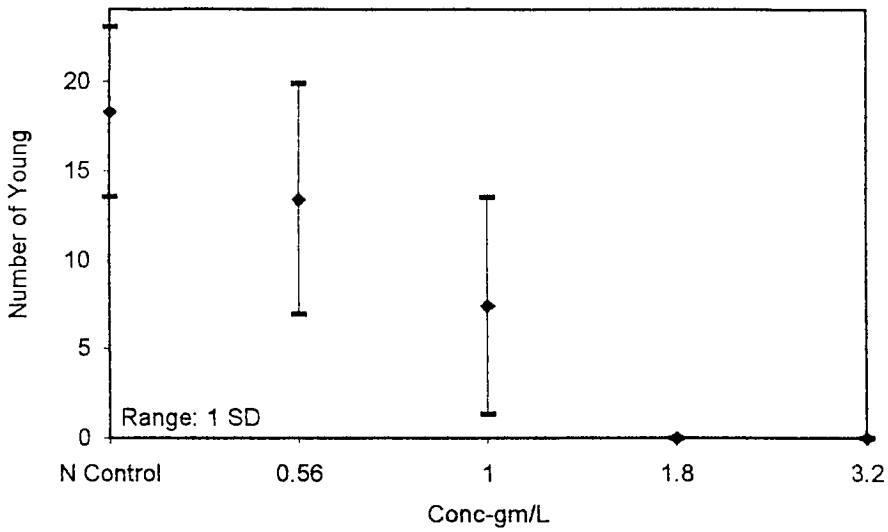


Point	Estimate	SD	95% CL		Skew
IC1*	0.0209	0.1052	0.0131	0.5661	4.768
IC5*	0.1046	0.1211	0.0653	0.5904	2.934
IC10*	0.2091	0.1304	0.1306	0.6207	1.953
IC15*	0.3137	0.1301	0.1959	0.6511	1.187
IC25*	0.5229	0.1350	0.3265	0.7706	0.740
IC40	0.7375	0.1540	0.5224	1.1177	0.963
IC50	0.8717	0.1515	0.6748	1.2314	1.031

Ceriodaphnia Survival and Reproduction Test

Start Date:	27 Jun-95	Test ID:	CER-69	Sample ID:	CA0000000
End Date:	04 Jul-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	27 Jun-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Reproduction

CER-69-NACL Sodium chloride



Conc-gm/L	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.53	24.80	25.80	0.37	1.40	8
0.56		24.79	24.20	25.80	0.52	2.10	8
1		24.79	24.20	25.80	0.49	2.00	8
1.8		24.90	24.40	25.80	0.45	1.80	8
3.2		24.76	24.20	25.80	0.50	2.00	8
N Control	pH	7.90	7.80	8.00	0.05	0.70	8
0.56		7.88	7.70	8.10	0.18	2.20	8
1		7.83	7.70	8.00	0.13	1.60	8
1.8		7.83	7.80	8.00	0.07	0.90	8
3.2		7.88	7.80	8.00	0.09	1.10	8
N Control	Final D.O.-mg/L	8.24	7.80	8.50	0.23	2.70	8
0.56		8.01	7.60	8.30	0.20	2.50	8
1		7.99	7.40	8.30	0.26	3.20	8
1.8		8.01	7.60	8.30	0.21	2.60	8
3.2		8.04	7.40	8.20	0.27	3.30	8
N Control	Hardness-mg/L	83.00	80.00	86.00	3.21	3.90	8
0.56							
1							
1.8							
3.2							
N Control	Conductivity-umh	143.75	132.00	164.00	12.82	8.90	8
0.56							
1							
1.8							
3.2							
N Control	Alkalinity-mg/L	68.75	60.00	72.00	5.42	7.90	8
0.56							
1							
1.8							
3.2							

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ANALYTICAL LABORATORIES
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GEOCHEMICAL ANALYSIS

TEXACO E & P, INC.
P.O. Box 5197-X
Bakersfield, Ca 93388

Attention: Mr. Dave Wright

Sample ID: Cawelo Discharge BioAssay

Sampled: Jun 26, 1995
Submitted: Jun 26, 1995
Reported: Jul 10, 1995

Lab No. 95-0385-1
Project: Cawelo Discharge

Analyzed For:	mg/L	Reacting Value meq/L	RV %
Sodium	153.8	6.69	39.15
Potassium	8.0	0.20	1.20
Ammonium	2.1	0.12	0.68
Calcium	20.4	1.02	5.96
Magnesium	3.4	0.28	1.64
Barium	0.3	0.00	0.03
Strontium	0.4	0.01	0.05
Iron	0.4	--	--
Sulfate	30.1	0.63	3.67
Chloride	142.5	4.02	23.52
Borate	3.9	0.05	0.29
Hydroxide	0.0	0.00	0.00
Carbonate	0.0	0.00	0.00
Bicarbonate	248.4	4.07	23.82
Silica	79.6	--	--
Excess Ionic Strength		-0.45	-2.66
Total Solids	693		
Salinity as NaCl	234		

pH :	8.09	
Hardness :	64.9	mg/L as Calcium Carbonate
Specific Gravity :	0.9999	
Conductivity :	840	µmhos/cm @ 25 °C
Resistivity :	1214.5	ohms cm @ 75 °F
Gypsum Requirement:	11.9	lbs Gypsum / 100 GPM-Hour

3161 Pegasus Drive P.O. Box 80475 Bakersfield, CA 93380-0475
805 392-8811

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GEOCHEMICAL ANALYSIS

TEXACO E & P, INC.
P.O. Box 5197-X
Bakersfield, Ca 93388

Attention: Mr. Dave Wright

Sample ID: Cawelo Discharge BioAssay

Sampled: Jun 28, 1995
Submitted: Jun 28, 1995
Reported: Jul 10, 1995

Lab No. 95-0391-1
Project: Cawelo Discharge

Analyzed For:	mg/L	Reacting Value meq/L	RV %
Sodium	153.0	6.66	39.18
Potassium	7.7	0.20	1.16
Ammonium	1.6	0.09	0.52
Calcium	22.1	1.10	6.49
Magnesium	3.4	0.28	1.65
Barium	0.3	0.00	0.03
Strontium	0.5	0.01	0.07
Iron	0.4	--	--
Sulfate	31.1	0.65	3.81
Chloride	141.8	4.00	23.55
Borate	3.9	0.05	0.29
Hydroxide	0.0	0.00	0.00
Carbonate	0.0	0.00	0.00
Bicarbonate	241.1	3.95	23.26
Silica	81.4	--	--
Excess Ionic Strength		-0.32	-1.89
Total Solids	688		
Salinity as NaCl	233		

pH :	8.06	
Hardness :	69.2	mg/L as Calcium Carbonate
Specific Gravity :	0.9996	
Conductivity :	830	µmhos/cm @ 25 °C
Resistivity :	1228.1	ohms cm @ 75 °F
Gypsum Requirement:	11.0	lbs Gypsum / 100 GPM-Hour

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GEOCHEMICAL ANALYSIS

TEXACO E & P, INC.
P.O. Box 5197-X
Bakersfield, Ca 93388

Attention: Mr. Dave Wright

Sample ID: Cawelo Discharge BioAssay

Sampled: Jun 30, 1995
Submitted: Jun 30, 1995
Reported: Jul 10, 1995

Lab No. 95-0395-1
Project: Cawelo Discharge

Analyzed For:	mg/L	Reacting Value meq/L	RV %
Sodium	132.0	5.74	36.15
Potassium	8.0	0.20	1.29
Ammonium	1.8	0.10	0.63
Calcium	21.0	1.05	6.60
Magnesium	3.9	0.32	2.02
Barium	ND < 0.1	0.00	0.00
Strontium	0.5	0.01	0.07
Iron	0.5	–	–
Sulfate	28.1	0.58	3.68
Chloride	136.5	3.85	24.24
Borate	3.9	0.05	0.31
Hydroxide	0.0	0.00	0.00
Carbonate	0.0	0.00	0.00
Bicarbonate	242.3	3.97	25.00
Silica	64.7	–	–
Excess Ionic Strength		-1.04	-6.55
Total Solids	643		
Salinity as NaCl	225		

pH :	8.24	
Hardness :	68.5	mg/L as Calcium Carbonate
Specific Gravity :	1.0003	
Conductivity :	840	µmhos/cm @ 25 °C
Resistivity :	1220.0	ohms cm @ 75 °F
Gypsum Requirement:	11.2	lbs Gypsum / 100 GPM-Hour

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LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

cc: WKM (EPTD-Bellaire)
T-J Sun (Beacon)
ECJ
J.F. Hall (PRL)
R.L. Schafer
J.L. Jones (Cawlo)

August 11, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfeild, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Discharge
DATE RECEIVED:	25 July -95
ABC LAB. NO.:	TEX0751882

CHRONIC FATHEAD LARVAE SURVIVAL & GROWTH BIOASSAY

SURVIVAL	NOEC =	32.00 %
	TUc =	3.13
	IC25 =	46.48 %
	IC50 =	62.33 %
GROWTH	NOEC =	32.00 %
	TUc =	3.13
	IC25 =	43.77 %
	IC50 =	71.63 %

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Larval Fish Survival and Growth Test

Start Date:	25 Jul-95	Test ID:	TEX0751882	Sample ID:	CA0082295
End Date:	01 Aug-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	25 Jul-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Survival

Conc-%	1	2	3	4
N Control	0.800	0.900	0.900	0.800
10	0.700	0.900	0.800	0.700
18	0.900	0.900	1.000	0.900
32	0.800	0.900	0.700	0.500
56	0.500	0.300	0.800	0.600
100	0.100	0.000	0.200	0.100

			Arcsin Squareroot Transformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.850	1.000	1.178	1.107	1.249	6.95	4				6	40
10	0.775	0.912	1.085	0.991	1.249	11.29	4	0.897	2.410	0.251	9	40
18	0.925	1.088	1.290	1.249	1.412	6.32	4	-1.072	2.410	0.251	3	40
32	0.725	0.853	1.033	0.785	1.249	18.97	4	1.390	2.410	0.251	11	40
56	0.550	0.647	0.840	0.580	1.107	26.12	4	*3.248	2.410	0.251	18	40
100	0.100	0.118	0.316	0.159	0.464	39.37	4	*8.266	2.410	0.251	36	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.977	0.884	0.0091	0.0758
Bartlett's Test indicates equality of variance (p = 0.4768)	4.523	15.086		

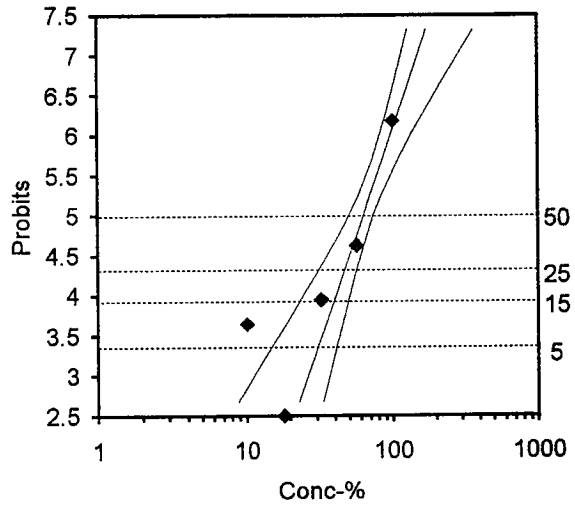
Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	32	56	42.332	3.125	0.2238	0.4846	0.0217	22.302	2.7729	5, 18

Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	5.2929	1.2109	2.9195	7.6663
Intercept	-4.4991	2.2265	-8.863	-0.135
TSCR	0.1609	0.0331	0.096	0.2258

Point	Probits	%	95% Fiducial Limits	
EC1	2.674	22.65	8.75	33.03
EC5	3.355	30.47	14.86	40.86
EC10	3.718	35.69	19.66	45.88
EC15	3.964	39.71	23.70	49.70
EC25	4.326	46.48	31.09	56.18
EC40	4.747	55.82	42.10	65.64
EC50	5.000	62.33	49.84	73.06
EC60	5.253	69.59	58.01	82.71
EC75	5.674	83.58	71.35	106.38
EC85	6.036	97.84	82.38	136.66
EC90	6.282	108.85	89.93	163.47
EC95	6.645	127.48	101.67	214.79
EC99	7.326	171.48	126.51	362.58

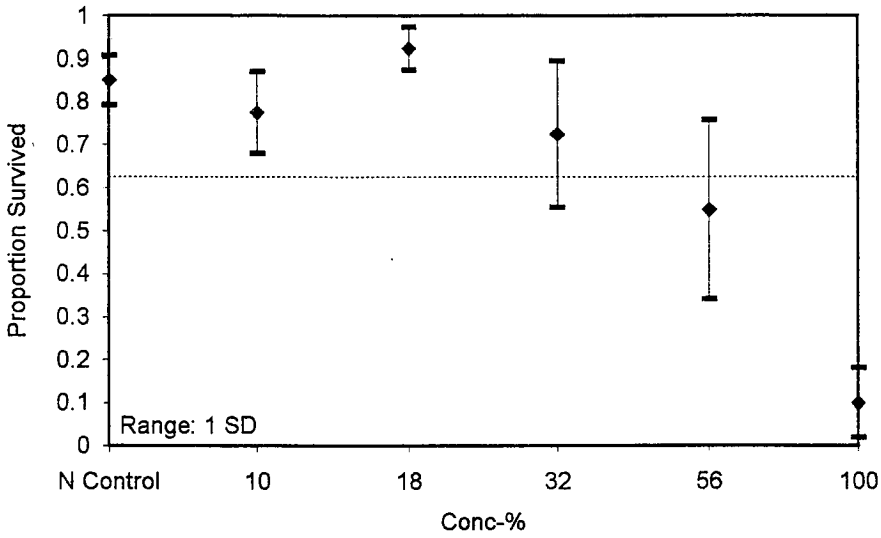
Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.150	4.859	11.345	1.795	0.1889	5



Larval Fish Survival and Growth Test

Start Date:	25 Jul-95	Test ID:	TEX0751882	Sample ID:	CA0082295
End Date:	01 Aug-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	25 Jul-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Survival

TEX0751882-EFF1 POTW



Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.60	25.00	25.80	0.28	1.10	8
10		25.46	25.00	25.80	0.33	1.30	8
18		25.43	25.00	25.80	0.30	1.20	8
32		25.40	25.00	25.80	0.31	1.20	8
56		25.40	25.00	25.80	0.31	1.20	8
100		25.38	25.00	25.80	0.31	1.20	8
N Control	pH	8.01	7.90	8.10	0.06	0.80	8
10		7.94	7.80	8.00	0.07	0.90	8
18		7.91	7.80	8.00	0.06	0.80	8
32		7.84	7.70	8.00	0.09	1.20	8
56		7.76	7.60	8.00	0.12	1.50	8
100		7.73	7.60	8.00	0.13	1.70	8
N Control	Final D.O.-mg/L	7.89	7.30	8.20	0.27	3.40	8
10		7.64	7.30	7.90	0.20	2.60	8
18		7.66	7.30	8.10	0.25	3.20	8
32		7.59	7.20	7.80	0.18	2.40	8
56		7.58	7.00	8.00	0.28	3.60	8
100		7.60	7.10	8.00	0.26	3.40	8
N Control	Hardness-mg/L	81.25	80.00	85.00	2.32	2.80	8
10							
18							
32							
56							
100		100.25	99.00	102.00	1.17	1.20	8
N Control	Alkalinity-mg/L	65	60	67	3	5	8
10							
18							
32							
56							
100		239	238	240	1	0	8

Larval Fish Survival and Growth Test

Start Date:	25 Jul-95	Test ID:	TEX0751882	Sample ID:	CA0082295
End Date:	01 Aug-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	25 Jul-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Growth-Weight

Conc-%	1	2	3	4
N Control	0.290	0.290	0.250	0.240
10	0.210	0.220	0.310	0.240
18	0.260	0.220	0.280	0.250
32	0.220	0.220	0.220	0.270
56	0.220	0.160	0.170	0.120
100	0.040	0.000	0.080	0.170

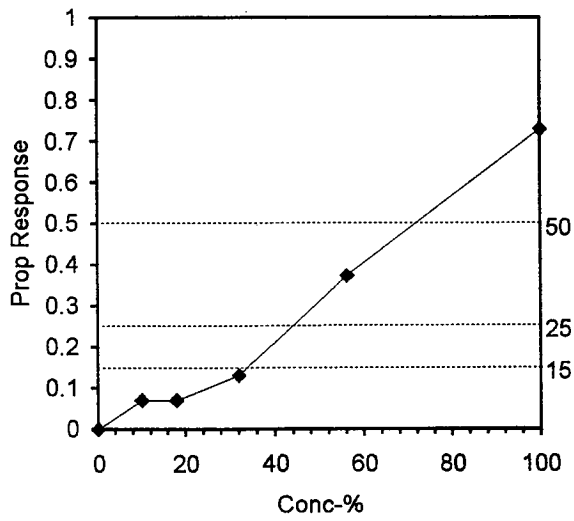
			Untransformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.268	1.000	0.268	0.240	0.290	9.83	4					
10	0.245	0.916	0.245	0.210	0.310	18.41	4	1.009	2.290	0.051		
18	0.253	0.944	0.253	0.220	0.280	9.90	4	0.673	2.290	0.051		
32	0.233	0.869	0.233	0.220	0.270	10.75	4	1.570	2.290	0.051		
56	0.168	0.626										
100	0.073	0.271										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.928	0.844	0.8374	0.179
Bartlett's Test indicates equality of variance (p = 0.6795)	1.512	11.345		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	32	56		3.125	0.0531	0.0009	0.001	0.8616	3.4903	3, 12

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	0.2675		
10	0.2488	0.0841	0.0701
18	0.2488	0.0561	0.0701
32	0.2325	0.1308	0.1308
56	0.1675	0.3738	0.3738
100	0.0725	0.7290	0.7290

Linear Interpolation(ICp) with 80 bootstrap resamples

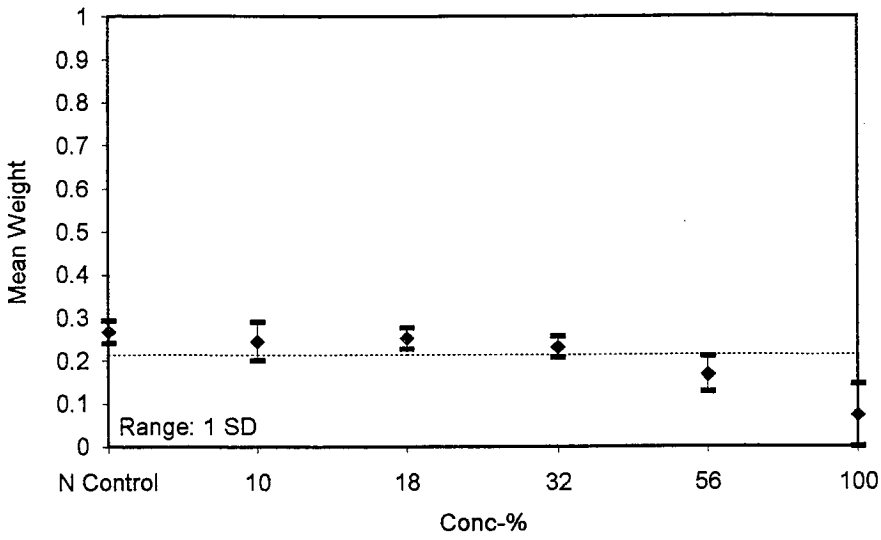


Point	Estimate	SD	95% CL (Exp)		Skew
IC1*	1.427	7.804	0.234	51.361	2.218
IC5*	7.133	9.432	1.171	52.004	1.156
IC10	24.892	9.958	0.000	47.975	0.035
IC15	33.892	9.485	0.000	56.047	-0.179
IC25	43.769	-	-	-	-
IC40	59.242	-	-	-	-
IC50	71.632	-	-	-	-

Larval Fish Survival and Growth Test

Start Date:	25 Jul-95	Test ID:	TEX0751882	Sample ID:	CA0082295
End Date:	01 Aug-95	Protocol ID:	EPAM 87	Sample Type:	EFF1 POTW
Sample Date:	25 Jul-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	C. Discharge			Response:	Growth-Weight

TEX0751882-EFF1 POTW



Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.60	25.00	25.80	0.28	1.10	8
10		25.46	25.00	25.80	0.33	1.30	8
18		25.43	25.00	25.80	0.30	1.20	8
32		25.40	25.00	25.80	0.31	1.20	8
56		25.40	25.00	25.80	0.31	1.20	8
100		25.38	25.00	25.80	0.31	1.20	8
N Control	pH	8.01	7.90	8.10	0.06	0.80	8
10		7.94	7.80	8.00	0.07	0.90	8
18		7.91	7.80	8.00	0.06	0.80	8
32		7.84	7.70	8.00	0.09	1.20	8
56		7.76	7.60	8.00	0.12	1.50	8
100		7.73	7.60	8.00	0.13	1.70	8
N Control	Final D.O.-mg/L	7.89	7.30	8.20	0.27	3.40	8
10		7.64	7.30	7.90	0.20	2.60	8
18		7.66	7.30	8.10	0.25	3.20	8
32		7.59	7.20	7.80	0.18	2.40	8
56		7.58	7.00	8.00	0.28	3.60	8
100		7.60	7.10	8.00	0.26	3.40	8
N Control	Hardness-mg/L	81.25	80.00	85.00	2.32	2.80	8
10							
18							
32							
56							
100		100.25	99.00	102.00	1.17	1.20	8
N Control	Alkalinity-mg/L	65	60	67	3	5	8
10							
18							
32							
56							
100		239	238	240	1	0	8

AQUATIC
BIOASSAY &
CONSULTING
LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

August 11, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Discharge
DATE RECEIVED:	25 July -95
ABC LAB. NO.:	TEX0751882

CHRONIC CERIODAPHNIA SURVIVAL & REPRODUCTION BIOASSAY

SURVIVAL	NOEC =	100.00 %
	TUc =	1.00
	IC25 =	>100.00 %
	IC50 =	>100.00 %
REPRODUCTION	NOEC =	18.00 %
	TUc =	5.56
	IC25 =	18.20 %
	IC50 =	26.87 %

Very truly yours,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Ceriodaphnia Survival and Reproduction Test

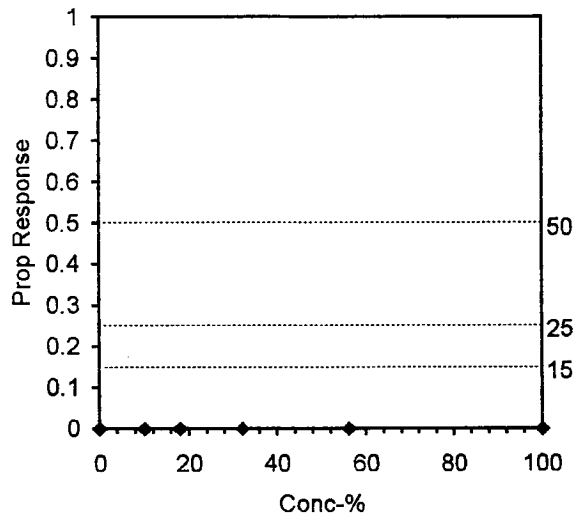
Start Date:	25 Jul-95	Test ID:	TEX0751882	Sample ID:	CA0082295
End Date:	01 Aug-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	25 Jul-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Survival

Conc-%	Alive	Dead	Total	Fisher P
N Control	9	1	10	
10	10	0	10	0.5000
18	10	0	10	0.5000
32	8	2	10	0.5000
56	10	0	10	0.5000
100	9	1	10	0.7632

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	0.9667		
10	0.9667	-0.1111	0.0000
18	0.9667	-0.1111	0.0000
32	0.9000	0.1111	0.0690
56	0.9000	-0.1111	0.0690
100	0.9000	0.0000	0.0690

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1	20.030	-	-	-	-
IC5	28.150	-	-	-	-
IC10	>100	-	-	-	-
IC15	>100	-	-	-	-
IC25	>100	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

	Measured	Water Quality Summary					
Conc-%	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.60	25.00	25.80	0.28	1.10	8
10		25.46	25.00	25.80	0.33	1.30	8
18		25.43	25.00	25.80	0.30	1.20	8
32		25.40	25.00	25.80	0.31	1.20	8
56		25.40	25.00	25.80	0.31	1.20	8
100		25.38	25.00	25.80	0.31	1.20	8
N Control	pH	8.01	7.90	8.10	0.06	0.80	8
10		7.94	7.80	8.00	0.07	0.90	8
18		7.91	7.80	8.00	0.06	0.80	8
32		7.84	7.70	8.00	0.09	1.20	8
56		7.76	7.60	8.00	0.12	1.50	8
100		7.73	7.60	8.00	0.13	1.70	8
N Control	Final D.O.-mg/L	7.89	7.30	8.20	0.27	3.40	8
10		7.64	7.30	7.90	0.20	2.60	8
18		7.66	7.30	8.10	0.25	3.20	8
32		7.59	7.20	7.80	0.18	2.40	8
56		7.58	7.00	8.00	0.28	3.60	8
100		7.60	7.10	8.00	0.26	3.40	8
N Control	Hardness-mg/L	81.25	80.00	85.00	2.32	2.80	8
10							
18							
32							
56							
100		100.25	99.00	102.00	1.17	1.20	8

Ceriodaphnia Survival and Reproduction Test

Start Date:	25 Jul-95	Test ID:		TEX0751882		Sample ID:		CA0082295
End Date:	01 Aug-95	Protocol ID:		EPAF 91		Sample Type:		EFF2 Industrial
Sample Date:	25 Jul-95	Analyst Name:		F. Marcelino		Test Species:		CD Ceriodaphnia dubia
Comments:	C. Discharge					Response:		Survival
N Control	Conductivity-umh	124	120	130	3	3	8	
10		258	222	305	29	11	8	
18		313	298	359	20	7	8	
32		422	411	452	14	3	8	
56		612	589	679	28	5	8	
100		933	912	965	17	2	8	
N Control	Alkalinity-mg/L	65.00	60.00	67.00	3.12	4.80	8	
10								
18								
32								
56								
100		239.00	238.00	240.00	1.07	0.40	8	

Ceriodaphnia Survival and Reproduction Test

Start Date:	25 Jul-95	Test ID:	TEX0751882	Sample ID:	CA0082295
End Date:	01 Aug-95	Protocol ID:	EPAF 91	Sample Type:	EFF2 Industrial
Sample Date:	25 Jul-95	Analyst Name:	F. Marcelino	Test Species:	CD Ceriodaphnia dubia
Comments:	C. Discharge			Response:	Reproduction

Conc-%	1	2	3	4	5	6	7	8	9	10
N Control	15.00	17.00	16.00	15.00	19.00	8.00	14.00	17.00	23.00	17.00
10	20.00	16.00	24.00	20.00	20.00	14.00	20.00	18.00	18.00	21.00
18	15.00	12.00	18.00	6.00	15.00	19.00	13.00	9.00	13.00	13.00
32	16.00	7.00	2.00	2.00	8.00	0.00	0.00	2.00	3.00	22.00
56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

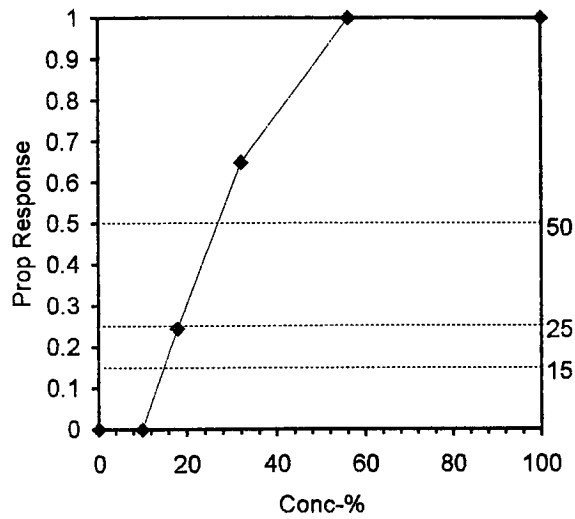
			Untransformed Data					Rank				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	16.10	1.000	16.10	8.00	23.00	23.69	10					
10	19.10	1.186	19.10	14.00	24.00	14.49	10	132.0	77.0			
18	13.30	0.826	13.30	6.00	19.00	29.02	10	82.5	77.0			
32	6.20	0.385	6.20	0.00	22.00	118.96	10	*69.0	77.0			
56	0.00	0.000										
100	0.00	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.010)	0.721	0.919	-1.368	0.7064
Bartlett's Test indicates equality of variance (p = 0.0228)	9.546	11.345		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	18	32	24	5.5556

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	17.60		
10	17.60	-0.1863	0.0000
18	13.30	0.1739	0.2443
32	6.20	0.6149	0.6477
56	0.00	1.0000	1.0000
100	0.00	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1	10.327	0.221	10.216	10.994	2.683
IC5	11.637	1.107	11.082	14.968	2.683
IC10	13.274	2.635	12.165	18.806	4.615
IC15	14.912	4.104	13.247	32.370	3.141
IC25	18.197	5.045	15.412	35.150	2.291
IC40	23.403	5.174	19.307	39.320	2.102
IC50	26.873	4.937	23.214	42.100	2.224

	Measured	Water Quality Summary					
Conc-%	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.60	25.00	25.80	0.28	1.10	8
10		25.46	25.00	25.80	0.33	1.30	8
18		25.43	25.00	25.80	0.30	1.20	8
32		25.40	25.00	25.80	0.31	1.20	8
56		25.40	25.00	25.80	0.31	1.20	8
100		25.38	25.00	25.80	0.31	1.20	8
N Control	pH	8.01	7.90	8.10	0.06	0.80	8
10		7.94	7.80	8.00	0.07	0.90	8
18		7.91	7.80	8.00	0.06	0.80	8
32		7.84	7.70	8.00	0.09	1.20	8
56		7.76	7.60	8.00	0.12	1.50	8
100		7.73	7.60	8.00	0.13	1.70	8
N Control	Final D.O.-mg/L	7.89	7.30	8.20	0.27	3.40	8

Ceriodaphnia Survival and Reproduction Test

Start Date:	25 Jul-95	Test ID:		TEX0751882		Sample ID:		CA0082295
End Date:	01 Aug-95	Protocol ID:		EPAF 91		Sample Type:		EFF2 Industrial
Sample Date:	25 Jul-95	Analyst Name:		F. Marcelino		Test Species:		CD Ceriodaphnia dubia
Comments:	C. Discharge					Response:		Reproduction
10			7.64	7.30	7.90	0.20	2.60	8
18			7.66	7.30	8.10	0.25	3.20	8
32			7.59	7.20	7.80	0.18	2.40	8
56			7.58	7.00	8.00	0.28	3.60	8
100			7.60	7.10	8.00	0.26	3.40	8
N Control		Hardness-mg/L	81.25	80.00	85.00	2.32	2.80	8
10								
18								
32								
56								
100			100.25	99.00	102.00	1.17	1.20	8
N Control		Conductivity-umh	124	120	130	3	3	8
10			258	222	305	29	11	8
18			313	298	359	20	7	8
32			422	411	452	14	3	8
56			612	589	679	28	5	8
100			933	912	965	17	2	8
N Control		Alkalinity-mg/L	65.00	60.00	67.00	3.12	4.80	8
10								
18								
32								
56								
100			239.00	238.00	240.00	1.07	0.40	8

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LABORATORIES, INC.

TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

August 09, 1995

Mr. Dave Wright
TEXACO
P.O. Box 519TX
Bakersfield, CA 93388

Dear Mr. Wright:

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 Freshwater Organisms" EPA/4-89/001. Results were as follows:

CLIENT:	TEXACO
SAMPLE I.D.:	C. Discharge
DATE RECEIVED:	27 July -95
ABC LAB. NO.:	TEX0751941

CHRONIC SELENASTRUM ALGAE GROWTH BIOASSAY

NOEC =	100.00 %
TUc =	1.00
IC25 =	>100.00 %
IC50 =	>100.00 %

Very truly yours,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Phytoplankton Growth Test

Start Date:	27 Jul-95	Test ID:	TEX0751941	Sample ID:	CA0082295
End Date:	31 Jul-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	27 Jul-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Discharge			Response:	Cell Density

Conc-%	1	2	3
N Control	191.0	202.0	209.0
10	371.0	368.0	355.0
18	432.0	444.0	411.0
32	422.0	319.0	374.0
56	343.0	373.0	416.0
100	337.0	353.0	368.0

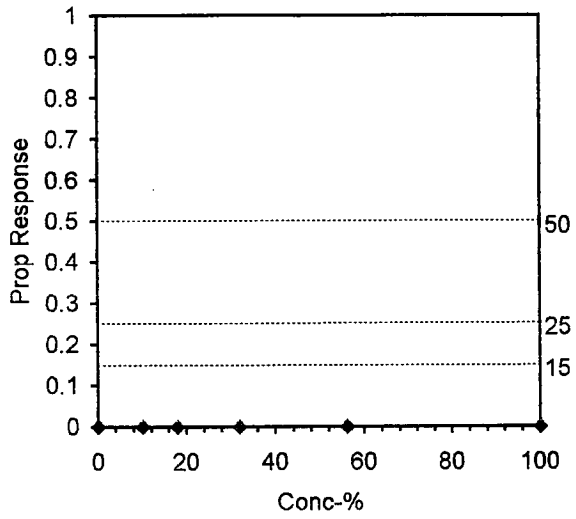
			Log (1+X) Transformed Data					t				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	200.7	1.000	2.304	2.283	2.322	0.85	3					
10	364.7	1.817	2.563	2.551	2.571	0.40	3	-9.558	2.500	0.068		
18	429.0	2.138	2.633	2.615	2.648	0.64	3	-12.154	2.500	0.068		
32	371.7	1.852	2.569	2.505	2.626	2.37	3	-9.761	2.500	0.068		
56	377.3	1.880	2.577	2.537	2.620	1.63	3	-10.057	2.500	0.068		
100	352.7	1.757	2.548	2.529	2.567	0.75	3	-9.015	2.500	0.068		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.962	0.858	-0.152	1.1573
Bartlett's Test indicates equality of variance (p = 0.2215)	6.989	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	100	>100		1	30.166	0.04	0.0011	36.386	3.1059	5, 12

		Prop Response	
Conc-%	Iso	N-Mean	N-Iso
N Control	349.3		
10	349.3	-0.8173	0.0000
18	349.3	-1.1379	0.0000
32	349.3	-0.8522	0.0000
56	349.3	-0.8804	0.0000
100	349.3	-0.7575	0.0000

Linear Interpolation(ICp) with
80 bootstrap resamples

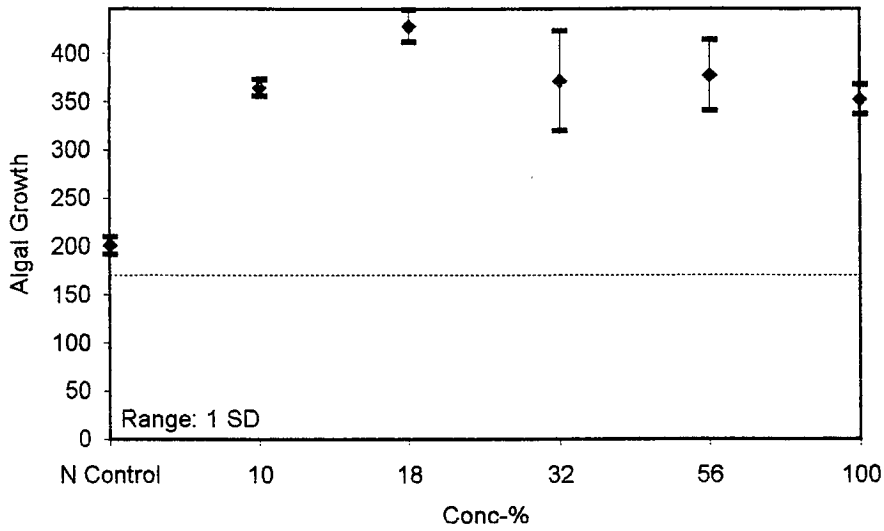


Point	Estimate	SD	95% CL (Exp)		Skew
IC1	>100	-	-	-	-
IC5	>100	-	-	-	-
IC10	>100	-	-	-	-
IC15	>100	-	-	-	-
IC25	>100	-	-	-	-
IC40	>100	-	-	-	-
IC50	>100	-	-	-	-

Phytoplankton Growth Test

Start Date:	27 Jul-95	Test ID:	TEX0751941	Sample ID:	CA0082295
End Date:	31 Jul-95	Protocol ID:	EPAF 89	Sample Type:	EFF1 POTW
Sample Date:	27 Jul-95	Analyst Name:	M.Meyer	Test Species:	SC Selenastrum capricornutum
Comments:	C. Discharge			Response:	Cell Density

TEX0751941-EFF1 POTW



Conc-%	Measured Parameters	Water Quality Summary Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.00	25.00	25.00			1
10		25.00	25.00	25.00			1
18		25.00	25.00	25.00			1
32		25.00	25.00	25.00			1
56		24.80	24.80	24.80			1
100		24.80	24.80	24.80			1
N Control	pH	7.80	7.80	7.80			1
10		7.90	7.90	7.90			1
18		7.90	7.90	7.90			1
32		7.80	7.80	7.80			1
56		7.80	7.80	7.80			1
100		7.60	7.60	7.60			1
N Control	Hardness-mg/L	80.00	80.00	80.00			1
10							
18							
32							
56							
100		100.00	100.00	100.00			1
N Control	Alkalinity-mg/L	67.00	67.00	67.00			1
10							
18							
32							
56							
100		238.00	238.00	238.00			1

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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC SELENASTRUM GROWTH BIOASSAY

DATE: 25 July -95

STANDARD TOXICANT: Zinc Chloride

NOEC =	180.00	ug/l
IC25 =	251.26	ug/l
IC50 =	339.73	ug/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Phytoplankton Growth Test

Start Date:	27 Jul-95	Test ID:	SEL-32	Sample ID:	CA0000000
End Date:	31 Jul-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	27 Jul-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

Conc-µg/L	1	2	3
N Control	191.0	202.0	209.0
100	266.0	225.0	225.0
180	256.0	233.0	233.0
320	114.0	117.0	115.0
560	88.0	93.0	92.0

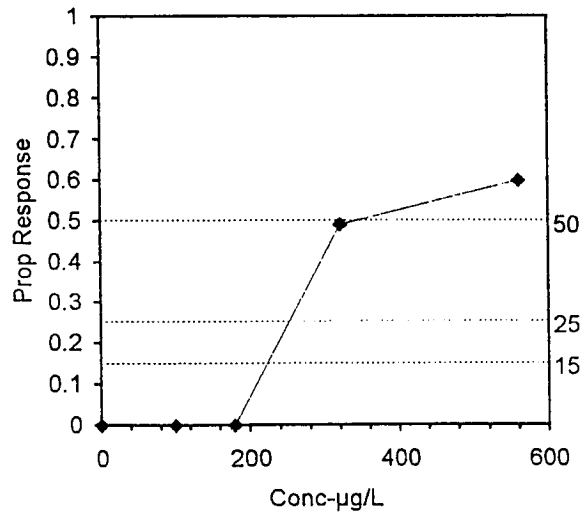
			Log (1+X) Transformed Data					t				
Conc-µg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	200.7	1.000	2.304	2.283	2.322	0.85	3					
100	238.7	1.189	2.378	2.354	2.427	1.76	3	-3.773	2.470	0.048		
180	240.7	1.199	2.383	2.369	2.410	0.99	3	-4.006	2.470	0.048		
320	115.3	0.575	2.066	2.061	2.072	0.28	3	*12.186	2.470	0.048		
560	91.0	0.453	1.964	1.949	1.973	0.64	3	*17.394	2.470	0.048		

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.928	0.835	0.9293	0.8294
Bartlett's Test indicates equality of variance (p = 0.2124)	5.827	13.277		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	180	320	240		22.22	0.1111	0.0006	193.14	3.478	4, 10

		Prop Response	
Conc-µg/L	Iso	N-Mean	N-Iso
N Control	226.7		
100	226.7	-0.1894	0.0000
180	226.7	-0.1993	0.0000
320	115.3	0.4252	0.4912
560	91.0	0.5465	0.5985

Linear Interpolation(ICp) with 80 bootstrap resamples

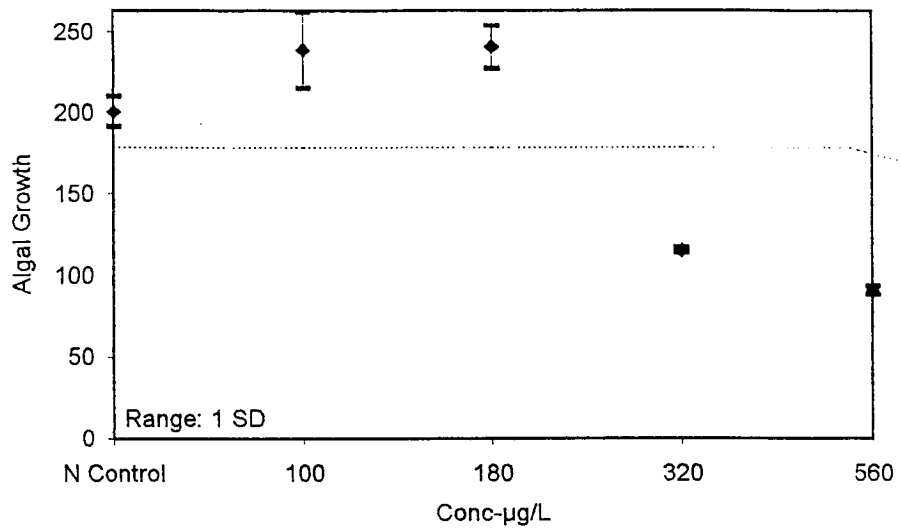


Point	Estimate	SD	95% CL (Exp)		Skew
IC1	182.85	0.09	182.43	183.06	-2.909
IC5	194.25	0.31	192.64	195.29	-0.620
IC10	208.50	0.60	206.08	210.59	-0.544
IC15	222.75	0.89	219.25	225.88	-0.537
IC25	251.26	1.48	245.42	256.47	-0.537
IC40	294.01	2.36	284.67	302.35	-0.539
IC50	339.73	16.53	291.90	418.35	0.480

Phytoplankton Growth Test

Start Date:	27 Jul-95	Test ID:	SEL-32	Sample ID:	CA0000000
End Date:	31 Jul-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	27 Jul-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

SEL-32-ZNCL Zinc chloride



Phytoplankton Growth Test

Start Date:	27 Jul-95	Test ID:	SEL-32	Sample ID:	CA0000000
End Date:	31 Jul-95	Protocol ID:	EPAF 89	Sample Type:	ZNCL Zinc chloride
Sample Date:	27 Jul-95	Analyst Name:	F. Marcelino	Test Species:	SC Selenastrum capricornutum
Comments:	Standard Toxicant			Response:	Cell Density

Conc-µg/L	Measured Parameters	Water Quality Summary					
		Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.00	25.00	25.00			1
100		25.00	25.00	25.00			1
180		25.00	25.00	25.00			1
320		25.00	25.00	25.00			1
560		25.00	25.00	25.00			1
N Control	pH	8.00	8.00	8.00			1
100		8.00	8.00	8.00			1
180		8.00	8.00	8.00			1
320		8.00	8.00	8.00			1
560		8.00	8.00	8.00			1
N Control	Hardness-mg/L	85.00	85.00	85.00			1
100							
180							
320							
560							
N Control	Alkalinity-mg/L	67.00	67.00	67.00			1
100							
180							
320							
560							

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TOXICITY TESTING • OCEANOGRAPHIC RESEARCH

CHRONIC FATHEAD MINNOW SURVIVAL AND GROWTH BIOASSAY

DATE: 25 July -95

STANDARD TOXICANT: Sodium Chloride

ENDPOINT: SURVIVAL

NOEC = 0.56 g/l

IC25 = 0.40 g/l
IC50 = 0.93 g/l

ENDPOINT: GROWTH

NOEC = 1.80 g/l

IC25 = 1.11 g/l
IC50 = 2.32 g/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Larval Fish Survival and Growth Test

Start Date:	18 Jul-95	Test ID:	FHD-49	Sample ID:	CA0000000
End Date:	25 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	18 Jul-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	1	2	3	4
N Control	0.800	0.900	0.900	0.800
0.56	0.300	1.000	0.800	1.000
1	0.300	0.100	0.400	0.100
1.8	0.300	0.000	0.200	0.100
3.2	0.000	0.000	0.200	0.300
5.6	0.200	0.200	0.200	0.100
10	0.000	0.000	0.000	0.000

			Arcsin Squareroot Transformed Data					t				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Stat	Critical	MSD	NRESP	NDOSE
N Control	0.850	1.000	1.178	1.107	1.249	6.95	4				6	40
0.56	0.775	0.912	1.128	0.580	1.412	34.82	4	0.330	2.410	0.368	9	40
1	0.225	0.265	0.477	0.322	0.685	38.64	4	*4.598	2.410	0.368	31	40
1.8	0.150	0.176	0.381	0.159	0.580	47.73	4	*5.227	2.410	0.368	34	40
3.2	0.125	0.147	0.340	0.159	0.580	63.13	4	*5.495	2.410	0.368	35	40
5.6	0.175	0.206	0.428	0.322	0.464	16.57	4	*4.918	2.410	0.368	33	40
10	0.000	0.000									40	40

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.945	0.884	-0.794	1.526
Bartlett's Test indicates equality of variance (p = 0.0865)	9.627	15.086		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU	MSDu	MSB	MSE	F	Critical	df
Dunnett's Multiple Comparison	0.56	1	0.7483		0.3413	0.6035	0.0465	12.977	2.7729	5, 18

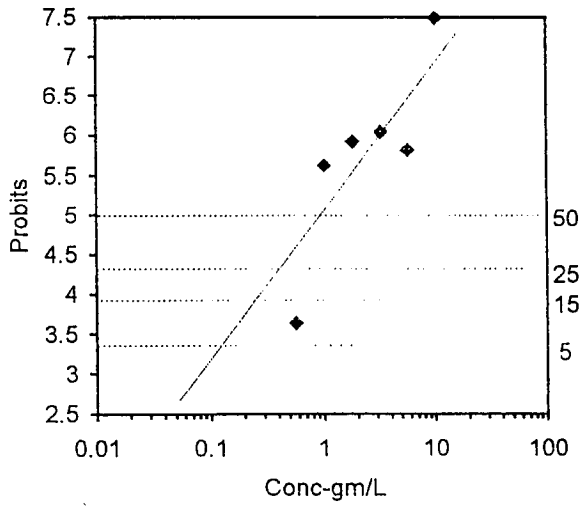
Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	1.8751	0.7387	-0.176	3.926
Intercept	5.0633	0.3547	4.0784	6.0481
TSCR	0.1361	0.1299	-0.225	0.4968

Warning: significant heterogeneity
Slope not significantly different from zero

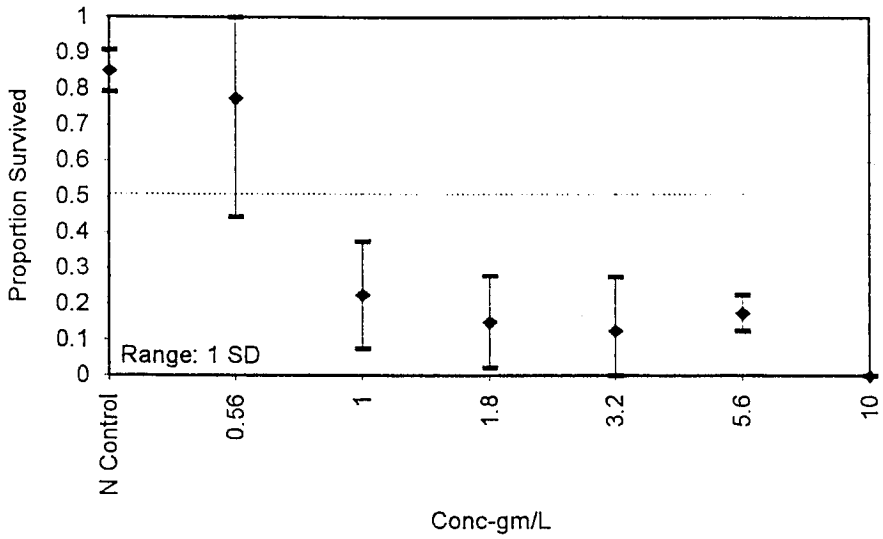
Point	Probits	gm/L	95% Fiducial Limits	
EC1	2.674	0.053	#N/A	#N/A
EC5	3.355	0.123	#N/A	#N/A
EC10	3.718	0.192	#N/A	#N/A
EC15	3.964	0.259	#N/A	#N/A
EC25	4.326	0.404	#N/A	#N/A
EC40	4.747	0.678	#N/A	#N/A
EC50	5.000	0.925	#N/A	#N/A
EC60	5.253	1.263	#N/A	#N/A
EC75	5.674	2.118	#N/A	#N/A
EC85	6.036	3.304	#N/A	#N/A
EC90	6.282	4.464	#N/A	#N/A
EC95	6.645	6.974	#N/A	#N/A
EC99	7.326	16.104	#N/A	#N/A

Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.150	24.440	13.277	-0.034	0.5333	3



Larval Fish Survival and Growth Test					
Start Date:	18 Jul-95	Test ID:	FHD-49	Sample ID:	CA0000000
End Date:	25 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	18 Jul-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Survival

FHD-49-NACL Sodium chloride



Larval Fish Survival and Growth Test

Start Date:	18 Jul-95	Test ID:	FHD-49	Sample ID:	CA0000000
End Date:	25 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	18 Jul-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Growth-Weight

	Measured	Water Quality Summary					
Conc-gm/L	Parameters	Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.60	25.00	25.80	0.28	1.10	8
0.56		25.24	24.40	25.50	0.39	1.50	8
1		25.24	24.40	25.50	0.39	1.50	8
1.8		25.25	24.50	25.50	0.36	1.40	8
3.2		25.25	24.50	25.50	0.36	1.40	8
5.6		25.25	24.50	25.50	0.36	1.40	8
10		25.00	25.00	25.00	0.00	0.00	2
N Control	pH	8.03	7.90	8.10	0.07	0.90	8
0.56		7.99	7.90	8.00	0.04	0.40	8
1		7.99	7.90	8.00	0.04	0.40	8
1.8		7.93	7.90	8.00	0.05	0.60	8
3.2		7.90	7.90	7.90	0.00	0.00	8
5.6		7.91	7.90	8.00	0.04	0.40	8
10		7.90	7.90	7.90	0.00	0.00	2
N Control	Final D.O.-mg/L	7.89	7.30	8.20	0.27	3.40	8
0.56		7.54	7.30	7.60	0.11	1.40	8
1		7.58	7.30	7.80	0.15	2.00	8
1.8		7.60	7.30	7.90	0.19	2.40	8
3.2		7.58	7.40	7.80	0.12	1.50	8
5.6		7.55	7.40	7.60	0.08	1.00	8
10		7.50	7.50	7.50	0.00	0.00	2
N Control	Hardness-mg/L	81.25	80.00	85.00	2.32	2.80	8
0.56							
1							
1.8							
3.2							
5.6							
10							
N Control	Conductivity-umh	123.50	120.00	130.00	3.34	2.70	8
0.56							
1							
1.8							
3.2							
5.6							
10							
N Control	Alkalinity-mg/L	65.00	60.00	67.00	3.12	4.80	8
0.56							
1							
1.8							
3.2							
5.6							
10							

Larval Fish Survival and Growth Test

Start Date:	18 Jul-95	Test ID:	FHD-49	Sample ID:	CA0000000
End Date:	25 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	18 Jul-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Growth-Weight

Conc-gm/L	1	2	3	4
N Control	0.290	0.290	0.250	0.240
0.56	0.290	0.240	0.360	0.290
1	0.180	0.130	0.300	0.260
1.8	0.290	0.000	0.280	0.100
3.2	0.000	0.000	0.030	0.090
5.6	0.150	0.200	0.140	0.150
10	0.000	0.000	0.000	0.000

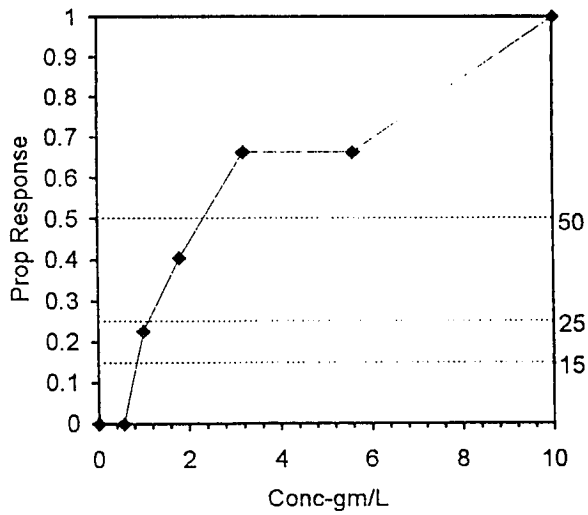
			Untransformed Data					Rank				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	0.268	1.000	0.268	0.240	0.290	9.83	4					
0.56	0.295	1.103	0.295	0.240	0.360	16.72	4	20.5	10.0			
1	0.218	0.813	0.218	0.130	0.300	35.29	4	16.0	10.0			
1.8	0.168	0.626	0.168	0.000	0.290	84.62	4	15.0	10.0			
3.2	0.030	0.112	0.030	0.000	0.090	141.42	4	*10.0	10.0			
5.6	0.160	0.598	0.160	0.140	0.200	16.93	4	*10.0	10.0			
10	0.000	0.000	0.000	0.000	0.000	0.00	4	*10.0	10.0			

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.010)	0.952	0.896	-0.289	1.6849
Equality of variances cannnot be confirmed				

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	1.8	3.2	2.4	

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	0.2813		
0.56	0.2813	-0.1028	0.0000
1	0.2175	0.1869	0.2267
1.8	0.1675	0.3738	0.4044
3.2	0.0950	0.8879	0.6622
5.6	0.0950	0.4019	0.6622
10	0.0000	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples

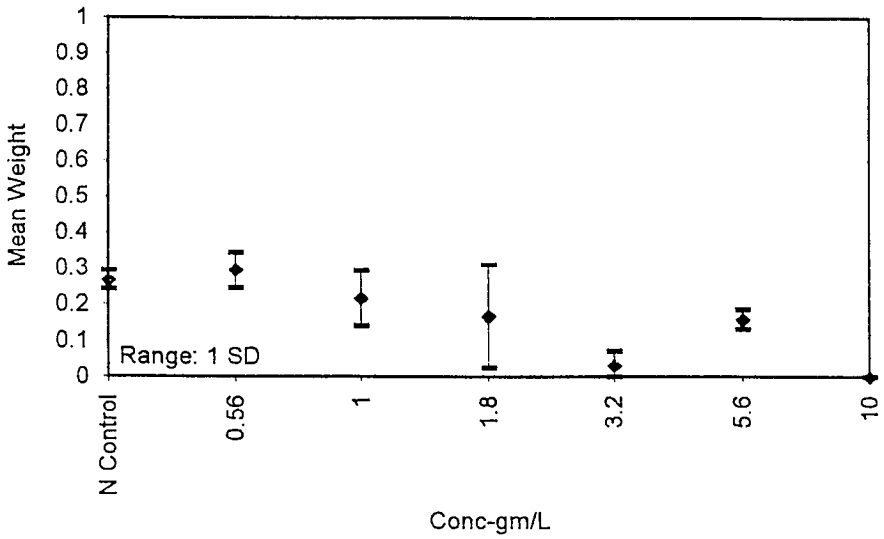


Point	Estimate	SD	95% CL (Exp)		Skew
IC1	0.5794	0.1380	0.0000	0.9391	-0.845
IC5	0.6571	0.2800	0.5654	2.5862	3.013
IC10	0.7541	0.3262	0.6387	2.7118	2.371
IC15	0.8512	0.3821	0.6784	2.8228	1.711
IC25	1.1050	0.4402	0.7216	3.0030	1.207
IC40	1.7800	0.4254	0.7680	3.1314	0.888
IC50	2.3190	0.4488	0.8654	3.2443	0.094

Larval Fish Survival and Growth Test

Start Date:	18 Jul-95	Test ID:	FHD-49	Sample ID:	CA0000000
End Date:	25 Jul-95	Protocol ID:	EPAM 87	Sample Type:	NACL Sodium chloride
Sample Date:	18 Jul-95	Analyst Name:	M.Meyer	Test Species:	PP Pimephales promelas
Comments:	Standard Toxicant			Response:	Growth-Weight

FHD-49-NACL Sodium chloride



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CHRONIC CERIODAPHNIA SURVIVAL AND REPRODUCTION BIOASSAY

DATE:	25 July -95
STANDARD TOXICANT:	Sodium Chloride
ENDPOINT:	SURVIVAL
NOEC =	1.00 g/l
IC25 =	0.66 g/l
IC50 =	1.41 g/l
ENDPOINT:	REPRODUCTION
NOEC =	<0.56 g/l
IC25 =	0.21 g/l
IC50 =	0.43 g/l

Yours very truly,

Thomas (Tim) Mikel
Laboratory Director

29 NORTH OLIVE STREET, VENTURA, CA 93001 • (805) 643-5621

Ceriodaphnia Survival and Reproduction Test

Start Date:	25 Jul-95	Test ID:	CER-74	Sample ID:	CA0000000
End Date:	01 Aug-95	Protocol ID:	EPAF 91	Sample Type:	NACL Sodium chloride
Sample Date:	25 Jul-95	Analyst Name:	M.Meyer	Test Species:	CD Ceriodaphnia dubia
Comments:	Standard Toxicant			Response:	Survival

Conc-gm/L	Alive	Dead	Total	Fisher P
N Control	10	0	10	
0.56	5	5	10	0.0163
1	10	0	10	1.0000
1.8	6	4	10	0.0433
3.2	0	10	10	0.0000

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	1	1.8	1.3416	

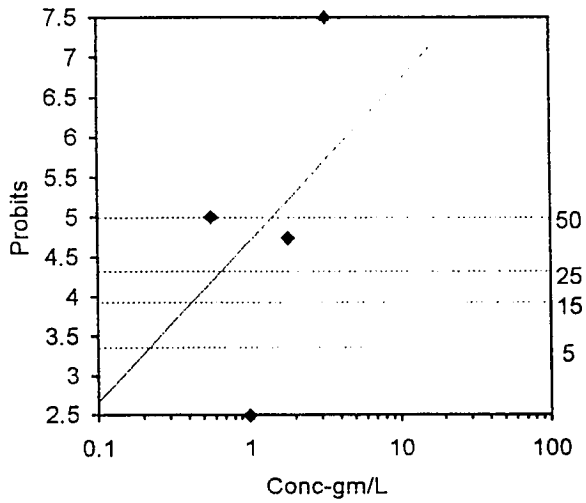
Maximum Likelihood-Probit Transform

Parameter	Estimate	SE	95% Fiducial Limits	
Slope	2.0278	2.1557	-7.248	11.303
Intercept	4.6949	0.6514	1.8919	7.4978
TSCR	0	2.9489	-12.69	12.688

Warning: significant heterogeneity
Slope not significantly different from zero

Point	Probits	gm/L	95% Fiducial Limits	
EC1	2.674	0.101	#N/A	#N/A
EC5	3.355	0.218	#N/A	#N/A
EC10	3.718	0.330	#N/A	#N/A
EC15	3.964	0.436	#N/A	#N/A
EC25	4.326	0.657	#N/A	#N/A
EC40	4.747	1.061	#N/A	#N/A
EC50	5.000	1.414	#N/A	#N/A
EC60	5.253	1.885	#N/A	#N/A
EC75	5.674	3.042	#N/A	#N/A
EC85	6.036	4.588	#N/A	#N/A
EC90	6.282	6.060	#N/A	#N/A
EC95	6.645	9.154	#N/A	#N/A
EC99	7.326	19.846	#N/A	#N/A

Control Resp	Chi-Sq	Critical	Mu	Sigma	Iter
0.000	15.651	9.210	0.150	0.4931	3



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Conc-gm/L	Measured Parameters	Water Quality Summary					
		Mean	Min	Max	SD	CV%	N
N Control	Temperature-°C	25.58	25.00	25.80	0.27	1.00	8
0.56		25.24	24.40	25.50	0.39	1.50	8
1		25.24	24.40	25.50	0.39	1.50	8
1.8		25.25	24.50	25.50	0.36	1.40	8
3.2		25.25	24.50	25.50	0.36	1.40	8
N Control	pH	8.03	7.90	8.10	0.07	0.90	8
0.56		7.99	7.90	8.00	0.04	0.40	8
1		7.99	7.90	8.00	0.04	0.40	8
1.8		7.93	7.90	8.00	0.05	0.60	8
3.2		7.90	7.90	7.90	0.00	0.00	8
N Control	Final D.O.-mg/L	7.88	7.30	8.20	0.27	3.40	8
0.56		7.54	7.30	7.60	0.11	1.40	8
1		7.58	7.30	7.80	0.15	2.00	8
1.8		7.60	7.30	7.90	0.19	2.40	8
3.2		7.58	7.40	7.80	0.12	1.50	8
N Control	Hardness-mg/L	81.25	80.00	85.00	2.32	2.80	8
0.56							
1							
1.8							
3.2							
N Control	Conductivity-umh	123.50	120.00	130.00	3.34	2.70	8
0.56							
1							
1.8							
3.2							
N Control	Alkalinity-mg/L	65.00	60.00	67.00	3.12	4.80	8
0.56							
1							
1.8							
3.2							

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Comments:	Standard Toxicant			Response:	Reproduction

Conc-gm/L	1	2	3	4	5	6	7	8	9	10
N Control	18.00	18.00	19.00	22.00	17.00	16.00	18.00	15.00	17.00	16.00
0.56	0.00	10.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	9.00	16.00	11.00	10.00	15.00	8.00	15.00	12.00	11.00	2.00
1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.00	3.00	11.00
3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

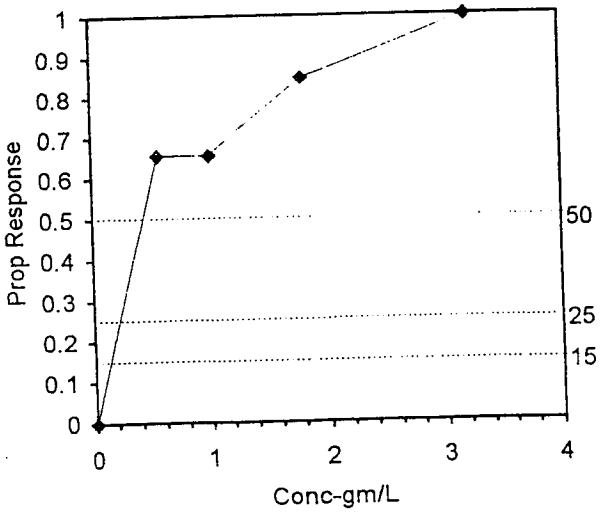
			Untransformed Data					Rank				
Conc-gm/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	MSD	NRESP	NDOSE
N Control	17.60	1.000	17.60	15.00	22.00	11.11	10					
0.56	1.20	0.068	1.20	0.00	10.00	262.94	10	*55.0	77.0			
1	10.90	0.619	10.90	2.00	16.00	37.81	10	*58.0	77.0			
1.8	2.70	0.153	2.70	0.00	13.00	185.64	10	*55.0	77.0			
3.2	0.00	0.000										

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.010)	0.748	0.919	-2.576	10.472
Bartlett's Test indicates equality of variance (p = 0.0619)	7.337	11.345		

Hypothesis Test (0.05 alpha)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	<0.56	0.56		

		Prop Response	
Conc-gm/L	Iso	N-Mean	N-Iso
N Control	17.60		
0.56	6.05	0.9318	0.6563
1	6.05	0.3807	0.6563
1.8	2.70	0.8466	0.8466
3.2	0.00	1.0000	1.0000

Linear Interpolation(ICp) with 80 bootstrap resamples



Point	Estimate	SD	95% CL		Skew
IC1*	0.0085	0.0005	0.0078	0.0097	0.546
IC5*	0.0427	0.0027	0.0390	0.0487	0.546
IC10*	0.0853	0.0053	0.0779	0.0974	0.546
IC15*	0.1280	0.0080	0.1169	0.1460	0.546
IC25*	0.2133	0.0133	0.1948	0.2434	0.546
IC40*	0.3413	0.0212	0.3116	0.3894	0.546
IC50*	0.4267	0.0265	0.3895	0.4868	0.546

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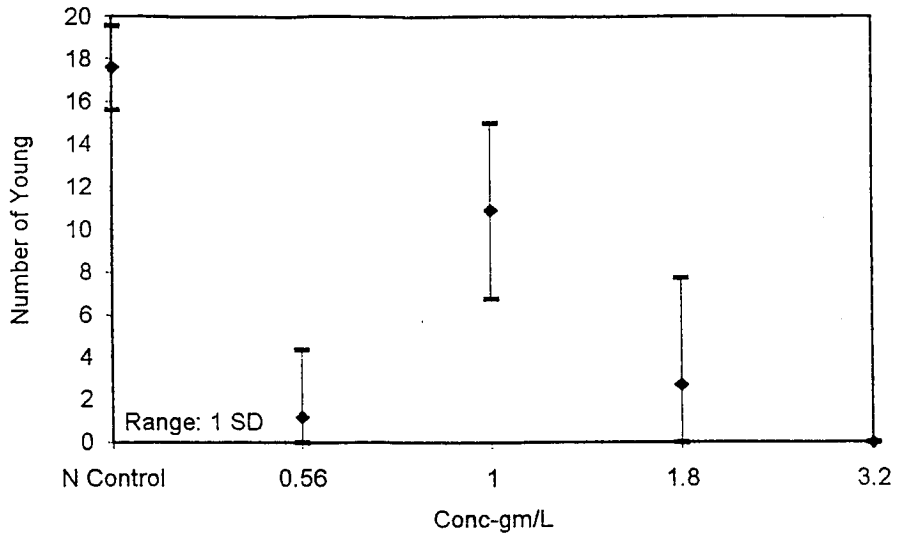
CER-74-NACL Sodium chloride