



# CHAIN OF CUSTODY FORM

Client Name/Address:  
**MWH-Arcadia**  
 618 Michillinda Avenue, Suite 200  
 Arcadia, CA 91007  
 Test America Contact: Joseph Doak

Project:  
**Boeing-SSFL NPDES  
 Semi-Annual Outfall 006  
 Stormwater at FSDF-2**

Project Manager: Bronwyn Kelly  
 Phone Number:  
 (626) 568-6691  
 Fax Number:  
 (626) 568-6515

Sampler: **R BANTA-G A**

Field readings:  
 Temp = 57.0  
 pH = 6.0  
 Time of readings = 4:30

Sample Description	Sample Matrix	Container Type	# of Coni.	Sampling Date/Time	Preservative	Bottle #	ANALYSIS REQUIRED													
							Total Recoverable Metals: Sb, Cd, Cu, Pb, Hg, Tl	TCDD (and all congeners)	Oil & Grease (1664-HEM)	Cl <sup>-</sup> , SO <sub>4</sub> , NO <sub>3</sub> +NO <sub>2</sub> -N, Perchlorate	TDS	Gross Alpha(900.0), Gross Beta(900.0), Tritium (H-3) (906.0), Sr-90 (905.0), Total Combined Radium 226 (903.0 or 903.1) & Radium 228 (904.0), Uranium (908.0), K-40, CS-137 (901.0 or 901.1)	Chronic Toxicity	Total Dissolved Metals: Sb, Cd, Cu, Pb, Hg, Tl						
Outfall 006	W	1L Poly	1	11-26-08 13:30	HNO <sub>3</sub>	1A	X													
Outfall 006	W	1L Poly	1	11-26-08 13:30	HNO <sub>3</sub>	1B	X													
Outfall 006	W	1L Amber	2		None	2A-2B		X												
Outfall 006	W	1L Amber	2		HCl	3A, 3B		X												
Outfall 006	W	500 ml Poly	2		None	4A, 4B		X												
Outfall 006	W	500 ml Poly	1		None	5			X											
Outfall 006	W	2.5-Gal-Gube 500 ml Amber	1		None	6A				X										
Outfall 006	W	1 Gal Poly	1		None	6B														
Outfall 006	W	1L Poly	1	11-26-08 13:30	None	7														
Outfall 006	W	1L Poly	1	11-26-08 13:30	None	8														

Comments:  
 Unfiltered and unpreserved analysis  
 Test first and second rain event of the year  
 Filter w/in 24hrs of receipt at lab

Relinquished By: **R Banta** Date/Time: 11-26-08 1415  
 Received By: **Shirley TAI** Date/Time: 11/26/08 1415

Relinquished By: **Shirley TAI** Date/Time: 11/26/08 1730  
 Received By: **Shirley TAI** Date/Time: 11-26-08 1730

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

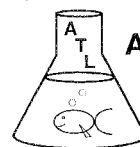
Turn around Time: (check)  
 24 Hours \_\_\_\_\_ 5 Days \_\_\_\_\_  
 48 Hours \_\_\_\_\_ 10 Days \_\_\_\_\_  
 72 Hours \_\_\_\_\_ Normal **X**

Sample Integrity: (check)  
 Intact \_\_\_\_\_ On Ice: \_\_\_\_\_

Data Requirements: (check)  
 No Level IV \_\_\_\_\_ All Level IV \_\_\_\_\_

NPDES Level IV \_\_\_\_\_

# LABORATORY REPORT



**Aquatic  
Testing  
Laboratories**

*"dedicated to providing quality aquatic toxicity testing"*

**Date:** December 5, 2008  
**Client:** TestAmerica – Irvine  
17461 Derian Ave., Suite 100  
Irvine, CA 92614  
Attn: Joseph Doak

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

**Laboratory No.:** A-08112606-001  
**Sample ID.:** IRK2828-01 (Outfall 006)

**Sample Control:** The sample was received by ATL within the recommended hold time, in a chilled state, and with the chain of custody record attached. Testing was conducted on only one sample per client instruction.

Date Sampled: 11/26/08  
Date Received: 11/26/08  
Temp. Received: 6°C  
Chlorine (TRC): 0.0 mg/l  
Date Tested: 11/27/08 to 12/04/08

**Sample Analysis:** The following analyses were performed on your sample:

*Ceriodaphnia dubia* Survival and Reproduction Test (EPA Method 1002).

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

## Result Summary:

<b>Chronic:</b>	<u>NOEC</u>	<u>TUc</u>
<i>Ceriodaphnia</i> Survival:	100%	1.0
<i>Ceriodaphnia</i> Reproduction:	100%	1.0

**Quality Control:** Reviewed and approved by:

  
Joseph A. LeMay  
Laboratory Director

**CERIODAPHNIA CHRONIC BIOASSAY  
EPA METHOD 1002.0**



Lab No.: A-08112606-001  
Client/ID: Test America – IRK2828-01 (Outfall 006)

Date Tested: 11/27/08 to 12/04/08

**TEST SUMMARY**

Test type: Daily static-renewal.  
Species: *Ceriodaphnia dubia*.  
Age: < 24 hrs; all released within 8 hrs.  
Test vessel size: 30 ml.  
Number of test organisms per vessel: 1.  
Temperature: 25 +/- 1°C.  
Dilution water: Mod. hard reconstituted (MHRW).  
QA/QC Batch No.: RT-081104.

Endpoints: Survival and Reproduction.  
Source: In-laboratory culture.  
Food: .1 ml YTC, algae per day.  
Test solution volume: 15 ml.  
Number of replicates: 10.  
Photoperiod: 16/8 hrs. light/dark cycle.  
Test duration: 7 days.  
Statistics: ToxCalc computer program.

**RESULTS SUMMARY**

Sample Concentration	Percent Survival	Mean Number of Young Per Female
Control	100%	22.5
100% Sample	100%	26.9
Sample not statistically significantly less than Control for either endpoint.		

**CHRONIC TOXICITY**

Survival NOEC	100%
Survival TUc	1.0
Reproduction NOEC	100%
Reproduction TUc	1.0

**QA/QC TEST ACCEPTABILITY**

Parameter	Result
Control survival ≥80%	Pass (100% survival)
≥15 young per surviving control female	Pass (22.5 young)
≥60% surviving controls had 3 broods	Pass (100% with 3 broods)
PMSD <47% for reproduction; if >47% and no toxicity at IWC, the test must be repeated	Pass (PMSD = 13.2%)
Statistically significantly different concentrations relative difference > 13%	Pass (no concentration significantly different)
Concentration response relationship acceptable	Pass (no significant response at concentration tested)

**Ceriodaphnia Survival and Reproduction Test-7 Day Survival**

Start Date: 11/27/2008 15:00 Test ID: 8112606 Sample ID: Outfall 006  
 End Date: 12/4/2008 16:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF2-Industrial  
 Sample Date: 11/26/2008 13:30 Protocol: FWCH 4TH-EPA-821-R-02-0 Test Species: CD-Ceriodaphnia dubia  
 Comments:

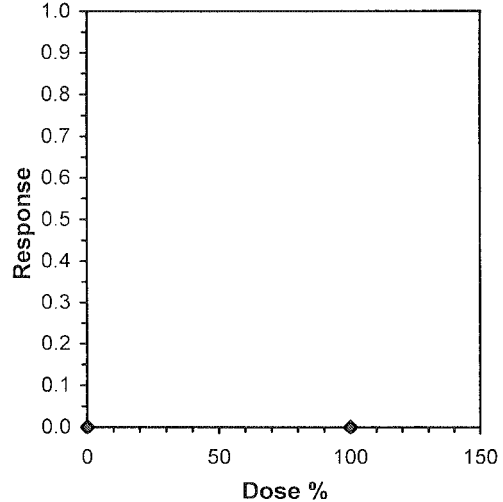
Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Conc-%	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical	Isotonic Mean	N-Mean
D-Control	1.0000	1.0000	0	10	10	10			1.0000	1.0000
100	1.0000	1.0000	0	10	10	10	1.0000	0.0500	1.0000	1.0000

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	100	>100		1
Treatments vs D-Control				

**Linear Interpolation (200 Resamples)**

Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



**Ceriodaphnia Survival and Reproduction Test-Reproduction**

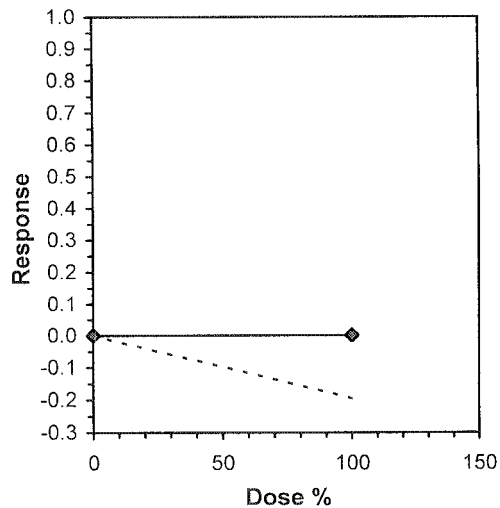
Start Date: 11/27/2008 15:00 Test ID: 8112606 Sample ID: Outfall 006  
 End Date: 12/4/2008 16:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: EFF2-Industrial  
 Sample Date: 11/26/2008 13:30 Protocol: FWCH 4TH-EPA-821-R-02-0 Test Species: CD-Ceriodaphnia dubia  
 Comments:

Conc-%	1	2	3	4	5	6	7	8	9	10
D-Control	24.000	20.000	23.000	25.000	20.000	25.000	22.000	21.000	23.000	22.000
100	35.000	26.000	26.000	20.000	31.000	33.000	26.000	21.000	22.000	29.000

Conc-%	Mean	N-Mean	Transform: Untransformed				N	t-Stat	1-Tailed Critical	MSD	Isotonic	
			Mean	Min	Max	CV%					Mean	N-Mean
D-Control	22.500	1.0000	22.500	20.000	25.000	8.182	10				24.700	1.0000
100	26.900	1.1956	26.900	20.000	35.000	18.911	10	-2.572	1.796	3.072	24.700	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt		
Shapiro-Wilk's Test indicates normal distribution ( $p > 0.05$ )	0.97558	0.905	0.20719	0.30033		
F-Test indicates unequal variances ( $p = 5.73E-03$ )	7.63607	6.54109				
Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Heteroscedastic t Test indicates no significant differences Treatments vs D-Control	3.07231	0.13655	96.8	14.6333	0.0192	1, 18

Linear Interpolation (200 Resamples)				
Point	%	SD	95% CL	Skew
IC05	>100			
IC10	>100			
IC15	>100			
IC20	>100			
IC25	>100			
IC40	>100			
IC50	>100			



**CERIODAPHNIA DUBIA CHRONIC BIOASSAY**  
**EPA METHOD 1002.0 Raw Data Sheet**



Lab No.: A-08112606-001

Client ID: TestAmerica - IRK2828-01 Outfall 006

Start Date: 11/27/2008

		DAY 1		DAY 2		DAY 3		DAY 4		DAY 5		DAY 6		DAY 7	
		0 hr	24hr	0 hr	24hr	0 hr	24hr	0 hr	24hr	0 hr	24hr	0 hr	24hr	0 hr	24hr
Analyst Initials:		[Signature]		[Signature]		[Signature]		[Signature]		[Signature]		[Signature]		[Signature]	
Time of Readings:		1500	1400	1400	1200	1200	1430	1430	1500	1500	1500	1500	1400	1400	1600
Control	DO	8.4	8.3	8.8	8.6	8.8	8.7	8.8	8.0	8.9	9.0	9.0	9.2	8.8	8.6
	pH	7.7	7.5	7.5	7.7	7.6	7.6	7.6	7.6	7.6	7.5	7.5	7.6	7.2	7.4
	Temp	24.2	24.0	24.7	24.2	24.8	24.5	24.2	24.3	24.3	24.0	25.3	24.1	24.5	24.2
100%	DO	7.6	8.3	8.3	8.8	8.9	8.8	9.4	8.7	9.2	9.1	10.0	8.9	10.3	8.3
	pH	5.9	6.9	5.6	7.1	5.6	7.0	5.7	7.0	5.7	7.0	5.4	6.9	5.5	7.0
	Temp	24.2	24.0	25.1	24.1	24.6	24.4	24.7	24.3	24.6	24.4	25.1	24.3	25.4	24.2

Additional Parameters	Control	100% Sample
Conductivity (umohms)	300	349
Alkalinity (mg/l CaCO <sub>3</sub> )	65	19
Hardness (mg/l CaCO <sub>3</sub> )	96	35
Ammonia (mg/l NH <sub>3</sub> -N)	<0.1	0.1

Source of Neonates											
Replicate:	A	B	C	D	E	F	G	H	I	J	
Brood ID:	6B	4A	6F	6E	5S	2B	2B	3C	2G	1J	

Sample	Day	Number of Young Produced										Total Live Young	No. Live Adults	Analyst Initials	
		A	B	C	D	E	F	G	H	I	J				
Control	1	0	0	0	0	0	0	0	0	0	0	0	0	10	[Signature]
	2	0	0	0	0	0	0	0	0	0	0	0	0	10	[Signature]
	3	0	3	3	0	0	3	0	0	0	0	9	10	[Signature]	
	4	4	0	0	3	4	0	5	4	3	4	27	10	[Signature]	
	5	8	0	7	7	6	7	6	7	7	6	61	10	[Signature]	
	6	0	7	0	0	0	15	0	0	0	0	22	10	[Signature]	
	7	12	10	13	15	10	0	11	10	13	12	106	10	[Signature]	
	Total	24	20	23	29	20	25	22	21	23	22	225	10	[Signature]	
100%	1	0	0	0	0	0	0	0	0	0	0	0	10	[Signature]	
	2	0	0	0	0	0	0	0	0	0	0	0	10	[Signature]	
	3	0	3	0	0	0	5	0	0	0	0	8	10	[Signature]	
	4	4	0	3	4	5	0	3	5	3	3	30	10	[Signature]	
	5	8	6	5	6	7	0	6	6	7	8	61	10	[Signature]	
	6	0	17	16	0	19	14	0	0	0	0	66	10	[Signature]	
	7	23	20	0	10	0	14	17	10	12	18	104	10	[Signature]	
	Total	35	26	26	20	31	33	26	21	22	29	269	10	[Signature]	

Circled fourth brood not used in statistical analysis.

7<sup>th</sup> day only used if <60% of the surviving control females have produced their third brood.

NOV. 26. 2008 9:22PM

DEL MAR ANALYTICAL **FACT ORDER**

NO. 209 P. 1

**TestAmerica Irvine**

**IRK2828**

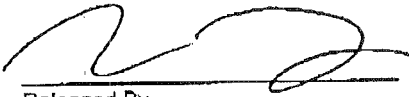
**SENDING LABORATORY:**

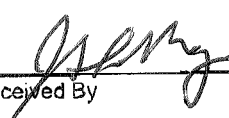
TestAmerica Irvine  
17461 Derian Avenue, Suite 100  
Irvine, CA 92614  
Phone: (949) 261-1022  
Fax: (949) 260-3297  
Project Manager: Joseph Doak

**RECEIVING LABORATORY:**

Aquatic Testing Laboratories-SUB  
4350 Transport Street, Unit 107  
Ventura, CA 93003  
Phone :(805) 650-0546  
Fax: (805) 650-0756  
Project Location: CA - CALIFORNIA  
Receipt Temperature: 6 °C Ice: Y N

Analysis	Units	Due	Expires	Comments
<b>Sample ID: IRK2828-01</b>	<b>Water</b>		<b>Sampled: 11/26/08 13:30</b>	
Bioassay-7 dy Chmic	N/A	12/09/08	11/28/08 01:30	Cerio, EPA/821-R02-013, Sub to Aquatic testing
<i>Containers Supplied:</i>				

  
Released By \_\_\_\_\_ Date/Time 11/26/08

  
Received By \_\_\_\_\_ Date/Time 11-26-08 17:30

Released By \_\_\_\_\_ Date/Time \_\_\_\_\_

Received By \_\_\_\_\_ Date/Time \_\_\_\_\_



CHAIN OF CUSTODY FORM

Client Name/Address: <b>MWH-Arcadia</b> 618 Michillinda Avenue, Suite 200 Arcadia, CA 91007 Test America Contact: Joseph Doak		Project: Boeing-SSFL NPDES <b>Semi-Annual Outfall 006</b> Stormwater at FSDF-2		ANALYSIS REQUIRED Total Recoverable Metals: Sp, Cd, Cu, Pb, Hg, Tl TCDD (and all congeners) Oil & Grease (1664-HEM) Cl <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> +NO <sub>2</sub> <sup>-</sup> , Perchlorate TDS Gross Alpha(900.0), Gross Beta(900.0), Tritium (H-3) (906.0), Sr-90 (905.0), Total Combined Radium 226 (903.0 or 903.1) & Radium 228 (904.0), Uranium (908.0), K-40, CS-137 (901.0 or 901.1) Chronic Toxicity Total Dissolved Metals: Sb, Cd, Cu, Pb, Hg, Tl										Field readings: Temp = 57.0 pH = 6.0 Time of readings = 11:30	
Project Manager: Bronwyn Kelly Sampler: <i>RBAINGA</i>		Phone Number: (626) 568-6691 Fax Number: (626) 568-6515		Total Recoverable Metals: Sp, Cd, Cu, Pb, Hg, Tl TCDD (and all congeners) Oil & Grease (1664-HEM) Cl <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> +NO <sub>2</sub> <sup>-</sup> , Perchlorate TDS Gross Alpha(900.0), Gross Beta(900.0), Tritium (H-3) (906.0), Sr-90 (905.0), Total Combined Radium 226 (903.0 or 903.1) & Radium 228 (904.0), Uranium (908.0), K-40, CS-137 (901.0 or 901.1) Chronic Toxicity Total Dissolved Metals: Sb, Cd, Cu, Pb, Hg, Tl										Comments: Unfiltered and unpreserved analysis Test first and second rain event of the year Filter w/in 24hrs of receipt at lab	
Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date/Time	Preservative	Bottle #	Total Recoverable Metals: Sp, Cd, Cu, Pb, Hg, Tl	TCDD (and all congeners)	Oil & Grease (1664-HEM)	Cl <sup>-</sup> , SO <sub>4</sub> <sup>2-</sup> , NO <sub>3</sub> <sup>-</sup> +NO <sub>2</sub> <sup>-</sup> , Perchlorate	TDS	Gross Alpha(900.0), Gross Beta(900.0), Tritium (H-3) (906.0), Sr-90 (905.0), Total Combined Radium 226 (903.0 or 903.1) & Radium 228 (904.0), Uranium (908.0), K-40, CS-137 (901.0 or 901.1)	Chronic Toxicity	Total Dissolved Metals: Sb, Cd, Cu, Pb, Hg, Tl	Field readings: Temp = 57.0 pH = 6.0 Time of readings = 11:30
Outfall 006	W	1L Poly	1	11-26-08 13:30	HNO <sub>3</sub>	1A	X								
Outfall 006	W	1L Poly	1	11-26-08 13:30	HNO <sub>3</sub>	4B	X								
Outfall 006	W	1L Amber	2		None	2A-2B		X							
Outfall 006	W	1L Amber	2		HCl	3A, 3B		X							
Outfall 006	W	500 ml Poly	2		None	4A, 4B			X						
Outfall 006	W	500 ml Poly	1		None	5				X					
Outfall 006	W	2-5 Gal Cube 500 ml Amber	1		None	6A						X			
Outfall 006	W	1 Gal Poly	1		None	6B									
Outfall 006	W	1L Poly	1	11-26-08 13:30	None	7							X		
Outfall 006	W	1L Poly	1	11-26-08 13:30	None	8								X	
Relinquished By: <i>Ruby</i>				Date/Time: 11-26-08 1415		Received By: <i>Shwaleen</i>		Date/Time: 11/26/08 1415		Turn around Time: (check) 24 Hours _____ 5 Days _____ 48 Hours _____ 10 Days _____ 72 Hours _____ Normal <input checked="" type="checkbox"/>		Sample Integrity: (check) Intact _____ On Ice: _____		Data Requirements: (check) No Level IV _____ All Level IV _____ NPDES Level IV _____	
Relinquished By: <i>Shwaleen</i>				Date/Time: 11/26/08 1730		Received By: <i>Alamy</i>		Date/Time: 11-26-08 1730		Turn around Time: (check) 24 Hours _____ 5 Days _____ 48 Hours _____ 10 Days _____ 72 Hours _____ Normal <input checked="" type="checkbox"/>		Sample Integrity: (check) Intact _____ On Ice: _____		Data Requirements: (check) No Level IV _____ All Level IV _____ NPDES Level IV _____	



***REFERENCE  
TOXICANT  
DATA***

**CERIODAPHNIA CHRONIC BIOASSAY**  
**EPA METHOD 1002.0**  
**REFERENCE TOXICANT - NaCl**



QA/QC Batch No.: RT-081104

Date Tested: 11/04/08 to 11/11/08

**TEST SUMMARY**

Test type: Daily static-renewal.

Species: *Ceriodaphnia dubia*.

Age: <24 hrs; all released within 8 hrs.

Test vessel size: 30 ml.

Number of test organisms per vessel: 1.

Temperature: 25 +/- 1°C.

Dilution water: Mod. hard reconstituted (MHRW).

Reference Toxicant: Sodium chloride (NaCl).

Endpoints: Survival and Reproduction.

Source: In-laboratory culture.

Food: .1 ml YTC, algae per day.

Test solution volume: 20 ml.

Number of replicates: 10.

Photoperiod: 16/8 hrs. light/dark cycle.

Test duration: 7 days.

Statistics: ToxCalc computer program.

**RESULTS SUMMARY**

Sample Concentration	Percent Survival		Mean Number of Young Per Female	
Control	100%		22.5	
0.25 g/l	100%		23.0	
0.5 g/l	100%		21.9	
1.0 g/l	100%		15.8	*
2.0 g/l	100%		4.4	*
4.0 g/l	0%	*	0	**

\* Statistically significantly less than control at P = 0.05 level  
 \*\* Reproduction data from concentrations greater than survival NOEC are excluded from statistical analysis.

**CHRONIC TOXICITY**

Survival LC50	2.8 g/l
Reproduction IC25	0.90 g/l

**QA/QC TEST ACCEPTABILITY**

Parameter	Result
Control survival ≥80%	Pass (100% Survival)
≥15 young per surviving control female	Pass (22.5 young)
≥60% surviving controls had 3 broods	Pass (100% with 3 broods)
PMSD <47% for reproduction	Pass (PMSD = 9.8%)
Stat. sig. diff. conc. relative difference >13%	Pass (Stat. sig. diff. conc. relative difference = 29.8%)
Concentration response relationship acceptable	Pass (Response curve normal)

**Ceriodaphnia Survival and Reproduction Test-7 Day Survival**

Start Date: 11/4/2008 15:00 Test ID: RT-081104 Sample ID: REF-Ref Toxicant  
 End Date: 11/11/2008 15:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: NACL-Sodium chloride  
 Sample Date: 11/4/2008 Protocol: FWCH 4TH-EPA-821-R-02-0 Test Species: CD-Ceriodaphnia dubia  
 Comments:

Conc-gm/L	1	2	3	4	5	6	7	8	9	10
D-Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.25	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Conc-gm/L	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical	Number Resp	Total Number
D-Control	1.0000	1.0000	0	10	10	10			0	10
0.25	1.0000	1.0000	0	10	10	10	1.0000	0.0500	0	10
0.5	1.0000	1.0000	0	10	10	10	1.0000	0.0500	0	10
1	1.0000	1.0000	0	10	10	10	1.0000	0.0500	0	10
2	1.0000	1.0000	0	10	10	10	1.0000	0.0500	0	10
4	0.0000	0.0000	10	0	10	10			10	10

**Hypothesis Test (1-tail, 0.05)**      NOEC      LOEC      ChV      TU

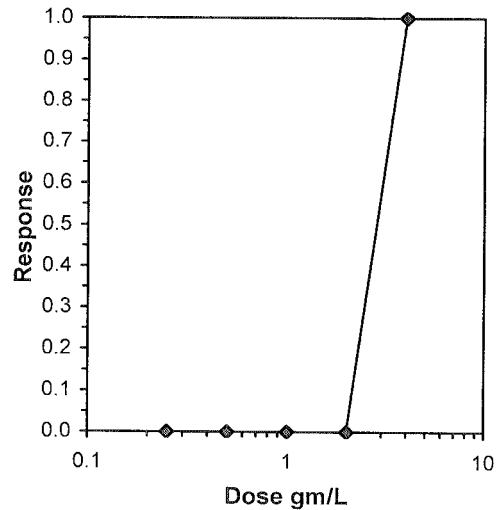
Fisher's Exact Test                      2              4              2.82843

Treatments vs D-Control

**Graphical Method**

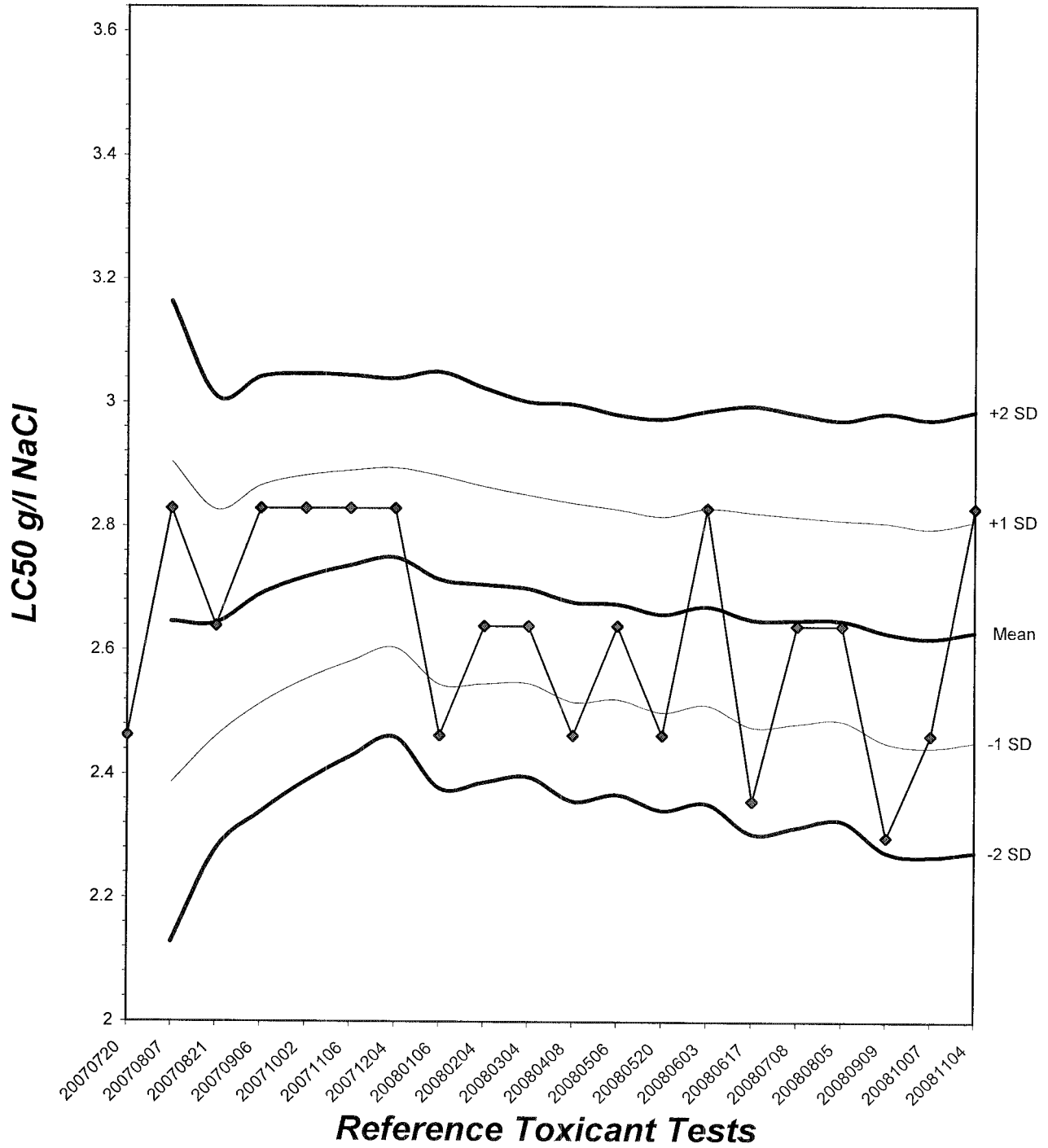
Trim Level      EC50  
 0.0%      2.8284

2.8284



# Ceriodaphnia Chronic Survival Laboratory Control Chart

CV% = 6.77



**Ceriodaphnia Survival and Reproduction Test-Reproduction**

Start Date: 11/4/2008 15:00 Test ID: RT-081104 Sample ID: REF-Ref Toxicant  
 End Date: 11/11/2008 15:00 Lab ID: CAATL-Aquatic Testing Labs Sample Type: NACL-Sodium chloride  
 Sample Date: 11/4/2008 Protocol: FWCH 4TH-EPA-821-R-02-0 Test Species: CD-Ceriodaphnia dubia  
 Comments:

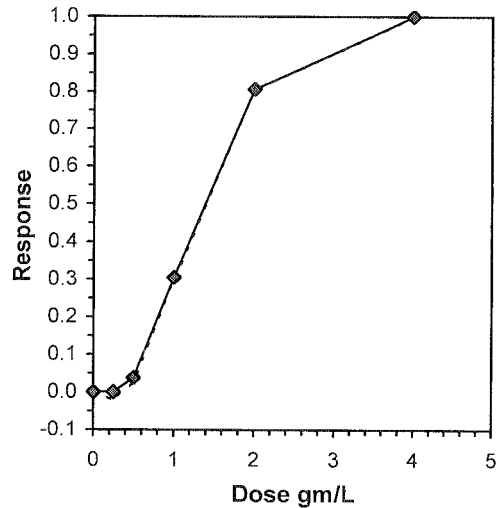
Conc-gm/L	1	2	3	4	5	6	7	8	9	10
D-Control	23.000	20.000	23.000	22.000	23.000	22.000	26.000	21.000	22.000	23.000
0.25	19.000	23.000	22.000	25.000	25.000	22.000	25.000	23.000	24.000	22.000
0.5	21.000	24.000	20.000	25.000	18.000	23.000	22.000	20.000	22.000	24.000
1	9.000	15.000	18.000	10.000	18.000	17.000	16.000	19.000	19.000	17.000
2	2.000	4.000	6.000	5.000	6.000	4.000	5.000	4.000	4.000	4.000
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Conc-gm/L	Transform: Untransformed							Rank Sum	1-Tailed Critical	Isotonic	
	Mean	N-Mean	Mean	Min	Max	CV%	N			Mean	N-Mean
D-Control	22.500	1.0000	22.500	20.000	26.000	7.027	10			22.750	1.0000
0.25	23.000	1.0222	23.000	19.000	25.000	8.198	10	115.50	76.00	22.750	1.0000
0.5	21.900	0.9733	21.900	18.000	25.000	9.969	10	98.50	76.00	21.900	0.9626
*1	15.800	0.7022	15.800	9.000	19.000	22.486	10	55.00	76.00	15.800	0.6945
*2	4.400	0.1956	4.400	2.000	6.000	26.677	10	55.00	76.00	4.400	0.1934
4	0.000	0.0000	0.000	0.000	0.000	0.000	10			0.000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.93086	0.947	-1.0207	1.76892
Bartlett's Test indicates equal variances (p = 0.02)	12.1425	13.2767		

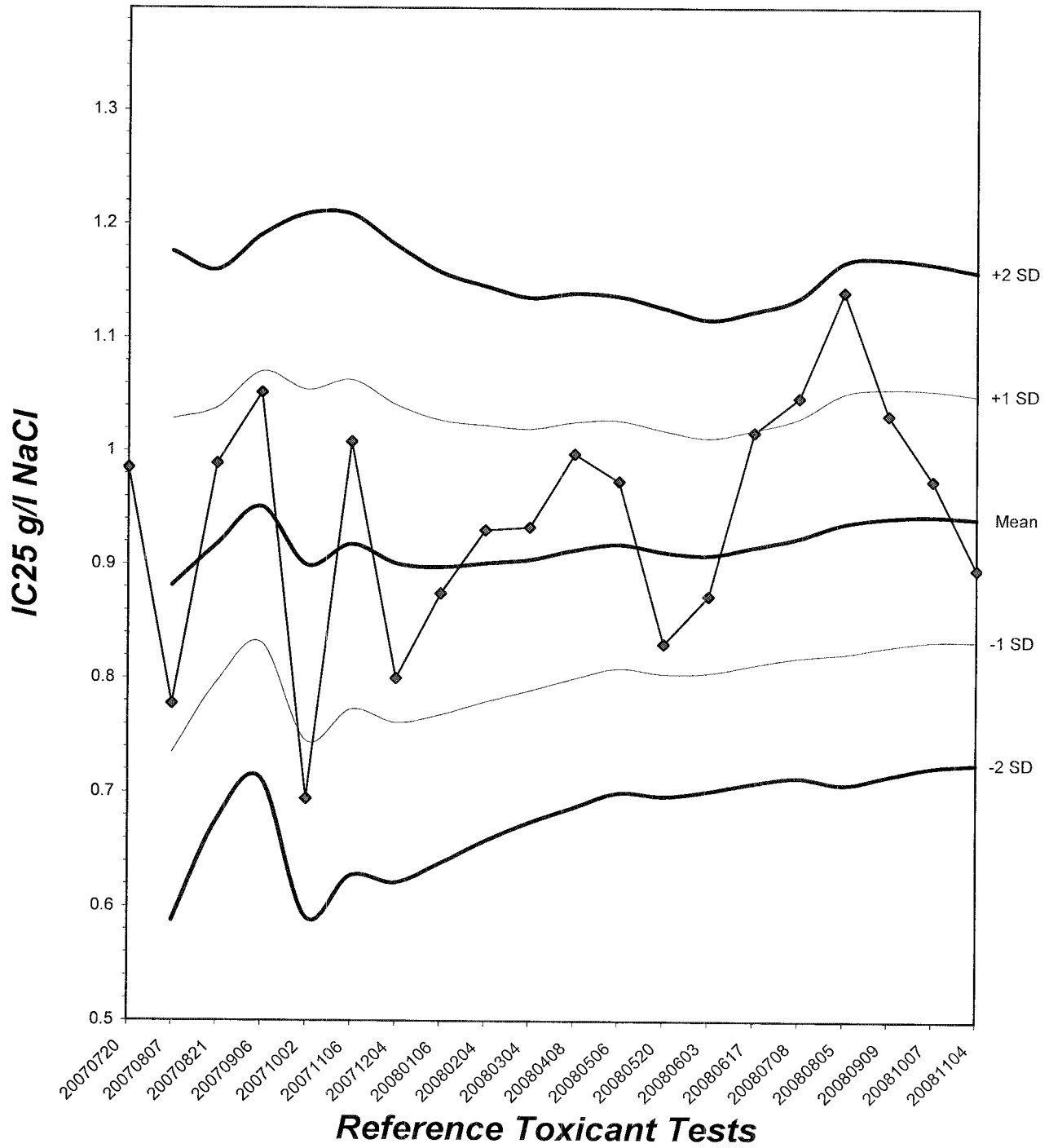
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	0.5	1	0.70711	
Treatments vs D-Control				

Linear Interpolation (200 Resamples)				
Point	gm/L	SD	95% CL	Skew
IC05	0.5236	0.0738	0.3349	0.6024
IC10	0.6168	0.0540	0.4824	0.7162
IC15	0.7100	0.0536	0.6133	0.8309
IC20	0.8033	0.0606	0.7087	0.9480
IC25	0.8965	0.0688	0.7913	1.0519
IC40	1.1886	0.0706	1.0517	1.3109
IC50	1.3882	0.0549	1.2688	1.4826



# Ceriodaphnia Chronic Reproduction Laboratory Control Chart

CV% = 11.5



# CERIODAPHNIA DUBIA CHRONIC BIOASSAY

Reference Toxicant - NaCl

## Reproduction and Survival Raw Data Sheet



QA/QC No.: RT-081104

Start Date: 11/04/2008

Sample	Day	Number of Young Produced										Total Live Young	No. Live Adults	Analyst Initials
		A	B	C	D	E	F	G	H	I	J			
Control	1	0	0	0	0	0	0	0	0	0	0	0	10	RL
	2	0	0	0	0	0	0	0	0	0	0	0	10	
	3	0	0	0	0	0	4	4	0	0	0	8	10	
	4	4	2	3	2	3	0	0	4	2	3	23	10	
	5	0	0	8	7	0	6	8	7	0	0	36	10	
	6	7	8	12	0	8	12	14	0	6	8	75	10	
	7	12	10	②	13	12	⑩	0	10	14	12	83	10	
	Total	23	20	23	22	23	22	26	21	22	23	225	10	
0.25 g/l	1	0	0	0	0	0	0	0	0	0	0	10	RL	
	2	0	0	0	0	0	0	0	0	0	0	10		
	3	0	3	0	0	0	0	4	0	0	7	10		
	4	2	0	4	3	4	4	3	0	3	2	25		10
	5	7	8	6	8	7	0	0	7	0	6	49		10
	6	0	12	0	0	0	6	8	12	7	14	59		10
	7	10	⑧	12	14	14	12	14	⑫	14	⑩	90		10
	Total	19	23	22	25	25	22	25	23	24	22	230		10
0.5 g/l	1	0	0	0	0	0	0	0	0	0	0	10	RL	
	2	0	0	0	0	0	0	0	0	0	0	10		
	3	0	3	0	0	0	0	0	0	4	7	10		
	4	3	0	4	4	2	3	2	2	4	0	24		10
	5	6	7	0	0	6	0	7	8	6	6	46		10
	6	0	0	6	7	10	6	0	0	12	14	55		10
	7	12	14	10	14	⑩	14	13	10	0	⑫	87		10
	Total	21	24	20	25	18	23	22	20	22	24	219		10

Circled fourth brood not used in statistical analysis.

7<sup>th</sup> day only used if <60% of the surviving control females have produced their third brood.



**CERIODAPHNIA DUBIA CHRONIC BIOASSAY**  
**Reference Toxicant - NaCl**  
**Reproduction and Survival Raw Data Sheet**



QA/QC No.: RT-081104

Start Date: 11/04/2008

Sample	Day	Number of Young Produced										Total Live Young	No. Live Adults	Analyst Initials
		A	B	C	D	E	F	G	H	I	J			
1.0 g/l	1	0	0	0	0	0	0	0	0	0	0	0	10	R
	2	0	0	0	0	0	0	0	0	0	0	0	10	R
	3	0	0	0	0	0	0	0	0	0	4	4	10	R
	4	3	2	2	4	3	4	3	4	2	0	27	10	R
	5	0	0	6	0	0	0	6	0	0	6	18	10	R
	6	6	7	10	6	5	5	7	6	7	7	66	10	R
	7	0	6	0	0	10	8	0	9	10	0	43	10	R
	Total	9	15	18	10	18	17	16	19	19	17	158	10	R
2.0 g/l	1	0	0	0	0	0	0	0	0	0	0	10	R	
	2	0	0	0	0	0	0	0	0	0	0	10	R	
	3	0	0	0	0	0	0	2	0	0	0	2	10	R
	4	0	2	0	0	0	0	0	2	0	0	4	10	R
	5	2	0	3	3	4	2	3	0	2	2	21	10	R
	6	0	2	0	0	0	2	0	2	0	0	6	10	R
	7	0	0	3	2	2	0	0	0	2	2	11	10	R
	Total	2	4	6	5	6	4	5	4	4	4	44	10	R
4.0 g/l	1	<del>0</del>	<del>0</del>	<del>0</del>	<del>0</del>	<del>0</del>	<del>0</del>	<del>0</del>	<del>0</del>	<del>0</del>	0	0	R	
	2	0	0	0	0	0	0	0	0	0	0	0	R	
	3	-	-	-	-	-	-	-	-	-	-	-	R	
	4	-	-	-	-	-	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	-	-	-	-	-	
	6	-	-	-	-	-	-	-	-	-	-	-	-	
	7	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	0	0	0	0	0	0	0	0	0	0	0	0	R

Circled fourth brood not used in statistical analysis.  
 7<sup>th</sup> day only used if <60% of the surviving control females have produced their third brood.

# CERIODAPHNIA DUBIA CHRONIC BIOASSAY

## Reference Toxicant - NaCl Water Chemistries Raw Data Sheet



QA/QC No.: RT-081104

Start Date: 11/04/2008

		DAY 1		DAY 2		DAY 3		DAY 4		DAY 5		DAY 6		DAY 7	
		Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final	Initial	Final
Analyst Initials:		Rm	Rm	Rm	Rm	Rm	Rm	Rm	Rm	Rm	Rm	Rm	Rm	Rm	Rm
Time of Readings:		1500	1600	1600	1600	1600	1300	1300	1400	1400	1400	1400	1400	1500	1500
Control	DO	8.0	8.5	7.3	8.7	8.6	8.6	8.9	8.5	9.1	8.3	8.8	8.1	8.7	8.6
	pH	7.6	8.0	7.5	8.0	7.8	8.0	7.7	8.0	7.7	8.0	7.7	8.0	7.9	8.0
	Temp	24.5	24.3	24.2	24.5	24.2	24.6	24.9	24.8	24.6	24.6	24.2	24.3	24.5	24.2
0.25 g/l	DO	8.0	8.5	7.3	8.6	8.6	8.5	8.9	8.4	9.1	8.2	8.9	8.0	8.6	8.5
	pH	7.6	8.0	7.5	7.9	7.8	8.0	7.7	8.0	7.7	8.0	7.7	8.0	7.9	8.1
	Temp	24.5	24.2	24.2	24.6	24.2	24.6	24.9	24.7	24.5	24.7	24.2	24.2	24.4	24.2
0.5 g/l	DO	8.0	8.6	7.4	8.8	8.6	8.5	8.9	8.6	9.1	8.4	8.8	8.2	8.6	8.4
	pH	7.6	8.0	7.5	7.9	7.8	8.0	7.8	8.0	7.8	8.0	7.7	8.0	7.9	8.1
	Temp	24.5	24.2	24.1	24.8	24.2	24.7	24.9	24.5	24.4	24.6	24.3	24.1	24.3	24.3
1.0 g/l	DO	8.0	8.5	7.5	8.8	8.5	8.6	8.9	8.5	9.0	8.4	8.9	8.1	8.5	8.1
	pH	7.7	8.0	7.5	7.9	7.9	8.0	7.8	8.0	7.8	8.1	7.8	8.0	7.9	8.1
	Temp	24.5	24.1	24.1	24.5	24.3	24.6	25.0	24.8	24.3	24.7	24.3	24.2	24.4	24.2
2.0 g/l	DO	8.0	8.6	7.6	8.7	8.5	8.7	8.9	8.8	8.9	8.3	8.9	8.1	8.4	8.6
	pH	7.7	8.1	7.5	7.9	8.0	8.0	7.9	8.0	7.9	8.1	7.8	8.1	7.9	8.1
	Temp	24.5	24.1	24.0	24.8	24.5	24.7	25.0	24.4	24.0	24.6	24.2	24.3	24.3	24.4
4.0 g/l	DO	8.0	8.6	-	-	-	-	-	-	-	-	-	-	-	-
	pH	7.7	8.1	-	-	-	-	-	-	-	-	-	-	-	-
	Temp	24.4	24.1	-	-	-	-	-	-	-	-	-	-	-	-

Dissolved Oxygen (DO) readings are in mg/l O<sub>2</sub>; Temperature (Temp) readings are in °C.

Additional Parameters	Control			High Concentration		
	Day 1	Day 3	Day 5	Day 1	Day 3	Day 5
	Conductivity (µS)	335	340	345	6470	3270
Alkalinity (mg/l CaCO <sub>3</sub> )	70	70	69	70	70	69
Hardness (mg/l CaCO <sub>3</sub> )	97	99	100	96	98	99

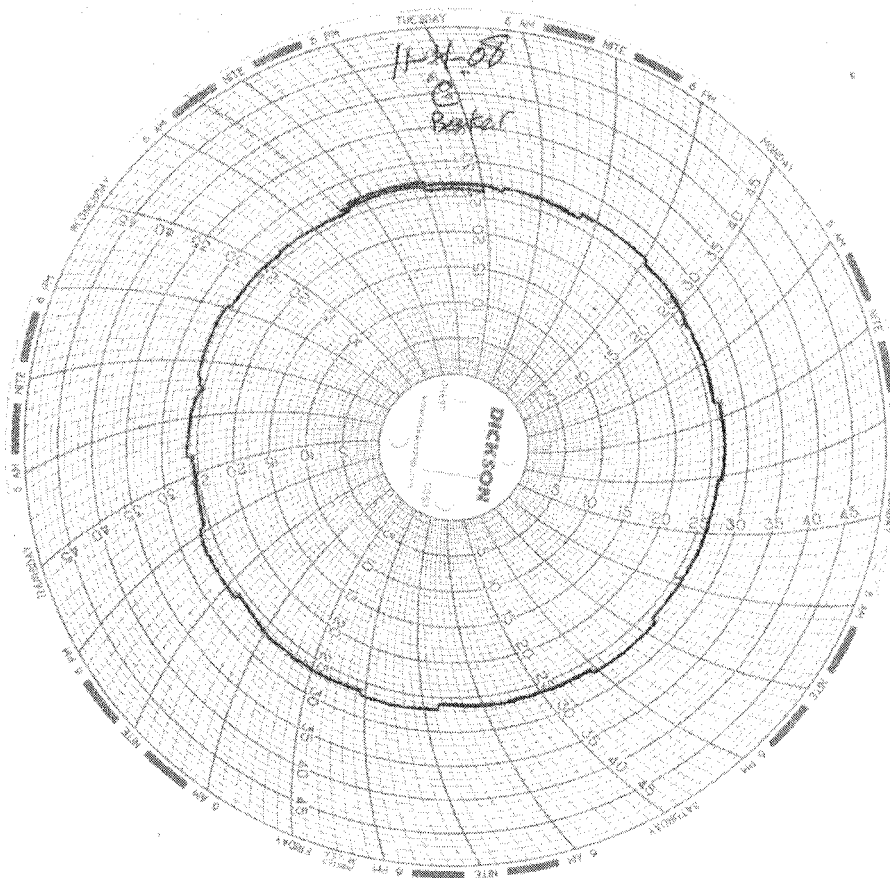
Source of Neonates										
Replicate:	A	B	C	D	E	F	G	H	I	J
Brood ID:	A3	B2	C1	D3	E3	F2	G1	H2	F3	J1

# *Test Temperature Chart*

*Test No: RT-081104*

*Date Tested: 11/04/08 to 11/11/08*

*Acceptable Range: 25 $\pm$ 1 $^{\circ}$ C*





TestAmerica Laboratories, Inc.

## ANALYTICAL REPORT

REVISED

PROJECT NO. BOEING NPDES

SSFL MWH-Pasadena/Boeing

Lot #: F8L030234

Joseph Doak

TestAmerica Irvine  
17461 Derian Ave  
Suite 100  
Irvine, CA 92614-5817

TESTAMERICA LABORATORIES, INC.

A handwritten signature in black ink, appearing to read "Sherryl A. Adam", is written in a cursive style.

Sherryl Adam  
Project Manager

January 28, 2009

**Case Narrative**  
**LOT NUMBER: F8L030234**  
**REVISED**

**This report has been revised to include Uranium results to be reported in pCi/L per client request.**

This report contains the analytical results for the sample received under chain of custody by TestAmerica St. Louis on November 29, 2008. This sample is associated with your SSFL MWH-Pasadena/Boeing project.

The analytical results included in this report meet all applicable quality control procedure requirements.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by TestAmerica St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

**Observations/Nonconformances**

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

**Total Uranium by Laser Phosphorimetry**

The sample results were converted from ug/L to pCi/L per client request. The conversion assumes that all of the uranium is naturally occurring.

**Affected Samples:**

F8L030234 (1): IRK2828-01

**METHODS SUMMARY**

F8L030234

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
Gamma Spectroscopy - Cesium-137 & Hits	EPA 901.1 MOD	
Gross Alpha/Beta EPA 900	EPA 900.0 MOD	EPA 900.0
H-3 by Distillation & LSC	EPA 906.0 MOD	
Radium-226 by GFPC	EPA 903.0 MOD	EPA 903.0
Radium-228 by GFPC	EPA 904 MOD	EPA 904
Strontium 90 by GFPC	EPA 905 MOD	
Total Uranium By Laser Ph osphorimetry	ASTM 5174-91	

**References:**

ASTM Annual Book Of ASTM Standards.

EPA "EASTERN ENVIRONMENTAL RADIATION FACILITY RADIOCHEMISTRY  
PROCEDURES MANUAL" US EPA EPA 520/5-84-006 AUGUST 1984

**SAMPLE SUMMARY**

F8L030234

<u>WO #</u>	<u>SAMPLE#</u>	<u>CLIENT SAMPLE ID</u>	<u>SAMPLED DATE</u>	<u>SAMP TIME</u>
K3089	001	IRK2828-01	11/26/08	13:30

**NOTE(S) :**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

## TestAmerica Irvine

Client Sample ID: IRK2828-01

## Radiochemistry

Lab Sample ID: F8L030234-001  
 Work Order: K3089  
 Matrix: WATER

Date Collected: 11/26/08 1330  
 Date Received: 11/29/08 0915

Parameter	Result	Qual	Total Uncert. (2 $\sigma$ +/-)	RL	mdc	Prep Date	Analysis Date
Gamma Cs-137 & Hits by EPA 901.1 MOD				pCi/L		Batch # 8344329	Yld %
Cesium 137	1.1	U	5.3	20.0	10	12/09/08	12/21/08
Potassium 40	-100	U	3100		300	12/09/08	12/21/08
Gross Alpha/Beta EPA 900				pCi/L		Batch # 8339115	Yld %
Gross Alpha	2.9	J	1.2	3.0	1.1	12/04/08	12/07/08
Gross Beta	8.1		1.5	4.0	1.6	12/04/08	12/07/08
Radium 226 by EPA 903.0 MOD				pCi/L		Batch # 8338402	Yld % 62
Radium (226)	0.119	J	0.074	1.00	0.091	12/03/08	12/26/08
Radium 228 by GFPC EPA 904 MOD				pCi/L		Batch # 8338404	Yld % 46
Radium 228	0.41	U	0.69	1.00	1.2	12/03/08	12/24/08
TRITIUM (Distill) by EPA 906.0 MOD				pCi/L		Batch # 8352094	Yld %
Tritium	50	U	170	500	290	12/17/08	12/19/08
SR-90 BY GFPC EPA-905 MOD				pCi/L		Batch # 8338424	Yld % 51
Strontium 90	0.33	U	0.28	3.00	0.44	12/03/08	12/15/08
Total Uranium by KPA ASTM 5174-91				pCi/L		Batch # 8345026	Yld %
Total Uranium	0.213	U	0.022	0.693	0.21	12/10/08	12/12/08

## NOTE(S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC.

J Result is greater than sample detection limit but less than stated reporting limit.

224



## TestAmerica Irvine

Client Sample ID: IRK2828-01 DUP

## Radiochemistry

Lab Sample ID: F8L030234-001X  
 Work Order: K3089  
 Matrix: WATER

Date Collected: 11/26/08 1330  
 Date Received: 11/29/08 0915

Parameter	Result	Qual	Total Uncert. (2 $\sigma$ +/-)	RL	mdc	Prep Date	Analysis Date
<b>Gross Alpha/Beta EPA 900</b>							
				pCi/L		Batch # 8339115	Yld %
Gross Alpha	2.6	J	1.2	3.0	1.3	12/04/08	12/07/08
Gross Beta	7.8		1.4	4.0	1.6	12/04/08	12/07/08
<b>Gamma Cs-137 &amp; Hits by EPA 901.1 MOD</b>							
				pCi/L		Batch # 8344329	Yld %
Cesium 137	0.02	U	9.0	20.0	17	12/09/08	12/21/08
Potassium 40	-100	U	1200		300	12/09/08	12/21/08
<b>TRITIUM (Distill) by EPA 906.0 MOD</b>							
				pCi/L		Batch # 8352094	Yld %
Tritium	80	U	170	500	290	12/17/08	12/19/08

## NOTE (S)

Data are incomplete without the case narrative.

MDC is determined by instrument performance only.

Bold results are greater than the MDC.

J Result is greater than sample detection limit but less than stated reporting limit.

225

## METHOD BLANK REPORT

## Radiochemistry

Client Lot ID: F8L030234  
 Matrix: WATER

Parameter	Result	Qual	Total Uncert. (2 $\sigma$ +/-)	RL	MDC	Prep Date	Lab Sample ID Analysis Date
Radium 226 by EPA 903.0 MOD			pCi/L	Batch #	8338402	Yld %	92 F8L030000-402B
Radium (226)	0.028	U	0.042	1.00	0.071	12/03/08	12/26/08
Radium 228 by GFPC EPA 904 MOD			pCi/L	Batch #	8338404	Yld %	62 F8L030000-404B
Radium 228	-0.09	U	0.51	1.00	0.90	12/03/08	12/24/08
SR-90 BY GFPC EPA-905 MOD			pCi/L	Batch #	8338424	Yld %	59 F8L030000-424B
Strontium 90	-0.14	U	0.36	3.00	0.63	12/03/08	12/15/08
Gross Alpha/Beta EPA 900			pCi/L	Batch #	8339115	Yld %	F8L040000-115B
Gross Alpha	-0.22	U	0.39	2.00	0.92	12/04/08	12/07/08
Gross Beta	0.10	U	0.60	4.00	1.0	12/04/08	12/07/08
Gamma Cs-137 & Hits by EPA 901.1 MOD			pCi/L	Batch #	8344329	Yld %	F8L090000-329B
Cesium 137	-0.7	U	8.4	20.0	15	12/09/08	12/21/08
Potassium 40	-40	U	190		220	12/09/08	12/21/08
Total Uranium by KPA ASTM 5174-91			pCi/L	Batch #	8345026	Yld %	F8L100000-026B
Total Uranium	0.150	U	0.018	0.693	0.21	12/10/08	12/12/08
TRITIUM (Distill) by EPA 906.0 MOD			pCi/L	Batch #	8352094	Yld %	F8L170000-094B
Tritium	140	U	180	500	300	12/17/08	12/19/08

## NOTE(S)

Data are incomplete without the case narrative.

MDC is determined using instrument performance only  
 Bold results are greater than the MDC.

U Result is less than the sample detection limit.

226

## Laboratory Control Sample Report

### Radiochemistry

Client Lot ID: F8L030234  
 Matrix: WATER

Parameter	Spike Amount	Result	Total Uncert. (2 $\sigma$ +/-)	MDC	% Yld	% Rec	Lab Sample ID QC Control Limits
<b>Gross Alpha/Beta EPA 900</b>							
Gross Beta	67.9	68.1	5.9	1.2		100	F8L040000-115C (72 - 117)
	Batch #:	8339115		900.0 MOD		Analysis Date:	12/07/08
<b>Gross Alpha/Beta EPA 900</b>							
Gross Alpha	49.4	55.8	6.2	1.1		113	F8L040000-115C (72 - 138)
	Batch #:	8339115		900.0 MOD		Analysis Date:	12/07/08
<b>Gamma Cs-137 &amp; Hits by EPA 901.1 MOD</b>							
Americium 241	141000	138000	11000	600		98	F8L090000-329C (90 - 110)
Cesium 137	53100	51500	3000	300		97	(90 - 110)
Cobalt 60	87900	84300	4700	200		96	(90 - 110)
	Batch #:	8344329		901.1 MOD		Analysis Date:	12/21/08
<b>Total Uranium by KPA ASTM 5174-91</b>							
Total Uranium	27.7	29.3	3.5	0.2		106	F8L100000-026C (90 - 116)
	Batch #:	8345026		5174-91		Analysis Date:	12/12/08
<b>Total Uranium by KPA ASTM 5174-91</b>							
Total Uranium	5.54	5.98	0.61	0.21		108	F8L100000-026C (90 - 116)
	Batch #:	8345026		5174-91		Analysis Date:	12/12/08
<b>TRITIUM (Distill) by EPA 906.0 MOD</b>							
Tritium	4840	4170	440	290		86	F8L170000-094C (77 - 110)
	Batch #:	8352094		906.0 MOD		Analysis Date:	12/19/08

**NOTE (S)**

MDC is determined by instrument performance only

Laboratory Control Sample/LCS Duplicate Report

Radiochemistry

Client Lot ID: F8L030234  
 Matrix: WATER

Parameter	Spike Amount	Result	Total Uncert. (2 $\sigma$ +/-)	% Yld	% Rec	Lab Sample ID	
						QC Control Limits	Precision
<b>Radium 226 by EPA 903.0 MOD</b>			<b>pCi/L</b>			<b>903.0 MOD</b>	<b>F8L030000-402C</b>
Radium (226)	11.3	10.8	0.96	97	96	(72 - 130)	
Spk 2	11.3	10.8	0.97	94	96	(72 - 130)	0.6 %RPD
	Batch #:	8338402		Analysis Date:	12/26/08		
<b>Radium 228 by GFPC EPA 904 MOD</b>			<b>pCi/L</b>			<b>904 MOD</b>	<b>F8L030000-404C</b>
Radium 228	7.39	9.0	1.1	73	122	(61 - 139)	
Spk 2	7.39	9.7	1.2	74	132	(61 - 139)	8 %RPD
	Batch #:	8338404		Analysis Date:	12/24/08		
<b>SR-90 BY GFPC EPA-905 MOD</b>			<b>pCi/L</b>			<b>905 MOD</b>	<b>F8L030000-424C</b>
Strontium 90	7.00	7.81	0.91	67	111	(73 - 135)	
Spk 2	7.00	8.60	0.99	62	123	(73 - 135)	10 %RPD
	Batch #:	8338424		Analysis Date:	12/15/08		

NOTE(S)

DUPLICATE EVALUATION REPORT

Radiochemistry

Client Lot ID: F8L030234  
 Matrix: WATER

Date Sampled: 11/26/08  
 Date Received: 11/29/08

Parameter	SAMPLE Result		Total Uncert. (2σ +/-)	% Yld	DUPLICATE Result	Total Uncert. (2σ +/-)	% Yld	QC Sample ID Precision
Gross Alpha/Beta EPA 900				pCi/L	900.0 MOD			F8L030234-001
Gross Alpha	2.9	J	1.2		2.6	J	1.2	9 %RPD
Gross Beta	8.1		1.5		7.8		1.4	4 %RPD
	Batch #:		8339115 (Sample)		8339115 (Duplicate)			
Gamma Cs-137 & Hits by EPA 901.1 MOD				pCi/L	901.1 MOD			F8L030234-001
Cesium 137	1.1	U	5.3		0.02	U	9.0	193 %RPD
Potassium 40	-100	U	3100		-100	U	1200	8 %RPD
	Batch #:		8344329 (Sample)		8344329 (Duplicate)			
TRITIUM (Distill) by EPA 906.0 MOD				pCi/L	906.0 MOD			F8L030234-001
Tritium	50	U	170		80	U	170	35 %RPD
	Batch #:		8352094 (Sample)		8352094 (Duplicate)			

NOTE (S)

Data are incomplete without the case narrative.  
 Calculations are performed before rounding to avoid round-off error in calculated results

J Result is greater than sample detection limit but less than stated reporting limit.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE REPORT

Radiochemistry

Client Lot ID: F8L090116  
 Matrix: WATER

Date Sampled: 11/26/08 1112  
 Date Received: 12/09/08 0830

Parameter	Spike Amount	SPIKE Result	Total Uncert. (2 $\sigma$ +/-)	Spike Yld	SAMPLE Result	Total Uncert. (2 $\sigma$ +/-)	QC Sample ID		QC Control Limits
							% Yld	%Rec	
Total Uranium by KPA ASTM 5			ug/L	5174-91			F8L090116-001		
Total Uranium	40.0	17800 a	2100		18200	2200	-101	a	(90 - 129)
Spk2	40.0	18100 a	2200		18200	2200	-334	a	(90 - 129)
							Precision:	2	%RPD
Batch #: 8345026			Analysis date:		12/12/08				

NOTE(S)

Data are incomplete without the case narrative.

Calculations are performed before rounding to avoid round-off error in calculated results

## MATRIX SPIKE REPORT

## Radiochemistry

Client Lot Id: F8L030234  
 Matrix: WATER

Date Sampled: 11/26/08  
 Date Received: 11/29/08

Parameter	Spike Amount	Spike Result	Total Uncert. (2σ +/-)	Spike Yld.	Sample Result	Total Uncert. (2σ +/-)	QC Sample ID		QC Control Limits
							%YLD	%REC	
Gross Alpha/Beta EPA 900			pCi/L	900.0 MOD			F8L030234-001		
Gross Beta	67.9	82.0	6.8		8.1	1.5		109	(66 - 147)
	Batch #:	8339115		Analysis Date:	12/07/08				
Gross Alpha/Beta EPA 900			pCi/L	900.0 MOD			F8L030234-001		
Gross Alpha	49.4	40.8	5.2		2.9	1.2		77	(44 - 150)
	Batch #:	8339115		Analysis Date:	12/07/08				
TRITIUM (Distill) by EPA 906.0 MOD			pCi/L	906.0 MOD			F8L030238-001		
Tritium	4840	4230	450		100	180		86	(47 - 150)
	Batch #:	8352094		Analysis Date:	12/19/08				

## NOTE(S)

Data are incomplete without the case narrative.

Calculations are performed before rounding to avoid round-off errors in calculated results.

*cur 174*

IRK2828

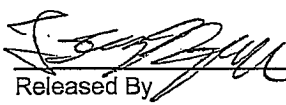
**SENDING LABORATORY:**

TestAmerica Irvine  
 17461 Derian Avenue, Suite 100  
 Irvine, CA 92614  
 Phone: (949) 261-1022  
 Fax: (949) 260-3297  
 Project Manager: Joseph Doak  
 Client: MWH-Pasadena/Boeing


**RECEIVING LABORATORY:**

TestAmerica St. Louis  
 13715 Rider Trail North  
 Earth City, MO 63045  
 Phone : (314) 298-8566  
 Fax: (314) 298-8757  
 Project Location: CA - CALIFORNIA  
 Receipt Temperature: \_\_\_\_\_ °C      Ice: Y / N

Analysis	Units	Due	Expires	Interlab	Price Surch	Comments
<b>Sample ID: IRK2828-01</b>		<b>Water</b>		<b>Sampled: 11/26/08 13:30</b>		
EDD + Level 4	N/A	12/09/08	12/24/08 13:30	\$0.00	0%	Excel EDD email to pm, Include Std logs for Lvl IV
Gamma Spec-O	mg/kg	12/09/08	11/26/09 13:30	\$250.00	0%	Out St Louis, K-40 and CS-137 only, DO NOT FILTER!
Gross Alpha-O	pCi/L	12/09/08	05/25/09 13:30	\$100.00	50%	Out St Louis, Boeing permit, DO NOT FILTER!
Gross Beta-O	pCi/L	12/09/08	05/25/09 13:30	\$100.00	50%	Out St Louis, Boeing permit, DO NOT FILTER!
Radium, Combined-O	pCi/L	12/09/08	11/26/09 13:30	\$238.00	50%	Out St Louis, Boeing permit, DO NOT FILTER!
Strontium 90-O	pCi/L	12/09/08	11/26/09 13:30	\$155.00	50%	Out St Louis, Boeing permit, DO NOT FILTER!
Tritium-O	pCi/L	12/09/08	11/26/09 13:30	\$80.00	50%	Out St Louis, Boeing permit, DO NOT FILTER!
Uranium, Combined-O	pCi/L	12/09/08	11/26/09 13:30	\$120.00	0%	Out St Louis, Boeing permit, DO NOT FILTER!
<b>Containers Supplied:</b>						
2.5 gal Poly (J)	500 mL Amber (K)					

  
 Released By \_\_\_\_\_

\_\_\_\_\_  
 Date/Time

  
 Received By \_\_\_\_\_

*11.29.08 0915*  
 \_\_\_\_\_  
 Date/Time

Released By \_\_\_\_\_  
 Date/Time

Received By \_\_\_\_\_  
 Date/Time





F8L030234  
238  
243

CONDITION UPON RECEIPT FORM

Client: TA Irvine 2/12.03-08

Quote No: 77635-81594

COC/RFA No: below 77635

174

Initiated By: [Signature] Date: 11.29.08 Time: 0915

Shipping Information

Shipper: (FedEx) UPS DHL Courier Client Other: \_\_\_\_\_ Multiple Packages: (Y) N

Shipping # (s):*	Sample Temperature (s):**
1. <u>7971 4437 5515</u>	1. <u>2</u>
2. <u>7961 4775 4360</u>	2. <u>2</u>
3. _____	3. _____
4. _____	4. _____
5. _____	5. _____

\*Numbered shipping lines correspond to Numbered Sample Temp lines

\*\*Sample must be received at 4°C ± 2°C. If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests- Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1. <u>(Y)</u> N	Are there custody seals present on the cooler?	8. Y <u>(N)</u>	Are there custody seals present on bottles?
2. Y <u>(N)</u> N/A	Do custody seals on cooler appear to be tampered with?	9. Y N <u>(N/A)</u>	Do custody seals on bottles appear to be tampered with?
3. <u>(Y)</u> N	Were contents of cooler frisked after opening, but before unpacking?	10. Y <u>(N)</u> <u>(N/A)</u>	Was sample received with proper pH? (If not, make note below)
4. <u>(Y)</u> N	Sample received with Chain of Custody?	11. <u>(Y)</u> N <u>2/12-01</u>	Sample received in proper containers?
5. <u>(Y)</u> N N/A	Does the Chain of Custody match sample ID's on the container(s)?	12. Y N <u>(N/A)</u>	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)
6. Y N <u>?</u>	Was sample received broken?	13. <u>(Y)</u> N N/A	Was Internal <u>COC/Workshare</u> received?
7. Y N <u>?</u>	Is sample volume sufficient for analysis?	14. <u>(Y)</u> N <u>(N/A)</u>	Was pH taken by original TestAmerica lab?

<sup>1</sup> For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes:

IRK 2802  
IRK 2832  
IRK 2828  
IRK 2835

IRK 2832-01, the 2.5 gal which I left on the bench Saturday has leaked - probably 2/12.01.08 there are 3 liters left.

Samples are not preserved - do these get filtered?

Per Sherryl, preserved the 1 sample from TA San Diego IRK2802. HNO<sub>3</sub> lot 007054 to pH of 1.

Corrective Action:

- Client Contact Name: \_\_\_\_\_
- Sample(s) processed "as is"
- Sample(s) on hold until: \_\_\_\_\_
- Project Management Review: [Signature]

Informed by: \_\_\_\_\_

If released, notify: \_\_\_\_\_

Date: 12-8-08

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

## **ANALYTICAL REPORT**

**MWH-Pasadena / Boeing**

Lot D8K290116

Project IRK2828

Joseph Doak  
17461 Derian Avenue  
Suite 100  
Irvine, CA 92614

TestAmerica Laboratories, Inc.



Danielle Fougere  
Project Manager

December 5, 2008

## Case Narrative

Enclosed is the report for one sample received at TestAmerica Laboratories, Inc. – Denver laboratory on November 29, 2008. The results included in this report relate only to the samples in this report and have been reviewed for compliance with the laboratory QA/QC plan and meet all requirements of NELAC. All data have been found to be compliant with laboratory protocol, with the exception of any items noted below.

This report may include reporting limits (RLs) less than the Denver laboratory's standard reporting limits. The reported sample results and associated reporting limits are being used specifically to meet the needs of this project. Note that data are not normally reported to these levels without qualification because they are inherently less reliable and potentially less defensible than required by the latest industry standards.

Dilution factors and footnotes have been provided to assist in the interpretation of the results. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at concentrations above the linear calibration curve, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica Laboratories, Inc. utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. A summary of quality control parameters is provided below.

This report shall not be reproduced except in full, without the written approval of the laboratory.

## Quality Control Summary for Lot D8K290116

### **Sample Receiving**

The cooler temperature for the samples received on November 29, 2008 at the Denver laboratory was 0.8°C. All sample containers were received in acceptable condition.

### **Total Mercury –Method 245.1**

Matrix spike analyses for QC batch 8336128 were performed on a sample from another client and/or lot, and were in control.

No anomalies were observed.

### **Dissolved Mercury –Method 245.1**

Matrix spike analyses for QC batch 8336136 were performed on a sample from another client and/or lot, and were in control.

No anomalies were observed.

## Quality Control Definitions of Qualifiers

Qualifier	Definition
U	Result is less than the method detection limit (MDL).
B	Organics: Method blank contamination. The associated method blank contains the target analyte at a reportable level. Inorganics: Estimated result. Result is less than the RL
J	Organics: Estimated result. Result is less than RL Inorganics: Method blank contamination. The associated method blank contains the target analyte at a reportable level.
E	Estimated result. Result concentrations exceed the calibration range.
p	Relative Percent Difference (RPD) is outside control limits.
*	Surrogate or Relative Percent Difference (RPD) is outside control limits.
DIL	The concentration is estimated or not reported due to dilution.
COL	More than 40% difference between the primary and confirmation detector results. The lower of the two results is reported.
CHI	More than 40% difference between the primary and confirmation detector results. The higher of the two results is reported.
L	Serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.
a	Spiked analyte recovery is outside stated control limits.
N	Spiked analyte recovery is outside stated control limits.
NC	The recovery and/or RPD were not calculated.
MSB	The recovery and/or RPD were not calculated because the sample amount was greater than four times the spike amount.

SUBCONTRACT ORDER

TestAmerica Irvine

IRK2828

C-8 IRK  
Lm 11/29/08

SENDING LABORATORY:

TestAmerica Irvine  
17461 Derian Avenue, Suite 100  
Irvine, CA 92614  
Phone: (949) 261-1022  
Fax: (949) 260-3297  
Project Manager: Joseph Doak  
Client: MWH-Pasadena/Boeing

RECEIVING LABORATORY:

TestAmerica Denver  
4955 Yarrow Street  
Arvada, CO 80002  
Phone : (303) 736-0100  
Fax: (303) 431-7171  
Project Location: CA - CALIFORNIA  
Receipt Temperature: \_\_\_\_\_ °C      Ice: Y / N

Analysis	Units	Due	Expires	Interlab Price	Surch	Comments
----------	-------	-----	---------	----------------	-------	----------

Sample ID: IRK2828-01

Water

Sampled: 11/26/08 13:30

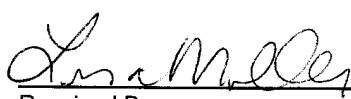
Level 4 + EDD-OUT	N/A	12/09/08	12/24/08 13:30	\$0.00	0%	Sub to Denver, transfer file EDD
Mercury - 245.1, Diss -OUT	ug/l	12/09/08	12/24/08 13:30	\$36.00	0%	Denver, Boeing, J flags
Mercury - 245.1-OUT	ug/l	12/09/08	12/24/08 13:30	\$36.00	0%	Denver, Boeing, permit, J flags,

Containers Supplied:

1 L Poly w/HNO3 (B)    125 mL Poly (N)

  
Released By

11-28-08/17:00  
Date/Time

  
Received By

11/29/08 0830  
Date/Time

Released By

Date/Time

Received By

Date/Time

TestAmerica Denver  
**Sample Receiving Checklist**

Lot #: D8K290116 Date/Time Received: 11/29/08 0830

Company Name & Sampling Site: TA Irvine

PM to Complete This Section: *Yes* *No*  
 Residual chlorine check required:   Quarantined:

Quote #:

Special Instructions:

Time Zone:  
 • EDT/EST • CDT/CST • MDT/MST • PDT/PST • OTHER

**Unpacking Checks:**

Cooler #(s): \_\_\_\_\_

Temperatures (°C): 0.8 \_\_\_\_\_

N/A Yes No

Initials

*LN*

- 1. Cooler seals intact? (N/A if hand delivered) If no, document on CUR.
- 2. Coolers scanned for radiation. Is the reading  $\leq$  to background levels? Yes:  No: \_\_\_\_\_
- 3. Chain of custody present? If no, document on CUR.
- 4. Bottles broken and/or are leaking? If yes, document on CUR.
- 5. Multiphasic samples obvious? If yes, document on CUR.
- 6. Proper container & preservatives used? (ref. Attachment D of SOP# DV-QA-0003) If no, document on CUR.
- 7. pH of all samples checked and meet requirements? If no, document on CUR.
- 8. Sufficient volume provided for all analysis requested? (ref. Attachment D of SOP# DV-QA-0003) If no, document on CUR, and contact PM before proceeding.
- 9. Did chain of custody agree with labels ID and samples received? If no, document on CUR.
- 10. Were VOA samples without headspace? If no, document on CUR.
- 11. Were VOA vials preserved? Preservative  HCl  4±2°C  Sodium Thiosulfate  Ascorbic Acid
- 12. Did samples require preservation with sodium thiosulfate?
- 13. If yes to #11, did the samples contain residual chlorine? If yes, document on CUR.
- 14. Sediment present in dissolved/filtered bottles? If yes, document on CUR.
- 15. Is sufficient volume provided for client requested MS, MSD or matrix duplicates? If no, document on CUR, and contact PM before proceeding.
- 16. Receipt date(s) > 48 hours past the collection date(s)? If yes, notify PA/PM.
- 17. Are analyses with short holding times requested?
- 18. Was a quick Turn Around (TAT) requested?

TestAmerica Denver  
Sample Receiving Checklist

Lot # D81290114

Login Checks:

N/A Yes No

Initials  
LM

- 19. Sufficient volume provided for all analysis requested? (ref. Attachment D of SOP# DV-QA-0003) If no, document on CUR, and contact PM before proceeding.
- 20. Is sufficient volume provided for client requested MS, MSD or matrix duplicates? If no, document on CUR, and contact PM before proceeding.
- 21. Did the chain of custody includes "received by" and "relinquished" by signatures, dates, and times?
- 22. Were special log in instructions read and followed?
- 23. Were AFCEE metals logged for refrigerated storage?
- 24. Were tests logged checked against the COC? Which samples were confirmed? 1
- 25. Was a Rush form completed for quick TAT?
- 26. Was a Short Hold form completed for any short holds?
- 27. Were special archiving instructions indicated in the General Comments? If so, what were they?

Labeling and Storage Checks:

Initials  
LM

- 28. Was the subcontract COC signed and sent with samples to bottle prep?
- 29. Were sample labels double-checked by a second person?
- 30. Were sample bottles and COC double checked for dissolved/filtered metals by a second person?
- 31. Did the sample ID, Date, and Time from label match what was logged?
- 32. Were stickers for special archiving instructions affixed to each box? See #27
- 33. Were AFCEE metals stored refrigerated?

Document any problems or discrepancies and the actions taken to resolve them on a Condition Upon Receipt Anomaly Report (CUR).

# EXECUTIVE SUMMARY - Detection Highlights

D8K290116

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
<b>NO DETECTABLE PARAMETERS</b>				



# METHODS SUMMARY

D8K290116

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
Dissolved Mercury (CVAA)	MCAWW 245.1	MCAWW 245.1
Mercury (Manual Cold Vapor Technique)	MCAWW 245.1	MCAWW 245.1

## References:

MCAWW "Methods for Chemical Analysis of Water and Wastes",  
EPA-600/4-79-020, March 1983 and subsequent revisions.

# METHOD / ANALYST SUMMARY

D8K290116

<u>ANALYTICAL METHOD</u>	<u>ANALYST</u>	<u>ANALYST ID</u>
MCAWW 245.1	Christopher Grisdale	9582

**References:**

MCAWW "Methods for Chemical Analysis of Water and Wastes",  
EPA-600/4-79-020, March 1983 and subsequent revisions.

# SAMPLE SUMMARY

D8K290116

<u>WO #</u>	<u>SAMPLE#</u>	<u>CLIENT SAMPLE ID</u>	<u>SAMPLED DATE</u>	<u>SAMP TIME</u>
K3TMN	001	IRK2828-01	11/26/08	13:30

**NOTE (S) :**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# QC DATA ASSOCIATION SUMMARY

D8K290116

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	WATER	MCAWW 245.1		8336128	8336053
	WATER	MCAWW 245.1		8336136	8336058

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## Total Metals

Lot ID: D8K290116

Client: TestAmerica Irvine

Method: 245.1

Associated Samples: 001

Batch: 8336128

Total Metals Analysis  
COVER PAGE - INORGANIC ANALYSIS DATA PACKAGE

Contract: TestAmerica Irvine SDG No.: D8K290116  
Lab Code: \_\_\_\_\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_  
SOW No.: \_\_\_\_\_

Sample ID. Lab Sample No.  
IRK2828-01 D8K290116-001

Were ICP interelement corrections applied? Yes/No YES  
Were ICP background corrections applied? Yes/No YES  
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Janice Collins Name: Janice Collins  
Date: 12/4/08 Title: Metals Analyst

## Total Metals Analysis Data Sheet

Lab Name: TESTAMERICA DENVER

Lot/SDG Number: D8K290116

Matrix: WATER

% Moisture: N/A

Basis: Wet

Client Sample ID: IRK2828-01

Lab Sample ID: D8K290116-001

Lab WorkOrder: K3TMN

Date/Time Collected: 11/26/08 13:30

Date/Time Received: 11/29/08 08:30

CAS No.	Analyte	Conc.	MDL	RL	Units	Q	Method
7439-97-6	Mercury	0.027	0.027	0.20	ug/L	U	245.1

**Total Metals Analysis**

-2A-

**INITIAL AND CONTINUING CALIBRATION VERIFICATION**

Contract: TestAmerica Irvine

Lab Code: \_\_\_\_\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG NO.: D8K290116

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Ultra Scientific

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury	7.000	7.096	101.4	5.000	5.150	103.0	5.147	102.9	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115



Total Metals Analysis

-2A-

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: TestAmerica Irvine

Lab Code: \_\_\_\_\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG NO.: D8K290116

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Ultra Scientific

Concentration Units: ug/L

Analyte	Initial Calibration			Continuing Calibration					M
	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Mercury				5.000	5.453	109.1			CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

Total Metals Analysis  
-2B-  
CRDL STANDARD FOR AA AND ICP

Contract: TestAmerica Irvine

Lab Code: \_\_\_\_\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: D8K290116

AA CRDL Standard Source: Ultra Scientific

ICP CRDL Standard Source: \_\_\_\_\_

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	Initial		Final		
	True	Found	%R	True	Found	%R	Found	%R
Mercury	0.200	0.13694	68.5					

Comments: