

Denison Environmental Services

X5P

Project: March 7&8, 2012, Faro Mine Complex

Rainbow Trout Bioassay

96-h LC50 %v/v: >100%**Maxxam Analytics**

4606 Canada Way
 Burnaby, BC
 Canada V5G 1K5
 tel: 604 734-7276
 fax: 604 731-2386
 web: <http://maxxam.ca>

Sample #: CX4506-01 / B220130 / 4337

Report #: 2-11-200-294-12-003

Sample Taken:	Mar. 8, 2012 1:35 PM	Sample pH:	6.9
Sample Collected By:	NG/BB/CF/KR/PK/RM/TP	Sample Dissolved Oxygen:	6.3 mg/L
Sample Received:	Mar. 9, 2012	Sample Temperature:	14.7 °C
Start Date/Time:	Mar. 9, 2012 5:00 PM	Sample Conductance:	2086 µmho/cm

Conc. (%v/v)	Cond. (µmho/cm)	Temp.		pH		D.O.		Percent Mortality				Number of Mortalities
		Initial (°C)	Final (°C)	Initial	Final	Initial (mg/L)	Final (mg/L)	24 hr	48 hr	72 hr	96 hr	
0	49	14.7	14.4	7.3	7.7	10.2	9.4	0	0	0	0	0
100	2063	14.7	14.6	6.8	8.2	6.9	9.4	0	0	0	0	0

Comments:

At test initiation the fish in 100% concentration were surfacing; after 10 min the fish were quiescent at the bottom of the tank. For the remainder of the test all fish appeared and behaved normally. The cumulative fish culture mortality in previous 7 days was 0.13%. The acceptability criteria for fish culture mortality is <2%.

Test Conditions:

Organisms per Replicate:	10	Preaeration Time:	30 min.
Test Volume:	18 L	Rate of aeration:	6.5 ml/min/L
Loading Density:	0.33 g/L		

Test Organism: Rainbow Trout (*Oncorhynchus mykiss*)

Weight (Mean + SD):	0.6 ± 0.25 g	Length (Mean + SD):	4.1 ± 0.5 cm
Weight (Range):	0.23– 1.38 g	Length (Range):	3– 5.1 cm

Reference Toxicant: Zinc


Test was conducted on: 23/02/2012
 Test gave a 96-h LC50 of 0.19 (0.14, 0.25) mg/L
 The historical mean LC50 and warning limits were 0.15 (0.05, 0.42) mg/L.

Dilution Water: Vancouver Tapwater hardened and dechlorinated


EDTA Hardness:	18 mg CaCO ₃ /L	Other parameters available on request
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Test Method: Biological Test Method: Reference Method for Determining Acute Lethality of Effluent to Rainbow Trout, EPS 1/RM/13, Second Edition, December 2000 and May 2007 Amendments. Results contained in this report refer only to the testing of samples as submitted.

Analyst


 2012 March 5

Verified By


 MAR 14 2012

Denison Environmental Services

X13

Project: March 7&8, 2012, Faro Mine Complex

Rainbow Trout Bioassay

96-h LC50 %v/v: >100%

Maxxam Analytics

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Sample #: CX4509-06 / B220130 / 4337				Report #: 2-11-200-294-12-004			
Sample Taken:	Mar. 8, 2012 2:34 PM	Sample pH:	7.0				
Sample Collected By:	NG/BB/CF/KR/PK/RM/TP	Sample Dissolved Oxygen:	9.0 mg/L				
Sample Received:	Mar. 9, 2012	Sample Temperature:	16.0 °C				
Start Date/Time:	Mar. 9, 2012 5:00 PM	Sample Conductance:	2465 µmho/cm				

Conc. (%v/v)	Cond. (µmho/cm)	Temp.		pH		D.O.		Percent Mortality				Number of Mortalities
		Initial (°C)	Final (°C)	Initial	Final	Initial (mg/L)	Final (mg/L)	24 hr	48 hr	72 hr	96 hr	
0	49	14.7	14.4	7.3	7.7	10.2	9.4	0	0	0	0	0
100	2458	15.8	14.6	7.1	8.2	9.2	9.3	0	10	10	20	2

Comments:

At test initiation the fish in 100% concentration were surfacing. For the remainder of the test all surviving fish appeared and behaved normally. The cumulative fish culture mortality in previous 7 days was 0.13%. The acceptability criteria for fish culture mortality is <2%.

Test Conditions:

Organisms per Replicate:	10	Preaeration Time:	30 min.
Test Volume:	18 L	Rate of aeration:	6.5 ml/min/L
Loading Density:	0.33 g/L		

Test Organism: Rainbow Trout (*Oncorhynchus mykiss*)

Weight (Mean + SD):	0.6 ± 0.25 g	Length (Mean + SD):	4.1 ± 0.5 cm
Weight (Range):	0.23– 1.38 g	Length (Range):	3– 5.1 cm

Reference Toxicant: Zinc

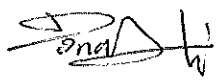
Test was conducted on: 23/02/2012
 Test gave a 96-h LC50 of 0.19 (0.14, 0.25) mg/L
 The historical mean LC50 and warning limits were 0.15 (0.05, 0.42) mg/L.

Dilution Water: Vancouver Tapwater hardened and dechlorinated

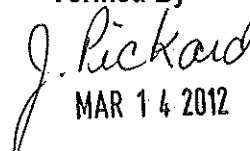
EDTA Hardness: 18 mg CaCO₃/L Other parameters available on request

Test Method: Biological Test Method: Reference Method for Determining Acute Lethality of Effluent to Rainbow Trout, EPS 1/RM/13, Second Edition, December 2000 and May 2007 Amendments. Results contained in this report refer only to the testing of samples as submitted.

Analyst


 2012 Mar 15

Verified By


 MAR 14 2012