Certificate of Analysis

MMG RESOURCES INC
ATTN: ANDREW MITCHELL
200 - 1159 ALLOY DRIVE
THUNDER BAY ON P7B 6M8

Report Date: 10-NOV-09 16:03 (MT)
Version: FINAL

Lab Work Order #: L831482 **Date Received:** 20-OCT-09

Project P.O. #: 09-00623
Job Reference:
Legal Site Desc:
CofC Numbers: 08-012472

Other Information:

Comments:

Maureen Olinek
Senior Account Manager

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L831482-1 LUP-20-10-18-09-W							
Sampled By: TC on 18-OCT-09 @ 16:15							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003524
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.187		0.010	mg/L		22-OCT-09	R1003246
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Arsenic (As)-Total	0.00238		0.00040	mg/L		22-OCT-09	R1003246
Barium (Ba)-Total	0.0677		0.0030	mg/L		22-OCT-09	R1003246
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Boron (B)-Total	0.144		0.050	mg/L		22-OCT-09	R1003246
Cadmium (Cd)-Total	0.00106		0.000050	mg/L		22-OCT-09	R1003246
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Cobalt (Co)-Total	0.0633		0.0020	mg/L		22-OCT-09	R1003246
Copper (Cu)-Total	0.0040		0.0010	mg/L		22-OCT-09	R1003246
Lead (Pb)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Lithium (Li)-Total	0.046		0.010	mg/L		22-OCT-09	R1003246
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Nickel (Ni)-Total	0.167		0.0020	mg/L		22-OCT-09	R1003246
Selenium (Se)-Total	<0.0020	DLM	0.0020	mg/L		22-OCT-09	R1003246
Silver (Ag)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Tin (Sn)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Uranium (U)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Vanadium (V)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Zinc (Zn)-Total	0.512		0.0040	mg/L		22-OCT-09	R1003246
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	128		0.50	mg/L		21-OCT-09	R997383
Iron (Fe)-Total	0.323		0.010	mg/L		21-OCT-09	R997383
Magnesium (Mg)-Total	14.9		0.10	mg/L		21-OCT-09	R997383
Manganese (Mn)-Total	1.50		0.0020	mg/L		21-OCT-09	R997383
Potassium (K)-Total	10.2		0.10	mg/L		21-OCT-09	R997383
Sodium (Na)-Total	121		1.0	mg/L		21-OCT-09	R997383
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	<5.0		5.0	mg/L		20-OCT-09	R993943
Ammonia-N	0.202	RRV	0.050	mg/L		21-OCT-09	R996155
Cyanide, Total	<0.0020		0.0020	mg/L	26-OCT-09	26-OCT-09	R1016223
Hardness (as CaCO3)	381			mg/L		22-OCT-09	
Total Suspended Solids	3.0		3.0	mg/L		21-OCT-09	R996403
pH	5.55		0.10	pH		20-OCT-09	R993943
L831482-2 LUP-21-10-18-09-W							
Sampled By: TC on 18-OCT-09 @ 15:55							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003524
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.016		0.010	mg/L		22-OCT-09	R1003246
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Arsenic (As)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Barium (Ba)-Total	<0.0030		0.0030	mg/L		22-OCT-09	R1003246
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L831482-2 LUP-21-10-18-09-W							
Sampled By: TC on 18-OCT-09 @ 15:55							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Boron (B)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Cadmium (Cd)-Total	0.000095		0.000050	mg/L		22-OCT-09	R1003246
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		22-OCT-09	R1003246
Copper (Cu)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Lead (Pb)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Lithium (Li)-Total	<0.010		0.010	mg/L		22-OCT-09	R1003246
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		22-OCT-09	R1003246
Selenium (Se)-Total	0.00050		0.00040	mg/L		22-OCT-09	R1003246
Silver (Ag)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Tin (Sn)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Uranium (U)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Vanadium (V)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Zinc (Zn)-Total	0.0053		0.0040	mg/L		22-OCT-09	R1003246
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	1.23		0.50	mg/L		23-OCT-09	R1001764
Iron (Fe)-Total	0.023		0.010	mg/L		21-OCT-09	R997383
Magnesium (Mg)-Total	0.58		0.10	mg/L		21-OCT-09	R997383
Manganese (Mn)-Total	0.0023		0.0020	mg/L		21-OCT-09	R997383
Potassium (K)-Total	0.44		0.10	mg/L		21-OCT-09	R997383
Sodium (Na)-Total	<1.0		1.0	mg/L		23-OCT-09	R1001764
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	<5.0		5.0	mg/L		20-OCT-09	R993943
Ammonia-N	<0.050		0.050	mg/L		21-OCT-09	R996155
Cyanide, Total	<0.0020		0.0020	mg/L	26-OCT-09	26-OCT-09	R1016223
Hardness (as CaCO3)	5.0			mg/L		23-OCT-09	
Total Suspended Solids	<3.0		3.0	mg/L		21-OCT-09	R996403
pH	6.40		0.10	pH		20-OCT-09	R993943
L831482-3 LUP-22-10-18-09-W							
Sampled By: TC on 18-OCT-09 @ 15:30							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003524
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.022		0.010	mg/L		22-OCT-09	R1003246
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Arsenic (As)-Total	0.00044		0.00040	mg/L		22-OCT-09	R1003246
Barium (Ba)-Total	0.0033		0.0030	mg/L		22-OCT-09	R1003246
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Boron (B)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Cadmium (Cd)-Total	0.000085		0.000050	mg/L		22-OCT-09	R1003246
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		22-OCT-09	R1003246
Copper (Cu)-Total	0.0844		0.0010	mg/L		22-OCT-09	R1003246
Lead (Pb)-Total	0.00015		0.00010	mg/L		22-OCT-09	R1003246
Lithium (Li)-Total	<0.010		0.010	mg/L		22-OCT-09	R1003246
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L831482-3 LUP-22-10-18-09-W							
Sampled By: TC on 18-OCT-09 @ 15:30							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Nickel (Ni)-Total	0.0033		0.0020	mg/L		22-OCT-09	R1003246
Selenium (Se)-Total	0.00079		0.00040	mg/L		22-OCT-09	R1003246
Silver (Ag)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Tin (Sn)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Uranium (U)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Vanadium (V)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Zinc (Zn)-Total	0.0200		0.0040	mg/L		22-OCT-09	R1003246
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	3.03		0.50	mg/L		21-OCT-09	R997383
Iron (Fe)-Total	0.065		0.010	mg/L		21-OCT-09	R997383
Magnesium (Mg)-Total	0.85		0.10	mg/L		21-OCT-09	R997383
Manganese (Mn)-Total	0.0202		0.0020	mg/L		21-OCT-09	R997383
Potassium (K)-Total	0.84		0.10	mg/L		21-OCT-09	R997383
Sodium (Na)-Total	2.4		1.0	mg/L		21-OCT-09	R997383
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	<5.0		5.0	mg/L		20-OCT-09	R993943
Ammonia-N	<0.050		0.050	mg/L		21-OCT-09	R996155
Cyanide, Total	<0.0020		0.0020	mg/L	26-OCT-09	26-OCT-09	R1016223
Hardness (as CaCO3)	11.1			mg/L		22-OCT-09	
Total Suspended Solids	3.0		3.0	mg/L		21-OCT-09	R996403
pH	6.42		0.10	pH		20-OCT-09	R993943
L831482-4 LUP-22-10-18-09-WD							
Sampled By: TC on 18-OCT-09 @ 15:30							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003524
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.021		0.010	mg/L		22-OCT-09	R1003246
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Arsenic (As)-Total	0.00046		0.00040	mg/L		22-OCT-09	R1003246
Barium (Ba)-Total	0.0036		0.0030	mg/L		22-OCT-09	R1003246
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Boron (B)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Cadmium (Cd)-Total	0.000480		0.000050	mg/L		22-OCT-09	R1003246
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		22-OCT-09	R1003246
Copper (Cu)-Total	0.0011		0.0010	mg/L		22-OCT-09	R1003246
Lead (Pb)-Total	0.00013		0.00010	mg/L		22-OCT-09	R1003246
Lithium (Li)-Total	<0.010		0.010	mg/L		22-OCT-09	R1003246
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Nickel (Ni)-Total	0.0031		0.0020	mg/L		22-OCT-09	R1003246
Selenium (Se)-Total	0.00046		0.00040	mg/L		22-OCT-09	R1003246
Silver (Ag)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Tin (Sn)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Uranium (U)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Vanadium (V)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L831482-4 LUP-22-10-18-09-WD							
Sampled By: TC on 18-OCT-09 @ 15:30							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Zinc (Zn)-Total	0.0245		0.0040	mg/L		22-OCT-09	R1003246
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	3.02		0.50	mg/L		21-OCT-09	R997383
Iron (Fe)-Total	0.026		0.010	mg/L		21-OCT-09	R997383
Magnesium (Mg)-Total	0.81		0.10	mg/L		21-OCT-09	R997383
Manganese (Mn)-Total	0.0177		0.0020	mg/L		21-OCT-09	R997383
Potassium (K)-Total	0.65		0.10	mg/L		21-OCT-09	R997383
Sodium (Na)-Total	2.2		1.0	mg/L		21-OCT-09	R997383
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	<5.0		5.0	mg/L		20-OCT-09	R993943
Ammonia-N	<0.050		0.050	mg/L		21-OCT-09	R996155
Cyanide, Total	<0.0020		0.0020	mg/L	26-OCT-09	26-OCT-09	R1016223
Hardness (as CaCO3)	10.9			mg/L		22-OCT-09	
Total Suspended Solids	<3.0		3.0	mg/L		21-OCT-09	R996403
pH	6.39		0.10	pH		20-OCT-09	R993943
L831482-5 LUP-24-10-18-09-M							
Sampled By: TC on 18-OCT-09 @ 15:00							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003524
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.018		0.010	mg/L		22-OCT-09	R1003246
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Arsenic (As)-Total	0.00045		0.00040	mg/L		22-OCT-09	R1003246
Barium (Ba)-Total	0.0057		0.0030	mg/L		22-OCT-09	R1003246
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Boron (B)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Cadmium (Cd)-Total	0.000075		0.000050	mg/L		22-OCT-09	R1003246
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Cobalt (Co)-Total	0.0023		0.0020	mg/L		22-OCT-09	R1003246
Copper (Cu)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Lead (Pb)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Lithium (Li)-Total	<0.010		0.010	mg/L		22-OCT-09	R1003246
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Nickel (Ni)-Total	0.0100		0.0020	mg/L		22-OCT-09	R1003246
Selenium (Se)-Total	0.00071		0.00040	mg/L		22-OCT-09	R1003246
Silver (Ag)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Tin (Sn)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Uranium (U)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Vanadium (V)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Zinc (Zn)-Total	0.0308		0.0040	mg/L		22-OCT-09	R1003246
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	9.76		0.50	mg/L		21-OCT-09	R997383
Iron (Fe)-Total	0.016		0.010	mg/L		21-OCT-09	R997383
Magnesium (Mg)-Total	1.46		0.10	mg/L		21-OCT-09	R997383
Manganese (Mn)-Total	0.0693		0.0020	mg/L		21-OCT-09	R997383
Potassium (K)-Total	1.12		0.10	mg/L		21-OCT-09	R997383
Sodium (Na)-Total	8.7		1.0	mg/L		21-OCT-09	R997383

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ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L831482-5 LUP-24-10-18-09-M							
Sampled By: TC on 18-OCT-09 @ 15:00							
Matrix: WATER							
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	<5.0		5.0	mg/L		20-OCT-09	R993943
Ammonia-N	<0.050		0.050	mg/L		21-OCT-09	R996155
Cyanide, Total	<0.0020		0.0020	mg/L	26-OCT-09	26-OCT-09	R1016223
Hardness (as CaCO3)	30.4			mg/L		22-OCT-09	
Nitrate (as N)	0.437		0.050	mg/L		20-OCT-09	R992523
Special Request	See Attached					22-OCT-09	R1041027
Total Suspended Solids	<3.0		3.0	mg/L		21-OCT-09	R996403
pH	6.35		0.10	pH		20-OCT-09	R993943
L831482-6 LUP-25-10-18-09-W							
Sampled By: TC on 18-OCT-09 @ 14:40							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003524
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.028		0.010	mg/L		22-OCT-09	R1003246
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Arsenic (As)-Total	0.00106		0.00040	mg/L		22-OCT-09	R1003246
Barium (Ba)-Total	0.0048		0.0030	mg/L		22-OCT-09	R1003246
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Boron (B)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Cadmium (Cd)-Total	0.000135		0.000050	mg/L		22-OCT-09	R1003246
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		22-OCT-09	R1003246
Copper (Cu)-Total	0.0016		0.0010	mg/L		22-OCT-09	R1003246
Lead (Pb)-Total	0.00203		0.00010	mg/L		22-OCT-09	R1003246
Lithium (Li)-Total	<0.010		0.010	mg/L		22-OCT-09	R1003246
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Nickel (Ni)-Total	0.0034		0.0020	mg/L		22-OCT-09	R1003246
Selenium (Se)-Total	0.00080		0.00040	mg/L		22-OCT-09	R1003246
Silver (Ag)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Tin (Sn)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Uranium (U)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Vanadium (V)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Zinc (Zn)-Total	0.0305		0.0040	mg/L		22-OCT-09	R1003246
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	3.38		0.50	mg/L		21-OCT-09	R997383
Iron (Fe)-Total	0.042		0.010	mg/L		21-OCT-09	R997383
Magnesium (Mg)-Total	0.80		0.10	mg/L		21-OCT-09	R997383
Manganese (Mn)-Total	0.0152		0.0020	mg/L		21-OCT-09	R997383
Potassium (K)-Total	1.09		0.10	mg/L		21-OCT-09	R997383
Sodium (Na)-Total	2.7		1.0	mg/L		21-OCT-09	R997383
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	<5.0		5.0	mg/L		20-OCT-09	R993943
Ammonia-N	<0.050		0.050	mg/L		21-OCT-09	R996155
Cyanide, Total	<0.0020		0.0020	mg/L	26-OCT-09	26-OCT-09	R1016223
Hardness (as CaCO3)	11.8			mg/L		22-OCT-09	
Total Suspended Solids	5.0		3.0	mg/L		21-OCT-09	R996403

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L831482-6 LUP-25-10-18-09-W							
Sampled By: TC on 18-OCT-09 @ 14:40							
Matrix: WATER							
pH	6.60		0.10	pH		20-OCT-09	R993943
L831482-7 LUP-FILED BLANK-10-19-09							
Sampled By: TC on 19-OCT-09 @ 06:00							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003524
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	<0.010		0.010	mg/L		22-OCT-09	R1003246
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Arsenic (As)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Barium (Ba)-Total	<0.0030		0.0030	mg/L		22-OCT-09	R1003246
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Boron (B)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		22-OCT-09	R1003246
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		22-OCT-09	R1003246
Copper (Cu)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Lead (Pb)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Lithium (Li)-Total	<0.010		0.010	mg/L		22-OCT-09	R1003246
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		22-OCT-09	R1003246
Nickel (Ni)-Total	<0.0020		0.0020	mg/L		22-OCT-09	R1003246
Selenium (Se)-Total	<0.00040		0.00040	mg/L		22-OCT-09	R1003246
Silver (Ag)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Tin (Sn)-Total	<0.050		0.050	mg/L		22-OCT-09	R1003246
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Uranium (U)-Total	<0.00010		0.00010	mg/L		22-OCT-09	R1003246
Vanadium (V)-Total	<0.0010		0.0010	mg/L		22-OCT-09	R1003246
Zinc (Zn)-Total	<0.0040		0.0040	mg/L		22-OCT-09	R1003246
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	<0.50		0.50	mg/L		21-OCT-09	R997383
Iron (Fe)-Total	<0.010		0.010	mg/L		21-OCT-09	R997383
Magnesium (Mg)-Total	<0.10		0.10	mg/L		21-OCT-09	R997383
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		21-OCT-09	R997383
Potassium (K)-Total	<0.10		0.10	mg/L		21-OCT-09	R997383
Sodium (Na)-Total	<1.0		1.0	mg/L		21-OCT-09	R997383
Miscellaneous Parameters							
Alkalinity, Total (as CaCO3)	<5.0		5.0	mg/L		20-OCT-09	R993943
Ammonia-N	<0.050		0.050	mg/L		21-OCT-09	R996155
Cyanide, Total	<0.0020		0.0020	mg/L	26-OCT-09	26-OCT-09	R1016223
Hardness (as CaCO3)	<1.3			mg/L		22-OCT-09	
Total Suspended Solids	<3.0		3.0	mg/L		21-OCT-09	R996403
pH	5.59		0.10	pH		20-OCT-09	R993943
L831482-8 POND2 TOXICITY							
Sampled By: TC on 19-OCT-09 @ 09:00							
Matrix: WATER							
Miscellaneous Parameters							
Daphnia Magna	See Attached					22-OCT-09	R1045103
Special Request	See Attached					22-OCT-09	R1045103
Acute Testing	See Attached					22-OCT-09	R1045103

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L831482-8 POND2 TOXICITY Sampled By: TC on 19-OCT-09 @ 09:00 Matrix: WATER							
Trout Bioassay	See Attached					22-OCT-09	R1045103

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjustment For Sample Matrix Effects
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-ED	Water	Alkalinity, Total	APHA 2320 B-Auto-Pot. Titration
CN-TOT-WT	Water	Cyanide, Total	APHA 4500CN C E-STRONG ACID DIST COLORIM
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
ETL-HARDNESS-TOT-ED	Water	Hardness (from Total Ca and Mg)	APHA 2340 B-Calculation
HG-T-CVAA-ED	Water	Mercury (Hg) - Total	EPA 245.7 / EPA 245.1
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
NH4-ED	Water	Ammonia-N	APHA4500NH3F Colorimetry
NO3-IC-ED	Water	Nitrate as N by IC	APHA 4110 B-ION CHROMATOGRAPHY
PH-ED	Water	pH	APHA 4500 H-Electrode
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
SPECIAL REQUEST-HQ	Misc.	Special Request HydroQual	SEE SUBLET LAB RESULTS
SPECIAL REQUEST-SR	Misc.	Special Request SRC	SEE SUBLET LAB RESULTS

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS LABORATORY GROUP - WATERLOO, ONTARIO, CANADA
SR	Saskatchewan Research Council - Saskatoon, Saskatchewan, Can
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
HQ	HydroQual Laboratories Ltd. - Calgary, Alberta, Canada

Chain of Custody Numbers:

08-012472

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mk/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

SRC Group # 2009-9949

SRC ANALYTICAL

Nov 09, 2009

422 Downey Road
Saskatoon, Saskatchewan, Canada
S7N 4N1
(306) 933-6932 or 1-800-240-8808
Fax: (306) 933-7922

ALS
9936-67th Avenue
Edmonton, Alberta T6E 0P5
Attn: ALSED Reporting

Sample # **50053**
Date Sampled: **Oct 18, 2009**
Sample Matrix: **WATER**
Description: **L831482-5 LUP-24-10-18-09-M**

Client PO #: **L831482**
Date Received: **Oct 22, 2009**

Analyte	Units	Result	DL
Radio Chemistry			
Radium-226	Bq/L	0.006	0.005

HydroQual Laboratories Ltd.

Algae Test Report

Client: ALS106
Reference: 09-1927-01-AGD

Result Summary

Client: ALS Laboratory Group; operation Edmonton

Sample: L831482-8
Pond 2 Toxicity
Collection: collected on 2009/10/19 at not given by T.C.
Receipt: received on 2009/10/21 at 0851 by E.A. Benner
Containers: received 6 x 20L pails at 12 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

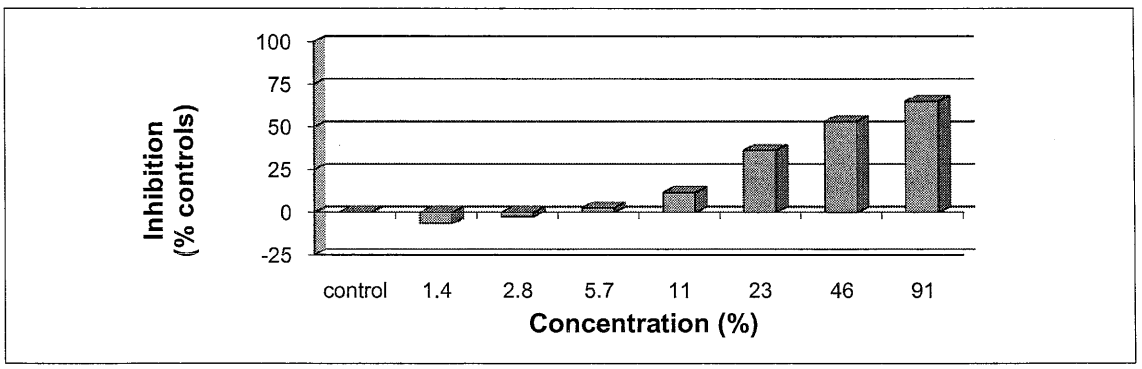
Test: started on 2009/10/22 ; ended on 2009/10/25

Contents

Result:

	Endpoint (72-hour)	Value	Confidence Limits (95%) lower	upper		Method Calculated
Chronic: (growth)	IC25	16	12	21	%	Log-Logistic + Hormesis
	IC50	40	32	52	%	Log-Logistic + Hormesis

Notes: ICx, concentrations inhibiting growth by 'x' percent relative to controls; CV, coefficient of variation (%); SD, standard deviation



The test data and results are authorized and verified correct.

E. Blais, B.Sc., Technical Lead

S. Krishnappa, B.Sc., Quality Coordinator

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: ALS106
Reference: 09-1927-01-AGD

Method: Biological Test Method: Growth Inhibition Test Using a Freshwater Alga *Psoudokirchneriella subcapitata (formerly Selenastrum capricornutum)*, 2007. Environment Canada, EPS 1/RM/25, 2nd Edition, March 2007

Test type: Algal Growth Inhibition Test (HQ 4.4.2.7)
Species: *Pseudokirchneriella subcapitata (formerly Selenastrum capricornutum* and Raphidocelis subcapitata)
Organism source: In-house culture (original source: UTCC 37; strain: LB37)
Culture age: The test was started with 6 day old, exponentially growing cells determined with an algal growth curve. This culture was initiated on 2009/08/14. Algal cultures are regrown every 2 months from slants made from a new culture purchased annually.
Culture observations: No unusual appearance or treatment of the algae was noted prior to or during the conduct of the test.

Sample initial chemistry: pH: 7.3; EC: 813 (µS/cm); DO: 9.8 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 225; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 3 days)
Sample storage: 4 ± 2°C in darkness

Test concentrations: 7 effluent concentrations (1.4, 2.8, 5.7, 11, 23, 46 and 91% (v/v) plus a negative control)
Test vessel: The test was conducted in 96 well microplates. Three replicate plates were run (a, b and c).
Test replicates: Three replicate microplates were run. Per plate there were 5 replicate wells per concentration and 10 replicate wells per control.
Test volume: 220 µL final volume in each well with 200 µL of sample;
10µL of enrichment medium and 10µL of algal inoculum.
Inoculum: The initial cell density of the inoculum was 9812 (cells/mL), it was prepared less than ≤2-3 hours before test initiation.
Control/dilution water: Made up with deionized City of Calgary water spiked with nutrients as per EPS 1/RM/25 (made by adding 1mL of each of the 5 stock solutions to 10mL of DRO)
Sample Filtration: 100 mL filtered through a 0.45 µm pore diameter membrane.
Sample treatment: Sample spiked with nutrients as per EPS 1/RM/25; no other chemicals added.
Measurements: Final cell densities were determined from cell counts.
Aeration: Not required
pH Adjustment: Not required
Lighting: The plates were incubated under continuous light: 3850 lux
(cool white fluorescent bulbs) 53.9 µmol/(m^2•S)
Test temperature: 24 ± 2°C

Note: Outlined sections are protocol deviations explained on the comment page

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: ALS106
Reference: 09-1927-01-AGD

Endpoint: Growth, 72-h IC25 (with 95% confidence limits)
Test endpoint was bracketed by at least 1 test concentration (except for <0.1% or >91 %).
No outliers were observed within the data set.

Test validity: Control growth was a 23 fold increase over the inoculum.
The cv of the standard control wells was 12 %.
(must be ≥ 16 fold increase with a cv of ≤ 20%)

Statistics: See Data Analysis section.
Mann-Kendall Trend analysis ($p>0.05$) indicates there was no volatility in the sample.

Reference toxicant: 72-h test with Zinc ($ZnSO_4$*7H2O) initiated October 23, 2009;
(must be within 14 days of the test initiation)
current results: (72-h IC25 and 95% confidence limits) = 1.15 (0.99-1.25) log (µg Zn^{2+}/L)
The reference toxicant test was performed under the same conditions as those used during this test.

Note: Outlined sections are protocol deviations explained on the comment page

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

HydroQual Laboratories Ltd.

Algae Test Report

Client: ALS106
Reference: 09-1927-01-AGD

Test Data

Test Log:

Date	Day	Technician	Time	Rotated	Temperature (°C)
2009/10/22	0	E. Blais	1200	no	25
2009/10/23	1	H. Stewart	0820	yes	24
2009/10/24	2	S. Ehman	0900	yes	23
2009/10/25	3	S. Ehman	1230	no	24

pH Measurements:

Concentration	Initial Value
control	6.5
91%	7.0

Concentration	Final Mean	% CV
control (well D6)	6.5	0
control (well D7)	6.5	0

Standard Control Wells:

Average	277
SD	32
CV%	12

Average Cell Counts Control Data:

Column Well	2b	2c	2e	2f	2g
Cell Densities ($x10^3$)	3100	2950	2850	2850	2900
Column Well	11b	11c	11e	11f	11g
Cell Densities ($x10^3$)	3250	3150	3150	2200	2200

Test Results at 72hrs

Concentration (%)	Cell Yield Densities ($x10^3$ / mL) Plate a	Plate b	Plate c	Average	SD	CV (%)	Percent Controls	Inhibition (%)	Stimulation (%)
control	261	226	195	227	33	15	100	0	0
1.4	257	230	239	242	14	6	106	-6	6
2.8	217	252	230	233	18	8	103	-3	3
5.7	217	217	230	221	8	3	97	3	-3
11	204	186	213	201	14	7	88	12	-12
23	115	146	173	145	29	20	64	36	-36
46	97	93	128	106	19	18	47	53	-53
91	58	87	93	79	18	23	35	65	-65

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Comments/Statistics

Client: ALS106
Reference: 09-1927-01-AGD

Test Result Comments:
None

Data Analysis:
Endpoints for growth were calculated using a non-linear regression model (4P Log-Logistic + Hormesis) with CETIS v. 1.7.0 rev Q.

Protocol Deviations:
None

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

HydroQual Laboratories Ltd.

Warning Chart
Algae

Test Method: 72 hours Algal Growth Inhibition Test (IC25, five or more treatments plus a control)
HydroQual Test Method Manual, section: 4.4.2.7

Reference: Biological Test Method: Growth Inhibition Test Using the Freshwater Alga *Selenastrum capricornutum*, 2007. Environment Canada, EPS 1/RM/25.

Test Organism:

test species:	*Pseudokirchneriella subcapitata*
culture:	20090814AG
original source/strain:	UTCC 37 / LB37
culture vessels:	2L Erlenmeyer flask
water source:	deionized water
growth medium:	nutrient solution
cultivation method:	batch as per test conditions
culture condition at start of test:	normal
culture age:	3-7 days
growth phase:	exponentially growing

Test Design:

test type:	static
toxicant:	zinc
test vessel:	96 well flat bottom microplate
test volume (µL):	220
no. of replicate plates:	3
no. of replicate wells / treatment per plate (control, sample):	10, 5
mean temperature (°C):	24 ± 2°C
photoperiod:	continuous light
light level:	4200 lux ± 5%
contol/dilution water:	deionized water and nutrients: prepared as per EPS1/RM/25

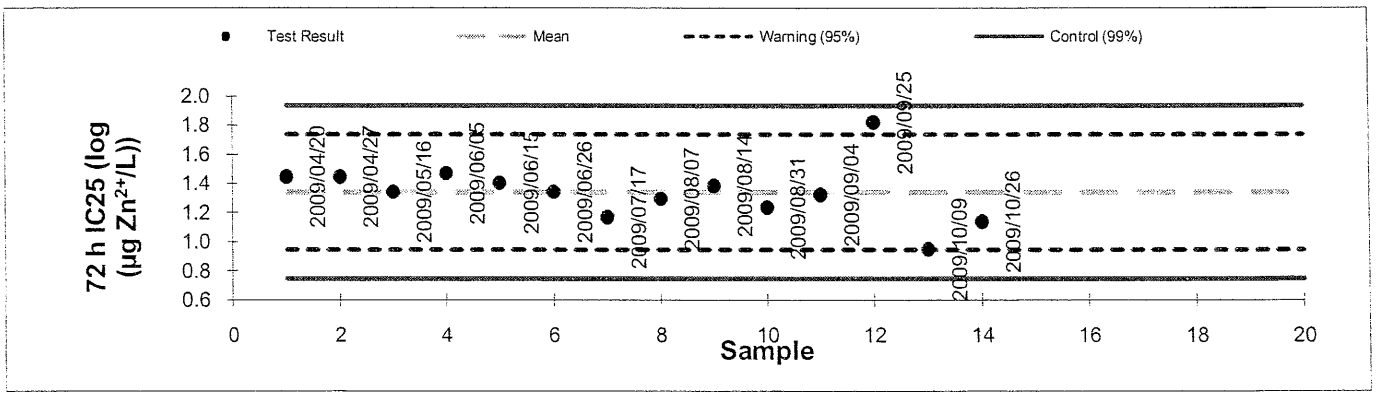
Current Test

toxicant	Zinc ($ZnSO_4$*$7H_2O$)				
started on	2009/10/23	ended on	2009/10/26		
Result (IC25 @ 72h)	1.15	log (µg $Zn2^+$/L); geometric mean			
Confidence Limits (95%)	lower	0.99	upper	1.25	

Historical Values

mean	1.34	sd	0.20	cv(%):	15
	lower	upper			
warning limits (±2 sd)	0.94	1.74	(95% confidence limits)		
control limits (±3 sd)	0.74	1.94	(99% confidence limits)		

notes: sd, standard deviation; cv, coefficient of variance, na; could not be calculated



Qualty Assurance Unit:

Authorized by S. Krishnappa, B.Sc., Quality Assurance Coordinator
The test data and results are verified correct.

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

HydroQual Laboratories Ltd.

Ceriodaphnia (6-8d LC50/IC25) Test Report

Client: ALS106
Reference: 09-1927-01-CDD

Result Summary

Client: ALS Laboratory Group; operation Edmonton

Sample: L831482-8
Pond 2 Toxicity
Collection: collected on 2009/10/19 at not given by T.C.
Receipt: received on 2009/10/21 at 0851 by E.A. Benner
Containers: received 6 x 20L pails at 12 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

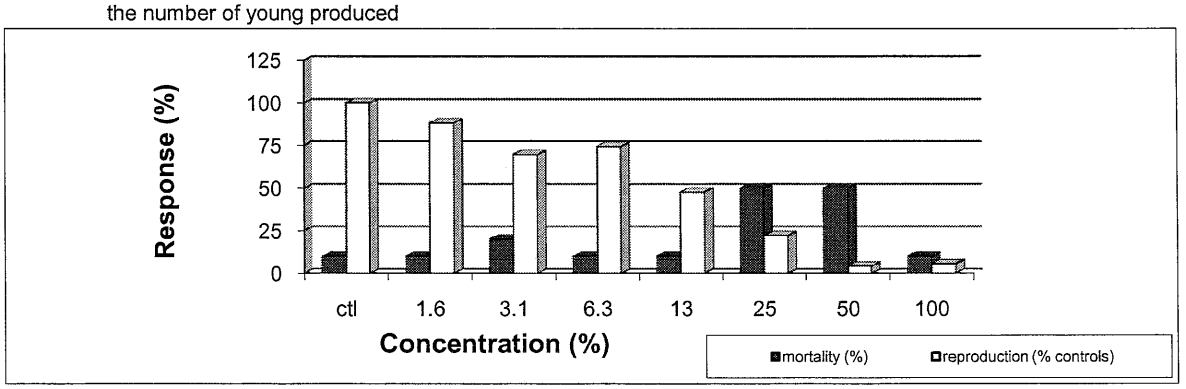
Test: started on 2009/10/22 ; ended on 2009/10/28

Contents

Result:

	Endpoint (6-day)	Value	Confidence Limits (95%) lower	upper	Units	Method Calculated
Acute:	LC25	65	na	na	%	Log-Normal
(survival)	LC50	>100	na	na	%	Log-Normal
Chronic:	IC25	2.8	<1.6	9.1	%	Linear Interpolation
(fecundity)	IC50	12	7.4	17	%	Linear Interpolation

Notes: LCx & ICx, concentrations lethal or inhibitory to 'x' percent of the test population; fecundity, reproduction as the number of young produced



The test data and results are authorized and verified correct.

E. Blais, B.Sc., Technical Lead

S. Krishnappa, B.Sc., Quality Coordinator

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: ALS106
Reference: 09-1927-01-CDD

Method: Biological Test method: Test of Reproduction and Survival Using the Cladoceran *Ceriodaphnia dubia*, 2007. Environment Canada, EPS 1/RM/21.

Test type: *Ceriodaphnia* 6-day Survival and Reproduction Static Renewal Test (HQ 4.4.3.2)
Species: *Ceriodaphnia dubia*
Age: <24 hours old; all from same brood source within 12 hours of the same age.
Organism source: in-house cultures; cultures from a single brood organism to provide test organisms.
Culture health: Culture mortality was 4% (must be ≤ 20%).
7-d prior to test initiation: No ephippia were noted in the cultures at any time.
Average young produced per adult in the first three broods was 20 (must be ≥ 15)
Number of young produced by each brood organism in the last complete brood before use was 9 (must be ≥ 8).
Organism observations: No unusual behavior, appearance or treatment of test organisms was noted prior to or during the test. All first-generation mortality was recorded on the day it was observed.
Sample initial chemistry: pH: 7.3; EC: 813 (µS/cm); DO: 9.8 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 225; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 3 days); The test was conducted with three subsamples, samples a, b, and c were for days 0 to 2, 3 to 5, and 6 to 8.
Sample storage: 4 ± 2°C in darkness

Test vessel: The tests were conducted in 30 mL plastic vessels (2 cm depth).
Test volume: 15 mL of solution (1 cm depth); replenished daily.
Control/dilution water: The control and dilution water was a mixture of moderately hard reconstituted water and Bow River Water (50:50). Chemicals added to dilution water: 0.96 g NaHCO3, 0.60 g CaSO4, 0.60 g MgSO4, 0.04 g KCl per 20L.
Test concentrations: 7 effluent concentrations (1.6, 3.1, 6.3, 13, 25, 50, 100% (v/v) plus a negative control)
Test replicates: One neonate <24 hours old was loaded per test vessel;
10 replicates/concentration
Feeding: The test organisms were fed daily a mixture of fermented trout chow, yeast, alfalfa powder, and the green alga *Pseudokirchneriella subcapitata* (formerly *Selenastrum capricornutum* and *Raphidocelis subcapitata*).
Food expiration date: 2009/11/01
Measurements: pH, conductivity, dissolved oxygen and temperature were measured daily.
Sample pre-treatment: The sample was not aerated, filtered or pH adjusted prior to or during testing.
The dissolved oxygen concentration (mg/L) was: 7
The sample pH was: 7.6
Lighting: Overhead full spectrum fluorescent lights; 100-600 lux at surface
Photoperiod: 16h light:8h dark
Test temperature: 25 ± 1°C

Note: Outlined sections are protocol deviations explained on the comment page

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Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: ALS106
Reference: 09-1927-01-CDD

Endpoints: Survival, 6-d LC50 (with 95% confidence limits)
Reproduction, 6-d IC25 (with 95% confidence limits)
Test endpoints were bracketed by at least 1 test concentration (except for <1.6% or >100 %)
No outliers were observed within the data set.

Test completion: 70% of the control organisms had ≥ 3 broods on day 6 (must be ≥ 60% within 8 days) Any neonates produced after third brood were not included in the mean young per adult calculation.

Test validity: The control had 90% survival (must ≥ 80%)
Number of young produced by each surviving control adult within the first three broods was 15 (must be ≥ 15).

Reference toxicant: 6-d test with NaCl initiated on October 15, 2009;
(must be within 14 days of test initiation)
current results: (6-d LC50 and 95% confidence limits) =
3.42 (3.36-3.49) log (mg/L NaCl)
current results: (6-d IC50 and 95% confidence limits) =
2.65 (2.55-2.92) log (mg/L NaCl)
The reference toxicant test was performed under the same conditions as those used during this test.

Note: Outlined sections are protocol deviations explained on the comment page

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Data

Client: ALS106
Reference: 09-1927-01-CDD

Test Log:

Date	Day	Time	Technicians	Temperature (°C) Control	Sample
2009/10/22	0	1145	E. Blais	25	25
2009/10/23	1	1120	E. Petho	25	25
2009/10/24	2	1135	J. Amyotte	25	25
2009/10/25	3	1105	J. Amyotte	25	25
2009/10/26	4	1245	E. Petho	24	24
2009/10/27	5	0955	E. Petho	24	24
2009/10/28	6	1115	E. Petho	na	na

Chemistry Summary Tables:

New Solutions

Conc. %	ctl	1.6	3.1	6.3	13	25	50	100

Old Solutions

ctl	1.6	3.1	6.3	13	25	50	100

Average Values

pH	8.1	8.1	8.1	8.1	8.1	8.0	7.9	7.6	8.0	8.0	8.0	8.1	8.0	8.0	7.9	7.5
cond.	429	428	433	446	470	513	613	810	463	481	534	485	518	556	669	935
DO	7.4	7.3	7.3	7.2	7.2	7.2	7.2	7.5	7.4	7.2	7.1	7.1	7.1	7.0	7.0	7.0
temp.	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25

Coefficients of Variation (%)

pH	3	3	3	3	2	2	2	3	2	2	2	2	2	2	2	3
cond.	6	4	4	4	3	3	1	0	7	6	5	5	5	4	4	3
DO	8	8	8	7	7	6	6	6	6	5	6	5	5	5	5	5
temp.	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

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Ceriodaphnia (6-8d LC50/IC25) Test Report

Test Data

Client: ALS106
Reference: 09-1927-01-CDD

Biology (number of young produced):

Day	1	2	3	4	5	6	7	8

Replicate	Control							
1	0	0	0	4	7	8		
2	0	0	0	0	5	6		
3	0	0	0	0	6	9		
4	0	0	2	4	0	5		
5	0	0	0	3	6	7		
6	0	0	4	0	7	6		
7	0	0	0	3	6	11		
8	0	0	0	0	0	8		
9	0	0	0	4	7	6		
10	0	0	0	4	4	**3**		

	13%							
1	0	0	0	0	6	0		
2	0	0	0	0	7	6		
3	0	0	0	0	4	0		
4	0	0	0	0	4	0		
5	0	0	0	0	6	4		
6	0	0	0	5	0	2		
7	0	0	0	3	5	3		
8	0	0	0	5	3	0		
9	0	0	0	0	3	**3**		
10	0	0	0	0	0	0		

	1.6%							
1	0	0	0	4	3	6		
2	0	0	0	4	3	7		
3	0	0	0	3	10	6		
4	0	0	0	0	3	6		
5	0	0	0	0	8	9		
6	0	0	0	4	0	5		
7	0	0	0	0	7	9		
8	0	0	0	4	8	4		
9	0	0	0	0	5	**0**		
10	0	0	0	3	0	7		

	25%							
1	0	0	0	**0**	X	X		
2	0	0	0	0	0	0		
3	0	0	0	3	0	**2**		
4	0	0	0	5	**0**	X		
5	0	**0**	X	X	X	X		
6	0	0	0	0	X	X		
7	0	0	4	0	0	5		
8	0	0	0	3	0	4		
9	0	0	0	2	**0**	X		
10	0	0	0	2	2	0		

	3.1%							
1	0	0	0	0	0	7		
2	0	0	0	4	6	3		
3	0	0	0	3	3	5		
4	0	0	0	0	5	10		
5	0	0	0	3	3	6		
6	0	0	0	0	3	6		
7	0	0	0	4	0	7		
8	0	**0**	X	X	X	X		
9	0	0	0	3	3	**7**		
10	0	0	0	4	0	6		

	50%							
1	0	0	0	0	0	0		
2	0	0	0	0	0	**0**		
3	0	0	0	0	0	0		
4	0	0	0	0	0	0		
5	0	0	0	**0**	X	X		
6	0	**0**	X	X	X	X		
7	0	**0**	X	X	X	X		
8	0	0	0	0	0	**0**		
9	0	0	0	0	2	4		
10	0	0	0	0	0	0		

Notes: #, young produced; 0, no young; X, dead; bold #, number of young the test organism had the day it died; —, young produced after third brood

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Ceriodaphnia (6-8d LC50/IC25) Test Report

Test Data

Client: ALS106
Reference: 09-1927-01-CDD

Biology (number of young produced):

Day	1	2	3	4	5	6	7	8

Replicate	6.3%							
1	0	0	0	3	6	0		
2	0	0	0	4	7	0		
3	0	0	0	3	0	7		
4	0	0	0	0	3	0		
5	0	0	0	0	0	**6**		
6	0	0	0	0	6	0		
7	0	0	0	4	7	6		
8	0	0	0	0	7	7		
9	0	0	0	4	6	10		
10	0	0	0	0	3	9		

1	2	3	4	5	6	7	8

100%							
0	0	0	0	0	0		
0	0	0	0	2	0		
0	0	0	0	2	0		
0	0	0	0	0	0		
0	0	0	0	0	2		
0	0	0	0	0	0		
0	0	0	0	**0**	X		
0	0	0	0	0	2		
0	0	0	0	0	0		
0	0	0	0	0	0		

Notes: #, young produced; 0, no young; X, dead; bold #, number of young the test organism had the day it died; —, young produced after third brood

Biology Summary Tables:

Conc. %	ctl	1.6	3.1	6.3	13	25	50	100

Day	Number of Organism Alive							
0	10	10	10	10	10	10	10	10
1	10	10	10	10	10	10	10	10
2	10	10	9	10	10	9	8	10
3	10	10	9	10	10	9	8	10
4	10	10	9	10	10	8	7	10
5	10	10	9	10	10	6	7	9
6	9	9	8	9	9	5	5	9
7								
8								

	Percent Mortality (%)							
mean	10	10	20	10	10	50	50	10

Replicate	Total Young Produced by Each Adult							
1	19	13	7	9	6	0	0	0
2	11	14	13	11	13	0	0	2
3	15	19	11	10	4	5	0	2
4	11	9	15	3	4	5	0	0
5	16	17	12	6	10	0	0	2
6	17	9	9	6	7	0	0	0
7	20	16	11	17	11	9	0	0
8	8	16	0	14	8	7	0	2
9	17	5	13	20	6	2	6	0
10	11	10	10	12	0	4	0	0

	ctl	1.6	3.1	6.3	13	25	50	100

Day	Daily Young Production							
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	6	0	0	0	0	4	0	0
4	22	22	21	18	13	15	0	0
5	48	47	23	45	38	2	2	4
6	69	59	57	45	18	11	4	4
7								
8								

Total	145	128	101	108	69	32	6	8

Young Per Adult (within first three broods)

mean	15	13	10	11	7	3	1	1
sd	4.01	4.42	4.2	5.22	3.81	3.29	1.9	1.03
cv(%)	27.6	34.5	41.6	48.4	55.3	103	316	129

Young Production as a Percent of Controls

100	88	70	74	48	22	4	6

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HydroQual Laboratories Ltd.

Ceriodaphnia (6-8d LC50/IC25) Test Report

Test Data

Client: ALS106
Reference: 09-1927-01-CDD

Chemistry:

	New Solutions								Old Solutions							
Conc. %	ctl	1.6	3.1	6.3	13	25	50	100	ctl	1.6	3.1	6.3	13	25	50	100
Day	pH (units)								pH (units)							
0	7.8	7.9	8.0	8.0	8.0	7.9	7.8	7.6								
1	8.2	8.2	8.1	8.1	8.1	8.1	7.9	7.6	8.0	8.0	8.0	8.1	8.0	8.0	7.9	7.7
2	8.3	8.3	8.3	8.3	8.3	8.2	8.1	7.9	8.1	8.2	8.2	8.2	8.1	8.1	8.0	7.8
3	8.0	8.0	7.9	7.9	7.9	7.8	7.8	7.3	7.9	7.9	8.0	8.0	8.0	7.9	7.8	7.6
4	7.9	7.9	7.9	7.9	7.9	7.9	7.8	7.5	7.9	7.9	7.9	7.9	7.9	7.8	7.7	7.4
5	8.4	8.4	8.4	8.4	8.3	8.2	8.1	7.6	8.3	8.3	8.3	8.3	8.2	8.2	8.1	7.4
6									7.8	7.8	7.8	7.8	7.8	7.7	7.6	7.3
7																
8																
	Conductivity (µS/cm)								Conductivity (µS/cm)							
0	385	391	398	412	440	495	601	806								
1	464	442	445	457	481	526	620	809	406	427	485	439	472	517	626	902
2	444	440	445	458	480	520	619	815	487	487	550	487	518	552	658	920
3	424	429	432	445	467	491	610	810	488	505	538	502	542	573	673	926
4	424	430	436	448	472	521	613	814	461	476	555	481	509	554	668	953
5	433	435	441	457	479	525	617	806	453	489	522	492	526	564	684	937
6									484	503	556	511	541	578	706	973
7																
8																
	Dissolved Oxygen (mg/L)								Dissolved Oxygen (mg/L)							
0	6.5	6.4	6.5	6.6	6.7	6.7	6.7	7.0								
1	7.6	7.4	7.1	7.1	7.1	7.1	7.1	7.6	7.2	7.1	6.9	7.0	6.9	6.8	6.8	6.8
2	7.3	7.1	7.1	7.1	7.1	7.1	7.1	7.2	7.3	7.3	6.8	6.9	6.9	6.8	6.8	6.6
3	8.2	8.1	8.2	7.9	8.0	7.9	7.9	8.3	7.9	7.6	7.5	7.5	7.5	7.4	7.4	7.4
4	7.8	7.6	7.6	7.5	7.5	7.5	7.5	7.7	7.6	7.4	7.3	7.4	7.3	7.2	7.0	7.1
5	7.2	7.0	7.0	6.8	6.8	6.8	6.9	7.4	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.5
6									7.6	7.4	7.4	7.4	7.4	7.4	7.3	7.3
7																
8																
	Temperature (°C)								Temperature (°C)							
0	25	25	25	25	25	25	25	25								
1	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
3	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
4	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
5	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
6									25	25	25	25	25	25	25	25
7																
8																

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Comments/Statistics

Client: ALS106
Reference: 09-1927-01-CDD

Test Result Comments:
None

Data Analysis:
Endpoints for mortality were calculated using a linear regression model (Log-Normal Probit) with CETIS v. 1.7.0 rev Q.

Regression analysis was attempted on the data, but the assumptions of normality and equal variance were not met. Therefore, endpoints for reproduction were calculated using a Linear Interpolation model with CETIS v. 1.7.0 rev Q.

Protocol Deviations:
None

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Quality Assurance Information

Culture history for adults used in the test for reference 09-1927:

Number of young produced per brood adult:
(Note: The third brood per adult may be on the day the test is set)

	row/replicate	A2	B4	B6	B7	B9	D3	E1	E3	E4	A3	
	number of young											
	number of adults											
		A2	B4	B6	B7	B9	D3	E1	E3	E4	A3	
	number of young											
	number of adults											
		A2	B4	B6	B7	B9	D3	E1	E3	E4	A3	
	number of young											
	number of adults											
		A2	B4	B6	B7	B9	D3	E1	E3	E4	A3	
	number of young			7	4	5						
	number of adults			1	1	1						
		A2	B4	B6	B7	B9	D3	E1	E3	E4	A3	
	number of young	2	2	6	10	5	10	6	6	2	5	
	number of adults	1	1	1	1	1	1	1	1	1	1	
		A2	B4	B6	B7	B9	D3	E1	E3	E4	A3	
	number of young	5	5	11	8	6	2	3	8	5	12	
	number of adults	1	1	1	1	1	1	1	1	1	1	
		A2	B4	B6	B7	B9	D3	E1	E3	E4	A3	
DAY USED	number of young	9	9	11	8	9	10	10	8	8	9	
2009/10/22	number of adults	1	1	1	1	1	1	1	1	1	1	
		A2	B4	B6	B7	B9	D3	E1	E3	E4	A3	
totals (# of young in first 3 broods)	number of young	16	16	24	22	16	22	19	22	15	26	

Number of young produced per organism in the last brood before use	9
Mean number of surviving young per adult over the first three broods	20
Culture mortality over the last seven days	4

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Warning Chart
Ceriodaphnia

Test Method: *Ceriodaphnia* Survival and Reproduction Test (6 treatments plus a control)
HydroQual Test Method Manual, section: 4.4.3.2
Reference: Biological Test Method: Test of Reproduction and Survival Using the Cladoceran *Ceriodaphnia dubia*, 2007. Environment Canada, EPS 1/RM/21

Test Organism:

test species:	*Ceriodaphnia dubia*
culture source:	in-house
original culture source:	Environment Canada
ephippia in stock culture:	none
food type:	YAT:Algae
frequency of feeding:	daily
age of test organisms:	<24 hours
culture mortality 7 days prior:	3
culture fecundity 7 days prior within the first three broods:	21
young produced in previous brood:	9
culture condition prior to test initiation:	normal
culture water:	50:50 water

Test Design:

test type:	static renewal
toxicant:	sodium chloride (NaCl)
test vessel:	30 mL plastic cup
test volume (mL):	15
replicates per treatment:	10
organisms per replicate:	1
feeding:	daily
temperature (°C):	24-26
photoperiod:	16 hours light: 8 hours dark
light level (surface):	100-600 lux
hardness adjustment:	no

*Note: there are 2 subcultures within this culture source, separated by one week in age. The test is set with organisms from one subculture. The number of young a culture has is monitored daily. If young are not used that day, they are discarded, therefore organisms in tests are <24h.

Control/Dilution Water:

source:	equal volumes of Bow River water and moderately hard reconstituted water (50:50 water)
pH (units):	8.0
conductance (uS/cm):	416
dissolved oxygen (mg/L):	7.6
NH_4^+ (mg/L):	<0.1
hardness (mg $CaCO_3$/L):	102
alkalinity (mg $CaCO_3$/L):	88
total residual chlorine (mg/L):	<0.01

Note: moderately hard reconstituted water prepared as per EPS 1/RM/21

Comments: There were no protocol deviations during the conduct of this test.

Quality Assurance Unit: _____

Authorized by S. Krishnappa, B.Sc., Quality Assurance Coordinator
The test data and results are verified correct.

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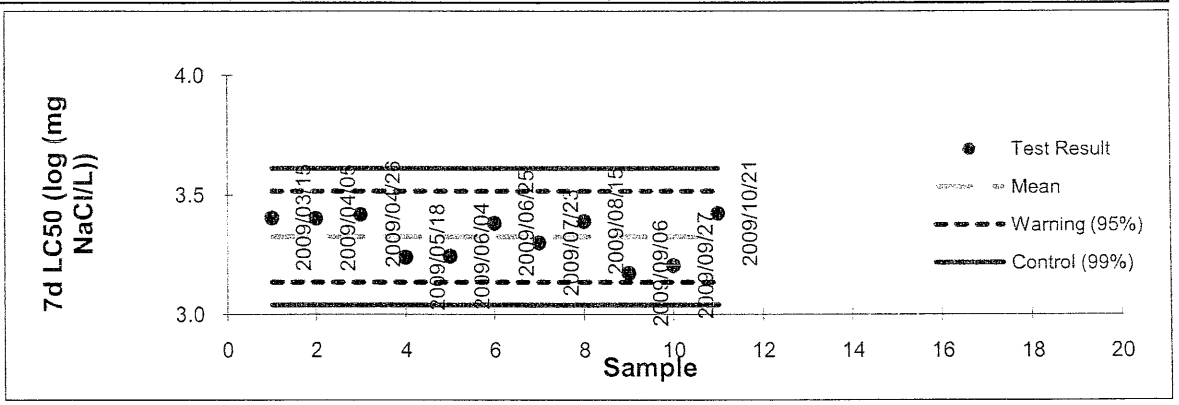
Mortality

Current Test

toxicant	Sodium chloride (NaCl)				
started on	2009/10/15	ended on	2009/10/21		
Result (6d LC50):	3.42	log (mg NaCl/L); geometric mean			
Confidence Limits (95%)	lower	3.36	upper	3.49	

Historical Values

mean	3.33	sd	0.10	cv(%):	3
	lower	upper			
warning limits (±2 sd)	3.14	3.52	(95% confidence limits)		
control limits (±3 sd)	3.04	3.61	(99% confidence limits)		



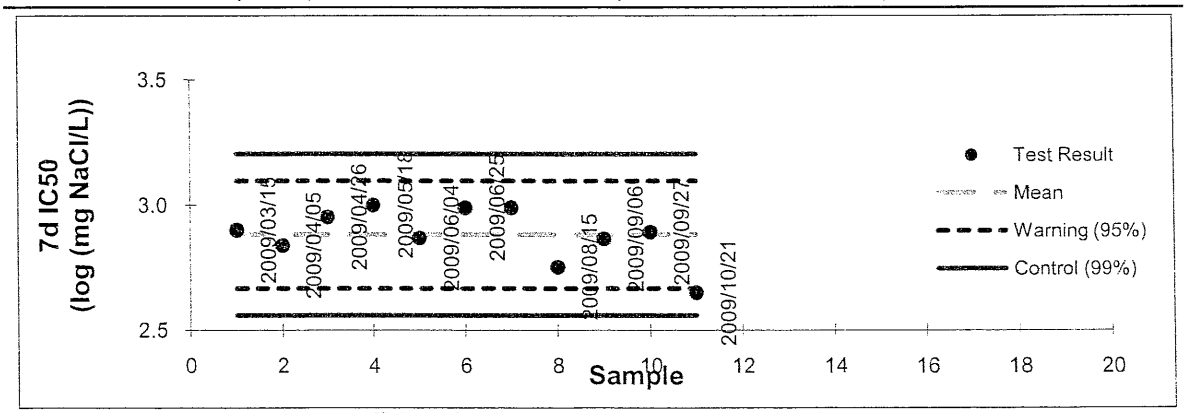
Reproduction

Current Test

toxicant	Sodium chloride (NaCl)				
started on	2009/10/15	ended on	2009/10/21		
Result (6d IC50):	2.65	log (mg NaCl/L); geometric mean			
Confidence Limits (95%)	lower	2.55	upper	2.92	

Historical Values

mean	2.88	sd	0.11	cv(%):	4
	lower	upper			
warning limits (±2 sd)	2.67	3.10	(95% confidence limits)		
control limits (±3 sd)	2.56	3.20	(99% confidence limits)		



Notes: sd, standard deviation; cv, coefficient of variance; NA, could not be calculated

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HydroQual Laboratories Ltd.

Ceriodaphnia
Test Report

Quality Assurance Information

Culture history for adults used in the test for reference QA236:

Number of young produced per brood adult:
(Note: The third brood per adult may be on the day the test is set)

row/replicate	D2	D3	D5	E1	E8	A3	B7	B8	A2	E6	

number of young											
number of adults											

	D2	D3	D5	E1	E8	A3	B7	B8	A2	E6	
number of young											
number of adults											

	D2	D3	D5	E1	E8	A3	B7	B8	A2	E6	
number of young											
number of adults											

	D2	D3	D5	E1	E8	A3	B7	B8	A2	E6	
number of young	7	6	6	5		5			8		
number of adults	1	1	1	1		1			1		

	D2	D3	D5	E1	E8	A3	B7	B8	A2	E6	
number of young	5	7	7	8	5	8	3	4	11	2	
number of adults	1	1	1	1	1	1	1	1	1	1	

	D2	D3	D5	E1	E8	A3	B7	B8	A2	E6	
number of young	6	10	11	10	6	8	8	6	10	5	
number of adults	1	1	1	1	1	1	1	1	1	1	

		D2	D3	D5	E1	E8	A3	B7	B8	A2	E6	
DAY USED	number of young	8	9	11	12	8	10	9	8	11	8	
2009/10/15	number of adults	1	1	1	1	1	1	1	1	1	1	

		D2	D3	D5	E1	E8	A3	B7	B8	A2	E6	
totals (# of young in first 3 broods)	number of young	18	23	24	23	19	21	20	18	29	15	

Number of young produced per organism in the last brood before use	9
Mean number of surviving young per adult over the first three broods	21
Culture mortality over the last seven days	3

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HydroQual Laboratories Ltd.

Fathead minnow (7-d LC50/IC25) Test Report

Result Summary

Client: ALS106
Reference: 09-1927-01-FMD

Client: ALS Laboratory Group; operation Edmonton

Sample: L831482-8
Pond 2 Toxicity
Collection: collected on 2009/10/19 at not given by T.C.
Receipt: received on 2009/10/21 at 0851 by E.A. Benner
Containers: received 6 x 20L pails at 12 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

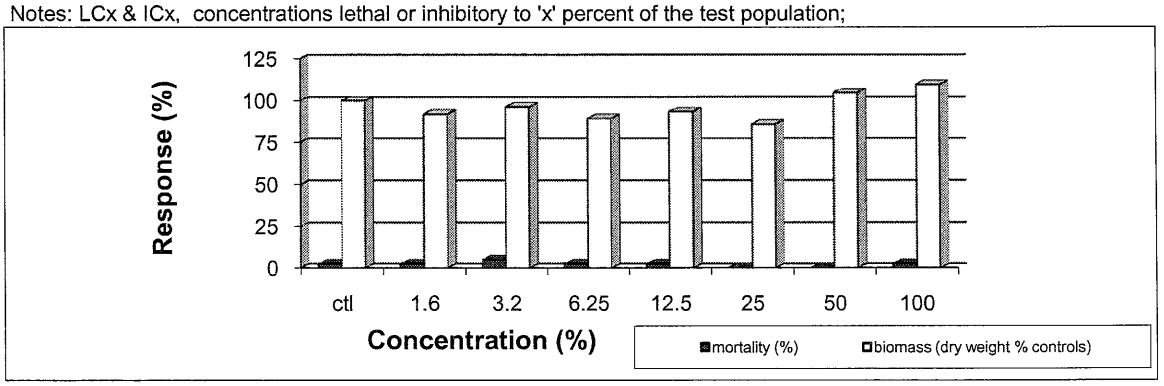
Test: started on 2009/10/22 ; ended on 2009/10/29

Contents

Result:

	Endpoint (7-day)	Value	Confidence Limits (95%) lower	upper	Units	Method Calculated
Acute:	LC25	>100			%	could not be calculated
(survival)	LC50	>100			%	could not be calculated
Chronic:	IC25	>100			%	could not be calculated
(growth)	IC50	>100			%	could not be calculated

Notes: LCx & ICx, concentrations lethal or inhibitory to 'x' percent of the test population;



The test data and results are authorized and verified correct.

E. Blais, B.Sc., Technical Lead

S. Krishnappa, B.Sc., Quality Coordinator

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Test Conditions

Client: ALS106
Reference: 09-1927-01-FMD

Method: Biological Test Method: Test of Larval Growth and Survival Using Fathead minnows, 1992. Environment Canada, EPS 1/RM/22. (amended September 2008)

Test type: Fathead Minnow 7-d Survival and Growth Static Renewal Test (HQ 4.4.4.6)
Species: *Pimephales promelas*
Age: ≤ 24 hour post hatch
Organism source: Aquatox Inc., Hot Springs, Arkansas (Batch 20091022FM)
Culture conditions: temperature, 25 °C; dissolved oxygen, 95-100 % saturation
Shipped: 2009/10/21
Breeding Stock Mortality: < 1 % during the week prior to test initiation
Organisms upon receipt: mortality, < 1 %; temperature, 23 °C: dissolved oxygen, 8.4 mg/L
No acclimation was necessary. Test organisms maintained at 25 ± 1°C until loaded
The EC guidance document on the importation of test organisms (1999) has been followed. Test organisms were received in good condition, with inflated swim bladders and normal feeding behaviour.
Organism observation: No unusual behaviour or appearance or treatment of test organisms was noted prior to shipping, upon arrival, preceding or during the test. Normal feeding behaviour was noted during the test.
Sample initial chemistry: pH: 7.3; EC: 813 (µS/cm); DO: 9.8 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 225; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤3 days); The test was conducted with three subsamples; samples a, b, and c were for days 0 to 2, 3 to 5, and 6 to 8.
Sample storage: 4 ± 2°C in darkness

Test vessel: Tests were conducted in 500 mL plastic vessels
Test volume: 250 mL of solution (depth of 6.5 cm), replenished daily
Control/dilution water: The control and dilution water was dechlorinated City of Calgary water acclimated to the test conditions; no chemicals were added to the dilution/control water
Test concentrations: 7 effluent concentrations (1.6, 3.2, 6.3, 13, 25, 50, 100% (v/v) plus a negative control)
Test replicates: Ten fish ≤ 24 hours old were loaded per test vessel; 4 replicates/conc.
Feeding: The test organisms were fed twice daily newly-hatched brine shrimp nauplii
The fish are not fed during the final 12 hours of the test
Measurements: pH, conductivity, dissolved oxygen and temperature were measured daily
Sample pre-treatment: The sample was not aerated, filtered or pH adjusted prior or during testing
The dissolved oxygen concentration (mg/L) was: 7.5
The sample pH was: 8
Lighting: Overhead full spectrum fluorescent lights; 100-500 lux at surface
Photoperiod: 16h light:8h dark
Test temperature: 25 ± 1°C

Note: Outlined sections are protocol deviations explained on the comment page

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Client: ALS106
Reference: 09-1927-01-FMD

Test Conditions

Endpoint: Survival, 7-d LC50 (with 95% confidence limits)
Biomass, 7-d IC25 (with 95% confidence limits)
Test endpoints were bracketed by at least 1 test concentration (except for <1.6% or >100 %)
No outliers were observed within the data set

Test validity: Control had 97% survival (must ≥ 80%)
Control had 0% abnormal behaviour (must < 20%), e.g.atypical swimming, loss of equilibrium
The average dry weight of the control fish was 0.53 (must ≥ 0.25 mg)

Reference toxicant: 7-d test with NaCl initiated October 22, 2009;
current results: (7-d LC50 and 95% confidence limits) = 2.87 (2.78-2.96) log (mg/L NaCl)
current results: (7-d IC25 and 95% confidence limits) = 2.47 (2.28-2.59) log (mg/L NaCl)
The reference toxicant test was performed under the same conditions as those used during this test.

Note: Outlined sections are protocol deviations explained on the comment page

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Test Data

Client: ALS106
Reference: 09-1927-01-FMD

Test Log:

Date	Day	Time	Technicians	Temperature Before Use(°C)	
				Control	Sample
2009/10/22	0	1530	T. Kloschinsky/ E. Petho	25	25
2009/10/23	1	1345	H. Stewart	25	25
2009/10/24	2	1130	C. A. Martens	25	25
2009/10/25	3	1250	J. Amyotte	25	25
2009/10/26	4	1345	H. Stewart	25	25
2009/10/27	5	1055	T. Kloschinsky	25	25
2009/10/28	6	1100	T. Kloschinsky	25	26
2009/10/29	7	1430	T. Kloschinsky	na	na

Daily Swimming Behavior:

Day	ctl	1.6	3.2	6.3	12.5	25	50	100
0	normal	normal	normal	normal	normal	normal	normal	normal
1	normal	normal	normal	normal	normal	normal	normal	normal
2	normal	normal	normal	normal	normal	normal	normal	normal
3	normal	normal	normal	normal	normal	normal	normal	normal
4	normal	normal	normal	normal	normal	normal	normal	normal
5	normal	normal	normal	normal	normal	normal	normal	normal
6	normal	normal	normal	normal	normal	normal	normal	normal
7	normal	normal	normal	normal	normal	normal	normal	normal

Chemistry Summary Tables:

	New Solutions								Old Solutions							
Conc. (%)	ctl	1.6	3.2	6.25	12.5	25	50	100	ctl	1.6	3.2	6.25	12.5	25	50	100
Average Values																
pH	8.0	8.1	8.1	8.1	8.1	8.1	8.0	7.7	7.9	7.9	7.9	7.9	7.9	7.9	7.8	7.4
cond.	371	375	382	397	428	488	604	826	392	388	395	406	444	511	621	836
DO	7.7	7.6	7.5	7.5	7.4	7.4	7.5	7.6	7.3	6.8	6.6	6.4	6.4	6.5	6.5	6.5
temp	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Coefficients of Variation (%)																
pH	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2
cond.	6	5	4	3	3	2	1	2	8	4	5	4	4	3	3	4
DO	7	5	4	5	4	4	4	5	7	8	6	7	8	9	8	8
temp	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2

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Fathead minnow (7-d LC50/IC25) Test Report

Test Data

Client: ALS106
Reference: 09-1927-01-FMD

Biology (number alive):

Conc. (%)	ctl	1.6	3.2	6.25	12.5	25	50	100	ctl	1.6	3.2	6.25	12.5	25	50	100
Replicate	Day 1								Day 5							
a	10	10	10	10	10	10	10	10	9	10	10	9	9	10	10	10
b	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
c	10	10	10	10	10	10	10	9	10	10	10	10	10	10	10	9
d	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Day 2								Day 6							
a	10	10	10	10	10	10	10	10	9	9	9	9	9	10	10	10
b	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
c	10	10	10	10	10	10	10	9	10	10	10	10	10	10	10	9
d	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Day 3								Day 7							
a	10	10	10	10	10	10	10	10	9	9	9	9	9	10	10	10
b	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
c	10	10	10	10	10	10	10	9	10	10	9	10	10	10	10	9
d	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Day 4								Unpreserved Dry Weights (mg)							
a	10	10	10	10	10	10	10	10	5.10	4.52	5.15	4.01	4.83	4.35	5.97	6.57
b	10	10	10	10	10	10	10	10	5.27	5.04	5.46	4.92	4.99	5.05	5.62	5.81
c	10	10	10	10	10	10	10	9	5.08	5.27	4.76	5.16	5.06	4.51	5.00	5.43
d	10	10	10	10	10	10	10	10	5.83	4.73	5.12	4.92	4.99	4.37	5.69	5.48

Biology Summary Tables:

	Mortality (%)								Biomass Data (mg per fish)							
a	10	10	10	10	10	0	0	0	0.51	0.45	0.51	0.40	0.48	0.44	0.60	0.66
b	0	0	0	0	0	0	0	0	0.53	0.50	0.55	0.49	0.50	0.51	0.56	0.58
c	0	0	10	0	0	0	0	10	0.51	0.53	0.48	0.52	0.51	0.45	0.50	0.54
d	0	0	0	0	0	0	0	0	0.58	0.47	0.51	0.49	0.50	0.44	0.57	0.55
mean	3	3	5	3	3	0	0	3	0.53	0.49	0.51	0.48	0.50	0.46	0.56	0.58
sd	5	5	6	5	5	0	0	5	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
cv(%)	200	200	115	200	200	na	na	200	7	7	6	11	2	7	7	9

Average Dry Weight of Surviving Control Fish:	0.53

Biomass as a Percent of Controls							
100	92	96	89	93	86	105	109

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HydroQual Laboratories Ltd.

Fathead minnow (7-d LC50/IC25) Test Report

Test Data

Client: ALS106
Reference: 09-1927-01-FMD

Chemistry:

	New Solutions								Old Solutions							
Conc. (%)	ctl	1.6	3	6.25	12.5	25	50	100	ctl	1.6	3	6.25	12.5	25	50	100
Day	pH (units)								pH (units)							
0	8.1	8.2	8.2	8.2	8.2	8.2	8.1	8.0								
1	8.1	8.2	8.2	8.2	8.2	8.1	8.1	7.8	8.1	8.0	7.9	7.9	7.9	7.9	7.8	7.7
2	8.3	8.3	8.3	8.3	8.3	8.3	8.2	7.9	7.9	8.0	8.0	8.0	8.0	8.0	7.9	7.3
3	8.0	8.0	8.1	8.0	8.0	8.0	7.8	7.7	7.8	7.8	7.9	7.9	7.9	7.9	7.7	7.2
4	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.6	7.5	7.6	7.6	7.6	7.7	7.7	7.7	7.4
5	8.0	8.1	8.2	8.2	8.2	8.2	8.0	7.6	7.9	8.0	7.9	7.9	7.9	7.9	7.9	7.5
6	7.9	8.0	8.0	8.0	8.0	8.0	7.8	7.5	7.9	7.8	7.8	7.7	7.7	7.7	7.7	7.3
7									8.2	8.2	8.2	8.1	8.1	8.1	8.0	7.6
8																
	Conductivity (µS/cm)								Conductivity (µS/cm)							
0	393	389	393	408	448	493	610	835								
1	376	384	391	404	431	489	602	807	385	389	395	404	439	490	601	797
2	375	392	400	411	442	498	610	834	401	402	416	416	455	518	638	856
3	370	383	388	402	431	495	606	854	395	402	407	426	469	532	636	898
4	395	372	383	395	419	476	599	844	403	399	416	420	458	526	632	835
5	342	355	363	381	417	484	601	808	351	370	382	396	432	495	601	819
6	344	348	358	375	408	480	601	803	359	362	375	389	431	512	615	834
7									449	390	377	393	426	502	623	814
8																
	Dissolved Oxygen (mg/L)								Dissolved Oxygen (mg/L)							
0	7.4	7.5	7.5	7.5	7.5	7.5	7.5	7.5								
1	8.5	8.2	7.9	7.8	7.6	7.7	7.6	7.9	7.6	6.7	6.5	6.3	6.5	6.5	6.6	6.7
2	7.5	7.4	7.4	7.4	7.3	7.3	7.3	7.4	6.6	6.4	6.4	6.3	6.3	6.4	6.4	6.5
3	7.6	7.8	7.6	7.7	7.7	7.7	7.8	8.0	7.9	7.8	7.3	7.4	7.4	7.6	7.4	7.3
4	7.3	7.2	7.2	7.1	7.1	7.1	7.1	7.2	7.0	6.8	6.3	6.1	6.1	6.1	6.1	6.1
5	7.2	7.2	7.2	7.0	7.0	7.0	7.1	7.3	7.2	6.5	6.2	6.1	5.9	5.9	5.9	5.9
6	8.4	8.0	7.9	7.9	7.9	7.8	7.9	8.2	7.7	7.3	7.0	6.7	6.7	6.7	6.8	6.7
7									6.9	6.3	6.3	6.1	6.0	6.0	6.0	6.0
8																
	Temperature (°C)								Temperature (°C)							
0	25	25	25	25	25	25	25	25								
1	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
2	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
3	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
4	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
5	25	25	25	25	25	25	25	25	24	24	24	24	24	24	24	24
6	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
7									24	24	24	24	24	24	24	24
8																

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Comments/Statistics

Client: ALS106
Reference: 09-1927-01-FMD

Test Result Comments:
None

Data Analysis:
Endpoints for mortality could not be calculated. No effect occurred.

Endpoints for biomass could not be calculated. No effect occurred.

Protocol Deviations:
None

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Warning Chart
Fathead minnow

Test Method: 7 days Fathead minnow Survival and Growth Test (five treatments plus a control)
HydroQual Test Method Manual, section: 4.4.4.6
Reference: Biological Test Method: Test of Larval Growth and Survival Using Fathead minnows, 1992. Environment Canada, EPS 1/RM/22. (amended September 2008)

Test Organism:

test species:	*Pimephales promelas*
culture source:	Aquatox Inc. (Arkansas, USA)
temp of breeding aquaria:	23 - 26 °C
food type:	frozen brine shrimp
frequency of feeding:	daily
breeding colony mortality:	<1% (last 7 days)
age of test organisms:	<24 hours
condition prior to test initiation:	normal
batch number:	20091022FM

Test Design:

test type:	static renewal
toxicant:	sodium chloride
test vessel:	polypropelyene cups, 11 x 9 cm
volume of test vessel:	450
test volume (ml):	250
depth of test solution:	>3 cm
replicates per treatment:	4 replicates
organisms per replicate:	10
feeding:	twice daily
temperature (°C):	24-26
photoperiod:	16 hours light: 8 hours dark
light level (surface):	100-500 lux

Control/Dilution Water:

source:	dechlorinated City of Calgary tap water no chemicals were added to the dilution water
pH (units):	7.0
conductance (µS/cm):	341
dissolved oxygen (mg/L):	7.7
NH_4^+ (mg/L):	<0.1
hardness (mg $CaCO_3$/L):	163
alkalinity (mg $CaCO_3$/L):	144
total residual chlorine (mg/L):	<0.01

Comments: None.

Quality Assurance Unit: _____

Authorized by S. Krishnappa, B.Sc., Quality Assurance Coordinator
The test data and results are verified correct.

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HydroQual Laboratories Ltd.

Warning Chart
Fathead minnow

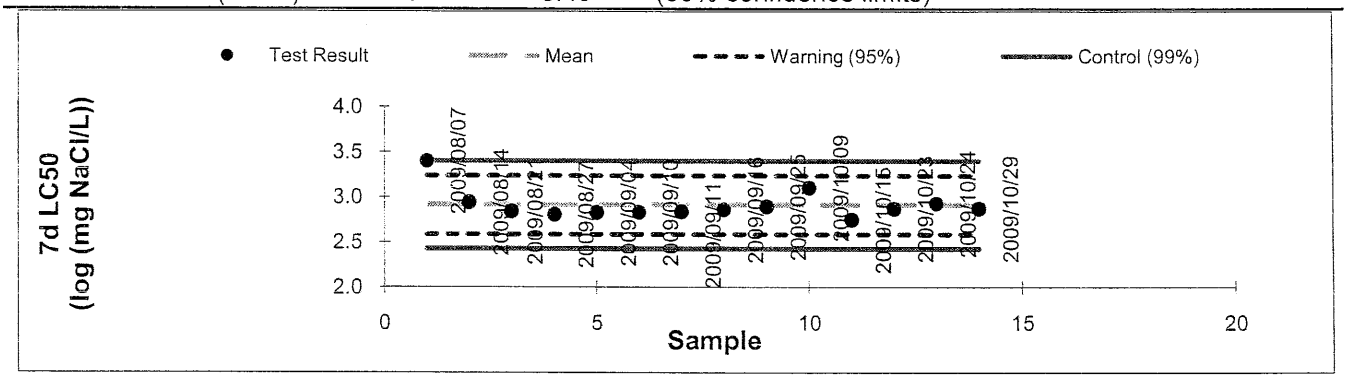
Mortality

Current Test

toxicant	Sodium Chloride (NaCl)				
started on	2009/10/22	ended on	2009/10/29		
Result (7 d LC50):	2.87	log (mg NaCl/L); geometric mean			
Confidence Limits (95%)	lower	2.78	upper	2.96	

Historical Values

mean	2.91	sd	0.16	cv(%):	6
	lower	upper			
warning limits (±2 sd)	2.59	3.24	(95% confidence limits)		
control limits (±3 sd)	2.43	3.40	(99% confidence limits)		

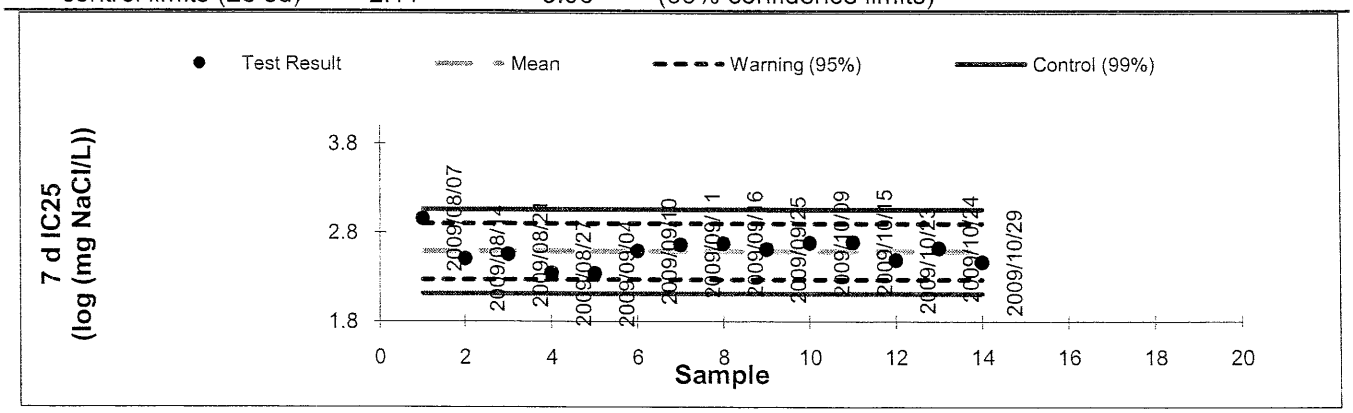


Biomass

started on	2009/10/22	ended on	2009/10/29		
Result (7 d IC25):	2.47	log (mg NaCl/L); geometric mean			
Confidence Limits (95%)	lower	2.28	upper	2.59	

Historical Values

mean	2.59	sd	0.16	cv(%):	6
	lower	upper			
warning limits (±2 sd)	2.27	2.90	(95% confidence limits)		
control limits (±3 sd)	2.11	3.06	(99% confidence limits)		



notes: sd, standard deviation; cv, coefficient of variance; N/A, could not be calculated

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HydroQual Laboratories Ltd.

Lemna minor Test Report

Result Summary

Client: ALS106
Reference: 09-1927-01-LMD

Client: ALS Laboratory Group; operation Edmonton

Sample: L831482-8
Pond 2 Toxicity
Collection: collected on 2009/10/19 at not given by T.C.
Receipt: received on 2009/10/21 at 0851 by E.A. Benner
Containers: received 6 x 20L pails at 12 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

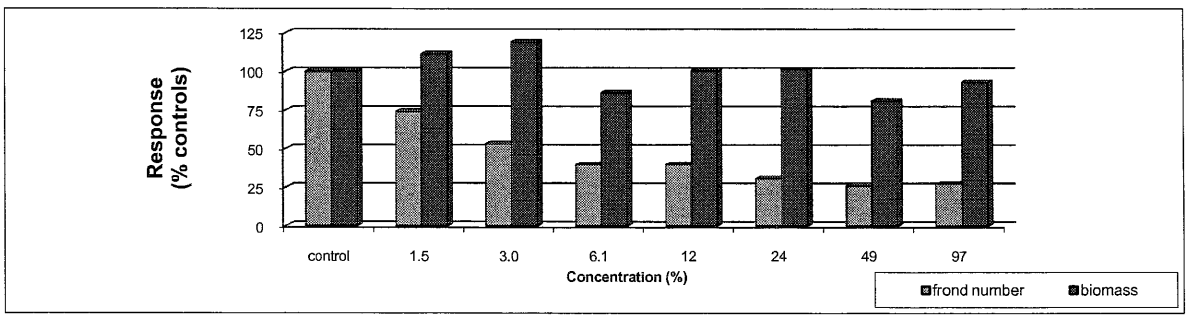
Test: started on 2009/10/22 ; ended on 2009/10/29

Contents

Result:

	Endpoint (7-day)	Value	Confidence Limits (95%) lower	upper	Units	Method Calculated
Chronic:	IC25	<1.5	<1.5	<1.5	%	Log-Logistic
(frond number)	IC50	2.1	1.7	2.6	%	Log-Logistic
Chronic:	IC25	>97			%	could not be calculated
(biomass)	IC50	>97			%	could not be calculated

Notes: ICx, concentrations lethal or inhibitory to 'x' percent of the test population;



The test data and results are authorized and verified correct.

E. Blais, B.Sc., Technical Lead

S. Krishnappa, B.Sc., Quality Coordinator

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Test Conditions

Client: ALS106
Reference: 09-1927-01-LMD

Method: Biological Test Method: Test for Measuring the Inhibition of Growth Using the Freshwater Macrophyte, *Lemna minor*. Environment Canada, EPS 1/RM/37 2nd Edition, January 2007

Test type: *Lemna* 7-d Inhibition of Growth Static Test (HQ 4.4.2.3)
Species: *Lemna minor*
Organism source: in-house culture, ≥ 3 weeks in age (original source: UTCC 492, clone 7730)
Culture health: The fronds were acclimated in test media for 24 hours prior to test initiation. The test culture was axenic prior to testing. There was an 11 fold increase in frond number of culture over last 7 days. Test loaded with 3 frond daughter plants, all with light green fronds and short roots.
Culture age: The test was started with 10 day old fronds.
Culture media: modified Hoagland's E+ medium
Organism observation: No unusual behaviour, appearance or treatment of test organisms was noted prior to or during the test.

Sample initial chemistry: pH: 7.3; EC: 813 (µS/cm); DO: 9.8 (mg/L); temperature: 15 °C hardness (mg CaC03/L): 225; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 3 days); The test was conducted with three subsamples, samples a, b, and c were for days 0 to 2, 3 to 4, and 5 to 7.
Sample storage: 4 ± 2°C in darkness

Test vessel: The test was a static test conducted in 200 mL polyethylene plastic containers with clear lids.
Test volume: The test volume was 150 mL, depth of ≥ 4 cm
Test concentrations: 7 effluent concentrations (1.5, 3.0, 6.1, 12.1, 24, 49, 97% (v/v) plus a negative control)
Test replicates: There were four replicates per treatment with two 3 frond daughter plants per replicate; replicates are rotated daily.
Control/dilution water: Test media (modified APHA medium) made up with deionized City of Calgary water water spiked with nutrients as per Environment Canada EPS 1/RM/37, 2007. made by adding 60 mL of each of the three stock solutions to 5.82 L of DRO The media aerated for 2 hours and was pH adjusted to 8.3±0.1 with 6N HCl or NaOH. The test media was not filtered.
Elutriate preparation: 2009/10/22
Sample pre-treatment: 1455 mL of sample spiked with 15 mL of each of the three APHA stock solutions, no other chemicals added. The sample was not pH adjusted or filtered prior to testing.
Aeration: The sample was pre-aerated for 20 minutes at a rate of 100 bubbles/minute with oil free filtered compressed air from a 1 mL glass pipette attached to an air pump.

Note: Outlined sections are protocol deviations explained on the comment page

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Test Conditions

Client: ALS106
Reference: 09-1927-01-LMD

Lighting: The cups were incubated under continuous full-spectrum light. The light levels were measured at the sample surface, at three locations on the testing bench, during testing:

left:	4010	lux	≈	64	µmol/m^2•S
centre:	4790	lux	≈	77	µmol/m^2•S
right:	4640	lux	≈	74	µmol/m^2•S

Measurements:
pH, conductivity, dissolved oxygen and temperature at test initiation and termination; temperature in the control, low, middle and high concentrations are recorded daily.

Test temperature: 25 ± 2°C

Endpoint: Growth (based on increase in frond number), 7-d IC25 (with 95% confidence limits)
Growth (based on dry weight), 7-d IC25 (with 95% confidence limits)
Test endpoints were bracketed by at least 1 test concentration.
(except for <1.6% or >97 %)
No outliers were observed within the data set

Test validity: The mean number of fronds in the controls have increased 8 times (must be ≥ 8 time increase). The average number attained at test termination was 48 (must be ≥48 fronds per test vessel).

Reference toxicant: 7-d test with Potassium Chloride (KCl) initiated October 6, 2009;
current results:
(Frond Number; 7-d IC25 and 95% confidence limits) = 3.39 (3.30-3.46) log(mg KCl/L)
current results:
(Biomass; 7-d IC25 and 95% confidence limits) = 3.78 (3.54-3.93) log (mg KCl/L)
The reference toxicant test was performed under the same conditions as those used during this test .

Note: Outlined sections are protocol deviations explained on the comment page

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Test Data

Client: ALS106
Reference: 09-1927-01-LMD

Test Log:

Date	Day	Time	Technicians	Rotate	Temperature (°C)			
					Control	3.0%	24%	97%
2009/10/22	0	1210	T. Kloschinsky	no	24	24	24	24
2009/10/23	1	0820	H. Stewart	yes	27	26	25	26
2009/10/24	2	0900	S. Ehman	yes	23	24	25	25
2009/10/25	3	0915	C. A. Martens	yes	23	23	23	23
2009/10/26	4	0830	E. Petho	yes	24	25	25	24
2009/10/27	5	0820	H. Stewart	yes	24	25	24	24
2009/10/28	6	0810	H. Stewart	yes	27	27	26	26
2009/10/29	7	1215	T. Kloschinsky	no	26	26	25	26

Chemistry:

Conc.(%)	control	1.5	3.0	6.1	12	24	49	97	
				Day 0					
pH	8.2	8.2	8.2	8.2	8.2	8.1	8.1	8.0	
cond.	877	877	896	923	987	1102	1307	1660	
DO	7.4	7.4	7.4	7.3	7.3	7.3	7.3	7.2	
temp.	25	25	25	25	25	25	25	25	
				Day 7					
pH	8.5	8.6	8.7	8.8	8.1	8.5	8.2	8.0	
cond.	2940	1423	1163	1112	1345	1575	2270	3480	
DO	8.4	8.8	8.9	9.3	9.5	9.1	8.2	8.0	
temp.	26	26	26	26	26	26	26	26	

Notes: pH, units; cond., conductivity (µS/cm); DO, dissolved oxygen (mg/L); temp., temperature (°C)

Frond Appearance:

Concentration (%)	Day 0	Day 7
control	green, short roots, healthy	green, long roots, healthy
1.5	green, short roots, healthy	green, long roots, healthy
3.0	green, short roots, healthy	green, long roots, healthy
6.1	green, short roots, healthy	green, medium roots, some chl,
12.1	green, short roots, healthy	green, medium roots, some chl,
24	green, short roots, healthy	green, medium roots, some chl,
49	green, short roots, healthy	green, medium roots, some chl,
97	green, short roots, healthy	green, short roots, cd, some chl,

Notes: chl, chlorotic; nec, necrotic; asf, abnormally sized fronds; gib, gibbosity; cd, colony destroyed; rd, roots destroyed; lb, loss of bouyancy

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Test Data

Client: ALS106
Reference: 09-1927-01-LMD

Frond number:

Conc.(%)	control	1.5	3.0	6.1	12.1	24	49	97
Replicate				Day 0				
a	6	6	6	6	6	6	6	6
b	6	6	6	6	6	6	6	6
c	6	6	6	6	6	6	6	6
d	6	6	6	6	6	6	6	6
				Day 7				
a	43	36	27	24	22	16	17	18
b	48	41	29	27	26	21	16	15
c	53	33	25	20	23	20	18	19
d	49	39	33	20	20	19	17	18

Increase in Frond Number:

Conc.(%)	control	1.5	3.0	6.1	12.1	24	49	97
Replicate								
a	37	30	21	18	16	10	11	12
b	42	35	23	21	20	15	10	9
c	47	27	19	14	17	14	12	13
d	43	33	27	14	14	13	11	12
average	42	31	23	17	17	13	11	12
sd	4	4	3	3	3	2	1	2
cv	10	11	15	20	15	17	7	15
% ctls	100	74	53	40	40	31	26	27
% stim	0	-26	-47	-60	-60	-69	-74	-73

Total Dry Weights (mg):

Conc.(%)	control	1.5	3.0	6.1	12.1	24	49	97
Replicate				Day 7				
a	2.6	3.0	3.0	1.9	2.4	2.6	1.9	2.7
b	2.6	2.7	3.3	2.4	2.7	2.8	1.9	2.0
c	3.4	3.1	2.8	2.9	3.1	3.1	2.5	2.9
d	2.2	3.2	3.7	2.0	2.7	2.4	2.3	2.4
				Day 7				
average	2.7	3.0	3.2	2.3	2.7	2.7	2.2	2.5
sd	0.5	0.2	0.4	0.5	0.3	0.3	0.3	0.4
cv	18	6	12	20	10	11	14	16
%ctls	100	111	119	86	100	101	81	93
% stim	0	11	19	-14	0	1	-19	-7

Notes: cv, coefficient of variation; %ctls, percent of controls; sd, standard deviation, % stim, percent stimulation

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Comments/Statistics

Client: ALS106
Reference: 09-1927-01-LMD

Test Result Comments:
None

Data Analysis:
Endpoints for frond number were calculated using a non-linear regression model (4P Log-Logistic) with CETIS v. 1.7.0 rev Q.

Enpoints for biomass could not be calculated. No inhibitory effect occurred.

Protocol Deviations:
None

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HydroQual Laboratories Ltd.

Warning Chart
Lemna

Test Method: 7 days *Lemna minor* Survival and Growth Test (five treatments plus a control)
HydroQual Test Method Manual, section: 4.4.2.3
Reference: Biological Test Method: Test for Measuring the Inhibition of Growth Using the Freshwater Macrophyte, *Lemna minor*, 2007. Environment Canada, EPS 1/RM/37.

Test Organism:

test species:	*Lemna minor*
culture source:	in-house
original culture source:	UTCC - 492 (clone 7730)
culture vessels:	250 mL Erlenmeyer flask
water source:	deionized water
growth medium:	Hoagland's E+ medium
cultivation method:	as per test conditons
temp of breeding aquaria:	25 ± 2°C
organism age:	7-10 days old acclimated to test media for 18 to 24 hours
mean increase in frond #:	
fold increase:	35

Test Design:

test type:	static
toxicant:	potassium chloride
water source:	deionized reverse osmosis water with nutrients as per EPS 1/RM/37
test vessel:	200mL polyethylene cups
test volume (ml):	150
test cover:	clear plastic lids
replicates per treatment:	4
organisms per replicate:	two 3 frond plants
temperature (°C):	25 ± 2°C
photoperiod:	24 hours light
light level (surface):	4, 500 ± 300 lux
light source:	cool white fluorescent
hardness adjustment:	no

Control/Dilution Water:
water source: City of Calgary tap water; deionized reverse osmosis water and nutrients as per EPS 1/RM/37

Comments: None.

Quality Assurance Unit: _____
Authorized by S. Krishnappa, B.Sc., Quality Assurance Coordinator
The test data and results are verified correct.

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HydroQual Laboratories Ltd.

Warning Chart
Lemna

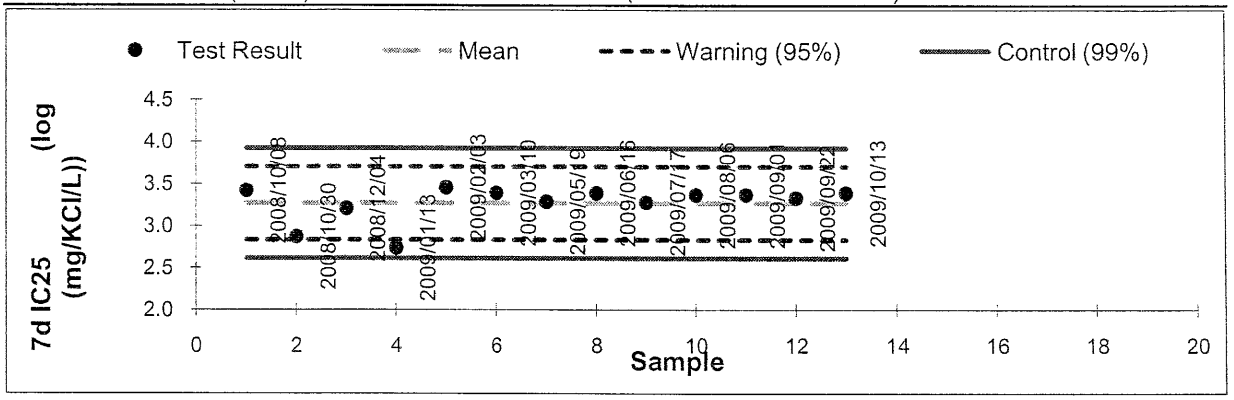
Frond Number

Current Test

toxicant	Potassium Chloride (KCl)				
started on	2009/10/06	ended on	2009/10/13		
Result (7 d IC25):	3.39	log (mg KCl/L); geometric mean			
Confidence Limits (95%)	lower	3.30	upper	3.46	

Historical Values

mean	3.27	sd	0.22	cv(%):	7
	lower	upper			
warning limits (±2 sd)	2.83	3.71	(95% confidence limits)		
control limits (±3 sd)	2.62	3.92	(99% confidence limits)		



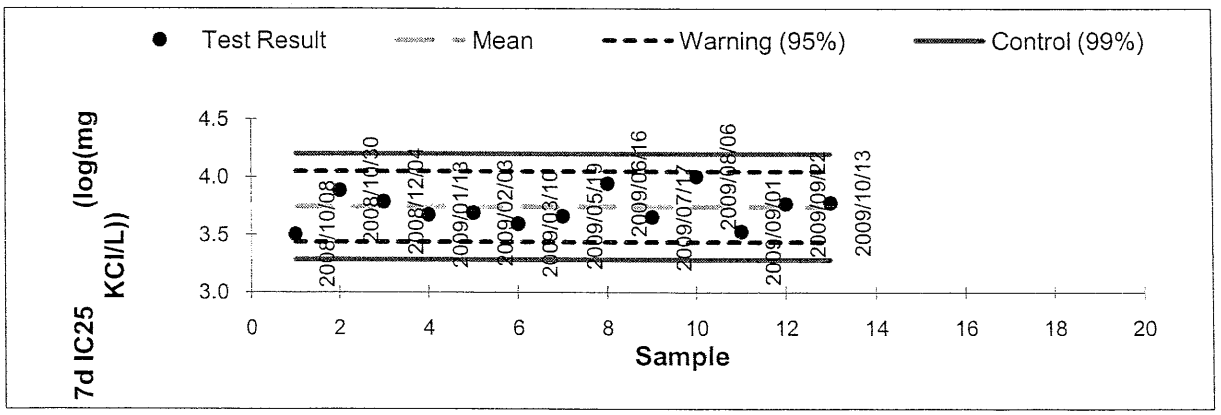
Biomass

Current Test

toxicant	Potassium Chloride (KCl)				
started on	2009/10/06	ended on	2009/10/13		
Result (7 d IC25):	3.78	log (mg KCl/L); geometric mean			
Confidence Limits (95%)	lower	3.54	upper	3.93	

Historical Values

mean	3.74	sd	0.15	cv(%):	4
	lower	upper			
warning limits (±2 sd)	3.44	4.05	(95% confidence limits)		
control limits (±3 sd)	3.28	4.20	(99% confidence limits)		



notes: sd, standard deviation; cv, coefficient of variance; NA, could not be calculated

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HydroQual Laboratories Ltd.

Trout (96-h LC50) Test Report

Result Summary

Client: ALS106
Reference: 09-1927-01-TRD

Client: ALS Laboratory Group; operation Edmonton

Sample: L831482-8
Pond 2 Toxicity
Collection: collected on 2009/10/19 at not given by T.C.
Receipt: received on 2009/10/21 at 0851 by E.A. Benner
Containers: received 6 x 20L pails at 12 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

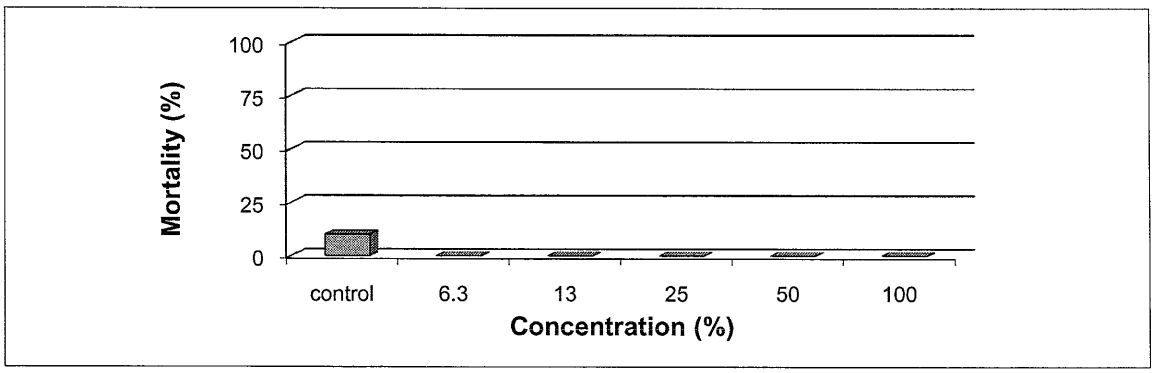
Test: started on 2009/10/22 ; ended on 2009/10/26

Contents

Result:

	Endpoint (96-hour)	Value (%)	Confidence Limits (95%) lower	upper	Method Calculated
Acute:	LC50	>100			could not be calculated
(mortality)	LC25	>100			could not be calculated

Notes: LC25 & LC50, concentrations lethal to 25% and 50% of the test population



The test data and results are authorized and verified correct.

E. Blais, B.Sc., Technical Lead

S. Krishnappa, B.Sc., Quality Coordinator

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Test Conditions

Client: ALS106
Reference: 09-1927-01-TRD

Method: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 2000. Environment Canada, EPS 1/RM/13. Second Edition (amended May 2007).

Test type: Trout 96-h Static Acute Test (HQ 4.4.4.1)
Species: *Oncorhynchus mykiss*
Organism source: Sun Valley Trout Farms (Batch 20090813TR)
Acclimation: 70 days (must be ≥2 weeks)
Stock mortality: 0.16% (seven days preceeding testing)

Sample initial chemistry: pH: 7.3; EC: 813 (µS/cm); DO: 9.8 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 225; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: The test was conducted in 22 L plastic pails with polyethylene liners
Test volume: 20 Litres (depth of solution in each test vessel ≥15cm)
Sample pre-treatment: All test solutions and controls were pre-aerated for 30 minutes at 6.5 ±1 mL/min/L
Dissolved oxygen in 100 % sample was 8.2 mg/L after pre-aeration
The sample was not filtered or pH adjusted prior to or during testing
Loading density: 0.455 g/Litre (must be ≤ 0.5 g/Litre)
Control/dilution water: Dechlorinated City of Calgary water acclimated to test conditions
Test concentrations: 5 effluent concentrations (6.3, 12.5, 25, 50, 100% (v/v) plus a negative control)
Test replicates: One replicate per treatment; 10 fish per replicate
Feeding: Fish are not fed 24 hours before test initiation and no feeding during test
Measurements: pH, conductivity, dissolved oxygen and temperature measured daily
Aeration: All treatments aerated at 6.5 ±1 mL/min/L by oil-free compressed air passed through airline tubes connected to disposable air stones
Lighting: Overhead full spectrum fluorescent lights; 100-500 lux at surface
Photoperiod: 16h light:8h dark
Test temperature: 15 ± 1°C

Endpoint: Mortality, 96-h LC50 (with 95% confidence limits)
Test validity: The control had 90% survival (must ≥ 90%)

Reference toxicant: 96-h test with Phenol (C_6H_6O) initiated October 1, 2009; current results (96-h LC50 and 95% confidence limits) = 0.89 (0.76-0.97) log (mg/L Phenol)

Note: Outlined sections are protocol deviations explained on the comment page; v/v, volume per volume

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Test Data

Client: ALS106
Reference: 09-1927-01-TRD

Test Log:

Date	Day	Time	Technician	Comment/Observation
2009/10/22	0	1230	E. Petho/ T. Kloschinsky	test fish loaded at 1230 h
2009/10/23	1	1100	H. Stewart/ E. Petho	all test fish appear normal
2009/10/24	2	1010	C. A. Martens/ S. Ehman	all test fish appear normal
2009/10/25	3	1030	C. A. Martens/ S. Ehman	all test fish appear normal
2009/10/26	4	1000	E. Blais/ H. Stewart	all test fish appear normal

Chemistry:

Conc. (%)	control	6.3	13	25	50	100		
Day	pH (units)							
0	7.9	7.8	7.8	7.8	7.7	7.4		
1	7.8	7.8	7.8	7.7	7.6	7.2		
2	8.2	8.2	8.2	8.1	7.9	7.2		
3	7.9	7.8	7.8	7.8	7.7	7.0		
4	7.7	7.6	7.8	7.7	7.6	7.4		
	Conductivity (µS/cm)							
0	395	430	406	513	637	851		
1	399	432	407	526	649	881		
2	404	437	411	516	639	857		
3	404	447	417	533	663	894		
4	409	449	421	528	663	897		
	Dissolved Oxygen (mg/L)							
0	8.0	8.0	8.1	8.1	8.2	8.2		
1	8.7	8.7	8.8	8.8	8.7	8.7		
2	8.7	8.4	8.5	8.5	8.5	8.3		
3	9.0	9.0	9.0	8.9	8.9	8.9		
4	8.4	8.4	8.3	8.3	8.4	8.9		
	Temperature (°C)							
0	14	14	14	14	14	14		
1	14	14	14	14	14	14		
2	14	14	14	14	14	14		
3	14	14	14	14	14	14		
4	14	14	14	14	14	14		

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HydroQual Laboratories Ltd.

Trout (96-h LC50) Test Report

Test Data

Client: ALS106
Reference: 09-1927-01-TRD

Number Alive:

Conc. (%)	control	6.3	13	25	50	100		
Day								
0	10	10	10	10	10	10		
1	9	10	10	10	10	10		
2	9	10	10	10	10	10		
3	9	10	10	10	10	10		
4	9	10	10	10	10	10		
				Mortality (%)				
4	10	0	0	0	0	0		

Biology Summary Tables:

Control Fish	Length (cm)	Wet Weight(g)
1	4.1	0.6
2	4.9	1.0
3	4.9	1.2
4	4.6	0.9
5	4.6	0.9
6	4.5	0.7
7	4.4	0.9
8	4.4	0.8
9	4.6	1.1
10	4.5	1.0
average	4.6	0.9
sd	0.2	0.2
cv(%)	5.2	19.7

Conc. (%)	Group Wet Weight (g)
control	9.1
6.3	10.9
13	10.1
25	10.1
50	9.8
100	9.6

Notes: nd, not done; na, not applicable; sd, standard deviation; cv(%), coefficient of variation

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Comments/Statistics

Client: ALS106
Reference: 09-1927-01-TRD

Test Result Comments:
None

Data Analysis:
Endpoints for mortality could not be calculated. No effect occurred.

Protocol Deviations:
None

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HydroQual Laboratories Ltd.

Warning Chart
Trout

Test Method: Trout 96h Static Acute Test. (LC50, five or more treatments plus a control) HydroQual Test Method Manual, section: 4.4.4.1

Reference: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 1990. Environment Canada, EPS 1/RM/13. including May 1996 and December 2000 amendments.

Test Organism:

test species:	*Oncorhyncus mykiss*
culture source:	Sun Valley Trout Parks
temperature (°C):	15 ± 1
dissolved oxygen:	saturated
stock mortality (last 7d):	0.87%
batch number:	20090813TR

Test Design:

vol. of test vessel (L):	22
test volume depth:	>15 cm
replicates per treatment:	1
fingerlings per replicate:	10
loading (g fish/L):	<0.5
temperature (°C):	15 ± 1
photoperiod:	16h light: 8h dark
light level (water surface):	100-500 lux
control/dilution water:	dechlorinated tap water

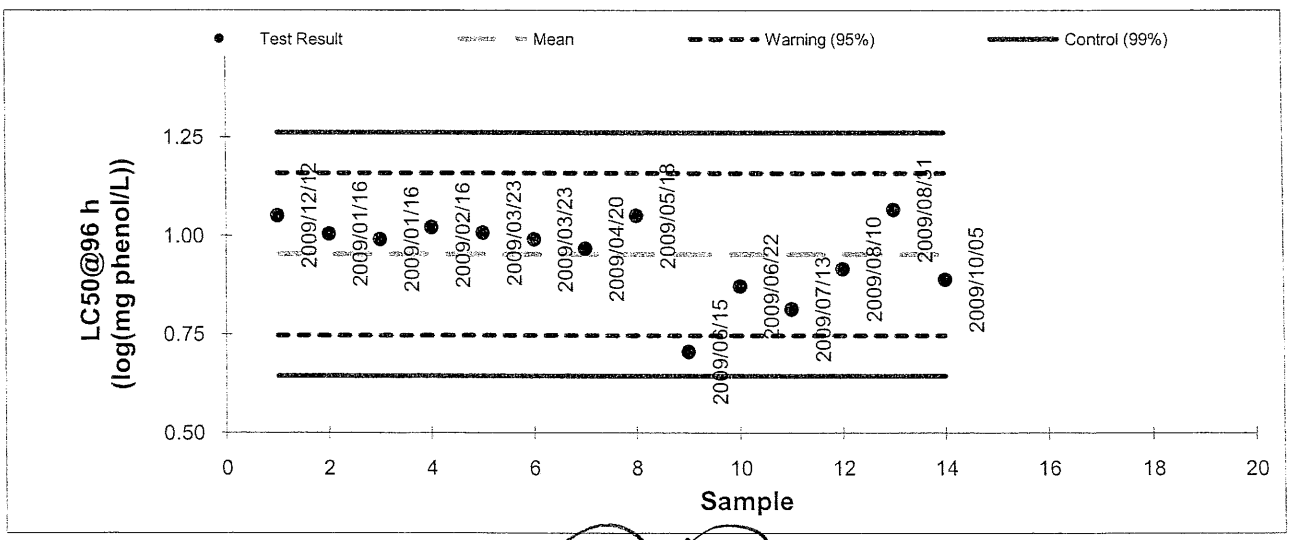
Current Test

toxicant	phenol (C_6H_5OH)				
started on	2009/10/01	ended on	2009/10/05		
Result (LC50 @ 96h)	0.89	log (mg phenol/L); geometric mean			
Confidence Limits (95%)	lower	0.76	upper	0.97	

Historical Values

mean	0.95	sd	0.10	cv(%):	11
	lower	upper			
warning limits (±2 sd)	0.75	1.16	(95% confidence limits)		
control limits (±3 sd)	0.64	1.26	(99% confidence limits)		

notes: sd, standard deviation; cv, coefficient of variance



Qualty Assurance Unit:

Authorized by S. Krishnappa, B.Sc., Quality Assurance Coordinator
The test data and results are verified correct.

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HydroQual Laboratories Ltd.

Trout (single concentration) Test Report

Client: ALS106
Reference: 09-1927-01-TRS

Result Summary

Client: ALS Laboratory Group; operation Edmonton

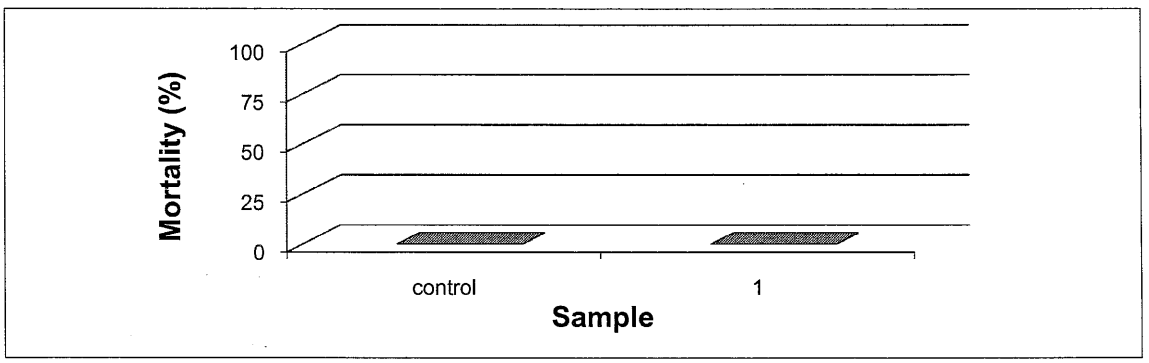
Sample: L831482-8
Pond 2 Toxicity
Collection: collected on 2009/10/19 at not given by T.C.
Receipt: received on 2009/10/21 at 0851 by E.A. Benner
Containers: received 6 x 20L pails at 12 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

Test: started on 2009/10/22 ; ended on 2009/10/26

Contents

Result:

Sample	Client Code	Mortality (%)	Comment
control	lab control	0	
1	L831482-8	0	not toxic as tested



The test data and results are authorized and verified correct.

E. Blais, B.Sc., Technical Lead

S. Krishnappa, B.Sc., Quality Coordinator

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Test Conditions

Client: ALS106
Reference: 09-1927-01-TRS

Method: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 2000. Environment Canada, EPS 1/RM/13. Second Edition (amended 2007).

Test type: Trout 96-h Static Acute Test (HQ 4.4.4.1)
Species: *Oncorhynchus mykiss*
Organism source: Sun Valley Trout Farms (Batch 20090813R)
Acclimation: 70 days (must be ≥ 2 weeks)
Stock mortality: 0.16% (seven days preceeding testing)

Sample initial chemistry: pH: 7.3; EC: 813 (µS/cm); DO: 9.8 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 225; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: The test was conducted in 22 L plastic pails with polyethylene liners
Test volume: 20 Litres (depth of solution in each test vessel ≥15cm)
Sample pre-treatment: All test solutions and controls were pre-aerated for 30 minutes at 6.5 ±1 mL/min/L
Dissolved oxygen in full strength sample was 8.2 mg/L after pre-aeration
The sample was not filtered or pH adjusted prior to or during testing
Loading density: 0.42 g/Litre (must be ≤ 0.5 g/Litre)
Control water: Dechlorinated City of Calgary water acclimated to test conditions
Test concentrations: Undiluted sample plus a negative control
Test replicates: One replicate per treatment; 10 fish per replicate
Feeding: Fish are not fed 24 hours before test initiation and no feeding during test
Measurements: pH, conductivity, dissolved oxygen and temperature measured daily
Aeration: All treatments aerated at 6.5 ±1 mL/min/L by oil-free compressed air passed through airline tubes connected to disposable air stones
Lighting: Overhead full spectrum fluorescent lights; 100-500 lux at surface
Photoperiod: 16h light:8h dark
Test temperature: 15 ± 1°C

Endpoint: Mortality, % mortality at 96-h
Test validity: The control had 100% survival (must ≥ 90%)

Reference toxicant: 96-h test with Phenol (C_6H_5OH) initiated October 1, 2009; current results (96-h LC50 and 95% confidence limits) = 0.89 (0.76-0.97) log (mg/L Phenol)

Note: Outlined sections are protocol deviations explained on the comment page; v/v, volume per volume

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Test Data

Client: ALS106
Reference: 09-1927-01-TRS

Test Log:

Date	Day	Time	Technician	Comment/Observation
2009/10/22	0	1230	E. Petho/ T. Kloschinsky	test fish loaded at 1230 h
2009/10/23	1	1100	H. Stewart/ E. Petho	all test fish appear normal
2009/10/24	2	1010	C. A. Martens/ S. Ehman	all test fish appear normal
2009/10/25	3	1030	C. A. Martens/ S. Ehman	all test fish appear normal
2009/10/26	4	1000	E. Blais/ H. Stewart	all test fish appear normal

Chemistry:

Sample	control	1						

pH (units)

Day								
0	7.9	7.4						
1	7.7	7.2						
2	8.1	7.2						
3	7.8	7.1						
4	7.8	7.5						

Conductivity (µS/cm)

0	377	850						
1	369	868						
2	384	849						
3	389	880						
4	393	956						

Dissolved Oxygen (mg/L)

0	8.1	8.2						
1	8.6	8.7						
2	8.2	8.2						
3	9.9	9.0						
4	8.3	8.6						

Temperature (°C)

0	14	14						
1	14	14						
2	15	14						
3	14	14						
4	14	14						

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HydroQual Laboratories Ltd.

Trout (single concentration) Test Report

Test Data

Client: ALS106
Reference: 09-1927-01-TRS

Number Alive:

Sample	control	1						
Day								
0	10	10						
1	10	10						
2	10	10						
3	10	10						
4	10	10						
				Mortality (%)				
4	0	0						

Biology Summary Tables:

Control Fish	Length (cm)	Wet Weight(g)
1	4.3	0.9
2	3.9	0.5
3	4.4	0.8
4	4.6	1.0
5	3.8	0.6
6	4.6	1.0
7	4.5	1.0
8	3.9	0.6
9	4.4	1.0
10	4.6	1.0
average	4.3	0.8
sd	0.3	0.2
cv(%)	7.4	23.9

Notes: nd, not done; na, not applicable; sd, standard deviation; cv(%), coefficient of variation

Sample	Group Wet Weight (g)
control	8.4
1	10.4

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Comments/Statistics

Client: ALS106
Reference: 09-1927-01-TRS

Test Result Comments:
None

Data Analysis:
None

Protocol Deviations:
None

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HydroQual Laboratories Ltd.

Warning Chart
Trout

Test Method: Trout 96h Static Acute Test. (LC50, five or more treatments plus a control) HydroQual Test Method Manual, section: 4.4.4.1

Reference: Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout, 1990. Environment Canada, EPS 1/RM/13. including May 1996 and December 2000 amendments.

Test Organism:

test species:	*Oncorhyncus mykiss*
culture source:	Sun Valley Trout Parks
temperature (°C):	15 ± 1
dissolved oxygen:	saturated
stock mortality (last 7d):	0.87%
batch number:	20090813TR

Test Design:

vol. of test vessel (L):	22
test volume depth:	>15 cm
replicates per treatment:	1
fingerlings per replicate:	10
loading (g fish/L):	<0.5
temperature (°C):	15 ± 1
photoperiod:	16h light: 8h dark
light level (water surface):	100-500 lux
control/dilution water:	dechlorinated tap water

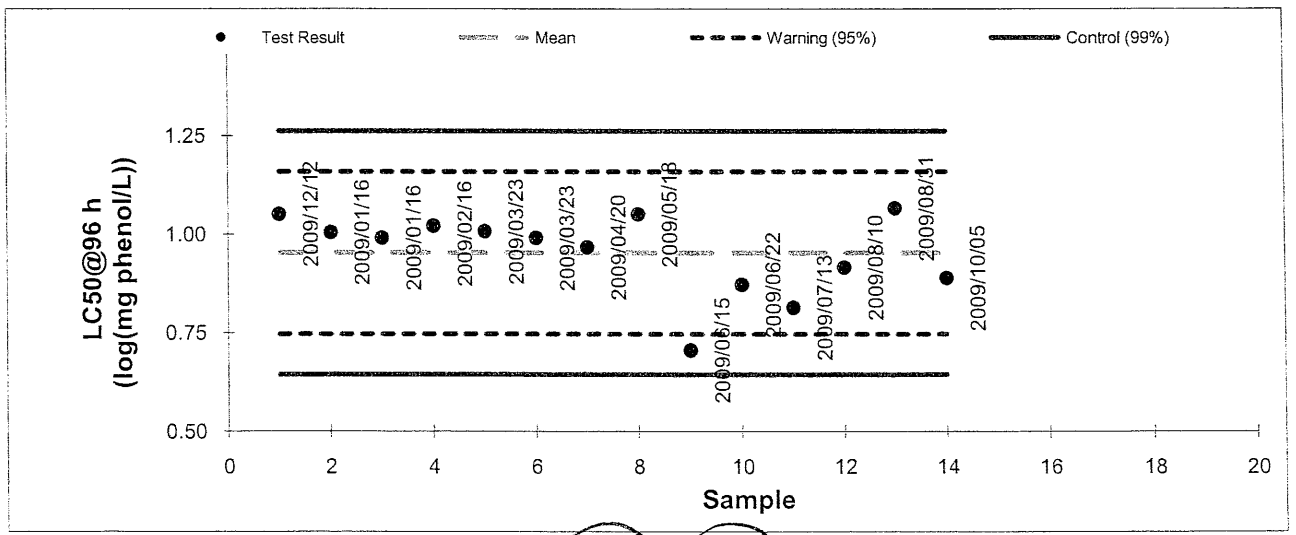
Current Test

toxicant	phenol (C_6H_5OH)				
started on	2009/10/01	ended on	2009/10/05		
Result (LC50 @ 96h)	0.89	log (mg phenol/L); geometric mean			
Confidence Limits (95%)	lower	0.76	upper	0.97	

Historical Values

mean	0.95	sd	0.10	cv(%):	11
	lower	upper			
warning limits (±2 sd)	0.75	1.16	(95% confidence limits)		
control limits (±3 sd)	0.64	1.26	(99% confidence limits)		

notes: sd, standard deviation; cv, coefficient of variance



Qualty Assurance Unit:

Authorized by S. Krishnappa, B.Sc., Quality Assurance Coordinator
The test data and results are verified correct.

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HydroQual Laboratories Ltd.

Daphnia (48-h LC50/EC50) Test Report

Result Summary

Client: ALS106
Reference: 09-1927-01-DAD

Contents

Client: ALS Laboratory Group; operation Edmonton

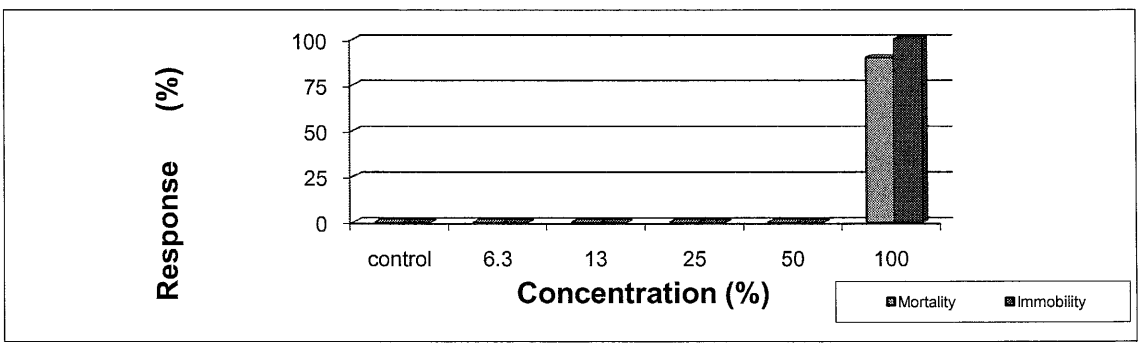
Sample: L831482-8
Pond 2 Toxicity
Collection: collected on 2009/10/19 at not given by T.C.
Receipt: received on 2009/10/21 at 0851 by E.A. Benner
Containers: received 6 x 20L pails at 12 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

Test: started on 2009/10/22 ; ended on 2009/10/24

Result:

	Endpoint (48-hour)	Value (%)	Confidence Limits (95%) lower	upper	Method Calculated
Acute: (mortality)	LC50	73	68	80	Spearman-Karber
	LC25	na	na	na	Spearman-Karber
Acute: (immobility)	EC50	71	57	88	Spearman-Karber
	EC25	na	na	na	Spearman-Karber

Notes: LC25 & LC50, concentrations lethal to 25% and 50% of the test population



The test data and results are authorized and verified correct.

E. Blais, B.Sc., Technical Lead

S. Krishnappa, B.Sc., Quality Coordinator

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Test Conditions

Client: ALS106
Reference: 09-1927-01-DAD

Method: Biological Test method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*, 2000. Environ. Can., EPS 1/RM/14. Second Edition.

Test type: *Daphnia* 48-h Static Acute Test (HQ 4.4.3.1)
Species: *Daphnia magna*
Age: < 24 hours old
Organism source: in-house culture
Stock mortality: 0%
Culture brood data: 8 days to first brood
26 neonates per average brood

Sample initial chemistry: pH: 7.3; EC: 813 (µS/cm); DO: 9.8 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 225; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: 385 mL plastic vessels
Test volume: 150 mL
Sample pre-treatment: The sample was not filtered or pH adjusted prior to or during testing
The sample was pre-aerated for 0 minutes (rate of 37.5 ± 12.5 mL/min.L^{-1})
The hardness of the sample was not adjusted (mg $CaCO_3$/L) prior to or during testing
Loading density: One daphnid/15 mL (must ≤ 1 organism/15 mL)
Control/dilution water: Dechlorinated City of Calgary water acclimated to test conditions
The hardness of the control/dilution water was 132 mg $CaCO_3$/L
Test concentrations: 5 effluent concentrations (6.3, 12.5, 25, 50, 100% (v/v) plus a negative control)
Test replicates: One replicate per treatment, 10 daphnids per replicate
Feeding: None
Aeration: None
Measurements: pH, conductivity, dissolved oxygen and temperature at test initiation and termination
Lighting: Cool white fluorescent lights; 400-800 lux at surface
Photoperiod: 16h light:8h dark
Test temperature: 20 ± 2°C

Note: Outlined sections are protocol deviations explained on the comment page

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Test Conditions

Client: ALS106
Reference: 09-1927-01-DAD

Endpoint: Mortality, 48-h LC50 (95% confidence limits)
Immobility, 48-h EC50 (95% confidence limits)

Test validity: The control had 100% survival (must ≥ 90%)
Control had 0 percent (%) abnormal behaviour (must ≤ 10%, immobility)

Reference toxicant: 48-h test with NaCl initiated October 19, 2009; current results (48-h LC50 and 95% confidence limits) = 0.77 (0.74-0.80) log (g/L NaCl)

Note: Outlined sections are protocol deviations explained on the comment page

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HydroQual Laboratories Ltd.

Daphnia (48-h LC50/EC50) Test Report

Test Data

Client: ALS106
Reference: 09-1927-01-DAD

Test Log:

Date	Day	Time	Technician	Comment/Observation
2009/10/22	0	1045	T. Kloschinsky	test *Daphnia* appear normal
2009/10/23	1	0845	T. Kloschinsky	test *Daphnia* appear normal
2009/10/24	2	1110	C. A. Martens	test *Daphnia* appear normal

Chemistry:

Conc. (%)	control	6.3	13	25	50	100		
Day	pH (units)							
0	7.9	8.0	8.1	8.1	8.0	7.8		
2	8.0	8.1	8.1	8.1	8.0	7.8		
	Conductivity (µS/cm)							
0	359	393	427	491	620	849		
2	368	401	438	497	619	879		
	Dissolved Oxygen (mg/L)							
0	8.0	7.9	7.9	7.9	7.9	7.9		
2	7.9	7.9	7.7	7.7	7.6	7.6		
	Temperature (°C)							
0	18	18	18	18	18	18		
2	18	18	18	18	19	19		

Biology:

Conc. (%)	control	6.3	13	25	50	100		
Day	Number Alive and Behavior (behavior is in brackets)							
1	10	10	10	10	10	10 (10I)		
2	10	10	10	10	10	1 (1I)		

Notes: F, floating; I, immobile; B, stuck on bubble; D, caught in debris; nd, not done; na, not applicable;

	Mortality (%)							
2	0	0	0	0	0	90		
	Immobility (%)							
2	0	0	0	0	0	100		

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Comments/Statistics

Client: ALS106
Reference: 09-1927-01-DAD

Test Result Comments:
None

Data Analysis:
Regression analysis was attempted on the data, but the assumption of normality was not met. Therefore, endpoints for mortality and immobility were calculated using a Spearman Karber model with CETIS v. 1.7.0 rev Q.

Protocol Deviations:
None

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Quality Assurance Information

Test Method: *Daphnia* Static Acute Test (LC50, five or more treatments plus a control)
HydroQual Test Method Manual, section: 4.4.3.1

Reference: Biological Test Method: Reference Method for Determining the Acute Lethality of Effluents to *Daphnia magna*, 1990. Environment Canada, EPS 1/RM/14. including May 1996 and December 2000 ammendments.

Test Organism:

test species:	*Daphnia magna*
culture source:	in-house
original culture source:	Environment Canada
days to first brood:	8
mean brood size:	26
ephippia in stock culture:	no
age of test organisms:	<24 hours old
culture mortality (%):	3.5%

Test Design:

vol. of test vessel (mL):	500
toxicant:	sodium chloride
test volume (mL):	150
replicates per treatment:	1
neonates per replicate:	10
volume per neonate (mL):	15
samples preaerated:	no
hardness adjustment:	no
temperature (°C):	20
photoperiod:	16h light:8h dark
light level (water surface):	400-800 lux
control/dilution water:	dechlorinated tap water

Current Test

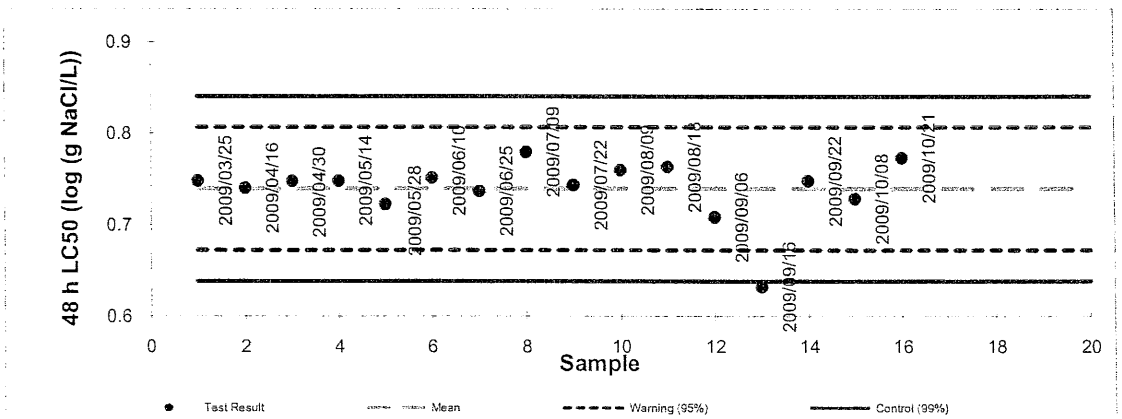
toxicant	Sodium Chloride (NaCl)				
started on	2009/10/19	ended on	2009/10/21		
Result (LC50 @ 48h)	0.77	log (g NaCl/L); geometric mean			
Confidence Limits (95%)	lower	0.74	upper	0.80	

Historical Values

mean	0.74	sd	0.03	cv(%):	5
	lower	upper			
warning limits (±2 sd)	0.67	0.81	(95% confidence limits)		
control limits (±3 sd)	0.64	0.84	(99% confidence limits)		

notes: sd, standard deviation; cv, coefficient of variance

Comments: None.



Quality Assurance Unit:

Authorized by S. Krishnappa, B.Sc., Quality Assurance Coordinator
The test data and results are verified correct.

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

HydroQual Laboratories Ltd.

Daphnia (single concentration) Test Report

Client: ALS106
Reference: 09-1927-01-DAS

Result Summary

Client: ALS Laboratory Group; operation Edmonton

Sample: L831482-8
Pond 2 Toxicity
Collection: collected on 2009/10/19 at not given by T.C.
Receipt: received on 2009/10/21 at 0851 by E.A. Benner
Containers: received 6 x 20L pails at 12 °C, in good condition with no seals and no initials
Description: type: water, collection method: not given

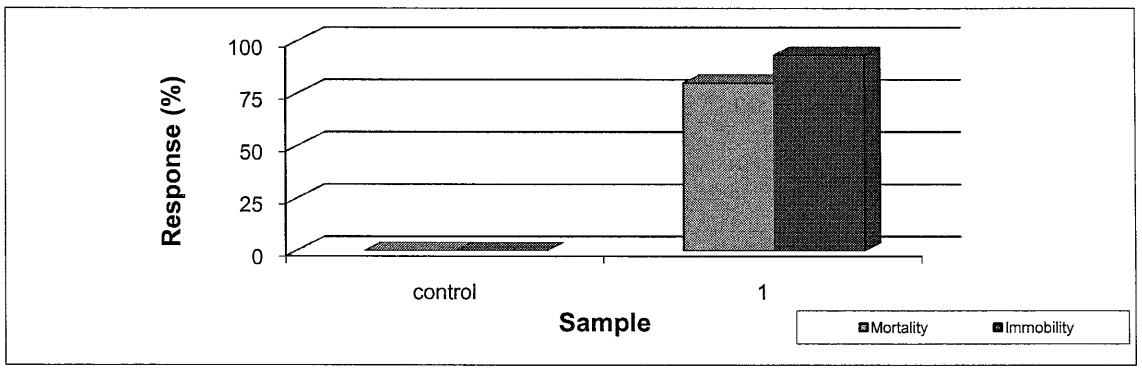
Test: started on 2009/10/22 ; ended on 2009/10/24

Contents

Result:

Sample	Client Code	Average Mortality (%)	Average Immobility (%)	Comment
control	lab control	0	0	
1	L831482-8	80	93	toxic as tested

Notes: sd, sample standard deviation; cv, coefficient of variation; nd, not done; na, not applicable;



The test data and results are authorized and verified correct.

E. Blais, B.Sc., Technical Lead

S. Krishnappa, B.Sc., Quality Coordinator

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Test Conditions

Client: ALS106
Reference: 09-1927-01-DAS

Method: Biological Test method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*, 2000. Environ. Can., EPS 1/RM/14. Second Edition.

Test type: *Daphnia* 48-h Static Acute Test (HQ 4.4.3.1)
Species: *Daphnia magna*
Age: < 24 hours old
Organism source: in-house culture
Stock mortality: 0%
Culture brood data: 8 days to first brood
26 neonates per average brood

Sample initial chemistry: pH: 7.3; EC: 813 (µS/cm); DO: 9.8 (mg/L); temperature: 15 °C
hardness (mg CaC03/L): 225; colour: colourless; odour: odourless
Sample holding time: 3 days (must be ≤ 5 days)
Sample storage: 4 ± 2°C in darkness

Test vessel: 385 mL plastic vessels
Test volume: 150 mL
Sample pre-treatment: The sample was not filtered or pH adjusted prior to or during testing
The sample was pre-aerated for 0 minutes (rate of 37.5 ± 12.5 mL/min.L^{-1})
The hardness of the sample was not adjusted (mg $CaCO_3$/L) prior to or during testing
Loading density: One daphnid/15 mL (must ≤ 1 organism/15 mL)
Control water: Dechlorinated City of Calgary water acclimated to test conditions
The hardness of the control/dilution water was 132 mg $CaCO_3$/L
Test concentrations: Undiluted sample plus a negative control
Test replicates: Three replicates per treatment, 10 daphnids per replicate
Feeding: None
Aeration: None
Measurements: pH, conductivity, dissolved oxygen and temperature at test initiation and termination
Lighting: Cool white fluorescent lights; 400-800 lux at surface
Photoperiod: 16h light:8h dark
Test temperature: 20 ± 2°C

Note: Outlined sections are protocol deviations explained on the comment page

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Test Conditions

Client: ALS106
Reference: 09-1927-01-DAS

Endpoint: Mortality, % mortality at 48-h
Immobility, % immobility at 48-h

Test validity: The control had 100% survival (must ≥ 90%)
Control had 0% abnormal behaviour (must ≤ 10%), e.g. immobility

Reference toxicant: 48-h test with NaCl initiated October 19, 2009; current results
(48-h LC50 and 95% confidence limits) = 0.77 (0.74-0.80) log (g/L NaCl)

Note: Outlined sections are protocol deviations explained on the comment page

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Test Data

Client: ALS106
Reference: 09-1927-01-DAS

Test Log:

Date	Day	Time	Technician	Comment/Observation
2009/10/22	0	1045	T. Kloschinsky	test *Daphnia* appear normal
2009/10/23	1	0845	T. Kloschinsky	test *Daphnia* appear normal
2009/10/24	2	1050	C. A. Martens	test *Daphnia* appear normal

Chemistry:

Sample	control			1		
replicate	a	b	c	a	b	c
Day	pH (units)					
0	7.9	8.0	8.1	7.9	7.6	7.4
2	7.9	8.0	8.1	7.8	7.6	7.5
	Conductivity (µS/cm)					
0	374	369	368	828	863	873
2	348	364	369	827	872	878
	Dissolved Oxygen (mg/L)					
0	8.0	7.9	7.9	7.9	8.0	8.0
2	7.6	7.6	7.6	7.6	7.5	7.5
	Temperature (°C)					
0	18	18	18	19	19	19
2	18	18	18	18	19	19

Biology:

Sample	control			1		
replicate	a	b	c	a	b	c
Day	Number Alive and Behavior (behavior is in brackets)					
1	10	10	10	10 (8I)	10 (10I)	10 (10I)
2	10	10	10	3 (2I)	0	3 (2I)
	Mortality (%)					
2	0	0	0	70	100	70
	Immobility (%)					
2	0	0	0	90	100	90

Notes: F, floating; I, immobile; B, stuck on bubble; D, caught in debris

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
Tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

Comments/Statistics

Client: ALS106
Reference: 09-1927-01-DAS

Test Result Comments:
None

Data Analysis:
None

Protocol Deviations:
None

HydroQual Laboratories Ltd., #4, 6125 12th Street SE, Calgary, Alberta, Canada T2H 2K1
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Quality Assurance Information

Test Method: *Daphnia* Static Acute Test (LC50, five or more treatments plus a control)
HydroQual Test Method Manual, section: 4.4.3.1

Reference: Biological Test Method: Reference Method for Determining the Acute Lethality of Effluents to *Daphnia magna*, 1990. Environment Canada, EPS 1/RM/14. including May 1996 and December 2000 ammendments.

Test Organism:		**Test Design:**	
test species:	*Daphnia magna*	vol. of test vessel (mL):	500
culture source:	in-house	toxicant:	sodium chloride
original culture source:	Environment Canada	test volume (mL):	150
days to first brood:	8	replicates per treatment:	1
mean brood size:	26	neonates per replicate:	10
ephippia in stock culture:	no	volume per neonate (mL):	15
age of test organisms:	<24 hours old	samples preaerated:	no
culture mortality (%):	3.5%	hardness adjustment:	no
		temperature (°C):	20
		photoperiod:	16h light:8h dark
		light level (water surface):	400-800 lux
		control/dilution water:	dechlorinated tap water

Current Test

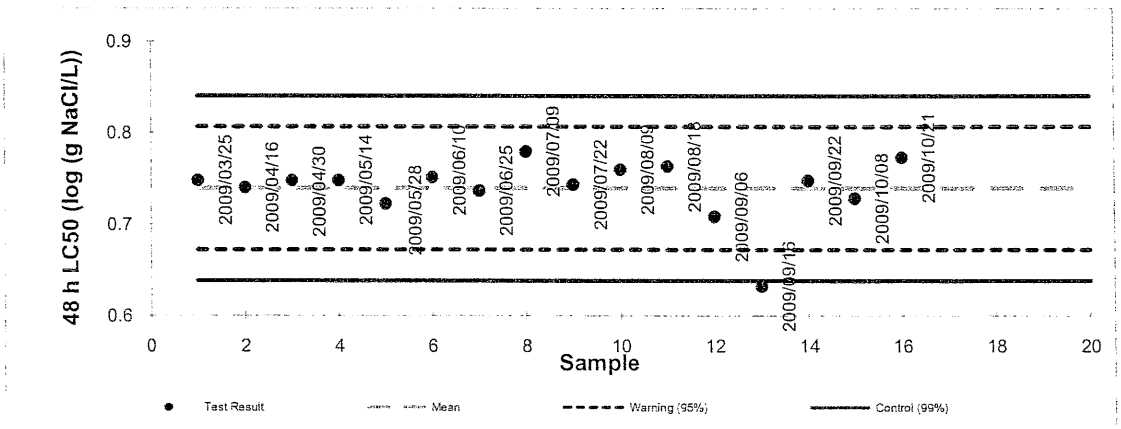
toxicant	Sodium Chloride (NaCl)				
started on	2009/10/19	ended on	2009/10/21		
Result (LC50 @ 48h)	0.77	log (g NaCl/L); geometric mean			
Confidence Limits (95%)	lower	0.74	upper	0.80	

Historical Values

mean	0.74	sd	0.03	cv(%):	5
	lower	upper			
warning limits (±2 sd)	0.67	0.81	(95% confidence limits)		
control limits (±3 sd)	0.64	0.84	(99% confidence limits)		

notes: sd, standard deviation; cv, coefficient of variance

Comments: None.



Quality Assurance Unit:

Authorized by S. Krishnappa, B.Sc., Quality Assurance Coordinator
The test data and results are verified correct.

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tel (403) 253-7121 fax (403) 252-9363 www.hydroqual.ca

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # **08-012472**

Page 1 of 1

Report to: MMG Act# 16023	**Report Format / Distribution**	**Service Requested:** (rush - subject to availability)
Company:	Standard: ___ Other: ___	X Regular (Default)
Contact: Andrew Mitchell	Select: PDF X Excel ___ Digital ___	Priority (2-3 Business Days) - 50% Surcharge
Address:	Email 1: Andrew Mitchell	Emergency (1 Business Day) - 100% Surcharge
	Email 2:	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: Fax:		**Analysis Request**
Invoice To: Same as Report ? Yes / No ?	**Client / Project Information:**	(Indicate Filtered or Preserved, F/P)
Company:	Job #:	
Contact:	PO / AFE:	
Address:	Legal Site Description:	
Phone: Fax:	Quote #:	
Lab Work Order # (lab use only): L831482	ALS Contact: M. OLINEK	Sampler: TC

Sample #	Sample Identification (This description will appear on the report)	Date	Time	Sample Type	pH, TSS	F/P Metals	F/P CN	F/P NH4	Alkalinity	Hardness	F/P RA226	F/P Nutrients	Toxicity				Number of Containers
	LUP-20-10-18-09-W (Q21390)	Oct. 18/09	1615 hrs	Water	X	X	X	X	X	X							4
	LUP-21-10-18-09-W (Q21391)	"	1555 hrs	"	X	X	X	X	X	X							4
	LUP-22-10-18-09-W (Q21395)	"	1530 hrs	"	X	X	X	X	X	X							4
	LUP-22-10-18-09-WD (Q21395)	"	"	"	X	X	X	X	X	X							4
	LUP-24-10-18-09-M (Q21398)	"	1500 hrs	"	X	X	X	X	X	X	X	X					18
	LUP-25-10-18-09-W (Q21397)	"	1440 hrs	"	X	X	X	X	X	X							4
	LUP-Field Blank-10-19-09 (Q21390)	Oct 19/09	0600 hrs	"	X	X	X	X	X	X							4
	Pond 2 Toxicity (Q21401)	"	0900 hrs	"									X				6

Special Instructions / Regulations / Hazardous Details

6 pails & 2 coolers

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)		
Released by:	Date & Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date & Time:	Observations: Yes / No ? If Yes attach SIF
	10/19/09	RS	20-oct-09	9:26	2.1°C			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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GENF 18.00 Front