



maxxam.ca

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72 HOUR ALGAL INHIBITION BIOASSAY ON JER-SWQ-04 SAMPLE SAMPLED IN JUNE 2012

Prepared for:

Shear Diamonds
Suite 220
6 Adelaide Street East
Toronto, ON
M5C 1H6

Prepared by:

Ecotoxicology Group
Maxxam Analytics

Job No.: B246481

Project No.: 2-11-0691

June 2012

**Summary of Algal Inhibition Test Results
for Shear Diamonds
Sampled: June 04, 2012**

Sample ID	No-Observable-Effects- Concentration (%v/v)	IC25 (%v/v) (95% confidence limits)
JER-SWQ-04	>90.91	>90.91 (N/A)

***Pseudokirchneriella subcapitata* Test Data Summary**

Client Name/Location	Shear Diamonds / Toronto, ON
Testing Lab/Location	Maxxam Analytics / Burnaby, BC
Maxxam Job No.	B246481
Sample Information	
Sample ID	JER-SWQ-04
Information on labelling/coding	See copy of Chain of Custody form
Sample temp. upon arrival	0-3°C
Sample collection date (y/m/d)	2012/June/04
Date (y/m/d)/time of sample receipt at lab	2012/June/05 @ 08:40
Test Organisms	
Species	<i>Pseudokirchneriella subcapitata</i>
Strain number and origin of culture	Strain UTCC #37 was obtained from the Canadian Phycological Culture Centre on 2011 Nov 16
Age of culture used to provide inoculum, at start of test	3 days old
Culture in logarithmic growth phase?	See attached growth curve
Inoculum prepared less than 2-3 hrs before microplate incubation?	Yes, at 14:33
Initial cell density of inoculum	10,000 cells/mL
Appearance, behaviour, or treatment of known-age culture before use	See Data Summary – Test Form A
Test Conditions & Facilities	
Test method	EPS 1/RM/25, 2 nd Edition, March 2007 BBY2SOP-00006 - <i>Pseudokirchneriella subcapitata</i> 72H Growth Inhibition Test
Date test started (y/m/d & time)	2012/June/07 @ 14:37
Date test ended (y/m/d & time)	2012/June/10 @ 14:07
Persons performing test	N. Shergill, A. Rakhmangulova
Mean test temperature	23 °C
Procedure/rate/duration of aeration of sample before test	No aeration of sample
pH adjustment	No pH adjustment
pH of aqueous sample before preparation and use in toxicity test	See Data Summary – Test Form A
pH of sample before any dilution at start	See Data Summary – Test Form A

of test	
pH from two controls at start & end of test	See Data Summary – Test Form A
Procedure for sample filtration	10 mL subsample was filtered through a preconditioned 0.45 µm pore diameter filter
Type & source of control/dilution water	Deionized water
Type & quantity of chemicals added to control/dilution H ₂ O	None
# and conc. of test solutions	See Test Form B
# of replicates per conc.	See Test Form B
Absorbance not used	Cell counts done by Nexcelom Cellometer® Auto X10 cell counter
Culture/test incubators & apparatus	Conviron Environmental Chamber – Model E7 Microplate- w/96 u-shaped wells
Microplate final volume	220 µl / well (200 µl sample, 10 µl enrichment media, and 10 µl algal inoculum)
Light intensity & quality	Full spectrum fluorescent lights, 3676-3822 lux
Composition of growth medium	See photocopies of 'Pseudokirchneriella Nutrient Spike Preparation Log' & 'Reagent and Stock Solution Preparation Log for Algal Nutrient Medium'
Anything unusual about the test, deviation from test method, problems	There was nothing unusual about the test, no deviations from test methods and no problems.
Results	Results contained in this report refer only to the testing of samples as submitted.
Date cells counted (y/m/d)	2012/June/10
Cell counts in each replicate	See Test Form B
Any findings of growth stimulation at any concentration?	Yes. The following concentrations were significant for stimulation as compared to the control: 10.101, 30.303, & 90.91%. See Dunnett's Multiple Comparison Test in CETIS
Volatile sample? If so, were test concentrations isolated from one another?	No, sample was not volatile.
Name & citation of program(s) and methods used for calculating statistical endpoint(s)	CETIS v1.7.0 – Regression Analysis not performed due to a significant lack of fit of all applicable models. Defaulted to Linear Interpolation
Residuals Analysis	N/A
IC25 (95% CL) (%v/v)	> 90.9 (N/A)

QA	
Did the test pass the test validity criteria: •homogeneity in the control (CV is $\leq 20\%$) •no trend or gradient in the control •increase by a factor of >16 in the control	Yes •% CV is – 11.85% •No trend •Algal cells increased by - 17
Ref tox test IC50 (95% CL) (mg Zn/L) and duration of test	0.0698 (0.0507, 0.0968) duration was ~72 hrs
Ref tox test historic mean & 2SD range (mg Zn/L)	0.0391; 2SD range: (0.0180 – 0.0847)
Invalid Ref tox test?	No
Date of ref tox test (y/m/d)	2012/May/30
Conditions of ref tox test	Same as test conditions

CETIS Analytical Report

Report Date: 20 Jun-12 15:06 (p 1 of 2)
Test Code: 05-6940-4493/SL-10461-0112

Alga Growth Inhibition Test

Maxxam Analytics

Analysis ID: 11-1243-1260	Endpoint: Cell Yield	CETIS Version: CETISv1.7.0
Analyzed: 20 Jun-12 15:05	Analysis: Parametric-Control vs Treatments	Official Results: Yes
Batch ID: 03-3288-3323	Test Type: Cell Growth	Analyst: N. Shergill
Start Date: 07 Jun-12 14:37	Protocol: EC/EPS 1/RM/25	Diluent: Algal Culture Media
Ending Date: 10 Jun-12 14:07	Species: Pseudokirchneriella subcapitata	Brine: Not Applicable
Duration: 71h	Source: In-House Culture	Age:
Sample ID: 14-2456-8653	Code: b246481	Client: Shear Diamonds
Sample Date: 04 Jun-12 12:00	Material: Industrial Effluent	Project: General
Receive Date: 06 Jun-12 08:40	Source: Shear Diamonds	
Sample Age: 75h	Station: JER-SWQ-04	

Data Transform	Zeta	Alt Hyp	Monte Carlo	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	0	C <> T	Not Run	3.367	10.101	5.8318	29.7	30.63%

Dunnett's Multiple Comparison Test

Control	vs	Conc-%	Test Stat	Critical	MSD	P-Value	Decision(5%)
Negative Control		0.125	1.3125	2.9188	5.1148	0.7295	Non-Significant Effect
		0.374	0.64676	2.9188	5.1148	0.9891	Non-Significant Effect
		1.122	0.77991	2.9188	5.1148	0.9700	Non-Significant Effect
		3.367	0.53262	2.9188	5.1148	0.9965	Non-Significant Effect
		10.101*	3.0055	2.9188	5.1148	0.0414	Significant Effect
		30.303*	5.8208	2.9188	5.1148	<0.0001	Significant Effect
		90.91*	12.859	2.9188	5.1148	<0.0001	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision
Extreme Value	Grubbs Single Outlier	2.6915	2.8927	0.1168	No Outliers Detected
Control Trend	Mann-Kendall Trend	-4		0.7195	Non-significant Trend in Controls

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(5%)
Between	1584.949	226.4212	7	33.796	<0.0001	Significant Effect
Error	140.6933	6.699682	21			
Total	1725.642	233.1209	28			

ANOVA Assumptions

Attribute	Test	Test Stat	Critical	P-Value	Decision(1%)
Variances	Bartlett Equality of Variance	11.396	18.475	0.1223	Equal Variances
Distribution	Shapiro-Wilk Normality	0.96114		0.3505	Normal Distribution

Cell Yield Summary

Conc-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	8	16.7	15.947	17.453	14.8	21.1	0.69949	1.9785	11.85%	0.0%
0.125		3	14.4	13.674	15.126	12.6	16.4	1.1015	1.9079	13.25%	13.77%
0.374		3	15.567	15.262	15.872	14.8	16.4	0.46308	0.80208	5.15%	6.79%
1.122		3	15.333	14.773	15.894	14.2	17	0.85114	1.4742	9.61%	8.18%
3.367		3	17.633	17.401	17.866	17.1	18.3	0.35277	0.61101	3.47%	-5.59%
10.101		3	21.967	20.708	23.225	18.2	24.4	1.9099	3.3081	15.06%	-31.54%
30.303		3	26.9	25.84	27.96	25	30.1	1.6093	2.7875	10.36%	-61.08%
90.91		3	39.233	37.112	41.355	33.2	44.2	3.2199	5.577	14.22%	-134.93%

2012 June 20 2012 June 21

CETIS Analytical Report

Report Date: 20 Jun-12 15:06 (p 2 of 2)
 Test Code: 05-6940-4493/SL-10461-0112

Alga Growth Inhibition Test

Maxxam Analytics

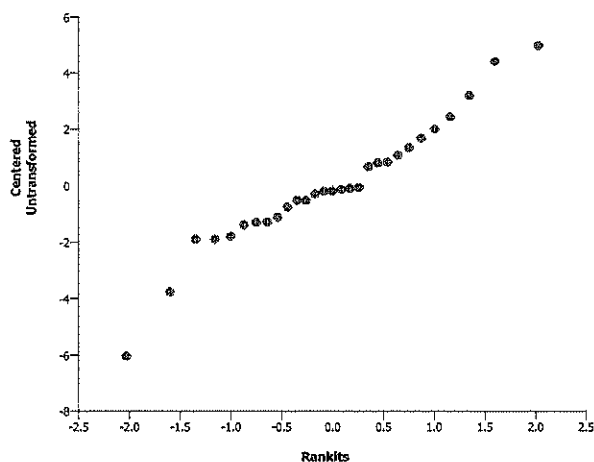
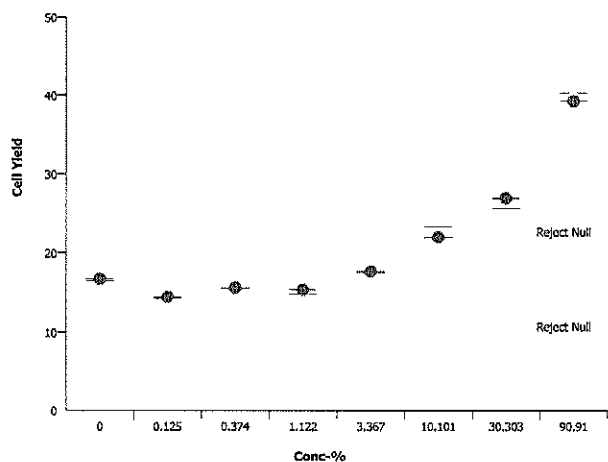
Analysis ID: 11-1243-1260 Endpoint: Cell Yield
 Analyzed: 20 Jun-12 15:05 Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1.7.0
 Official Results: Yes

Cell Yield Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	15.3	16.5	21.1	17.5	15.4	16.6	14.8	16.4
0.125		16.4	12.6	14.2					
0.374		16.4	15.5	14.8					
1.122		14.2	17	14.8					
3.367		17.5	18.3	17.1					
10.101		18.2	23.3	24.4					
30.303		30.1	25.6	25					
90.91		40.3	44.2	33.2					

Graphics



CETIS Analytical Report

Report Date: 20 Jun-12 14:55 (p 1 of 2)

Test Code: 05-6940-4493/SL-10461-0112

Alga Growth Inhibition Test

Maxxam Analytics

Analysis ID: 06-0664-9435	Endpoint: Cell Yield	CETIS Version: CETISv1.7.0
Analyzed: 20 Jun-12 14:55	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes
Batch ID: 03-3288-3323	Test Type: Cell Growth	Analyst: N. Shergill
Start Date: 07 Jun-12 14:37	Protocol: EC/EPS 1/RM/25	Diluent: Algal Culture Media
Ending Date: 10 Jun-12 14:07	Species: Pseudokirchneriella subcapitata	Brine: Not Applicable
Duration: 71h	Source: In-House Culture	Age:
Sample ID: 14-2456-8653	Code: b246481	Client: Shear Diamonds
Sample Date: 04 Jun-12 12:00	Material: Industrial Effluent	Project: General
Receive Date: 05 Jun-12 08:40	Source: Shear Diamonds	
Sample Age: 75h	Station: JER-SWQ-04	

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	57951	200	Yes	Two-Point Interpolation

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(5%)
Extreme Value	Grubbs Extreme Value	2.6915	2.8927	0.1168	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>90.91	N/A	N/A	<1.1	N/A	N/A
IC10	>90.91	N/A	N/A	<1.1	N/A	N/A
IC15	>90.91	N/A	N/A	<1.1	N/A	N/A
IC20	>90.91	N/A	N/A	<1.1	N/A	N/A
IC25	>90.91	N/A	N/A	<1.1	N/A	N/A
IC40	>90.91	N/A	N/A	<1.1	N/A	N/A
IC50	>90.91	N/A	N/A	<1.1	N/A	N/A

Cell Yield Summary

Calculated Variate

Conc-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	Diff%
0	Negative Control	8	16.7	14.8	21.1	0.69949	1.9785	11.85%	0.0%
0.125		3	14.4	12.6	16.4	1.1015	1.9079	13.25%	13.77%
0.374		3	15.567	14.8	16.4	0.46308	0.80208	5.15%	6.79%
1.122		3	15.333	14.2	17	0.85114	1.4742	9.61%	8.18%
3.367		3	17.633	17.1	18.3	0.35277	0.61101	3.47%	-5.59%
10.101		3	21.967	18.2	24.4	1.9099	3.3081	15.06%	-31.54%
30.303		3	26.9	25	30.1	1.6093	2.7875	10.36%	-61.08%
90.91		3	39.233	33.2	44.2	3.2199	5.577	14.22%	-134.93%

Cell Yield Detail

Conc-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
0	Negative Control	15.3	16.5	21.1	17.5	15.4	16.6	14.8	16.4
0.125		16.4	12.6	14.2					
0.374		16.4	15.5	14.8					
1.122		14.2	17	14.8					
3.367		17.5	18.3	17.1					
10.101		18.2	23.3	24.4					
30.303		30.1	25.6	25					
90.91		40.3	44.2	33.2					

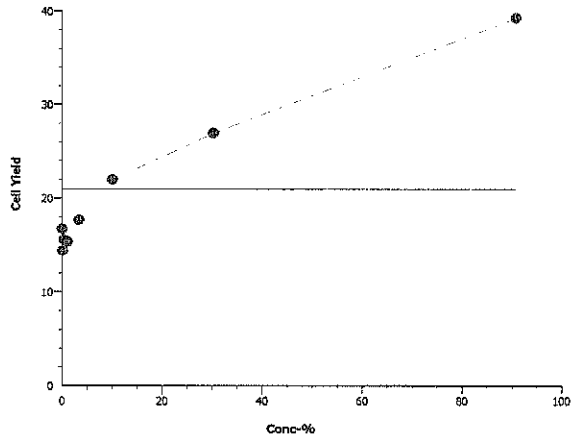
2012 June 20 2012 June 21

CETIS Analytical Report

Report Date: 20 Jun-12 14:55 (p 2 of 2)
Test Code: 05-6940-4493/SL-10461-0112

Alga Growth Inhibition Test		Maxxam Analytics	
Analysis ID: 06-0664-9435	Endpoint: Cell Yield	CETIS Version: CETISv1.7.0	
Analyzed: 20 Jun-12 14:55	Analysis: Linear Interpolation (ICPIN)	Official Results: Yes	

Graphics



2012 June 20 2012 June 21
Analyst: *[Signature]* QA: *[Signature]*

TEST FORM B

Client: 10461 Shear Diamonds Sample ID: DP0387-04
 Date Sampled: 2012 Jun04 Job#/Sample#: B246481
 Date & Time Started: 2012 Jun07 @ 14:37 Date & Time Ended: 2012 Jun10 @14:07
 Analyst(s): Arakhmangulova

Conc. (% v/v)	Well	Counts (*10 ⁴ Cells/mL)		Cell Yield (*10 ⁴ Cells/mL)	Mean Cell Yield (*10 ⁴ Cells/mL)
		1	2		
Lab Control	D2	14.6	18	15.3	16.7
Lab Control	D3	18	16.9	16.5	
Lab Control	D4	23.8	20.4	21.1	
Lab Control	D5	19	18	17.5	
Lab Control	D8	16.8	16	15.4	
Lab Control	D9	20.4	14.7	16.6	
Lab Control	D10	14.6	16.9	14.8	
Lab Control	D11	14.6	20.1	16.4	
0.125	C8	15.7	19.1	16.4	14.4
0.125	E8	13.6	13.5	12.6	
0.125	F8	15.8	14.6	14.2	
0.374	C7	16.8	18	16.4	15.6
0.374	E7	17	15.9	15.5	
0.374	F7	15.9	15.7	14.8	
1.122	C6	15.9	14.5	14.2	15.3
1.122	E6	16.8	19.1	17.0	
1.122	F6	12.4	19.2	14.8	
3.367	C5	17.9	19.1	17.5	17.6
3.367	E5	20.4	18.1	18.3	
3.367	F5	18.3	17.9	17.1	
10.101	C4	18	20.4	18.2	22.0
10.101	E4	25.9	22.6	23.3	
10.101	F4	25	25.8	24.4	
30.303	C3	30.4	31.8	30.1	26.9
30.303	E3	26.1	27.1	25.6	
30.303	F3	29.4	22.5	25.0	
90.91	C2	34.6	47.9	40.3	39.2
90.91	E2	46.8	43.6	44.2	
90.91	F2	35.1	33.2	33.2	

***Pseudokirchneriella subcapitata* Test
Data Summary**

Client: 10461, Sheer Diamonds S/J#: DP0387-042 / B246481

Sample Name: IFR-SWQ-04

Date and Time Sampled: 2012 Jun 08 Date & Time Received: 2012 Jun 05 @ 8:40

Date and Time Started: 2012 Jun 08 @ 14:37 Date & Time Ended: 2012 Jun 10 @ 14:07

Analyst: Dr. J. E. A. Rakhmangulova

Sample pH: 7.5 Sample Temperature: 24.5 °C Stats File: SL-10461-0112

Temperature (°C): Day 0 23 Day 1 23 Day 2 23 Day 3 23

Sample Description: clear & colorless pH: initial filtered: 6.5 final: Well B2 6.0

Culture Started on: 2012 Jun 04 B using 1.0 mL of algal culture as inoculum.

The appearance of culture used for preparing test inoculum: green

Standard Control pH (Initial: Well D6) 5.0 (final: Well D7) 5.5

Determination of Initial Cell Concentration of Inoculum:

The initial cell counts on the growing culture were 383, 364, 368, 358.

The initial average cell counts on the growing culture were 368.

After centrifugation of 2 mL of the growing culture with 23 mL of buffered water, decanting, and dilution of the inoculum to 20 mL, the first counts on the inoculum were 33, 45, 30, 36 and the average first counts were 36.

The inoculum was further diluted to a total of 29 mL of reagent water and the final count was 19, 23, 23, 22 (X = average of final counts * 10⁴) = 22 @ 14:33. Therefore, (Xi) 2200 cells were initially put into each test well and the initial cell density was (Xd) 10000 cells/mL.

To calculate # cells initially put into each test well (Xi): $[(0.5 * X) * 0.02] = [(0.5 * 22 * 10^4) * 0.02] = 2200$

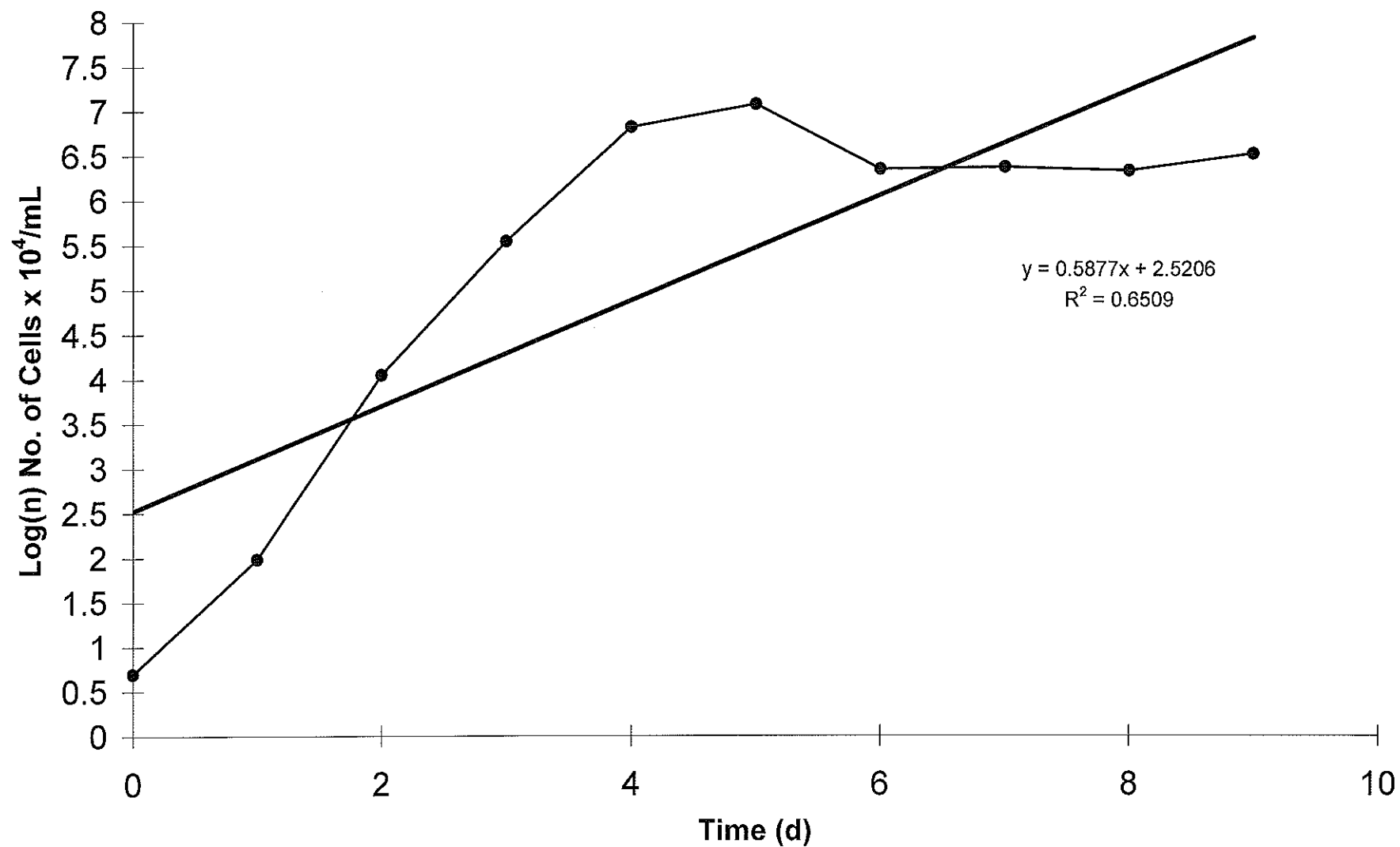
To calculate the initial cell density (Xd): $[(Xi) * (1000/220)] = [(2200) * (4.5455)] = 10000$

Observations during Test (Y/N):

Date	Algal Growth	Condensation	Rotate Plates	Analyst
2012 JUN 08	N	Y	Y	NS
2012 JUN 09	Y	Y	Y	NS
2012 Jun 10	Y	Y	Y	AR

Pseudokir
chneriella
subcapitat

***Pseudokirchneriella subcapitata* Growth Curve using CP111116 Apr 12 2012**
EC ~4000lux, 24oC, 0.5 ml culture to 50 mL nutrient medium



ECOTOXICOLOGY

NUTRIENT SPIKE PREPARATION FOR *Pseudokirchneriella subcapitata*

Add 6.88 mL of each Stock 1 to 5 for 500 mL OR 3.44 mL each Stock 1 to 5 in 250 mL.

Stock Solution	Date Stock Expires	Volume of Stock Added (mL)	Volume of Nutrient Spike Prepared (mL)	Date Prepared	Date Discarded	Analyst	Storage Location
#1	2012 Nov 30	3.44	250 3.44	2012 Jun 07	2012 Jun 07	AR	Bench
#2	2012 Oct 03	3.44	Special note: Used metal Mings for #2 stock				
#3	2012 Nov 30	3.44	N/A 2012 JUN 07.				
#4	2012 Sept 14	3.44	Initial pH = 8.1 Used 9 drops of 0.1M HCl				
#5	2012 Nov 30	3.44	Final pH = 7.5 ; Conductivity = 1103 2012 Jun 07 AR				
#1							
#2							
#3							
#4							
#5							
#1							
#2							
#3							
#4							
#5							
#1							
#2							
#3							
#4							
#5							
#1							
#2							
#3							
#4							
#5							

Reagent/Stock Solution	Stock Volume	Chemical	Brand	Lot Number	Nominal Weight	Actual Weight	Balance	Date Made	Date Discarded	Analyst	Storage Location
Buffered water	1L	NaHCO ₃	FISHER	116734	0.0150 g	0.0150	BBY2-0075	2012 JUN06	2012 JUN07	NS	Bench
Initial pH	7.5	# of drops required to adjust pH 7.0 using 0.1N HCL/ 0.1n NaOH						10	pH meter I.D.	BBY2-0074	

Buffered water	1L	NaHCO ₃			0.0150 g						Bench
Initial pH		# of drops required to adjust pH 7.0 using 0.1N HCL/ 0.1n NaOH							pH meter I.D.		

Buffered water	1L	NaHCO ₃			0.0150 g						Bench
Initial pH		# of drops required to adjust pH 7.0 using 0.1N HCL/ 0.1n NaOH							pH meter I.D.		

Buffered water	1L	NaHCO ₃			0.0150 g						Bench
Initial pH		# of drops required to adjust pH 7.0 using 0.1N HCL/ 0.1n NaOH							pH meter I.D.		

Buffered water	1L	NaHCO ₃			0.0150 g						Bench
Initial pH		# of drops required to adjust pH 7.0 using 0.1N HCL/ 0.1n NaOH							pH meter I.D.		

ECOTOXICOLOGY

REAGENT AND STOCK SOLUTION PREPARATION LOG FOR ALGAL NUTRIENT MEDIUM

Algal Stock Nutrient Solution	Stock Volume	Chemical	Brand	Lot Number	Nominal Weight (g)*	Actual Weight (g)	Balance / Pipette AIN	Date Made	Date Discarded	Analyst Initials
Stock Solution 1	500 mL	NaNO ₃	EMD	48852906	12.7500	12.7497	BBY2-0025	2012 May 30		DML
Stock Solution 2-A Used for all samples except for Metal Mining samples	500 mL	MgCl ₂ ·6H ₂ O			5.0000					
		CaCl ₂ ·2H ₂ O			2.2100					
		H ₃ BO ₃			0.0928					
		MnCl ₂ ·4H ₂ O			0.2878					
		FeCl ₃ ·6H ₂ O			0.0800					
		Na ₂ EDTA·2H ₂ O			0.1500					
		ZnCl ₂ (a)			1 mL of substock (a)					
		CoCl ₂ ·6H ₂ O (b)			1 mL of substock (b)					
		CuCl ₂ ·2H ₂ O (c-2)			1 mL of substock (c-2)					
		Na ₂ MoO ₄ ·2H ₂ O (d)			1 mL of substock (d)					
Substock (a)	100 mL	ZnCl ₂			0.1640					
Substock (b)	100 mL	CoCl ₂ ·6H ₂ O			0.0714					
Substock (c)	1000 mL	CuCl ₂ ·2H ₂ O			0.0600					
Substock (c-2)	10 mL	CuCl ₂ ·2H ₂ O			1 mL of substock (c)					
Substock (d)	100 mL	Na ₂ MoO ₄ ·2H ₂ O			0.3630					
Stock Solution 3	500 mL	MgSO ₄ ·7H ₂ O	ACROS	A0221864	7.3500	7.3503	BBY2-0025	2012 May 30		DML
Stock Solution 4	500 mL	K ₂ HPO ₄			0.5220			2012 May 30		
Stock Solution 5	500 mL	NaHCO ₃	Fisher	116734	7.5000	7.5004	BBY2-0025	2012 May 30		DML

Storage Location:

Shelf BBY2-0104

20100106

ECOTOXICOLOGY

REAGENT AND STOCK SOLUTION PREPARATION LOG FOR ALGAL NUTRIENT MEDIUM

Algal Stock Nutrient Solution	Stock Volume	Chemical	Brand	Lot Number	Nominal Weight (g)*	Actual Weight (g)	Balance	Date Made	Date Discarded	Analyst Initials
Stock Solution 2-B Used for Metal Mining Samples with EDTA reduced to 25%	500 mL	MgCl ₂ ·6H ₂ O	Sigma	08860028	5.0000	5.0000	BBY2-0025	2012 Apr 03		LH
		CaCl ₂ ·2H ₂ O	EMD	47171751	2.2100	2.2100	BBY2-0025			
		H ₃ BO ₃	Fisher	114533	0.0928	0.0927	BBY2-0025			
		MnCl ₂ ·4H ₂ O	Sigma	06717C7	0.2078	0.2078	BBY2-0025			
		FeCl ₃ ·6H ₂ O	Sigma	HKBF9323V	0.0800	0.0800	BBY2-0025			
		Na ₂ EDTA·2H ₂ O	Amresco	1781C163	0.0375	0.0375	BBY2-0025			
		ZnCl ₂ (a)	n/a	n/a	1 mL of substock (a)	1 mL	volumetric pipette			
		CoCl ₂ ·6H ₂ O (b)	n/a	n/a	1 mL of substock (b)	1 mL	volumetric pipette			
		CuCl ₂ ·2H ₂ O (c-2)	n/a	n/a	1 mL of substock (c-2)	1 mL	volumetric pipette			
		Na ₂ MoO ₄ ·2H ₂ O (d)	n/a	n/a	1 mL of substock (d)	1 mL	volumetric pipette			

Storage Location:

fridge #1 BBY2-0104

ECOTOXICOLOGY

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BBY2FCD-00009/1

Page 1 of 2

REAGENT AND STOCK SOLUTION PREPARATION LOG FOR ALGAL NUTRIENT MEDIUM

Algal Stock Nutrient Solution	Stock Volume	Chemical	Brand	Lot Number	Nominal Weight (g)*	Actual Weight (g)	Balance / Pipette AIN	Date Made	Date Discarded	Analyst Initials
Stock Solution 1	500 mL	NaNO ₃			12.7500	n/a	2012 Apr 03, LH			
Stock Solution 2-A Used for all samples except for Metal Mining samples	500 mL	MgCl ₂ ·6H ₂ O	Sigma	08PK0028	5.0000	5.0000	BBY2-0025	2012 Apr 03		LH
		CaCl ₂ ·2H ₂ O	END	47171751	2.2100	2.2101	BBY2-0025			
		H ₃ BO ₃	Fisher	114533	0.0928	0.0929	BBY2-0025			
		MnCl ₂ ·4H ₂ O	Sigma	06717CJ	0.2078	0.2077	BBY2-0025			
		FeCl ₃ ·6H ₂ O	Sigma	HLBF9323V	0.0800	0.0800	BBY2-0025			
		Na ₂ EDTA·2H ₂ O	Amresco	1781C163	0.1500	0.1500	BBY2-0025			
		ZnCl ₂ (a)	n/a	n/a	1 mL of substock (a)	1 mL	volumetric pipette			
		CoCl ₂ ·6H ₂ O (b)	n/a	n/a	1 mL of substock (b)	1 mL	volumetric pipette			
		CuCl ₂ ·2H ₂ O (c-2)	n/a	n/a	1 mL of substock (c-2)	1 mL	volumetric pipette			
		Na ₂ MoO ₄ ·2H ₂ O (d)	n/a	n/a	1 mL of substock (d)	1 mL	volumetric pipette			
Substock (a)	100 mL	ZnCl ₂	Sigma	0033.1KH	0.1640	0.1642	BBY2-0025	2012 Apr 03		LH
Substock (b)	100 mL	CoCl ₂ ·6H ₂ O	Sigma	011M0120V	0.0714	0.0715	BBY2-0025	2012 Apr 03		LH
Substock (c)	1000 mL	CuCl ₂ ·2H ₂ O	Sigma	011M1787V	0.0600	0.0599	BBY2-0025	2012 Apr 03		LH
Substock (c-2)	10 mL	CuCl ₂ ·2H ₂ O	n/a	n/a	1 mL of substock (c)	1 mL	volumetric pipette	2012 Apr 03		LH
Substock (d)	100 mL	Na ₂ MoO ₄ ·2H ₂ O	Sigma	041M1821V	0.3630	0.3631	BBY2-0025	2012 Apr 03		LH
Stock Solution 3	500 mL	MgSO ₄ ·7H ₂ O			7.3500					
Stock Solution 4	500 mL	K ₂ HPO ₄			0.5220	n/a	2012 Apr 03, LH			
Stock Solution 5	500 mL	NaHCO ₃			7.5000					

Storage Location:

fridge #1 BBY2-0104

ECOTOXICOLOGY

REAGENT AND STOCK SOLUTION PREPARATION LOG FOR ALGAL NUTRIENT MEDIUM

Algal Stock Nutrient Solution	Stock Volume	Chemical	Brand	Lot Number	Nominal Weight (g)*	Actual Weight (g)	Balance / Pipette AIN	Date Made	Date Discarded	Analyst Initials
Stock Solution 1	500 mL	NaNO ₃			12.7500					
Stock Solution 2-A Used for all samples except for Metal Mining samples	500 mL	MgCl ₂ ·6H ₂ O			5.0000					
		CaCl ₂ ·2H ₂ O			2.2100					
		H ₃ BO ₃			0.0928					
		MnCl ₂ ·4H ₂ O			0.2078					
		FeCl ₃ ·6H ₂ O			0.0800					
		Na ₂ EDTA·2H ₂ O			0.1500					
		ZnCl ₂ (a)			1 mL of substock (a)					
		CoCl ₂ ·6H ₂ O (b)			1 mL of substock (b)					
		CuCl ₂ ·2H ₂ O (c-2)			1 mL of substock (c-2)					
		Na ₂ MoO ₄ ·2H ₂ O (d)			1 mL of substock (d)					
Substock (a)	100 mL	ZnCl ₂			0.1640					
Substock (b)	100 mL	CoCl ₂ ·6H ₂ O			0.0714					
Substock (c)	1000 mL	CuCl ₂ ·2H ₂ O			0.0600					
Substock (c-2)	10 mL	CuCl ₂ ·2H ₂ O			1 mL of substock (c)					
Substock (d)	100 mL	Na ₂ MoO ₄ ·2H ₂ O			0.3630					
Stock Solution 3	500 mL	MgSO ₄ ·7H ₂ O			7.3500					
Stock Solution 4	500 mL	sp: 2016 Sept 13 K ₂ HPO ₄	BDH	109015	0.5220	0.5221	BB42-0025	2012 mar 14		NS
Stock Solution 5	500 mL	NaHCO ₃			7.5000					

Storage Location:

Fridge #1 BB42-0104

Report Name: Entry

Job #: B246481

Page #: 1

Client: SHEAR DIAMONDS
SUITE 220
6 ADELAIDE STREET EAST
TORONTO ON
CANADA M5C 1H6

Inv Attn: Kyle Conway

Printed: 2012/06/06 Version 7
Reception Date: 2012/06/05
Reception Time: 8:40
Login Date: 2012/06/05
REQUIRED DATE: 2012/06/20, 18:00
Quote Number: B20058

Task Order:
Line Item:

Report: same

Attention: Kyle Conway
PHONE: (778) 372 - 2750Ext:
FAX: () -
EMAIL: kconway@sheardiamonds.com

P.O. Number:
PROJECT NUMBER:
Site Location:
Site #:
Client Number: 10461
Rpt Address #:
Q.C. Samples: No

Project Coordinator: IS

nario:# 10197 C- SHEAR DIAMONDS

***** RUSH *****

Maxxam Client	Store Recd.	Sampling		Test Codes
Number Sample ID/Report ID	Code OK	Date	MATRIX	
DP0387-01R JER-SWQ-04 JER-SWQ-04	12-MISC E1 Yes	2012/06/04	WATER	ALK, CLAC-W, EC, IONBAL •IONSUM, NO2+NO3-C, NO2NO3C NOIC, PHALK, SO4AC-W, TDSC BIORPT, BOD, CER, DAPH DISPOSAL, NH4AC-W, PO4AC-W SSHIPC, TDS, TOCCOLE-W TPACTL-W, TROUT, TSS, TURB
DP0387-02R JER-SWQ-04 JER-SWQ-04	5-A/V E1 Yes	2012/06/04	WATER	TEH30TE-W
DP0387-03R JER-SWQ-04 JER-SWQ-04	1-125PLIN1-MCAL Yes	2012/06/04	WATER	TIC
DP0387-04R JER-SWQ-04 JER-SWQ-04	5-MISC E1 -MVAN Yes	2012/06/04	WATER	HARDT-W, METTLL5V-W, METTLLV-W HARD-W, METDLL5V-W, METDLLV-W ECOATTACH, HGDLLV-W, HGTLLV-W PFILTMET-W, PKS72HV-W

Remarks: CM0

Please note: Client uses minimum billing (\$150.00) !

Entered by: CM0
Date: 2012/06/05
Time: 11:46

Approved by: IS
Date: 2012/06/06
Time: 13:51

Date of Sample Disposal:
Disposal by:

Continued...

Maxxam Analytics
4606 Canada Way
Burnaby, British Columbia, V5G 1K5
Phone: (604) 734 7276
Fax: (604) 731 2386



Page #: 1

SHEAR DIAMONDS -
TORONTO
Maxxam PM Ioana Stoica

To: Maxxam Calgary Environmental

RUSH

Job# B246481

☐ Yes ☐ No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)
☐ Yes ☐ No Special Protocol (if yes, Protocol _____)

Received @ Subcontract Lab by (sign) _____ (print) _____

Received @ Subcontract Lab (Date) _____ (Time) _____

Received Lab's Job # _____ Inspected by (print) _____ SIF ☐ Yes ☐ No

Upon receipt, record 3 temperatures for each package/cooler. If required by contract or legal sample, indicate if custody sealed.

Temp1 _____ Temp2 _____ Temp3 _____ Custody sealed _____

<u>Sample ID</u>	<u>MATRIX</u>	<u>Test(s) Required</u>	<u>Container</u>	<u>Date Sampled</u>	<u>Date Required</u>
DP0387-03R \ JER-SWQ-04	WATER	Carbon (Inorganic)	1(125PL)	2012/06/04	2012/06/07

NOTES:

- Please call us if due date cannot be met. Please reference Sample ID on your report.
2) Include copy of this completed form, Client COC & signed final report to calgarycustomerservice@maxxamanalytics.com

SHIPPING INSTRUCTIONS

- ☒ Ship Immediately (highlight Yellow) ☐ Ship Cold
Requires 9am ☐ Ship Room Temp
☐ Requires Sat. Delivery ☐ Ship Frozen
☐ Regular Ship next available day ☐ COC Must be Attached
Sender (Print) _____ Initial _____

SHIPPING DEPARTMENT CHECKLIST

- ☐ Correct Shipping location
☐ Correct Sample Ids (Paperwork vs Bottles)
☐ Yes ☐ No Special-Cooler, Ice, Tape-custody seal, Date&Sign
Date Shipped _____
Shipper (Print) _____ Initial _____

Maxxam Analytics
4606 Canada Way
Burnaby, British Columbia, V5G 1K5
Phone: (604) 734 7276
Fax: (604) 731 2386



Page #: 1

SHEAR DIAMONDS -
TORONTO
Maxxam PM Ioana Stoica

To: Maxxam Edmonton Environmental

RUSH

Job# B246481

☐ Yes ☐ No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)
☐ Yes ☐ No Special Protocol (if yes, Protocol _____)

Received @ Subcontract Lab by (sign) _____ (print) _____

Received @ Subcontract Lab (Date) _____ (Time) _____

Received Lab's Job # _____ Inspected by (print) _____ SIF ☐ Yes ☐ No

Upon receipt, record 3 temperatures for **each** package/cooler. If required by contract or legal sample, indicate if custody sealed.

Temp1 _____ Temp2 _____ Temp3 _____ Custody sealed _____

<u>Sample ID</u>	<u>MATRIX</u>	<u>Test(s) Required</u>	<u>Container</u>	<u>Date Sampled</u>	<u>Date Required</u>
DP0387-01R \ JER-SWQ-04	WATER	Alkalinity @25C (pp, total), CO ₃ , HCO ₃ ,	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Chloride by Automated Colourimetry	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Total Dissolved Solids (Calculated)	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	See Attached Results	12(MISC)	2012/06/04	2012/06/19
DP0387-01R \ JER-SWQ-04	WATER	Biochemical Oxygen Demand	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Ceriodaphnia dubia, 7day LC50, IC50	12(MISC)	2012/06/04	2012/06/19
DP0387-01R \ JER-SWQ-04	WATER	Daphnia, 48hour LC50, EC50 (5 conc.)	12(MISC)	2012/06/04	2012/06/19
DP0387-01R \ JER-SWQ-04	WATER	Environmental Sample Disposal Fee	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Ammonia-N (Total)	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Orthophosphate by Konelab	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Sample Shipping & Handling	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Total Dissolved Solids (Filt. Residue)	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Conductivity @25C	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Carbon (Total Organic)	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Total Phosphorous	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Trout, 96hour LC50, (5 concentrations)	12(MISC)	2012/06/04	2012/06/19
DP0387-01R \ JER-SWQ-04	WATER	Total Suspended Solids (NFR)	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Turbidity	12(MISC)	2012/06/04	2012/06/07
DP0387-02R \ JER-SWQ-04	WATER	Hydrocarbons (C10-C30) in Water - GC/F	5(A/V)	2012/06/04	2012/06/07

Continued...

Maxxam Analytics
4606 Canada Way
Burnaby, British Columbia, V5G 1K5
Phone: (604) 734 7276
Fax: (604) 731 2386



SUBCONTRACTING REQUEST FORM

Page #: 2

SHEAR DIAMONDS -
TORONTO
Maxxam PM Ioana Stoica

To: Maxxam Edmonton Environmental

RUSH

Job# B246481

☐ Yes ☐ No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)
☐ Yes ☐ No Special Protocol (if yes, Protocol _____)

Received @ Subcontract Lab by (sign) _____ (print) _____

Received @ Subcontract Lab (Date) _____ (Time) _____

Received Lab's Job # _____ Inspected by (print) _____ SIF ☐ Yes ☐ No

Upon receipt, record 3 temperatures for each package/cooler. If required by contract or legal sample, indicate if custody sealed.

Temp1 _____ Temp2 _____ Temp3 _____ Custody sealed _____

<u>Sample ID</u>	<u>MATRIX</u>	<u>Test(s) Required</u>	<u>Container</u>	<u>Date Sampled</u>	<u>Date Required</u>
DP0387-01R \ JER-SWQ-04	WATER	Ion Balance	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Sum of cations, anions	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Nitrate and Nitrite	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Nitrate + Nitrite-N (calculated)	12(MISC)	2012/06/04	2012/06/07
P0387-01R \ JER-SWQ-04	WATER	Nitrogen, (Nitrite, Nitrate) by IC	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	pH @25°C (Alkalinity titrator)	12(MISC)	2012/06/04	2012/06/07
DP0387-01R \ JER-SWQ-04	WATER	Sulphate by Automated Colourimetry	12(MISC)	2012/06/04	2012/06/07

NOTES:

- 1) Please call us if due date cannot be met. Please reference Sample ID on your report.
- 2) Include copy of this completed form, Client COC & signed final report to calgarycustomerservice@maxxamanalytics.com

SHIPPING INSTRUCTIONS

- ☒ Ship Immediately (highlight Yellow) ☐ Ship Cold
Requires 9am ☐ Ship Room Temp
☐ Requires Sat. Delivery ☐ Ship Frozen
☐ Regular Ship next available day ☐ COC Must be Attached
Sender (Print) _____ Initial _____

SHIPPING DEPARTMENT CHECKLIST

- ☐ Correct Shipping location
☐ Correct Sample Ids (Paperwork vs Bottles)
☐ Yes ☐ No Special-Cooler, Ice, Tape-custody seal, Date&Sign
Date Shipped _____
Shipper (Print) _____ Initial _____



Calgary, 4000 19st St. NE, T2E 6P9 Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

Edmonton, 9331 - 48 Street, T6B 2R4 Ph: (780) 577-7100, Fax: (780) 450-4187, Toll free: (877) 465-8889

www.maxxamanalytics.com

Chain of Custody

A056126

Page: 1 of 1

Company:	Invoice To:	C/O Report Address	☐
	Shear Diamonds		
Contact:	Kyle Conway		
Address:	Jericho Mine Site		
	Prov	PC	
Contact #s:	Ph: 778-572-2726	Cell:	

Report To:	Same as Invoice	☐
Shear Diamonds		
6 Adelaide St. E, Suite 220		
Toronto ON		
Prov:	ON	PC:
Ph:		Cell:

Report Distribution (E-Mail):
keanway@sheardiamonds.com
wakehison@sheardiamonds.com
ahenviro@yahoo.ca
whineba.ca

REGULATORY GUIDELINES:
☐ AT1
☐ CCME
☐ Regulated Drinking Water
☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:
Project # / Name:
Site Location:
Quote #:
Sampled By:

SERVICE REQUESTED:	☒ RUSH (Contact lab to reserve)
	Date Required: _____
	☐ REGULAR (5 to 7 Days)

Sample ID		Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	BTEX	Sieve	Regulation	Salinity	Assessment	Basic																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Please indicate Filtered, Preserved or Both (F, P, F/P)

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Special Instructions:	# of Jars Used & Not Submitted	

LAB USE ONLY			Maxxam Job #:	B246481		
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