

Environment and Climate Change Canada Environnement et Changement climatique Canada

Report of Analysis

812-CE / CL- EPD COMPLIANCE 2017/18

Connor Fraleigh MOE BC Lower Mainland

Siute 200-10470 152 Street Surry, BC V3R 0Y3

Work Order: V18B061

Reported: 2018-03-07 Printed: 2018-03-07

J. Kiem

Authorization:

Lauretta Liem For Graham van Aggelen Manager, PYLET

The results reported pertain only to the samples submitted to and tested by the Environment and Climate Change Canada (ECCC) laboratory indicated in the report.

These ECCC laboratories are accredited by the Canadian Association for Laboratory Accreditation (CALA) to the standard ISO/IEC 17025 for each of the reported analytes, except where indicated by an asterisk (*). Please refer to the CALA website (<u>www.cala.ca</u>) to view the full Scope(s) of Accreditation.

Page 1 of 12 V18B061_1 Detailed 2018 03 07 1642

Client: Connor Fraleigh

ABSTRACT

Sample Manager contact:

Email: ec.coordonnateurdusoutiendelaboratoir-labsupportcoordinator.ec@canada.ca <mailto:ec.coordonnateurdusoutiendelaboratoir-labsupportcoordinator.ec@canada.ca> Phone: (604) 903-4413 QA Officer contact: Email: ec.agentdassurancedelaqualiteleepy-qualityassuranceofficerpylet.ec@canada.ca <mailto:ec.agentdassurancedelaqualiteleepy-qualityassuranceofficerpylet.ec@canada.ca> Phone: (604) 903-4411

Unit Description % by Volume Percent by volume **Description** Qualifier Not Acutely Lethal NAL * Non-Accredited Analysis/Analyte ND Not Detected at Reporting Limit (RL) NR Not Recoverable SAMPLE DESCRIPTION Sample_ Date Lab ID **Client ID** Station ID Matrix **Date/Time Sampled** Received Туре V18B061-01 **OUTFALL SAMPLE** Water 2018-02-21 00:00 PAC 2018-02-23 Grab SITE #1 Sampled By: Darren Sytewar

		REFERENCES	
Method ID	Laboratory Method	Reference	
V0503W	V_Microtox_IC50ML	EPS 1/RM/24	
Toxicology C	ontainers	Temperature °C	

ACUTE LETHALITY TEST USING RAINBOW TROUT (96 HOUR SINGLE CONCENTRATION) - REPORT

LAB SAMPLE ID: V18B061-01

DESCRIPTION OF SAMPLE:

-brown; E219092

DESCRIPTION OF TEST FACILITIES & CONDITIONS:

The fish were held at $15 \pm 2^{\circ}$ C for ≥ 2 weeks prior to the use in the test. Fish were not fed < 16 hours before the start of the test. Testing was started ≤ 5 days of sample collection. Tests were conducted in glass aquarium or plastic tanks lined with disposable polyethylene liners. Test solutions were randomly assigned to test locations. The height of the test solution was ≥ 15 cm. Aeration of oil-free compressed air was provided at a rate of 6.5 ± 1 ml/min.L through airstones. Photoperiod was 16 ± 1 hour light / 8 ± 1 hour dark with an intensity of 100-500 lux. All pH and conductivity measurements were performed using instruments that were automatically temperature compensated. Conductivity measurements are corrected for 25°C. Unless otherwise noted, all test conditions and validity criteria as specified by the Environment Canada test method were met.

pH Adjustment: Samples are normally tested without pH adjustment.

PROTOCOL USED:

Test was performed as prescribed in the laboratory's Standard Operating Procedure and the Environment Canada biological test method, Report EPS 1/RM/13 Second Edition 2000, amended May 2007 and February 2016.

TEST METHOD and/or SOP DEVIATIONS:

The control solutions were < 14°C at the start of the test. The requirement is 15 ± 1 °C.

ANALYSIS TYPE: 96 hr (Static) Single Conc. @ 73 %	Test Volume: 1 kg	Replicates: 1	Fish / Vessel: 2	Temp. (°C): 15 ± 1
---	-------------------	---------------	------------------	--------------------

CONTROL/DILUTION WATER: Fresh Water (≤ 10 ‰) Source: PYLET Well Water

TEST ORGANISM:	Species: Rainbow Trout	Oncorhynchus mykiss	Batch ID: 171227T6/rbt-fw	Tank #: 6
	Source: Aqua Farms		Mortality for 7d immediately pr	eceding test: < 2 %

CONTROL FISH DATA: Control Fish Status: no mortality, normal behaviour

Fork Length (cm)	Mean:	Min.:	Max.:	
Weight (g)	Mean:	Min.:	Max.:	Loading Density

TEST CONDITIONS - WATER QUALITY

Start Date: 2018-02-23

Aeration Start Time: Pre-

Pre-aeration Time (min): Test Start Time: 13:00

(g/L):

Conc. (%)		Control	Ctrl 9ppt salt	73
D.O. (mg/L)	Initial	10.5	10.1	9.2
	Final	10.3	9.7	9.6
Temp. (°C)	Initial	13.8	13.0	14.3
	Final	13.7	13.7	13.7
рН	Initial	7.65	7.55	7.22
	Final	7.92	7.98	8.08
Conductivity (µS/cm)	Initial	420	15930	15950

Page 3 of 12 V18B061_1 Detailed 2018 03 07 1642

Analyst: CWB

ACUTE LETHALITY TEST USING RAINBOW TROUT (96 HOUR SINGLE CONCENTRATION) - REPORT

LAB SAMPLE ID: V18B061-01

TEST CONDITIONS - CUMULATIVE MORTALITY / OBSERVATIONS †

	Concentration (%)										
Time Check	Cor	ntrol	Ctrl 9p	opt salt	7	3					
	mortality	obs.	mortality	obs.	mortality	obs.					
24 hr	0		0		0						
48 hr	0		0		0						
72 hr	0		0		0						
96 hr	0		0		0						

[†] Test observation Codes - EPS 1/RM/9 July 1990 amended May 1996 and 2007 Appendix E

*** immediate stress, coughing & erratic swimming + behaviour cannot be observed Integument: A Shedding B Mucous C Hemorrhaging Pigmentation: D Light E Dark F Mottled General behavior: G Quiescent H Hyperexcitable I Irritated J Surfacing K Sounding L Twitching M Tetanic N Normal Δ Moribund Swimming: O Ceased P Erratic Q Gyrating R Skittering S Inverted T On side Respiration: U Rapid V Slow W Coughing X Surface Z Irregular

QUALITY CONTROL: Reference Toxicant Test

Test Date: 2018-02-23	96 hr (Static) LC50 = 8.6 mg/L	95% confidence limits: 8.0 & 9.3	
Chemical: Phenol	Geomean 96 hr LC50 = 10.7 mg	/L 95% warning limits: 8.2 & 13.8	(n = 20)

ANALYSIS RESULTS:

Conc. (%)	Control	Ctrl 9ppt salt	73
96 hr Mortality (%)	0	0	0

96 hr (Static) Single Concentration = not acutely lethal @ 73% test concentration.

Where the single concentration (SC) is percent mortality of the test organisms held in a particular test solution over an exposure period of 96 hours.

RESULTS NOTES:

The test solution at 73 % has a salinity of 9.1 ppt.



LAB SAMPLE ID: V18B061-01

Analyst: CB

DESCRIPTION OF SAMPLE:

- 250mL sub-sample from 4x20L carboys of orange liquid

DESCRIPTION OF TEST FACILITIES & CONDITIONS:

Testing was started \leq 72 hours of sample collection. Tests were conducted in glass cuvettes. Test instrument was the Microtox M500. Test results were calculated using Microtox Omni software. All physical chemical measurements were performed using instruments that were automatically temperature compensated where necessary. Unless otherwise noted, all test conditions and validity criteria as specified by the Environment Canada test method were met.

PROTOCOL USED:

Test was performed as prescribed in the lab Standard Operating Procedure and the Environment Canada biological test method, Toxicity Test Using Luminescent Bacteria, Report EPS 1/RM/24 November 1992.

TEST METHOD and/or SOP DEVIATIONS:

The test was conducted at 15 ± 0.5°C.

ANALYSIS TYPE:

5 & 15 min IC50 Basic Test Turbidity correction: No Colour correction: No Test Equipment: Model 500 Analyzer

Test Volume: 1 mL Control Replicates: 1 Test Replicates: 1 Start date: 2018-02-27 Start time: 14:20 Test Temp. (°C): 15 ± 0.5

TEST CONCENTRATIONS (%):

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
0	0.195	0.391	0.781	1.563	3.125	6.25	12.5	25	50

CONTROL/DILUTION WATER TYPE and SOURCE:

Type: 2% NaCl Adjusted Source: DI Water

TEST ORGANISM:

Species: Vibrio fischeri Strain: NRRL B-11177 Source: Modern Water Reagent lot #: 17E4123A Receive date: 2017-10-31

Reagent expiry date: 2019-06-01 Reagent reconstitution time: 13:25 Test start time from reagent reconstitution (min): 55

SAMPLE ADJUSTMENTS:

Osmotic Adjustment: 2% NaCl by weight Source: Fisher Scientific (ACS)

QUALITY CONTROL: Reference Toxicant Test

Test Date: 2018-02-27 15 min (Static) IC50 = 20.4 mg/L 95% confidence limits: 15.3 & 27.2

Chemical: Phenol Geomean 15 min (Static) IC50 = 22.8 mg/L 95% warning limits: 16.8 & 30.8 (n = 20)

LAB SAMPLE ID: V18B061-01

ANALYSIS RESULTS:

5 minute (Static) IC50 = not acutely toxic 95% confidence limits: &

Where the inhibition concentration (IC50) is the concentration of material in water that is calculated to cause a 50% decrease in light emission of the test organisms over an exposure period of 5 minutes.

15 minute (Static) IC50 = not acutely toxic 95% confidence limits: &

Where the inhibition concentration (IC50) is the concentration of material in water that is calculated to cause a 50% decrease in light emission of the test organisms over an exposure period of 15 minutes.

15 minute (Static) IC25 = n/a 95% confidence limits: - & -

Where the inhibition concentration (IC25) is the concentration of material in water that is calculated to cause a 25% decrease in light emission of the test organisms over an exposure period of 15 minutes.

The statistical method used to generate the results was the MicrotoxOmni Software for Windows[®] Version 1.18 95/98/NT: [Copyright by Azur Environmental 1999, issued by Strategic Diagnostics Inc. 2004].

RESULTS NOTES:

The sample was not acutely toxic to Vibrio fischeri (Microtox® bacteria) over 5 minutes of exposure. The sample was not acutely toxic to Vibrio fischeri (Microtox® bacteria) over 15 minutes of exposure.

IC50ML V1.18 Appendix 1b V1.0 November 17, 2017



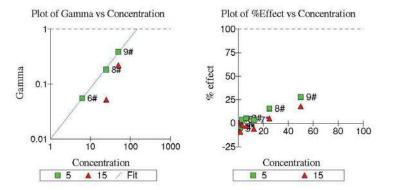
LAB SAMPLE ID: V18B061-01

Microtox Report

Acute Liquid Phase Microtox Test Report

Date: - -

Test Protocol: Basic-type Test Sample: V18B061-01 Toxicant: Reagent Lot no.: Test description: Outfall Sample Site #1 E219092 Data File: V18B061-02 Outfall Sample Site #1 E219092.K5; V18B061-02 Outfall Sample Site #1 E219092.K15;



			5	Mins Data	a:	13	5 Mins Dat	a:
Sample	Conc	Io	It	Gamma	% effect	It	Gamma	% effect
Control	0.000	92.23	85.76	0.9298 #		82.80	0.8978 #	
1	0.1953	85.64	82.84	-0.0387*	-4.028%	83.88	-0.0834 *	-9.100%
2	0.3906	87.66	81.79	-0.0034 *	-0.3428%	78.47	0.0028*	0.2888%
3	0.7813	84.92	83.50	-0.0543 *	-5.746%	82.85	-0.0798 *	-8.674%
4	1.563	86.06	83.63	-0.0431*	-4.508%	84.29	-0.0833 *	-9.098%
5	3.125	90.27	80.80	0.0388 *	3.738%	82.55	-0.0182 *	-1.863%
6	6.250	92.38	81.40	0.0552 #	5.238%	85.40	-0.0288 *	-2.973%
7	12.50	86.94	78.02	0.0361 *	3.490%	82.67	-0.0558 *	-5.918%
8	25.00	89.54	70.30	0.1843 #	15.56%	76.39	0.0523 #	4.970%
9	50.00	89.95	60.34	0.3861 #	27.86%	66.14	0.2209 #	18.10%

- used in calculation; * - invalid data; D - deleted from calcs. Autocalc has been used.

Calculations on 5 Mins data: IC50 Concentration:145.1% (95% confidence range: 33.72 to 623.9) 95% Confidence Factor: 4.301 IC50 value is greater than 100% Estimating Equation:LOG C =1.078 x LOG G +2.162 Coeff. of Determination (R²):0.9972 Slope: 0.9254 Correction Factor: 0.9298

Calculations on 15 Mins data: IC50 Concentration:103.4% Calculated from two data points, therefore no confidence range given.

Canada

IC50ML V1.18 Appendix 1b V1.0 November 17, 2017



LAB SAMPLE ID: V18B061-01

Microtox Report Con't

Estimating Equation:LOG C =0.4810 x LOG G +2.014 Slope: 2.079 Correction Factor: 0.8978

Signature:___

Printed: 06/03/6-18 03:20 PM

Climate Change C	anada Changement climatique Canada atoire:	ET			FOF	RMULA	ESTI NRE DI	L SAM E SOU	PLE S MISSI	UBMIS DN D'É	SION	FORM	/I DNS E	DULEST dar	ren. ste	Nato	ga.	be co	<u> </u>		
L	IT Client /Project No No du projet (NNNN) aggillioné par (F. Name , L.Name / sumorn, prénom)	Work Order No Numero de des VISBOG \ Client Proiect Manager/Gestionnai	mande d'	analyse	at)	Date	Time Re	o'd - Dat	e/Heure	ie récepti (NF		Temp	erature	on Arrival - Température à l'arri	vés (°C) El	NVIRODAT subi	mitter ID - Ider	ntification ENVIROD	_	ent	Page _/of/de _/
DARCE ple No. of containers Nmbr de récipients	agtilionné par (F. Name, L. Name / surriom, prénom) STEWARS Client / Field Sample No. No d'échantillon du client	Work Order No - Numéro de de Viene Project Manager/Gestionnai Churt DR - F CALCIGA & Client / Field Sample Alias No. No d'échantilion alias du client (Alias)	Dga Lay		ca	Da		eur (r.) es Requ		iame / su	imom, pr	renom)	Clan	timitter Email - Courriei de l'expe でん、Sたいぶくんの gひ ENVIRODAT Station D No de station ENVIRODAT	diteur Submitter bc.c. (230). Date	Tel No - No de tél 757 - 7 Ned / Échantillor Time/Heure	I de l'expéditeur 130 Y Inné Time Zone Fuseau horaire	Matrix / Matrice	Sample Type / Type d'echantilion	Preservative / Agent de conservation	Remarks, Site Description, Sample Descr Preservation Comments, etc. / Remar Description du site, Description de l'écha Commentaires sur le conservation et
(1-N)	(Required / Requis) OUTFAU SATWLE STTE # I	(Optional / Optionnel)	× × × 46 hr LCSD R	(X)	(X)	(%)	8 8	8	(x)	(%)	(x)	(x)	(%)	(LLNNELNNNN)	(YYYY-MM-DD) (AAAA-MM-JJ) 2018~02-21	(hh.mm)	e.g; EST	e.g. Water::Eau	NN	Yes Abo Out/Non	(Optional / Optionnel)
		CRIG	Ê												2010-02-01			WATER	01	NO	
_							-	1													
						_							_								
						_				1											
										0-12-10									-	-	
									-							1					
												-1									
						-		-			_								-		
								_													
	2																				
					_		-	-	-			_	-						-		
						_															
Netals Extraction/ raction des métau	Metals in water/Métaux dans l'eau:	Metals in water/Métaux dans l'eau: Extractable/Extractible		Me	tals in wa T	ter/Méta otal/Tota	iux dans	l'eau:						d/Métaux dans solide: able/Extractible		als in solid/Mét	aux dans so	lide:	M	etals in so	lid/Métaux dans solide:

A send regults to - connor. Saleigh@gu.bc.ca and _ dorran. stewart@gu.bc.ca

Anitogram Montréal Ottawa Burlingion Edmontion Montréal Vancouvet neilage Faitopi Cait Bown Stancion Canitet Poul Poul	ADDRATORY USE ONLY NA TYPE OF DU LADORATORY DE ENLENERT Martin Partin P							
Contacts des taboratoires		иссои с. 506-851-7208 с. 506-851-7208 453 453 453 453 101/1451 406-851-6608 453 454 454 454 454 454 454 454 454 454	L®\L\$F; 2i+496-2100 H\$X SEL Nouncept OC FEEØ FEBØD	911-166-019 (91/91	Amter no Canter الدجل 867 Lakeshore Road Burfington, ON 147 14 1605-336-5356	Paul Houle Paul Houle 5320 122 Street Edmonton, AB Telfrair 790-435-7335	TeVT61: 604-903-4444 PYLET 2645 Dollaron Highway Vorth 181 Vorth 181 204-903-4444	ms)
	ABORATORY USE ONLY LÀ PUSAGE DU LABORATORE SEULEMENT.				nothaituiti	noinomh3	Journo 2007	
p Blank Trip Blankensberuce antopola solie Sample Aanto Blankensberuce antolaie soled Sample Pooled::hike an commun and Spike Field Blanken:Einichi terrain pi Spike Trip Spike::Einichi terraport pi Spike Trip Spike::Einichi terraport		jiscrete Sample Thjicate Sample Thjicate Sample Composite Sample	Grab:instantande Duptiosade::Duptiosata Tripicata:					

Sample Type Code/Code du type d'échantillon

gollitacioà'h and uh abo2/abo2 antT alam

Page 2 of 2

Version 2,3- Jan 17, 2018

aboratory / Lab		Environmentent et Changement climatique Canada PTL	ET			FORM	E IULAIRI	STL S	Sampl Soumi	E SUE	BMISS D'ÉC	ION FO	RM LONS	DU LEST day	ren. ste	wato	gar.	be co	C		
C.L. ELEN	MENT Client /P	Project No No du projet (NNNN)	Work Order No Numéro de der											e on Arrival - Température à l'a			Č	ntification ENVIROD		ent	Page of/de
Sampled by- DARR sample No. Iaboratoire	le	par (F-Name, L. Name / surnom, prénom) STEWARS Client / Field Sample No. No d'échantillon du client	Client Project Manager/Gestionnai CONJOR FRAUGEH Client / Field Sample Alias No. No d'échantilion alias du client (Alias)	(IN)		Sy Sy			(F.Nam SHC Requeste			Dm, prénor) s dai	No de station ENVIRODAT	Date	Tet, No - No de tél 	130Y		Sample Type / Type d'échantillori	Preservative / Agent de conservation	Remarks, Site Description, Sample Descriptio Preservation Comments, etc. / Remarque Description de l'écharibition de l'écharibiti Commentaires sur le conservation etc.
(1-N)	BUT	(Required/Requis) FAU SAMPLESME # 1	(Optional / Optionnei) EQIGOPZ	× Martes Bar	2	8 8	x x	(x)	(X)	(X)	(X)	8 8	8	(LLNNLLANNN)	(1117-MM-DD) (AAAA-MM-JJ) 2018-02-23	(hh:mm)	e.g: EST	e.g: Water:Eau WATER	NN	YesAQ Out/Non	(Optional / Optionnel)
				ſ							_				Q010 02-21			WATER		~~~	
						_			_		_		-								
	_													1					-		
									_				_						_		
																	<u> </u>				
																2					
				-		_	-		-	_			-								
																			-		
				-		_			_	_	_		-						-		
							-					_							-		
Metals Extraction Extraction des mé		Metals in water/Métaux dans l'eau:	Metals in water/Métaux dans l'eau: Extractable/Extractible		Meta	is in water	/Métaux o	lans l'ea	au:	-		Me	als in sol	d/Métaux dans solide:	Met	als in solid/Mét		lide:			fid/Métaux dans solide:

A send regults to - connor. Saleigh@gov.bc.ca and _ dorren. stewart@gov.bc.ca

b Contacts / Contacts des laboratoires oncton blene Harper EL Harper IN des Meds Meds Meds Se 461-708	Montréal Montréal François Dunnouchel 105 McGill Montréal QC 105 McGill 105 McGill Montréal QC	Fax 613-991-9485 Ctawa OK Ctawa OK Ctawa OK Ctawa OK Ctawa OK Ctawa OK	Burfington Sharon Cartler Sharon Cartler MLET MLET Mriington, ON L75 MA L75 MA L75 MA L75 MA L75 MA L75 MA L72 MA	Fax: 780-435-7266 Faul Houle Fand Houle Fand Factor Faul Factor Faul Factor Faul Factor Faul Factor Fax: 780-435-7335 Faul Houle Fax: 780-435-7356 Fax: 780-4356 Fax: 780-43	Fax: 604-903-4402 101/91: 604-903-4404 Усн раценон: ВС 101/91: 604-903-4404 Как 645-901-4404 Как 645-901-4404 <
DA2U'I Á I YJNO 32U YAOTAROBAJ					

 # ENVIRODAT
 Element

 01
 Discrete Sample
 Crass:Instantiané

 03
 Discrete Sample
 Crass:Instantiané

 04
 Triplicate Sample
 Triplicates:Triplicate

 06
 Omposite Sample
 Composite

 06
 Composite Sample
 Triplicates:Triplicate

 06
 Composite Sample
 Composite

 07
 Discrete Sample
 Composite

 08
 Maturk Splike:
 Maturk Splike: Maturoe enrichite

 09
 Maturk Splike
 Maturk Splike: Composite

 09
 Maturk Splike
 Field Sample

 09
 Maturk Splike
 Field Splike: Enrichti trainin

 11
 Pooled Sample
 Fooled Simple Vooled: Mater on microlitic

 22
 Field Splike
 Field Splike: Enrichti trainin

 23
 Field Splike
 Field Splike: Enrichti trainin

Sample Type Code/Code du type d'échantillon

Page 2 of 2

8102 ,71 nsL -6,2 noimeV

EbeneO