



ENVIRONMENTAL DYNAMICS INC.  
ATTN: Meghan Marjanovic  
2195 - 2nd Ave  
Whitehorse YT Y1A 3T8

Date Received: 19-NOV-15  
Report Date: 03-DEC-15 16:27 (MT)  
Version: FINAL

Client Phone: 867-393-4882

## Certificate of Analysis

Lab Work Order #: L1704428  
Project P.O. #: NOT SUBMITTED  
Job Reference: MOUNT NANSEN 15-Y-0146  
C of C Numbers: 1  
Legal Site Desc:

Comments: Please note ALS identified sample L1704428-1 was sublet to Nautilus Environmental for Rainbow Trout LC50 analysis.

Can Dang  
Senior Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700  
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID					
Grouping	Analyte				

## Reference Information

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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\*\* 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
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### Chain of Custody Numbers:

1

### GLOSSARY OF REPORT TERMS

*Surrogate* - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

*mg/kg* - milligrams per kilogram based on dry weight of sample.

*mg/kg wwt* - milligrams per kilogram based on wet weight of sample.

*mg/kg lwt* - milligrams per kilogram based on lipid-adjusted weight of sample.

*mg/L* - milligrams per litre.

*<* - Less than.

*D.L.* - The reported Detection Limit, also known as the Limit of Reporting (LOR).

*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.



**ALS Environmental**  
ATTN: Can Dang  
Suite 100-8081 Lougheed Hwy.  
Burnaby, BC  
V5A 1W9

Report Date: December 2, 2015  
Work Order: 15960

## Data Report

**Species:** Rainbow trout (*Oncorhynchus mykiss*)  
**Protocol:** EPS 1/RM/13 (Second Ed. with 2007 amendments)

**Table 1.** Results for the 96-h rainbow trout acute toxicity test.

Sample ID	Collection Date and Time	96-h LC50 (% v/v)
L1704428-1 (WQ-LC50)	November 17, 2015 @ N/A	>100

N/A = Not Available.

The test met performance criteria and there were no deviations from the test method. The results presented here relate only to the sample tested.

Josh Baker, M.Sc., P.Chem  
Environmental Chemist

Reviewed By:  
Edmund Canaria, R.P.Bio  
Senior Reviewer

### Rainbow Trout Summary Sheet

Client: ALS

Start Date/Time: Nov 20/15 @ 1615h

Work Order No.: 15960

Test Species: Oncorhynchus mykiss

#### Sample Information:

Sample ID: L1704428-1 (WG-L50)  
Sample Date: NOV 17/15  
Date Received: NOV 20/15  
Sample Volume: 2x20L  
Other: /

**Test Validity Criteria:**  
≥ 90% control survival  
**WQ Ranges:**  
T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

#### Dilution Water:

Type: Dechlorinated Municipal Tap Water  
Hardness (mg/L CaCO<sub>3</sub>): 10  
Alkalinity (mg/L CaCO<sub>3</sub>): 10

#### Test Organism Information:

Batch No.: 102715  
Source: Aqua Farms  
No. Fish/Volume (L): 10/10L  
Loading Density (g/L): 0.33  
Mean Length ± SD (mm): 28 ± 2 Range: 25 - 31  
Mean Weight ± SD (g): 0.33 ± 0.06 Range: 0.25 - 0.41

#### Zinc Reference Toxicant Results:

Reference Toxicant ID: RIZn28  
Stock Solution ID: 15Zn05  
Date Initiated: Nov 16/15  
96-h LC50 (95% CL): 43.5 (35.6-53.2) mg/L Zn  
Reference Toxicant Mean and Historical Range: 75.7 (39.2-146.3) mg/L Zn  
Reference Toxicant CV (%): 39.0%

Test Results: The 96-hr LC50 is > 100% (v/v)

Reviewed by: [Signature] Date reviewed: Nov 30, 2015

## 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: ALS  
 Sample I.D. L1704428-1 (WQ-LC50)  
 W.O. # 15960  
 RBT Batch #: 102715  
 Date Collected/Time: Nov 17/15 @ N/A  
 Date Setup/Time: Nov 20/15 @ 1615h  
 Sample Setup By: EL  
  
 D.O. meter: 2  
 pH meter: 1  
 Cond. Meter: 2

Number Fish/Volume: 10/10L  
 7-d % Mortality: 0.1  
 Total Pre-aeration Time (mins): EL 10. 30mins  
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	15.0	/	15.0
pH	6.9		7.1
D.O. (mg/L)	9.0		9.3
Cond. (µS/cm)	1584		1584

Concentration (% v/v)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
Control				10	10	10	10	15.0	14.0	14.0	14.0	14.5	10.0	10.0	9.9	9.8	10.0	10.0	6.9	7.0	6.9	7.0	31	38
6.25				10	10	10	10	15.0	14.0	14.0	14.0	14.5	10.0	9.9	9.8	9.7	9.9	10.0	2.1	2.2	7.2	7.2	157	159
12.5				10	10	10	10	15.0	14.0	14.0	14.0	14.5	10.0	9.8	9.9	9.8	9.9	10.0	2.4	2.6	7.4	7.3	317	322
25				10	10	10	10	15.0	14.0	14.0	14.0	14.5	10.0	9.9	9.7	9.8	9.8	10.0	2.8	2.9	7.7	7.7	477	482
50				10	10	10	10	15.0	14.0	14.0	14.0	14.5	10.0	9.8	9.8	9.8	9.9	10.0	2.0	2.1	8.1	8.1	815	828
100				9	9	9	9	15.0	14.0	14.0	14.0	14.5	9.6	9.9	9.9	9.9	9.9	9.3	2.1	2.3	8.3	8.4	1584	1548
Initials				EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL	EL

WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Description/Comments: orange

Fish Description at 96 h OK Number of Stressed Fish at 96 h 0

Other Observations: \_\_\_\_\_

Reviewed by: EL Date Reviewed: Nov 30, 2015



L1704428

VANCOUVER

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Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL

8664 COMMERCE COURT  
BURNABY, BC V5A 4N7

LC50 Rainbow Trout  
wo # 15960

**NOTES:** Please reference on final report and invoice: PO# L1704428  
ALS requires QC data to be provided with your final results.

Please see enclosed 1 sample(s) in 2 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
L1704428-1 WQ-LC50	Special Request- Nautilus Environmental (SPECIAL REQUEST-NL 14)	11/17/2015 11/26/2015	

Subcontract Info Contact: Walter Lin (604) 253-4188  
Analysis and reporting info contact: Can Dang  
8081 LOUGHEED HWY  
SUITE 100  
BURNABY, BC V5A 1W9  
Phone: (604) 253-4188 Email: can.dang@alsglobal.com

Please email confirmation of receipt to: [can.dang@alsglobal.com](mailto:can.dang@alsglobal.com)

Shipped By: [Signature] Date Shipped: Nov 20, 2015  
Received By: Nautilus Date Received: NOV 20/15 @  
Verified By: NY- Nari Yamamoto Date Verified: \_\_\_\_\_  
Temperature: 8.0 °C  
Sample Integrity Issues: 2x20L

