



# Acute Toxicity Test Results

Sample TTII SAFEGUARD GREEN INFILL,  
collected November 28, 2022

Final Report

January 20, 2023

Submitted to: **Target Technologies**  
Burnaby, BC

## SAMPLE INFORMATION

Sample ID	Dates		Rainbow trout test initiation	Receipt temperature
	Collected	Received		
TTII SAFEGUARD GREEN INFILL	28-Nov-22 at N/A	28-Nov-22 at 1455h	03-Jan-23 at 1415h	20.3°C

N/A = Not Available

## TESTS

- Rainbow trout 96-h LC50 test

## RESULTS

### Toxicity test results

Test Concentration (g/L)	Survival (%)
Control	100
12.5	100
25	100
50	100
100	100
200	100

Sample ID	LC50 (g/L)
TTII SAFEGUARD GREEN INFILL	> 200 *

LC = Lethal Concentration, \* Highest concentration comprised of 2.4 kg of the product in 12 L of dilution water which is equivalent to 200 g/L.

The rainbow trout toxicity test exhibited 100% survival in the 200 g/L sample concentration (highest concentration tested) after 96-h exposure period.

Fish survival (100%) in all the sample concentrations tested exceeded any definitive calculations of a median lethal concentration (LC50) value for this sample and, therefore, the LC50 could only be estimated as greater than the highest concentration tested (LC50 >200 g/L).

**QA/QC**

<b>QA/QC summary</b>	<b>Rainbow trout</b>
Reference toxicant LC50 (95% CL)	2.1 (1.5 – 3.0) g/L KCl <sup>1</sup>
Reference toxicant historical mean (2 SD range)	1.3 (0.7 – 2.6) g/L KCl
Reference toxicant CV	35%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

<sup>1</sup> Test Date: December 22, 2022, LC = Lethal Concentration, CL = Confidence Limits, SD = Standard Deviation, CV = Coefficient of Variation

The test treatments were set up by adding the corresponding sample amounts into each test vessel and topped up to the test volume of 12L with dechlorinated water. For example, 2400 g of the sample was added to prepare the highest test concentration, which corresponded to 200 g/L sample concentration (see Table 1).



Report By:  
Ditty Kakkassery, R.P. Bio.  
Laboratory Biologist



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

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

**APPENDIX A – Summary of test conditions**

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**Table 1. Summary of test conditions: 96-h rainbow trout (*Oncorhynchus mykiss*) LC50 test.**

Test species	<i>Oncorhynchus mykiss</i>
Organism source	Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	20-L glass aquarium
Test volume	12 L
Test solution depth	≥15 cm
Test concentrations	Five concentrations 200 g/l, 100 g/l, 50 g/l, 25 g/l and 12.5 g/l plus laboratory control.
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	Dechlorinated Metro Vancouver municipal tapwater
Test solution renewal	None
Test temperature	15 ± 1°C
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light / 8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test measurements	Temperature, dissolved oxygen and pH measured daily; conductivity measured at test initiation and termination; survival checked daily
Test protocol	Environment Canada (1990), EPS 1/RM/9, with 1996 & 2007 amendments
Statistical software	CETIS Version 2.1.4
Test endpoints	Survival (96-hour LC50)
Test acceptability criterion for controls	Survival ≥90%
Reference toxicant	Potassium Chloride (KCl)

**APPENDIX B – Toxicity test data**

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# Rainbow Trout Summary Sheet

Client: Target Technologies

Start Date/Time: January 3, 2023; 1415h

Work Order No.: 222430

Test Species: Oncorhynchus mykiss

## Sample Information:

Sample ID: TT11 SAFEGUARD GREEN INFILL  
Sample Date: Nov 28, 2022  
Date Received: Nov 28, 2022  
Sample Volume: 1x 15 lbs bag  
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>): 20  
Alkalinity (mg/L CaCO<sub>3</sub>): 17

## Test Organism Information:

Batch No.: 120622A  
Source: DUNCAN  
No. Fish/Volume (L): 10/12L  
Loading Density (g/L): 0.34  
Mean Length ± SD (mm): 39 ± 2  
Mean Weight ± SD (g): 0.40 ± 0.06

Range: 36 - 42  
Range: 0.30 - 0.49

## KCI Reference Toxicant Results:

Reference Toxicant ID: RBTK56  
KCI Lot #: 213248  
Date Initiated: Dec. 22, 2022  
96-h LC50 (95% CL) [g/L KCI]: 2.1 (1.5-3.0)

Reference Toxicant Mean and Historical Range [g/L KCI]: 1.3 (0.7-2.6)  
Reference Toxicant CV (%): 35%

Test Results: The 96h LC50 is estimated to be > 200 g/l (w/v)\*  
\* Highest concentration tested.

Reviewed by: [Signature]

Date reviewed: Jan. 19, 2023

### 96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: Target Technologies  
 Sample I.D. TT11 SAFEGUARD GREEN INFILL  
 W.O. # 222430  
 RBT Batch #: 120622A  
 Date Collected/Time: Nov. 28, 2022/NA  
 Date Setup/Time: Jan. 3, 2023/1415h  
 CER #: 2  
 Sample Setup By: BAM

Number Fish/Volume: 10/12  
 7-d % Mortality: 0.10  
 Total Pre-aeration Time (mins): -  
 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			
D.O. (mg/L)			
pH			
Cond. (µS/cm)			
Salinity (ppt)			

Thermometer: CER#2  
 D.O. meter/probe: 515  
 Cond./Salinity meter/probe: 515  
 pH meter/probe: 515

Concentration g/L <small>BAM (% v/v)</small>	# 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	
Ctrl				10	10	10	10	15.0	14.5	14.5	14.5	15.0	9.6	9.7	9.7	9.7	9.8	7.0	7.0	7.0	7.0	7.1	49	57	
12.5				10	10	10	10	15.0	14.0	14.5	14.5	15.0	9.5	9.6	9.7	9.6	9.7	7.1	7.1	7.1	7.1	7.1	50	71	
25				10	10	10	10	15.0	14.0	14.5	14.5	15.0	9.6	9.6	9.7	9.7	9.7	7.2	7.2	7.2	7.2	7.1	54	88	
50				10	10	10	10	15.0	14.0	14.5	14.5	15.0	9.7	9.7	9.6	9.7	9.9	7.2	7.2	7.2	7.2	7.2	63	119	
100				10	10	10	10	15.0	14.0	14.5	14.5	15.0	9.7	9.7	9.6	9.7	9.8	7.2	7.3	7.3	7.3	7.3	64	181	
200				10	10	10	10	15.0	14.5	14.0	14.5	15.0	9.8	9.7	9.6	9.7	9.8	7.3	7.4	7.4	7.4	7.4	79	261	
Initials				T.C.	T.C.	T.C.	T.C.	BAM	T.C.	T.C.	T.C.	T.C.	BAM	T.C.	T.C.	T.C.	T.C.	BAM	T.C.	T.C.	T.C.	T.C.	BAM	T.C.	

Sample Description/Comments: 2.4kg of chemical added to 12L of dechlorinated tap water to make highest concentration 200g/L.

Fish Description at 96 h: All fish appear normal      Number of Stressed Fish at 96 h: 0

Other Observations: \_\_\_\_\_      Test solution depth in each vessel ≥15 cm? (Y/N): Y

Reviewed by: [Signature]      Date Reviewed: Jan. 19, 2023



**APPENDIX C – Chain-of-custody form**

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TESTING LOCATION (Please Circle)

**Burnaby**  
 8664 Commerce Court  
 Burnaby, British Columbia, Canada  
 V5A 4N7  
 Phone 604.420.8773

**Calgary**  
 #4, 6125 12 Street SE  
 Calgary, Alberta, Canada  
 T2H 2K1  
 Phone 403.253.7121

Chain of Custody

Date \_\_\_\_\_ Page \_\_\_ of \_\_\_

<b>Report to:</b>		<b>Invoice To:</b>		<b>ANALYSES REQUIRED</b>										<b>Receipt Temperature (°C)</b>							
Company	TARGET TECHNOLOGIES	Company	SAME																		
Address	8535 EASTLAKE DR	Address																			
City/Prov/PC	BURNABY BC	City/Prov/PC																			
Contact	NADIA MINATO	Contact																			
Phone	604.421.3620	Phone																			
Email	nminato@ttiionline.com	Email																			
		PO No.																			

Sample Collection By: \_\_\_\_\_ Sample Type: Grab  OR Composite

SAMPLE ID	DATE (DD/MM/YY)	TIME	MATRIX	# OF CONTAINERS AND VOLUME (e.g. 1 x 20 L)	COMMENTS																	
TT11	28/11/22			15LB BAG		Rbt																20.3
1 SAFEGUARD																						
2 GREEN INFILL																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						

<b>SPECIAL INSTRUCTIONS/COMMENTS (CLIENT)</b>		<b>SAMPLE RECEIPT DETAILS (LABORATORY)</b>				<b>SAMPLE DESCRIPTION AND COMMENTS (LABORATORY)</b>									
LC 50 BIOASSAY REPORT		1. Total No. of Containers	1	4. Ice Present in Cooler?	Y/N										
		2. Courier	Nadia	5. Seal Present?	Y/N										
		3. Good Condition?	Y/N	6. Initials Present on Seal?	Y/N										
<b>RELINQUISHED BY (CLIENT)</b>		<b>RECEIVED BY (LABORATORY)</b>				Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling, or transport of the sample, application or interpretation of the test data or results in part or in whole.									
NADIA MINATO <i>N. Minato</i>		Tyone		TT											
(Printed Name) (Signature)		(Printed Name) (Signature)		(Signature)											
TARGET TECHNOLOGIES		Nautilus		Nov. 28/22/14.55											
(Company) (Date DD/MM/YY and Time)		(Company) (Date DD/MM/YY and Time)		(Date DD/MM/YY and Time)											

**END OF REPORT**

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