



Report: Annual Water Treatment Performance Report - 2020

Overview: This report presents the 2020 results of the WLC AWTF and EVO SRF Phase 2 required under Permit 107517. This report summarizes the performance of the facilities and the selenium and nitrate removal for each facility.

This report was prepared by Teck.

For More Information

If you have questions regarding this report, please:

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Future studies will be made available at teck.com/elkvalley



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Subject: Annual Water Treatment Performance Report - 2020

Dear Liz, Jeanien, and Lowell

Please find enclosed the Annual Water Treatment Performance Report for 2020. This document satisfies the annual reporting requirements in Section 4A10 in Appendix 4 of Permit 107517.

As per Section 4A10 in Appendix 4 of Permit 107517 this report contains the following elements:

- i) A summary of facility performance compared to the key performance metrics listed in the Operations Plan;
- ii) Influent Sources and flow rates, including alternate sources;
- Selenium and nitrate load removal; iii)
- iv) Quantities of reagents used and residuals generated;
- Details on continuous improvement initiatives; V)
- A descriptions of any incidents including process upsets, spills, issues with and bypasses of the vi) Authorized Works, including recirculation events
- vii) A summary of all non-compliances with the requirements of Appendix 4, submitted in Annual Status Form
- viii) A map of monitoring locations with EMS and permittee descriptors;
- A summary and evaluation of key operational and receiving environment monitoring data ix) associated with the selenium and nitrate treatment facilities and all analytical results from the monitoring plans in Appendix 4 for the reporting year. Data must be suitably tabulated (i.e., excel spreadsheets), with appropriate graphs and comparison of results to limits, Approved and Working Water Quality Guidelines, Site Performance Objectives, or other criteria and benchmarks as specified by the director;
- If Site Performance Objectives in Appendix 4 are exceeded the permittee must provide an X) interpretation of significance, and the status of corrective action and/or ongoing investigations;
- All acute toxicity test-specific reports from the laboratory and an interpreted summary and xi) discussion of results, including recommendations and all subsequent actions;

- xii) All acute toxicity test lab reports must include data and/or observations for hardness, alkalinity, pH, temperature, and formation of precipitate either in the vessel or the organism;
- xiii) A summary of all QA/QC issues during the year.

Sincerely,

Marty Hafke Superintendent Environment, Water Operations

Cc:

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Enclosed: Annual Water Treatment Performance Report - 2020

Annual Water Treatment Performance Report 2020

March 31, 2021



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List of Acronyms

AMP	Adaptive Management Plan
AWTF	Active Water Treatment Facility
BC	British Columbia
BCWQG	British Columbia Water Quality Guidelines
BOD	Biological oxygen demand
CAP	Compliance action plan
CMm	Coal Mountain Mine
D	Dissolved
DGIR	Dangerous Goods Incident Report
EMBC	Emergency Management BC
EMLI	Ministry of Energy, Mines and Low Carbon Innovation
EMS	Environmental Management System
ENV	Ministry of Environment and Climate Change Strategy
EPH	Extractable petroleum hydrocarbons
EVO	Elkview Operations
EVO SRF	Elkview Operations Saturated Rock Fill
EVWQP	Elk Valley Water Quality Plan
EWT	Early warning triggers
FRO	Fording River Operations
FRO-S AWTF	Fording River South Active Water Treatment Facility
GHO	Greenhills Operations
KPI	Key Performance Indicator
LAEMP	Local Aquatic Effects Monitoring Plan
LCO	Line Creek Operations
NMP	Nitrate Management Plan
NST	No sample taken
NTU	Nephelometric turbidity unit
Q	Quarter (for example, Q1, Q3, Q3, Q4)
QA/QC	Quality assurance / quality control
RPD	Relative percent difference
SPO	Site performance objective
SRF	Saturated Rock Fill
Т	Total
TDS	Total dissolved solids
TSS	Total suspended solids
WLC AWTF	West Line Creek Active Water Treatment Facility

West Line Creek Active Water Treatment Facility

Executive Summary

In 2020 the WLC AWTF improved on 2019 results, achieving higher selenium load removal, nitrate load removal and throughput than in 2019. The WLC AWTF removed a total of 540.17 kg of selenium in 2020, averaging 1.47 kg removed a day (as compared to 475 kg of selenium removed in 2019, averaging 1.30 kg removed per day). The WLC AWTF removed a total of 36,766 kg of nitrate in 2020, averaging 100 kg removed a day (as compared to 29,587 kg of nitrate removed in 2019, averaging 82.9 kg removed per day). The average throughput of the WLC AWTF was 6535 m³/day (as compared to 5604 m³/day in 2019) and treated a total volume of 2,391,853 m³ (as compared to 2,045,459 m³ in 2019). While improving throughput and load removal, effluent quality remained within all limits for the year.

Teck continues efforts to improve the performance of the WLC AWTF. In 2020, work conducted on the mini bioreactors identified the opportunity to optimize bioreactor performance by adjusting pH. Teck provided notification to ENV to be able to adjust pH adjustment at multiple locations within the facility and may implement these changes in 2021 in order to achieve this optimization. Teck is also conducting evaluations on identifying sources of high concentration mine impact water with the intent of bringing that water to the WLC AWTF to further improve load removal.

Facility Performance

This section summarizes the facility performance in 2020. The March 11, 2021 amendment to Permit 107517 requires Teck to develop key performance metrics for the EVO SRF and FRO-S AWTF. Key performance metrics are not currently defined in WLC AWTF Operations Plan. Teck will develop these metrics alongside the development of the metrics for FRO-S AWTF. For the purposes of this report the performance metrics included in this report include selenium and nitrate load removal and facility throughput.

Selenium and Nitrate Load Removal

This section provides a summary of the WLC AWTF selenium and nitrate load removal in 2020.

Nitrate Removal

The WLC AWTF daily average, daily maximum and total nitrate removal results for 2020 are summarized below in Table 1 and displayed in Figure 1 below.

Table 1. West Line Creek Active Water Treatment Facility Nitrate Removal

	Nitrate Load Removal
Daily Average	100 kg/day
Daily Maximum	150 kg/day
Total	36,766 kg

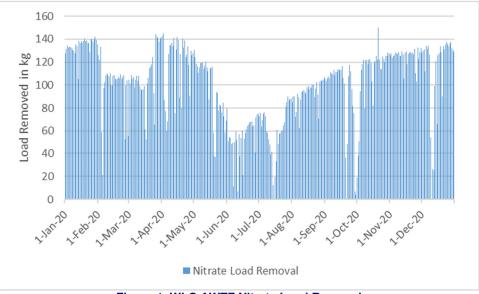
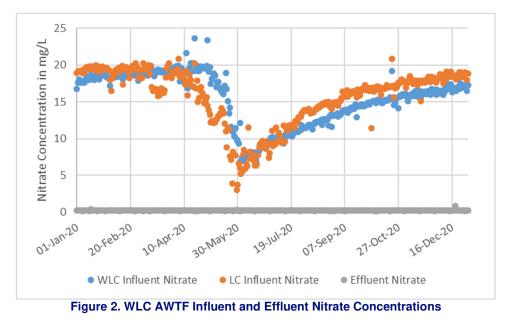


Figure 1. WLC AWTF Nitrate Load Removal

Load removal is a function of influent concentrations, effluent concentrations and facility throughput and availability. A decrease in load removal can occur due to any combination of lower influent concentrations, increased effluent concentrations and/or reduced throughput or availability. The average, minimum, and maximum blended influent concentrations during the 2020 operational phase were 16 mg/L, 7 mg/L, 20 mg/L. The influent and effluent nitrate concentrations are shown below in Figure 2.



The historical influent nitrate concentrations for the facility are shown below in Figure 3. Since WLC AWTF began operating nitrate concentrations in the influent source have been trending down. If this trend continues it is expected that the lower influent nitrate concentrations may result in lower nitrate removal over time.

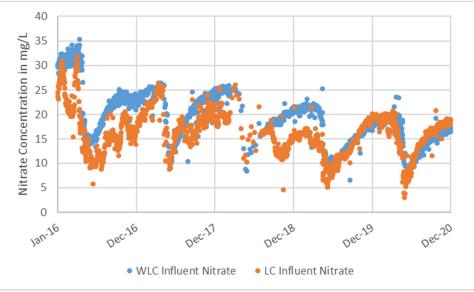


Figure 3. Seasonal WLC AWTF Nitrate Influent Concentrations

Selenium Removal

The WLC AWTF daily average, daily maximum and total selenium removal for 2020 are summarized below in Table 2 and displayed in Figure 4 below.

Table 2. West Line Creek Active Water Treatment Facility Selenium Removal

	Selenium Load Removal	
Daily Average	1.47 kg/day	
Daily Maximum	2.64 kg/day	
Total	540.17 kg	

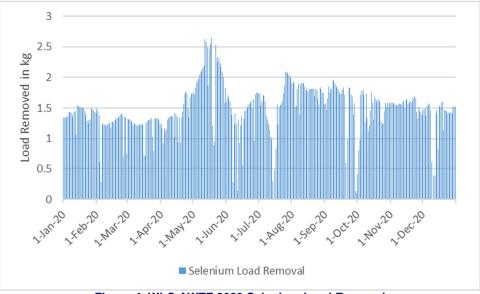
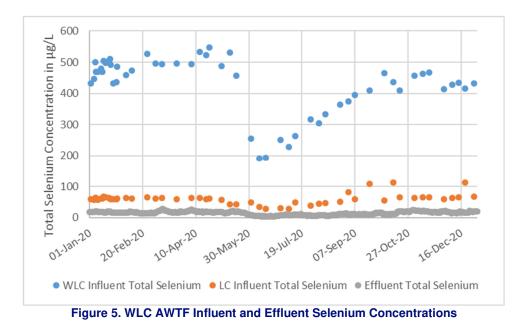


Figure 4. WLC AWTF 2020 Selenium Load Removal

Load removal is a function of influent concentrations, effluent concentrations and facility throughput and availability. A decrease in load removal can occur due to any combination of lower influent concentrations, increased effluent concentrations and/or reduced throughput or availability. The average, minimum, and maximum blended influent concentrations during the 2020 operational phase were 244 μ g/L, 158 μ g/L, 424 μ g/L. The influent and effluent selenium concentrations are shown below in Figure 5.



The historical influent selenium concentrations for the facility are shown below in Figure 6. Since WLC AWTF began operating selenium concentrations in the WLC influent source have been trending down. If this trend continues it is expected that the lower influent selenium concentrations may result in lower selenium removal over time.

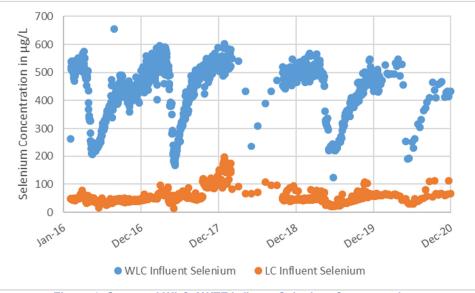


Figure 6. Seasonal WLC AWTF Influent Selenium Concentrations

Influent Sources and Flow Rates

The WLC AWTF treated WLC and LC in 2020. The WLC AWTF prioritizes WLC as the influent source for treatment because the selenium and nitrate concentrations are typically higher in WLC than in LC. During times of the year when WLC flows are lower than the design throughput of the facility, LC will be treated at rates that the target design throughput allows. The average daily WLC influent flow rate, average daily LC influent flow rate, average WLC AWTF total daily throughput and total volume of treated water during 2020 are summarized below in Table 3 and displayed in Figure 7 below.

Table 3. WLC AWTF 2020 Influent Sources and Flow Rates

Influent Source	Average Daily Throughput	Total Volume Treated
West Line Creek	3684 m ³ /day	1,348,362 m ³
Line Creek	2851 m ³ /day	1,043,491 m ³
Total Combined Influent	6535 m ³ /day	2,391,853 m ³

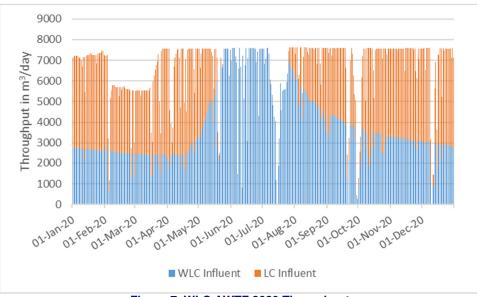


Figure 7. WLC AWTF 2020 Throughput

The design throughput of the facility is 7500 m³/day. During the 2020 operational phase the facility operated with an average throughput of 6535 m³/day. Throughput and availability at the facility was affected by a number of smaller events that caused either recirculation, or total shutdown of the facility. The majority of shutdown events were related to scheduled maintenance, minor power interruptions, or the AOP building. The two scheduled maintenance shutdowns that extended longer than 24 hours and two unscheduled shutdowns that extended longer than 24 hours and two unscheduled shutdowns that extended longer than 24 hours and two unscheduled shutdowns that extended longer than 24 hours are detailed below.

Facility throughput is also affected by the requirement to maintain minimum flows in the WLC AWTF fish bypass under Water License C133280. During low flows the facility throughput is reduced in order to maintain the required flows in the fish bypass.

July 14, 2020 and September 30, 2020 – WLC AWTF Scheduled Annual Maintenance

The WLC AWTF scheduled two extended shutdowns (longer than 24 hours) for annual maintenance on July 14, 2020 and September 30, 2020. These shutdowns were scheduled at these times to minimize impacts to the receiving environment. During these scheduled maintenance events the annual maintenance required for the AWTF and the ozone generators was done. While the facility was down for schedule maintenance, Teck also made updates to the facility Programmable Logic Control (PLC) and performed leak testing on the AOP unit to reduce ozone leaks from the AOP.

September 20, 2020 – WLC AWTF Unscheduled Extended Downtime

On September 20, 2020 one of the two power sources into the WLC AWTF lost power. The switch gear did not initiate the transfer from line power to the generator line as it was still detecting power from the secondary power line. This incident resulted in the facility being down for approximately 50 hours. Teck did not immediately notify the Director of this incident.

Investigation and Corrective Actions:

Teck investigated this incident and determined that the existing switch gear is designed with basic relay control and may not initiate the transfer to the generator when power is only lost from one of the two power sources to the facility. To prevent an incident of this nature from occurring again Teck has begun a project to upgrade the control system of the switch gear to a Programmable Logic Control based system. This should allow for more reliable switching between line power and generator power and should allow for better control during brownout

events. The preliminary design for the project is complete and Teck is targeting Q2/Q3 2021 for completing the upgrade.

December 9, 2020 – WLC AWTF Unscheduled Extended Downtime

On December 9th, 2020, at approximately 10:00 am, the WLC AWTF boiler faulted and the facility was put into recirculation. The function of the boiler is to warm the AWTF influent water to the temperatures required for the biology in the Fluidized Bed Reactors (FBRs) to be able to efficiently reduce nitrate and selenium. The WLC AWTF is not able to continuously run in forward flow without the boiler operating because the FBRs cannot operate effectively at cooler influent temperatures.

The WLC AWTF was able to bring the boiler back into operation and returned to continuous forward flow on December 12, 2020, at approximately 5:30 pm. The event spanned approximately 80 hours with the facility being in recirculation for approximately 72.5 hours. The facility ran in forward flow without the boiler for approximately 6.5 hours, beginning at 9:30 am and ending at 4:00 pm on December 11, 2020, to help mitigate biomass loss in the FBRs and increased chloride concentrations that can occur during recirculation events due to the addition of ferric chloride.

Investigation and Corrective Actions:

Through investigation and maintenance, Teck determined that the cause of the boiler fault was an electrical failure in the flue gas regulator (FGR) actuator at the boiler. This electrical component is within the safety system on the boiler and the replacement of the component requires a vendor supplied passcode and recalibration by a vendor certified technician. As the vendor did not have a certified technician with this expertise in the region, a technician was brought in from the lower mainland to complete the repair and recalibration. The vendor had to drive to the Elk Valley rather than fly, due to COVID restrictions, which further extended the downtime of the boiler. These repairs were successfully completed on December 12, 2020.

Future Preventative Actions:

Two comparable actuators in the boiler system were replaced during this repair to mitigate future recirculation events caused by a similar electrical failure on these actuators. Annual preventative maintenance is also completed on the boiler, although the vendor certified technician indicated that electrical failures of this nature may not present during this scheduled preventative maintenance.

Quantities of Reagents Used and Residuals Generated

The table below summarizes the quantity of reagents used in 2020.

Table 4. WLC AWTF 2020 Reagent Use

Reagent	Total Volume or Mass
Methanol	188,348 L
Acetic Acid	94,581 L
Ferric Chloride	441,643 L
Drewfloc 2205	6,749 L
Clearfloc CE5050	537 L
Ammonium Chloride	3,122 L

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Reagent	Total Volume or Mass	
Phosphoric Acid	7,900 L	
Micronutrient	154 L	
Hydrogen Peroxide	46,098 L	
Sodium Sulphite	435,797 L	
Liquid Oxygen	288,487 nm ³	
Liquid Nitrogen	7,677 nm ³	
Antiscalant	7,550 L	
Sodium Nitrate	34,799 kg	
Micro Sand	17,888 kg	
Diatomaceous earth	5,902 kg	
Citric Acid	500 kg	

The following table is a monthly summary (including types and volumes) of residuals generated by the WLC AWTF in 2020.

Table 5. WLC AWTF 2020 Residual Volumes

Month	Waste Volume (m ³)	Waste Composition	
Jan-20	41.7	Solid Residuals	
Feb-20	49.5	Solid Residuals	
Mar-20	61.7	Solid Residuals	
Apr-20	52.8	Solid Residuals	
May-20	44.5	Solid Residuals	
Jun-20	58.8	Solid Residuals	
Jul-20	49.1	Solid Residuals	
Aug-20	57.0	Solid Residuals	
Sep-20	85.8	Solid Residuals and Spent Treatment Plant Media	
Oct-20	54.0	Solid Residuals	
Nov-20	55.5	Solid Residuals	
Dec-20	72.4	Solid Residuals	

Month	Waste Volume (m ³)		
Total	682.8		

The volumes outlined above are the estimated loose material deposited in the WLC AWTF Landfill in 2020. A survey of the landfill conducted on December 7, 2020, indicates the compacted volume of material since the 2019 survey (November 8, 2019) is 413 m³.

Continuous Improvement Initiatives

Three skid-mounted sets of mini-bioreactors were operated at the WLC AWTF to allow for side-by-side testing of different variables. The mini FBR investigations of 2020 have identified the ability to adjust pH is important for optimization of bioreactors. Teck has provided ENV with a notification to include pH adjustment at multiple locations within the plant for WLC AWTF. For more details please reference the 2020 Annual Research and Technology Development Progress Report.

The influent concentrations for the WLC AWTF are continuing to decrease limiting the amount of load the facility is able to remove. In 2020 Teck began conducting evaluations on identifying sources of high concentration mine impact water with the intent of bringing that water to the WLC AWTF to further improve load removal.

Reportable Spills and Incidents

This sections summarizes process upsets, spills, issues with and bypasses of the Authorized Works, including recirculation events. Recirculation and downtime events included are greater than 24 hours in duration, consistent with the Draft Bypass Clauses 4C3.5 and 4D2.3 for the EVO SRF and FRO AWTF-S respectively in the March 11, 2021 Permit 107517 authorization.

Reportable Spills

There were no reportable spills at the WLC AWTF for 2020

Incidents resulting in bypasses of Authorized Works for greater than 24 hours

Recirculation and downtime events greater than 24 hours in duration are described in the Influent Sources and Flow Rates section of this report.

Noncompliances

A summary of all non-compliances is provided in Appendix A as an Annual Status Form. Additional detail on non-compliances from 2020 can be found below.

Missed Data Submission – July 30, 2020

Noncompliance Description

During data QA/QC review of the EMS submission file for Q2, prior to submission, it was noted that field turbidity measurements were missing. Teck had corrected the Q2 EMS submission file prior to submission; however, further investigation revealed that the Q1 EMS submission file was also missing field turbidity results. Field turbidity was reported for E291569 (Buffer Pond Outfall) in the Q1 2020 Elk Valley Water Quality Report (in *Appendix WLC1 – WLC Additional Sampling Q1 2020*), but it was not submitted to the EMS database. This noncompliance was reported to ENV on July 30, 2020.

Update on Corrective Actions

The field turbidity results for Q1 were uploaded to EMS on July 30, 2020. Teck has updated the configuration of the EMS submission file to include field turbidity for E293371 (WLC AWTF West Line Creek), E293370 (WLC AWTF Line Creek), and E291569 (Buffer Pond Outfall).

Hazardous Leachate Processing – November 11, 2020

Noncompliance Description

Appendix 4, Section 4B1 of Permit 107517 states that the WLC AWTF influent is comprised of contact water from waste rock piles and non-hazardous leachate from the WLC AWTF residual waste landfill.

During external lab data review on November 9, 2020 it was noted that two total selenium samples for leachate, E301611 (West Line Creek Monitoring Leachate Cell 1 A), collected on November 6, 2020 at 9:00 am and 9:30 am were 1010 ug/L and 1160 ug/L respectively. Both results exceed the criteria in Table 1, Schedule 4 of the *BC Hazardous Waste Regulations*. It was also identified that on November 6, 2020, the WLC AWTF processed 20 m3 of this leachate, and was non-compliant with the requirements for non-hazardous leachate outlined in Appendix 4, Section 4B1 of Permit 107517.

Update on Corrective Actions

While sampling of the leachate liquids was being completed in accordance with the WLC AWTF Leachate Handling Guidance Document, it was initially determined that the processes outlined in the document were not completely followed. Further investigation identified that the processes outlined in the document were not fully clear – the document has since been updated to provide additional clarity. The document outlines using total selenium results from the previous day to inform leachate handling and processing. Through investigation it was determined that the review of the previous day's total selenium results prior to processing leachate had not occurred.

The process for leachate monitoring when the incident occurred involves the liquid being pumped from the leachate holding cell into a tanker truck prior to sampling. Due to rainfall during the day, contributing to leachate levels in the landfill, and freezing temperatures at night, leachate was processed without following the steps outlined above to avoid equipment damage due to freezing and to maintain leachate levels at appropriate levels within the leachate holding cell. This resulted in the WLC AWTF processing 20 m3 of hazardous material on November 6, 2020. Processing the leachate did not have an operational impact on the WLC AWTF, effluent of the WLC AWTF remained on-spec when the leachate was processed. Teck has updated the process for leachate monitoring to mitigate incidents of this nature from occurring again.

The table below outlines the results and volumes processed from the event and prior to the event occurring.

Sample Date	Result	Date Results were Received	Date Leachate was Processed	Volume of Leachate Processed
Oct 14 10:00	200 μg/L	Oct 15 15:39	Oct 14	10 m ³
Oct 23 10:30	381 μg/L	Oct 24 15:45	Oct 23	10 m ³
Nov 2 11:00	662 μg/L	Nov 3 16:32	Nov 2	10 m ³
Nov 3 08:00	650 μg/L	Nov 4 16:21	Nov 3	10 m ³
Nov 5 09:30	889 μg/L	Nov 6 16:41	Nov 5	10 m ³
Nov 6 09:00	1010 μg/L	Nov 7 17:24	Nov 6	10 m ³
Nov 6 09:30	1160 μg/L	Nov 7 17:24	Nov 6	10 m ³

Table 6. Summary of hazardous leachate processed at the WLC AWTF.

Inspection Report 161140 – December 7, 2020

Noncompliance Description

On December 7, 2020 Teck received an inspection letter identifying that Teck failed to comply with the requirements outlined in Section 6.1 (Maintenance of Work and Emergency Procedures) of Permit 107517. On September 20, 2020 one of the two power sources into the WLC AWTF lost power. The switch gear did not

initiate the transfer from line power to the generator line as it was still detecting power from the secondary power line. This incident resulted in the facility being down for more than 24 hours. Teck did not immediately notify the Director of this incident.

Update on Corrective Actions

Teck investigated this incident and determined that the existing switch gear is designed with basic relay control and may not initiate the transfer to the generator when power is only lost from one of the two power sources to the facility. To prevent an incident of this nature from occurring again Teck has begun a project to upgrade the control system of the switch gear to a Programmable Logic Control based system. This should allow for more reliable switching between line power and generator power and should allow for better control during brownout events. The preliminary design for the project is complete and Teck is targeting Q2/Q3 2021 for completing the upgrade.

For future incidents, Teck will notify the Director any time the facility is down for greater than 24 hours, as required by Section 6.1 of Permit 107517. Notification of downtime of this duration (greater than 24 hours) is consistent with the Maintenance of Works, Emergency Procedures and Bypass Clauses 4C3.5 and 4D2.3 for the EVO SRF and FRO AWTF-S respectively in the March 11, 2021 Permit 107517 authorization.

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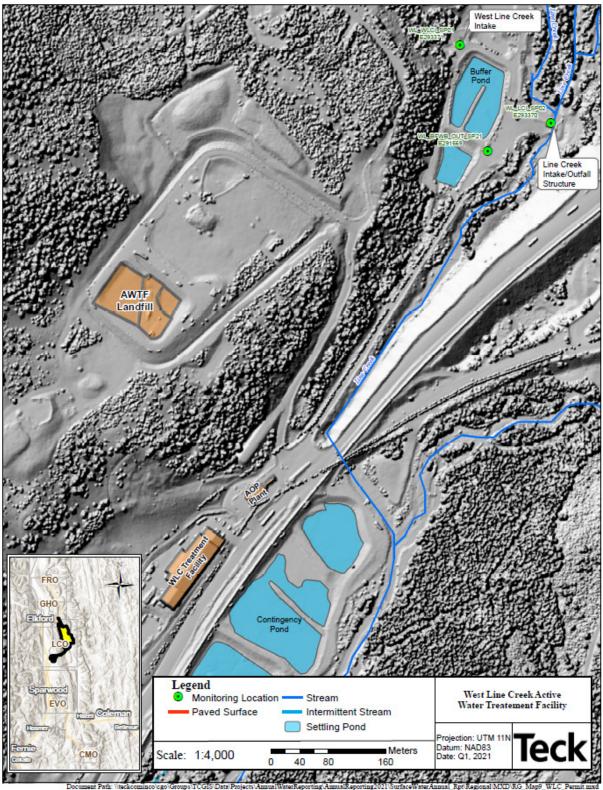


Figure 8. Map of the WLC AWTF and Associated Influent, Effluent and Receiving Environment Locations

Operational and Receiving Environment Monitoring Data

This section provides a summary and evaluation of key operational and receiving environment monitoring data associated with the WLC AWTF. Data related to the WLC AWTF effluent (E291569) permit limits and selenium and nitrate data for the downstream compliance point LC_LCDSSLCC (E297110) are included below.

Operational Data

Appendix 4, Section 4B1.2 of Permit 107517 requires the WLC AWTF effluent (E291569) to meet the following discharge limits:

Parameter	Units	Criteria	Limit
Ammonia	mg/L	Maximum	1.0
Biological Oxygen Demand	mg/L	Maximum	25
pH Range	-	Maximum	6.5 - 8.5
Nitrate	mg/L	Maximum	3.0
T - Phosphorus	mg/L	Maximum	0.3
T - Selenium	μg/L	Monthly Average	20
Total Suspended Solids	mg/L	Maximum	10.0
Antiscalant 1	mg/L	2 minute weighted	5

Table 7. WLC AWTF Effluent (E291569) 107517 Permit Limits

1. The 2 minute weighted average limit for antiscalant was adjusted to 10 mg/L in the March 11, 2021 amendment to Permit 107517.

There were no Permit Limit exceedances in 2020. The following graphs display the WLC AWTF effluent (E291569) compared to the limits in Appendix 4, Section 4B1.2 of Permit 107517 for 2020. Monthly averages are calculated by averaging daily averages. All monitoring data required in Table 4B3 of Permit 107517 for 2020 can be found in Appendix B.

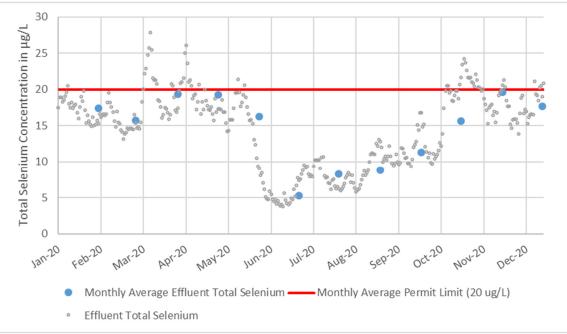


Figure 9. WLC AWTF Effluent (E291569) Total Selenium Compared to the 107517 Monthly Average Permit Limit

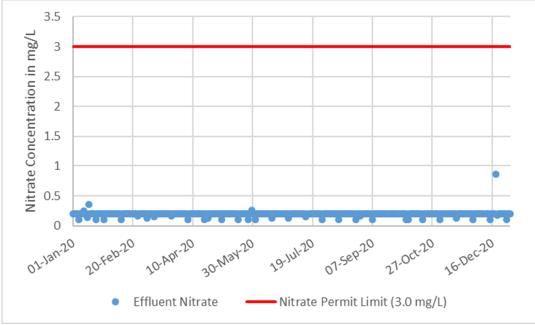
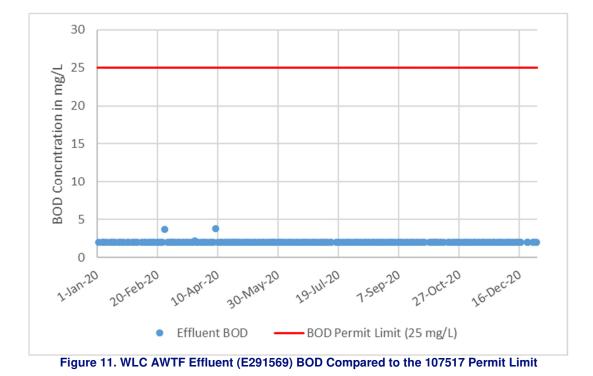


Figure 10. WLC AWTF Effluent Total (E291569) Nitrate Compared to the 107517 Permit Limit



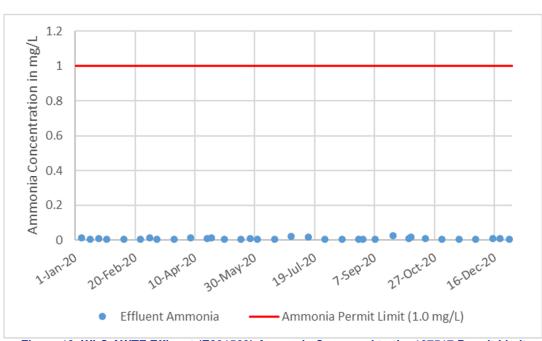


Figure 12. WLC AWTF Effluent (E291569) Ammonia Compared to the 107517 Permit Limit

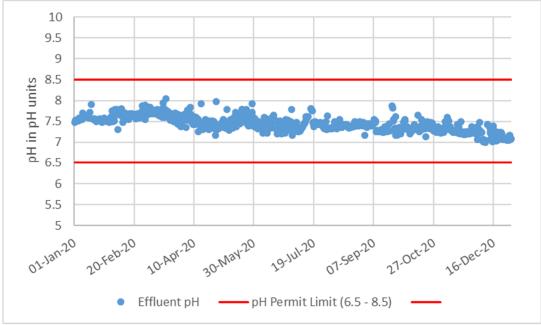


Figure 13. WLC AWTF Effluent (E291569) pH Compared to the 107517 Permit Limit

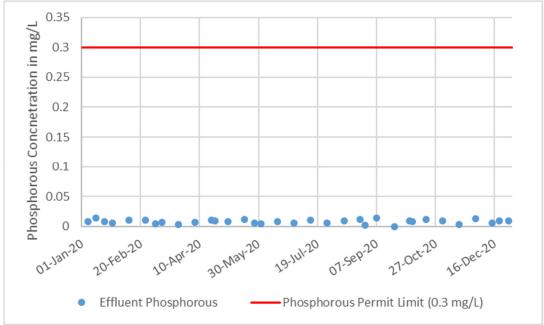


Figure 14. WLC AWTF Effluent (E291569) Phosphorous Compared to the 107517 Permit Limit

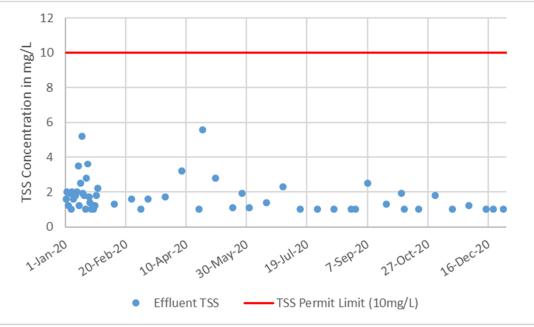
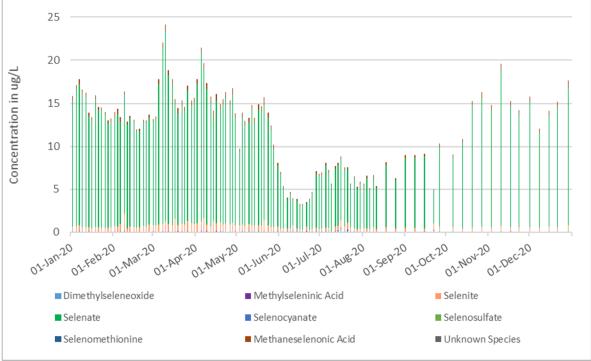


Figure 15. WLC AWTF Effluent (E291569) TSS Compared to the 107517 Permit Limit

The AOP continued to effectively oxidize the more bioavailable selenium species to selenate. The average concentration of non-selenate in the WLC AWTF effluent (E291569) was 1.2 ug/L in 2020. An evaluation of the concentrations of selenium in the aquatic biota (periphyton, invertebrates, and fish) downstream of the treatment facility can be found in the 2020 LCO LAEMP Report.





Receiving Environment Data

The Line Creek compliance point (LC_LCDSSLCC; E297110), downstream of the treatment facility, is required to meet the monthly average and daily maximum limits for nitrate and selenium.

Parameter	Units	Criteria	Limit
Total Selenium	μg/L	Daily Maximum	58
Total Selenium	μg/L	Monthly Average	50
Nitrate	mg/L	Daily Maximum	9
Nitrate	mg/L	Monthly Average	7

Table 8. Line Creek Compliance Point LCDSSLCC (E297110) 107517 Nitrate and Selenium Permit Limits

There were several noncompliances at LCDSSLCC in 2020 for nitrate and there was one daily maximum selenium noncompliance. The WLC AWTF (with the advanced oxidation process) has been operating since the end of 2018, and while the facility is successful in removing nitrate, the influent nitrate concentrations are not high enough for the facility to remove enough nitrate load to maintain compliance with the nitrate compliance limit at LC_LCDSSLCC during all periods of the year.

The single daily maximum selenium exceedance at LC_LCDSSLCC occurred on September 21 during an unscheduled shutdown of the WLC AWTF. At the time, Teck experienced a "brown" power outage in which the backup generators did not come online because the outage did not cause a complete loss of power. Consequently, the WLC AWTF was not operating from 7:00 AM on September 20 to 10:30 AM on September 22. Water quality results at LC_LCDSSLCC leading up to this period (three samples collected between September 1 and 15) were below the daily maximum nitrate and selenium compliance limits. Once the WLC AWTF was restarted, selenium and nitrate results returned to levels below the daily maximum compliance limits.

The following graphs display LCDSSLCC (E297110) compared to the nitrate and selenium limits for 2020.

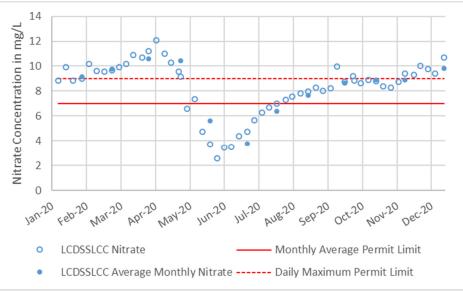
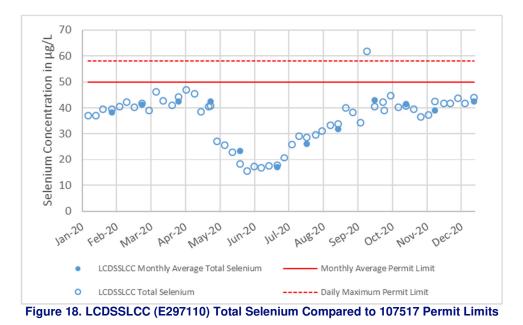


Figure 17. LCDSSLCC (E297110) Nitrate Compared to 107517 Permit Limits



As part of the nitrate and selenium treatment, the WLC AWTF adds ferric chloride to the process. The ferric chloride acts as a coagulant in the solid liquid separation phase of the treatment. Ferric chloride addition increases chloride concentrations downstream of the facility. The graph below shows the chloride concentrations at LCDSSLCC compared to the BCWQG Approved Maximum (600 mg/L) and the BCWQG Approved Average (150 mg/L). As shown below, the chloride concentrations remain below the Approved Maximum and Average BCWQG.

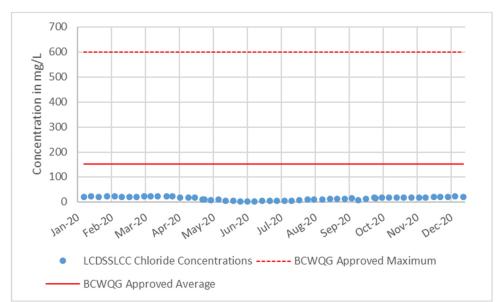


Figure 19. LCDSSLCC (E297110) Chloride Compared to Approved Maximum and Average BCWQG

Site Performance Objectives

The Total Phosphorous Site Performance Objective for the WLC AWTF was not exceeded in 2020.

Acute Toxicity

All acute toxicity test results conducted in 2020 on Rainbow Trout (*Oncorhynchus mykiss*) and water flea (*Daphnia magna*) are provided in Appendix C. Acute toxicity tests were conducted as required by Section 8.1 of Permit 107517. The acute toxicity tests conducted on the WLC AWTF effluent (E291569) in 2020 were:

- 29 96-hour Rainbow Trout 100% (single concentration) acute lethality toxicity tests.
- 29 48-hour Daphnia magna 100% (single concentration) acute lethality toxicity tests.

There were no acute toxicity failures on the WLC AWTF effluent (E291569) in 2020.

QA/QC Summary

Teck has established a quality assurance/quality control (QA/QC) program to promote the collection of high quality environmental data. Teck has developed protocols and procedures to collect representative samples and to minimize the potential for deterioration and contamination of samples before laboratory analysis.

Representativeness is the degree to which the data represent a characteristic of an environmental condition. In the field, representativeness is achieved by collecting samples at the permitted water sampling sites and adhering to sample collection procedures. In the laboratory, representativeness is achieved by the proper handling and storage of samples, the use of standard performance-based methods, and the initiation of analyses within hold times.

Comparability is the qualitative similarity of one dataset to another (i.e., the extent to which different data sets can be combined for use). Comparability is achieved by consistently using standardized field and laboratory methods and procedures.

Despite the considerable level of effort and management system tools employed to achieve high-quality data, there were instances in 2020 where data quality issues occurred.

Teck's Data Quality Objective

Teck conducts and manages a wide range of environmental monitoring programs. Teck depends on the data generated by these programs to inform management decisions and actions. Data can be categorized as either:

Category 1 – Data of Known Quality

Data is of known quality and are considered acceptable for use in decision-making. There is sufficient information on the dataset to be confident that the data, along with associated qualifiers, accurately represents the chemical concentrations present at the location at the time of sampling.

Category 2 – Data of Partially Known Quality

Data has a limited body of supporting QA/QC information. Although not sufficient to be considered Category 1, the data is considered suitable for qualitative use. These datasets may be considered for further evaluation based on project-specific Data Quality Objectives and intended end uses.

Category 3 – Data of Unknown Quality

Data includes sample concentration information, but lacks an adequate level of supporting QA/QC information. These datasets are not considered suitable for detailed project uses. However, considering the reputability of the source, these datasets may be used on a limited or provisional basis for qualitative comparisons with Category 1 and Category 2 datasets.

Teck's data quality objective is to produce Category 1 and 2 data at all times. To meet this objective, Teck has developed and implemented sampling and data management procedures that align with provincial standards. Teck applies these standards when samples are collected and analyzed, and when data is managed and stored.

Quantifying Data Quality

To determine the quality or category of each data point, Teck collects duplicate samples in the field and calculates relative percent difference (RPD). RPD is the arithmetic difference between two samples divided by the mean of those samples, then multiplied by one hundred to express the result as a percentage:

RPD =
$$\left(\frac{(a-b)}{(a+b)/2}\right) \times 100\%$$

Teck's environmental database, EQuIS, is configured to run RPD reports on demand. RPD results are assigned a pass/fail grade that correlates to the data quality categories described above. Teck uses the same RPD criteria outlined in the British Columbia Field Sampling Manual (2013):

- An RPD of <20% = Pass, Category 1
 - No action required; data point is considered validated.
- An RPD of >20%, with results < 5 times the detection limit = Pass, Category 1
 - No action required; result is not considered quantitatively meaningful.
- An RPD of >20% and <50%, with results >5 times the detection limit = Pass, Category 2
 - Data point is validated, but does have reasonable variance.
 - This analyte is monitored in future RPD evaluations to determine if the variance is a trend.
 - o If a variance of 20% to 50% persists, the lab is notified and requested to investigate.
- An RPD of >50%, with results >5 times the detection limit = Fail, Category 3
 - Data point is not validated and is not suitable for quantitative use.
 - If a variance >50% persists, the lab is notified and requested to investigate.
 - Lab can be requested to re-analyze the sample.

To determine if contamination has occurred during bottle storage, sample collection, sample handling, or sample analysis, Teck collects blank samples. Teck collects a set of trip blanks and field blanks with each sample event. Blank sample results are reviewed and if a measurable level of an analyte is detected, the blank sample is re-analyzed to confirm. Detectable results are investigated to determine the source of the contamination.

Laboratory QA/QC

Teck's water samples are analyzed by ALS Laboratory Group, Nautilus Environmental Company, and Brooks Applied Labs. Quality control samples and procedures (as specified in analytical method protocols) are completed by the laboratory and include:

- initial calibration
- initial calibration verification
- continuing calibration
- calibration or instrument blanks
- method blanks
- laboratory control samples
- internal standards (including certified reference material)
- serial dilutions
- matrix spikes
- laboratory duplicates

The laboratory determines a method detection limit (MDL) for each analyte. MDLs are statistically derived. They reflect the concentration at which an analyte can be detected in a clean matrix with 99% confidence that a false positive result has not been reported. The laboratory establishes method reporting limits (MRLs) at levels above the MDLs for each parameter. These values are based on the laboratory's experience analyzing environmental samples and reflect the typical sensitivity obtained by the analytical system; they represent the level of analyte above which concentrations are accurately quantified.

The laboratory quantifies parameters at concentrations above the MRL. Parameters detected at concentrations between the MDL and MRL are flagged with a "J" qualifier to indicate that the value is an estimate (i.e., the analyte concentration is greater than or equal to the MDL and less than the MRL). Parameters that are not detected are reported as the MDL and are flagged with a "U" qualifier. MDLs can be adjusted by the laboratory to reflect sample dilution and/or matrix interference.

QA/QC Results

Data quality issues encountered in 2020 were related to RPD failures, blank detect results, and hold-time exceedances. Teck continues to monitor QA/QC results to identify any potential issues with laboratory precision or sample contamination. Due to the relative infrequency of blank sample detections and RPD failures, Teck's dataset is considered to be of high quality and meets the intent of the monitoring program.

RPD Results

The precision of laboratory results was evaluated using field duplicate samples. RPD calculations as described above were performed on the 114 field duplicate samples collected in 2020. Of the 1,183 parameters evaluated for RPD, 1 (0.08%) failed the RPD criteria. A summary of the 2020 RPD results is provided below.

Table 9. WLC AWTF RPD Failures

Date	EMS ID	Location Code	Parameters	Reason
2/10/2020	E291569	WL_BFWB_OUT_SP21	Nitrate Nitrogen (NO3), As N	RPD

Blank Detect Results

In 2020, 81 blank samples were collected to determine if contamination was occurring during bottle storage, sample collection, sample handling, and sample analysis. Of the 1,203 parameters analyzed in these samples, 10 had results above detection limits (0.8%). <u>Table 10</u> summarizes blank detect results in 2020.

Table 10. WLC AWT 2020 Blank Detects

Date	EMS ID	Location Code	Parameters	Reason
1/6/2020	E291569	WL_BFWB_OUT_SP21	Nitrate Nitrogen (NO3), As N	Blank Detect
1/6/2020	E291569	WL_BFWB_OUT_SP21	Nitrogen, Ammonia (As N)	Blank Detect
1/13/2020	E291569	WL_BFWB_OUT_SP21	Total Dissolved Solids (Residue, Filterable)	Blank Detect
1/13/2020	E291569	WL_BFWB_OUT_SP21	Total Suspended Solids, Lab	Blank Detect
11/2/2020	E291569	WL_BFWB_OUT_SP21	Zinc - Total	Blank Detect
11/2/2020	E291569	WL_BFWB_OUT_SP21	Zinc - Dissolved	Blank Detect
11/10/2020	E291569	WL_BFWB_OUT_SP21	Selenite - Dissolved	Blank Detect
12/8/2020	E291569	WL_BFWB_OUT_SP21	Selenite - Dissolved	Blank Detect
12/20/2020	E291569	WL_BFWB_OUT_SP21	Selenium - Dissolved	Blank Detect
12/28/2020	E291569	WL_BFWB_OUT_SP21	Selenium - Dissolved	Blank Detect

Several of the parameters detected in blank samples occurred at all five Teck operations in the Elk Valley. These included barium, ammonia, and zinc. Because these occurred across the valley, it is likely there are potential contamination sources common to each site, specific to the mining industry, or related to the laboratory analysis. ALS Laboratories has indicated that analytical variability can affect the results of blank samples with very low detection limits; even the slightest variability (to 1/100th of a decimal place) can result in false detection.

Higher than expected field blank results at the regional sampling locations (2.4%) were due to dissolved metals contamination from field filtration equipment. Upon discovery, use of the equipment was discontinued. Contamination levels were low and did not have an effect on routine sample results.

Teck continues to evaluate blank detect results by location and by parameter to determine if detections are consistent across all five operations or specific to an area that might point to a deviation from standard procedures.

Equipment Calibration

Equipment calibrations for the WLC AWTF are summarized in Table 11.

Table 11. WLC AWTF Equipment Calibration

Equipment	Model	Calibration Frequency	Last Calibrated
Field Meter #1	YSI Handheld Multiparameter Instrument #1 (Pro Plus) (Temperature, pH, DO, Spec Cond., ORP)	Monthly calibration, daily verification	12/6/2020
Field Meter #2	YSI Handheld Multiparameter Instrument (Spare) (Pro Plus) (Temperature, pH, DO, Spec Cond., ORP)	Monthly calibration, daily verification. Only used if Field Meter #1 is out of service	12/6/2020
Field Meter #3	Hach TU5200 (Turbidity)	Annual calibration by manufacturer	10/6/2020

Hold Time Exceedances

Parameter hold-times were exceeded on 8 of 17,910 analyses completed in 2020 (0.04%).

The hold-time exceedances in 2020 were for time-sensitive water quality parameters, specifically sulphide, which exceeded hold time on 6 of 8 data points affected (75%). Through discussions with the external laboratories, the largest contributing cause to the sulphide exceedances was lab capacities issues resulting from equipment downtime for the sulphide analyzing equipment.

Teck continues to address the causes of hold-time exceedances by working with the laboratories to improve the timely reporting of issues such as equipment malfunctions, sample volumes, shipping delays, and laboratory resources. Timely reporting of these issues to Teck often provides field samplers enough time to resample to meet permit requirements.

Date	EMS ID	Location Code	Parameters	Reason
4/23/2020	E291569	WL_BFWB_OUT_SP21	Sulphide (as S)	EHT
4/23/2020	E293370	WL_LCI_SP02	Sulphide (as S)	EHT
4/23/2020	E293371	WL_WLCI_SP01	Sulphide (as S)	EHT
5/4/2020	E291569	WL_BFWB_OUT_SP21	Sulphide (as S)	EHT
7/13/2020	E293370	WL_LCI_SP02	Ortho-phosphate (as P)	HTA - EHT

Table 12. WLC AWTF 2020 Hold Time Exceedances

Date	EMS ID	Location Code	Parameters	Reason
7/13/2020	E293371	WL_WLCI_SP01	Ortho-phosphate (as P)	HTA - EHT
8/24/2020	E291569	WL_BFWB_OUT_SP21	Sulphide (as S)	EHT
12/28/2020	E291569	WL_BFWB_OUT_SP21	Sulphide (as S)	EHT

Elkview Operations Saturated Rockfill Phase 2

Executive Summary

Teck received authorization for operating the Elkview Operations Saturated Rockfill Phase 2 (EVO SRF P2) on October 22, 2020. Teck commenced commissioning of the EVO SRF P2 on December 10, 2020 with the wettesting of the Erickson Creek intake/outfall structure. During the wet testing there was intermittent influent flow from Erickson and intermittent effluent flow to Erickson. Wet testing activities were completed on December 19, 2020 and the system remained in recirculation as the facility continued the biomass growth stage in advance of moving into forward flow. This report includes activities associated with 2020 commissioning activities. Additional reporting required in the 107517 EVO SRF Full Scale Trial Authorization (September 7, 2018) can be found in the 2020 EVO SRF Annual Performance Report.

Facility Performance

This section summarizes the facility performance in 2020 and provides a comparison to the key performance metrics for selenium and nitrate treatment facilities.

Selenium and Nitrate Load Removal

This section provides a summary of the EVO SRF P2 selenium and nitrate load removal in 2020. Due to the long retention time of the SRF system, the Erickson influent has not yet reached the extraction wells so this data is representative of EVO SRF Phase 1 effluent. The load removal displayed is not representative of EVO SRF P2 performance.

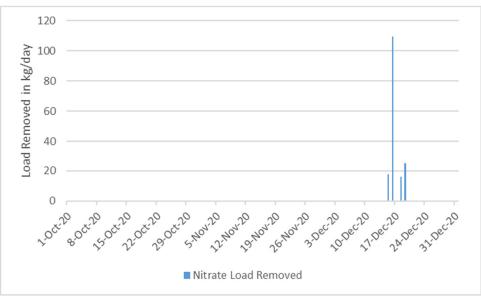


Figure 20. EVO SRF P2 2020 Nitrate Load Removal

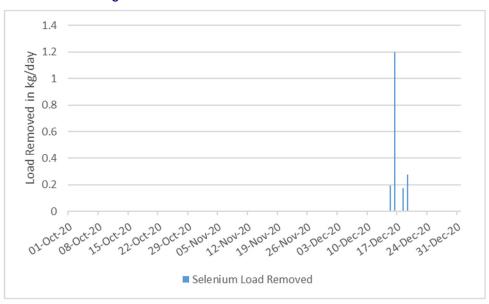


Figure 21. EVO SRF P2 2020 Selenium Load Removal

Influent Sources and Flow Rates

This section provides a summary of the EVO SRF P2 influent sources and flow rates. The EVO SRF transitioned to P2 in Q4 of 2020. The SRF remained in full recirculation during the fourth quarter except for short periods of wet testing the Erickson Creek intake/outfall.

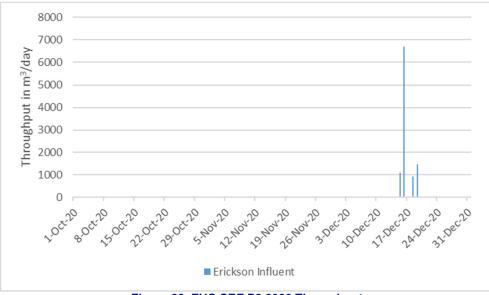


Figure 22. EVO SRF P2 2020 Throughput

During the wet testing water was taken into the SRF from Erickson Creek and effluent was returned to Erickson Creek. The graph below displays the influent and effluent flows during the wet testing activities. The EVO SRF P2 is designed to match influent and effluent flow rates. Wet testing of the intake/outfall with flow matching began December 15th, as shown in the graph below.

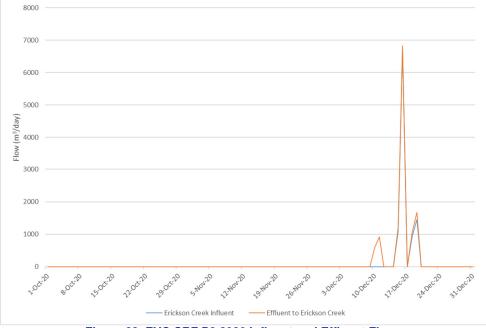


Figure 23. EVO SRF P2 2020 Influent and Effluent Flows

Quantities of Reagents Used and Residuals Generated

The EVO SRF does not produce residuals that require disposal.

The table below summarizes the quantity of reagents used in 2020 for the EVO SRF P2. Table 13. EVO SRF P2 2020 Reagent Quantities

Reagent	Total Volume or Mass
Methanol	19,259 L
Phosphoric Acid	79 L
Sodium Nitrate	4,426 kg
Sodium Chloride	0 kg
Antiscalant	57 L

Continuous Improvement Initiatives

Teck commenced commissioning of the EVO SRF P2 on December 10, 2020 with the wet-testing of the Erickson Creek intake/outfall structure. Commissioning efforts for the remainder of 2020 were focused on wet testing.

Reportable Spills and Incidents

This sections summarizes process upsets, spills, issues with and bypasses of the Authorized Works, including recirculation events. Recirculation and downtime events included are greater than 24 hours in duration, consistent with the Draft Bypass Clauses 4C3.5 and 4D3.3 for the EVO SRF and FRO AWTF-S respectively in the December 2, 2020 draft Permit 107517 authorization.

Noncompliances

December 2020 – Missed Samples

On January 6, 2021, during a review of December 2020 sample data, Teck noted that analysis of certain parameters was missed for E321811 (F2_ECIN) and E321812 (F2_BPO) due to operator error. As per Table 4C4 of Appendix 4 of Permit 107517 (October 22, 2020), total metals samples are required to be collected monthly at E321811 and E321812, and selenium speciation samples are required to be collected weekly at E321811 and E321812 when influent and effluent water is available. For location E321811, Total Metals and Selenium Speciation analysis was missed. For location E321812, Total Metals analysis was missed. The non-compliance was confirmed in January 2021 and due to this timing, additional samples could not be taken to meet the sampling requirements.

An initial investigation indicated that the operators were following a sample schedule that had sampling for total metals and selenium speciation scheduled at a different time than the sampling for other parameters. The missed samples occurred during pre-commissioning wet testing of the P2 Erickson intake/outfall structure at the EVO SRF. During this time, the influent and effluent were available intermittently, resulting in a small window (less than one week) for the sampling events to take place during the month. Teck

has incorporated additional flexibility into the sampling schedule and has reinforced the sampling requirements with the operating team at the EVO SRF in response to this event.

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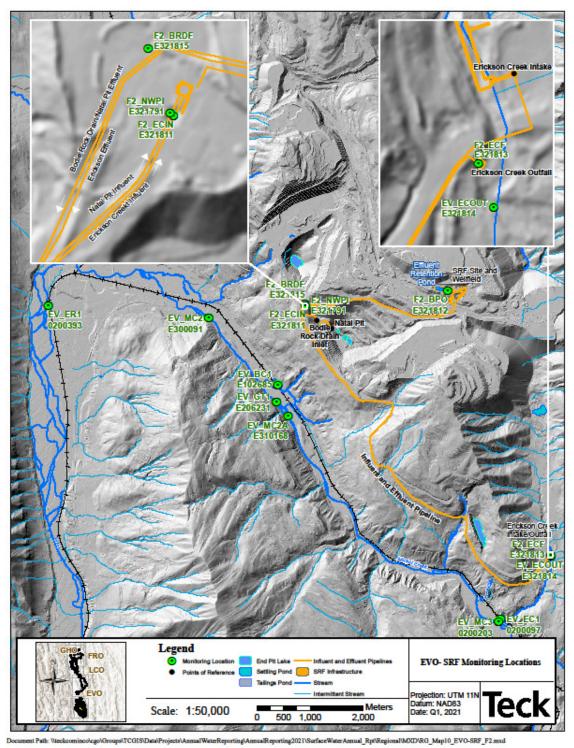


Figure 24. EVO SRF P2 Map and Associated Influent, Effluent and Receiving Environment Locations

Receiving Environment Monitoring Data

The EVO SRF P2 commissioning period began on December 10th, 2020 and ends 180 days after the beginning of Stage 3 of commissioning (moving into forward flow treating Erickson Creek) during which time the effluent is required to be non-acutely toxic. As per Appendix 4, Section 4A1 of Permit 107517, the limits listed in the table below are not in affect during this time.

Appendix 4, Section 4C1.2 of Permit 107517 requires the EVO SRF effluent (E321812) to meet the following discharge limits. These discharge limits will apply to the EVO SRF effluent after the commissioning phase ends.

Parameter	Units	Criteria	Limit
Ammonia	mg/L	Maximum	1.2
Biological Oxygen Demand	mg/L	Maximum	25
pH Range	-	Maximum	6.5 – 9.0
Nitrite	mg/L	Maximum	0.4
T - Phosphorus	mg/L	Monthly Average	0.10
Sulphide	mg/L	Monthly Average	0.01
Dissolved Oxygen	mg/L	Minimum	5.0
Antiscalant	mg/L	2 minute weighted	10

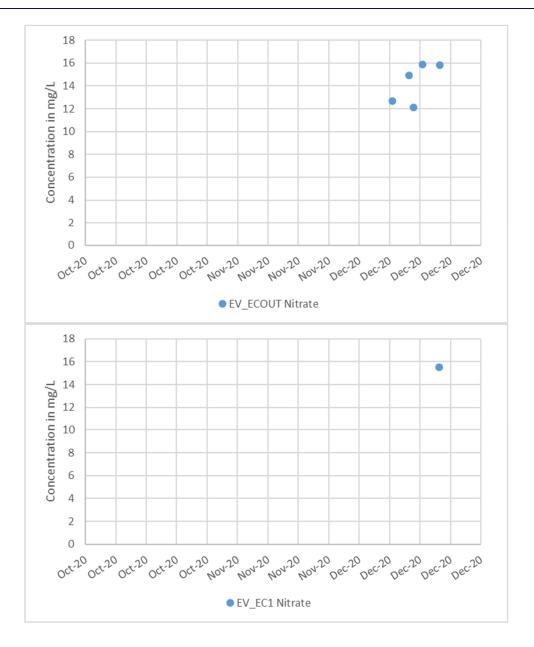
Table 14. EVO SRF P2 Effluent (E321812) 107517 Permit Limits

Water quality is monitored downstream of the EVO SRF P2 at multiple locations including EV_ECOUT (E321814), EV_EC1 (0200097) and EV_MC2 (E321814). The Elkview Compliance point EV_MC2 is required to meet the following limits for nitrate and selenium. EV_MC2 remained below the Permit Limits during the wet testing phase of the EVO SRF.

Table 15. Elkview Compliance Point EV_MC2 (E321814) 107517 Permit Limits

Parameter	Units	Criteria	Limit
Total Selenium	μg/L	Monthly Average	28
Nitrate	mg/L	Monthly Average	6

Limited data was collected in 2020 during or after the wet testing phase of the EVO SRF. The graphs below show the nitrate and selenium concentrations collected during or after wet testing. This data is not representative of EVO SRF P2 performance. All monitoring data required in Table 4C4 of Permit 107517 for 2020 can be found in Appendix B.



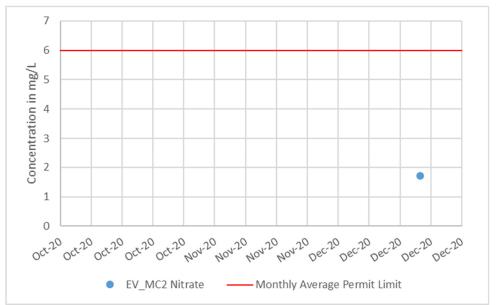
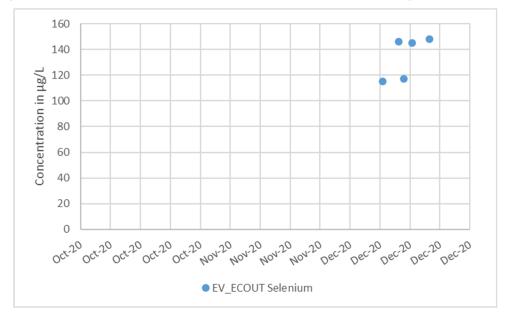


Figure 25. Nitrate Concentrations Downstream of the EVO SRF P2 During 2020 Wet Testing



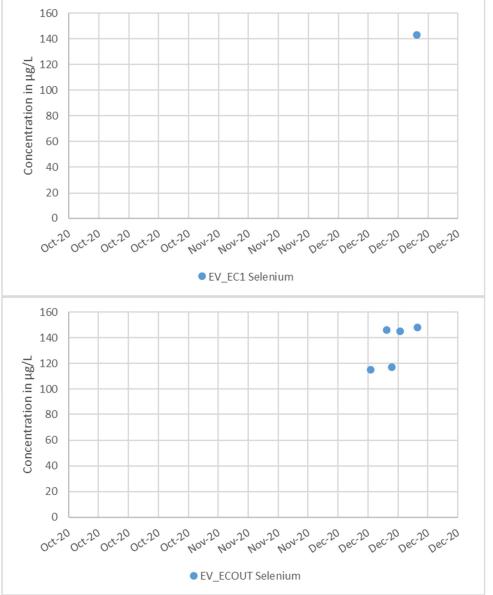


Figure 26. Total Selenium Concentrations Downstream of the EVO SRF P2 During 2020 Wet Testing

Site Performance Objectives

The EVO SRF Water Temperature Site Performance Objectives do not come into effect until the 180 day commissioning period is complete on August 13, 2021 (as per Appendix 4, Section 4A1 of Permit 107517).

Acute Toxicity

All acute toxicity test results conducted for EVO SRF P2 in 2020 on Rainbow Trout (*Oncorhynchus mykiss*) and water flea (*Daphnia magna*) are provided in Appendix C. Acute toxicity tests were conducted as required by Section 8.1 of Permit 107517. The acute toxicity tests conducted on the EVO SRF effluent (E321812) during P2 in 2020 were:

• 2 96-hour Rainbow Trout 100% (single concentration) acute lethality toxicity tests.

• 2 48-hour Daphnia magna 100% (single concentration) acute lethality toxicity tests.

There were no acute toxicity test failures on the EVO SRF effluent (E321812) during P2 in 2020.

Due to the long retention time of the SRF system the Erickson influent has not yet reached the extraction wells and this data is representative of EVO SRF Phase 1 effluent.

QA/QC Summary

Teck has established a quality assurance/quality control (QA/QC) program to promote the collection of high quality environmental data. Teck has developed protocols and procedures to collect representative samples and to minimize the potential for deterioration and contamination of samples before laboratory analysis.

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Data includes sample concentration information, but lacks an adequate level of supporting QA/QC information. These datasets are not considered suitable for detailed project uses. However, considering the reputability of the source, these datasets may be used on a limited or provisional basis for qualitative comparisons with Category 1 and Category 2 datasets.

Teck's data quality objective is to produce Category 1 and 2 data at all times. To meet this objective, Teck has developed and implemented sampling and data management procedures that align with provincial standards. Teck applies these standards when samples are collected and analyzed, and when data is managed and stored.

Quantifying Data Quality

To determine the quality or category of each data point, Teck collects duplicate samples in the field and calculates relative percent difference (RPD). RPD is the arithmetic difference between two samples divided by the mean of those samples, then multiplied by one hundred to express the result as a percentage:

RPD = (difference/mean) x 100% or

RPD =
$$\left(\frac{(a-b)}{(a+b)/2}\right) \times 100\%$$

Teck's environmental database, EQuIS, is configured to run RPD reports on demand. RPD results are assigned a pass/fail grade that correlates to the data quality categories described above. Teck uses the same RPD criteria outlined in the British Columbia Field Sampling Manual (2013):

An RPD of <20% = Pass, Category 1

• No action required; data point is considered validated.

- An RPD of >20%, with results < 5 times the detection limit = Pass, Category 1
 - No action required; result is not considered quantitatively meaningful.
- An RPD of >20% and <50%, with results >5 times the detection limit = Pass, Category 2
 - Data point is validated, but does have reasonable variance.
 - This analyte is monitored in future RPD evaluations to determine if the variance is a trend.
 - If a variance of 20% to 50% persists, the lab is notified and requested to investigate.
- An RPD of >50%, with results >5 times the detection limit = Fail, Category 3
 - Data point is not validated and is not suitable for quantitative use.
 - If a variance >50% persists, the lab is notified and requested to investigate.
 - Lab can be requested to re-analyze the sample.

To determine if contamination has occurred during bottle storage, sample collection, sample handling, or sample analysis, Teck collects blank samples. Teck collects a set of trip blanks and field blanks with each sample event. Blank sample results are reviewed and if a measurable level of an analyte is detected, the blank sample is re-analyzed to confirm. Detectable results are investigated to determine the source of the contamination.

Laboratory QA/QC

Teck's water samples are analyzed by ALS Laboratory Group, Nautilus Environmental Company, and Brooks Applied Labs. Quality control samples and procedures (as specified in analytical method protocols) are completed by the laboratory and include:

- initial calibration
- initial calibration verification
- continuing calibration
- calibration or instrument blanks
- method blanks
- laboratory control samples
- internal standards (including certified reference material)
- serial dilutions
- matrix spikes
- laboratory duplicates

The laboratory determines a method detection limit (MDL) for each analyte. MDLs are statistically derived. They reflect the concentration at which an analyte can be detected in a clean matrix with 99% confidence that a false positive result has not been reported. The laboratory establishes method reporting limits (MRLs) at levels above the MDLs for each parameter. These values are based on the laboratory's experience analyzing

environmental samples and reflect the typical sensitivity obtained by the analytical system; they represent the level of analyte above which concentrations are accurately quantified.

The laboratory quantifies parameters at concentrations above the MRL. Parameters detected at concentrations between the MDL and MRL are flagged with a "J" qualifier to indicate that the value is an estimate (i.e., the analyte concentration is greater than or equal to the MDL and less than the MRL). Parameters that are not detected are reported as the MDL and are flagged with a "U" qualifier. MDLs can be adjusted by the laboratory to reflect sample dilution and/or matrix interference.

QA/QC Results

Data quality issues encountered in 2020 were related to RPD failures, blank detect results, and hold-time exceedances. Teck continues to monitor QA/QC results to identify any potential issues with laboratory precision or sample contamination. Due to the relative infrequency of blank sample detections and RPD failures, Teck's dataset is considered to be of high quality and meets the intent of the monitoring program.

For the QA/QC issues related to RPD failures and blank detects of the EVO SRF P2 monitoring program are captured in the Elk Valley Regional Water Quality Report under Elkview Operations – Permit 425 and 107517 QA/QC issues. This is due to the sampling program for the EVO SRF P2 locations being completed in conjunction with the sampling at the EVO specific monitoring locations. For further details on this evaluation refer to the Elk Valley Regional Water Quality Report.

For the QA/QC issues related to the EVO SRF P2 exclusive monitoring, for parameters only outlined in Appendix 4C4, Table 1, the following sections outline these RPD failures, blank detect results, and hold-time exceedances.

RPD Results

The precision of laboratory results was evaluated using field duplicate samples. RPD calculations as described above were performed on the 3 field duplicate samples collected during commissioning in 2020. Of the 86 parameters evaluated for RPD, 1 (1.16%) failed the RPD criteria, 5 (5.81%) received Pass -1, and 3 (3.49%) were Pass-2. Table 16 summarizes the 2020 RPD results.

Date	EMS ID	Location Code	Parameters	Reason
12/10/2020	E321814	EV_ECOUT	Total Suspended Solids, Lab	Pass-2
12/10/2020	E321814	EV_ECOUT	Turbidity, Lab	Pass-2
12/10/2020	E321814	EV_ECOUT	Aluminum, T	Pass-2
12/10/2020	E321814	EV_ECOUT	Copper, T	Pass-1
12/10/2020	E321814	EV_ECOUT	Lead, T	Pass-1
12/10/2020	E321814	EV_ECOUT	Carbon, Total Organic, T	Pass-1
12/10/2020	E321814	EV_ECOUT	Copper, D	Pass-1
12/10/2020	E321814	EV_ECOUT	Mercury, T	Pass-1
12/10/2020	E321814	EV_ECOUT	Zinc, D	Fail

Table 16. EVO SRF P2 RPD Results

Blank Detect Results

In 2020, 3 blank samples were collected to determine if contamination was occurring during bottle storage, sample collection, sample handling, and sample analysis. Of the 96 parameters analyzed in these samples, 4 had results above detection limits (4.17%). Table 17 summarizes blank detect results in 2020.

Table 17. EVO SRF P2 Blank Detects

Date	EMS ID	Location Code	Parameters	Reason
12/10/2020	E321814	EV_ECOUT	Copper -D	Blank Detect
12/10/2020	E321814	EV_ECOUT	Copper - T	Blank Detect
12/10/2020	E321814	EV_ECOUT	Tin - T	Blank Detect
12/10/2020	E321814	EV_ECOUT	Zinc - D	Blank Detect

Several of the parameters detected in blank samples occurred at all five Teck operations in the Elk Valley. These included barium, ammonia, and zinc. Because these occurred across the valley, it is likely there are potential contamination sources common to each site, specific to the mining industry, or related to the laboratory analysis. ALS Laboratories has indicated that analytical variability can affect the results of blank samples with very low detection limits; even the slightest variability (to 1/100th of a decimal place) can result in false detection.

Teck continues to evaluate blank detect results by location and by parameter to determine if detections are consistent across all five operations or specific to an area that might point to a deviation from standard procedures.

Equipment Calibration

Equipment calibrations are summarized in Table 18.

Table 18. EVO SRF P2 Equipment Calibration

Equipment	Model	Calibration Frequency	Last Calibrated
Field Meter	YSI Handheld Multiparameter Instrument #1 (EXO 1)	Weekly calibration, daily	12/21/2020
#1	(Temperature, pH, DO, EC, ORP, Turbidity)	verification	
Field Meter	YSI Handheld Multiparameter Instrument #2 (EXO 1)	Weekly calibration, daily	12/21/2020
#2	(Temperature, pH, DO, EC, ORP, Turbidity)	verification	
Field Meter #3	YSI Handheld Multiparameter Instrument #3 (EXO 1) (Temperature, pH, DO, EC, ORP, Turbidity)	Weekly calibration, daily verification	12/21/2020

Appendix A

This appendix contains the Annual Status Form for Appendix 4 of Permit 107517.



Annual Status Form

AUTHORIZATION NUMBER: 107517

AUTHORIZATION TYPE: Effluent, Permit

LEGAL AUTHORIZATION HOLDER NAME: Teck Coal Limited

AUTHORIZED PERSON NAME: Marty Hafke

AUTHORIZED PERSON SIGNATURE: SIGNATURE DATE: March 31, 2021

I understand that it is an offense to mislead a government official, and I declare that all of the information presented is accurate and true. I have been given the authority by the authorization holder to sign this form.

CONDITION NUMBER	CONDITION DESCRIPTION		COMPLIANT? (Yes/No/ND)	ACTION TAKEN
Section 9.1	The pemittee must submit the results of the discharge and receiving environment water sampling program directly into the EMS database using the appropriate EMS site identification numbers within 30 days of the end of the quarter in which the samples were colleced. Flow data is to be submitted annually.			More detail is reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Non-compliances
Section 4A1	The commissioning phase includes reasonable refinement or adjustment of works to optimize effi regard, a maximum of 120 days is considered a facility.The permittee must stipulate the start date Commissioning Plan as per	ciency and/or effluent quality. In this easonable time to commission the e of the commissioning period in the	Yes	N/A
Section 4A1	During commissioning of a treatment facility, the specific facility included in the subsequent section required to be non-acutely toxic	ns do not apply, but the discharge is	Yes	N/A
Section 4A2	A Commissioning Plan for each selenium and nitrat by a Qualified Professional, submitted to the d commencement of the discharge from	irector and implemented prior to	Yes	N/A
Section 4A2	The Commissioning Plan must include but is not procedures required to commission and to start-up treatment facility, including any additional mor demonstrate that no adverse environmental in	o following a shut-down of the water hitoring and reporting required to	Yes	N/A
	An Operations Plan for each selenium and nitrate authorized works in Appendix 4 must be prepared l to the director and implemented prior to comme	y a Qualified Professional, submitted		
	treatment facilit Operations Plan must include but is not necessarily	The facility operator's manual, with provision for its continual	Yes	N/A
Section 4A3	limited to:	improvement; An overview of the planned maintenance program which includes an inventory of facility components and authorized replacement parts, and a detailed description of	Yes	N/A
Section 4A3	Operations Plan must include but is not necessarily limited to:	inspection, repair and replacement frequency for facility components; uocumentation to verny that the facility is operated at all times within specifications and in a manner to ensure compliance with this	Yes	N/A
Section 4A3	Operations Plan must include but is not necessarily limited to: Operations Plan must include but is not necessarily	authorization and other applicable legislation; Procedures for safely shutting down	Yes	N/A
Section 4A3	limited to: Operations Plan must include but is not necessarily	the treatment facility; and Actions to be taken if effluent quality fails to meet the requirements of this	Yes	N/A
	limited to:	permit; contingency planning which describes built-in redundancy of the facility and outlines measures to prevent	Yes	N/A
Section 4A3	Operations Plan must include but is not necessarily limited to:	emergency conditions from occurring; and Key metrics to be used to	Yes	N/A
	Operations Plan must include but is not necessarily limited to:	demonstrate the performance of the treatment facility relative to the intended performance.	Yes	N/A
Section 4A3	The Operations Plan must be reviewed and updated following the first year of facility operations and as needed thereafter to assess its appropriateness for the authorized works, discharges and conditions.		Yes	N/A
Section 4A3	Results of the initial review must be provided to the director in the commissioning report		Yes	N/A
Section 4A3	Any significant update to the plan must be submit adoption.		Yes	N/A
Section 4A3	Minor updates must be summarized in the quarterl minor update must be summarized in the guarterl		Yes	N/A

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Date: March 31, 2021

CONDITION NUMBER	CONDITION DESCRIPTION			ACTION TAKEN
Section 4A4	A Site-Specific Environmental Emergency Response I and nitrate treatment		Yes	N/A
Section 4A4	The plan must be submitted to the director prior to the selenium and nitrate treat		Yes	N/A
Section 4A4	The site specific Environmental Emergency Response Plan must include, but is not limited to:	A description of measures to mitigate any health or environmental impacts, if emergencies occur;	Yes	N/A
Section 4A4	The site specific Environmental Emergency Response Plan must include, but is not limited to:	Specific reference to the Spill Reporting Regulation; Instructions for staff in the event of	Yes	N/A
Section 4A4	The site specific Environmental Emergency Response Plan must include, but is not limited to:	an emergency, including contact information for local authorities (fire, police, public health), Emergency Managemnet BC, and the director.	Yes	N/A
	Any significant update to the Site Specific Environm	ental Emergency Response Plan must		
Section 4A4	be submitted to the director within Minor updates to the Site Specific Environmental		Yes	N/A
Section 4A4	summarized in the quarterly report for the time per	od when the minor update was made.	Yes	N/A
Section 4A5	The permittee must sample the parameters at frequencies as defined in subsequent		No	More detail is reported in the Annual Water Treatment Report for 2020 under the Elkview Operations Saturated Rock Fill Phase 2, Section: Non-compliances
Section 4A6	Within 12 months of finalizing the commissioning phase of the selenium and nitrate treatment facility, the permittee must submit a commissioning report, prepared by a Qualified Professional to the director.	recommend any necessary system	Yes	N/A
Section 4A7	The permittee must submit a quarterly treatment within 30 days of the end of the quarter in wh	performance report to the director ich the samples were collected.	Yes	N/A
	The quarterly treatment performance report must	Effluent water quality results used to calculate monthly averages for the		
Section 4A7	include the following for each water treatment facility:	limits in Section 2 and Appendix 4, if applicable; Effluent water quality results	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	The quarterly treatment performance report must include the following for each water treatment facility:	exceeding limits and targets or other criteria, such as daily maximums or as specified by the director;	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	The quarterly treatment performance report must include the following for each water treatment facility: The quarterly treatment performance report must	Facility throughput and availability;	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	include the following for each water treatment facility: The quarterly treatment performance report must	Selenium and nitrate load removal;	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	include the following for each water treatment facility: The quarterly treatment performance report must	A summary of selenium speciation data;	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	include the following for each water treatment facility: The quarterly treatment performance report must	Identification of all missing data and all QA/QC issues; All toxicity test results and raw	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	include the following for each water treatment facility: The quarterly treatment performance report must	laboratory data sheets for all mortality results; All reportable spills or other incidents	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	include the following for each water treatment facility: The quarterly treatment performance report must	related to water quality, occurring in the quarter; A summary of operational and/or	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	include the following for each water treatment facility: The quarterly treatment performance report must	performance highlights and trends from the quarter;	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	include the following for each water treatment facility: The quarterly treatment performance report must	Explanation of the most probable cause(s) of any non-compliances;	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A7	include the following for each water treatment facility:	All measures taken to reduce or eliminate non-compliances; and Any additional sampling results for the compliance points identified in	Yes	N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the Quarterly Elk Valley Water Quality Reports prior to that.
	The quarterly treatment performance report must include the following for each water treatment	the compliance points identified in Section 2 obtained for any reason, whether compliance, maintenance, or operational purposes. All test data must be reported within 30 days of the end of the quarter in which sampling occurred. These additional results may be reported in summary form. Further information on the testing event may be requested in		N/A - Reported in Quarterly Water Treatment Report for Q4 2020, and in the
Section 4A7	facility: The permittee must submit an annual treatment p March 31 of each year following the data collection all facilities, though discussion for each facility r	calendar year. The report may include	Yes	Quarterly Elk Valley Water Quality Reports prior to that.
Section 4A8	permittee may submit a series of reports. Each deliv file sizes.		Yes	N/A - Submitted in accompanying Annual Water Treatment Report for 2020

CONDITION NUMBER	CONDITION DESCR	IPTION	COMPLIANT? (Yes/No/ND)	ACTION TAKEN
		A summary of facility performance		N/A - Reported in the Annual Water Treatment Report for 2020 under the West
Section 4A8	The report must include the following for each water treatment facility:	compared to the key performance metrics listed in the Operations Plan;	Yes	Line Creek Active Water Treatment Faciliy, Section: Facility Performance; and Elkview Operations Saturated Rockfill Phase 2, Section: Facility Performance N/A - Reported in the Annual Water Treatment Report for 2020 under the West
Section 4A8	The report must include the following for each water treatment facility:	Influent sources and flow rates, including alternate sources;	Yes	Line Creek Active Water Treatment Faciliy, Section: Influent Sources and Flow Rates; and Elkview Operations Saturated Rockfill Phase 2, Section: Influent Sources and Flow Rates N/A – Reported in the Annual Water Treatment Report for 2020 under the West
Section 4A8	The report must include the following for each water treatment facility:	Selenium and nitrate load removal;	Yes	Line Creek Active Water Treatment Faciliy, Section: Selenium and Nitrate Load Removal; and Elkview Operations Saturated Rockfill Phase 2, Section: Selenium and Nitrate Load Removal
	The report must include the following for each	Quantities of reagents used and		N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Quantities of Reagents used and Residuals Generated; and Elkview Operations Saturated Rockfill Phase 2,
Section 4A8	water treatment facility:	residuals generated;	Yes	Section: Quantities of Reagents used and Residuals Generated N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Continuous Improvement
Section 4A8	The report must include the following for each water treatment facility:	Details on continuous improvement initiatives;	Yes	Initiatives; and Elkview Operations Saturated Rockfill Phase 2, Section: Continuous Improvement Initiatives
Section 4A8	The report must include the following for each water treatment facility:	A description of any incidents including process upsets, spills, issues with and bypasses of the Authorized Works, including recirculation events;	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Reportable Spilles and Incidents; and Elkview Operations Saturated Rockfill Phase 2, Section: Non- compliances Reportable Spilles and Incidents N/A - This Annual Status Form. More detail is also reported in the Annual Water
Section 4A8	The report must include the following for each water treatment facility:	A summary of all non-compliances with the requirements of Appendix 4, submitted in an Annual Status Form;	Yes	Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Non-compliances and Elkview Operations Saturated Rockfill Phase 2, Section: Non-compliances N/A – This Annual Status Form. More detail is also reported in the Annual Water
Section 4A8	The report must include the following for each water treatment facility:	A map of monitoring locations with EMS and permittee descriptors; A summary and evaluation of key	Yes	Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Map; and Elkview Operations Saturated Rockfill Phase 2, Section: Map
Section 4A8	The report must include the following for each water treatment facility:	environment monitoring data associated with the selenium and nitrate treatment facilities and all analytical results from the monitoring plans in Appendix 4 for the reporting year. Data must be suitably tabulated (i.e., excel spreadsheets), with appropriate graphs and comparison of results to limits, Approved and Working Water Quality Guidelines, Site Performance Objectives, or other criteria and benchmarks as specified by the director;	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Operational and Receiving Environment Monitoring Data; and Elkview Operations Saturated Rockfill Phase 2, Section: Operational and Receiving Environment Monitoring Data
	The report must include the following for each	Appendix 4 are exceeded the permittee must provide an interpretation of significance, and the status of corrective actions and/or		N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Site Performance Objectives; and Elkview Operations Saturated Rockfill Phase 2, Section: Site
Section 4A8	water treatment facility: The report must include the following for each water treatment facility:	ongoing investigations; an acute councily test-specific reports from the laboratory and an interpreted summary and discussion of results, including recommendations and all subsequent actions; All acute toxicity test lab reports must include data and/or observations for hardness, alkalinity, pH, temperature,	Yes	Performance Objectives N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Acute Toxicity; and Elkview Operations Saturated Rockfill Phase 2, Section: Acute Toxicity N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Acute Toxicity; and Elkview Operations Saturated Rockfill Phase 2, Section: Acute Toxicity. These lab reports
Section 4A8	The report must include the following for each water treatment facility:	and formation of precipitate either in the vessel or on the organism.	Yes	are also included as an Appendix to the Annual Water Treatment Report for 2020
Section 4A8	The report must include the following for each water treatment facility:	A summary of all QA/QC issues during the year	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: QA/QC Summary; and Elkview Operations Saturated Rockfill Phase 2, Section:QA/QC Summary
Section 4B1	The WLC AWTF influent is comprised of contact v hazardous leachate from the WLC AW The maximum authorized rate of discharge of		No	More detail is reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Non-compliances
Section 4B1.1	effluent at the West Line Creek Active Water Treatment Facility (WLC AWTF) is 8,300 cubic meters per day.	discharge of effluent at the WLC AWTF must not exceed 8,300 cubic meters per day.	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Influent Sources and Flow Rates
Section 4B1.2	The characteristics of the discharge at the treated effluent outlet of the WLC AWTF must not exceed the limits specified.	Ammonia in the discharge at the treated effluent outlet of the WLC AWTF must not exceed 1.0 mg/L. Biological Oxygen Demand in the	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Operational and Receiving Environment Monitoring Data; Operational Data
Section 4B1.2	The characteristics of the discharge at the treated effluent outlet of the WLC AWTF must not exceed the limits specified. The characteristics of the discharge at the treated	discharge at the treated effluent outlet of the WLC AWTF must not exceed 25 mg/L.	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Operational and Receiving Environment Monitoring Data; Operational Data N/A - Reported in the Annual Water Treatment Report for 2020 under the West
Section 4B1.2	The characteristics of the discharge at the treated effluent outlet of the WLC AWTF must not exceed the limits specified. The characteristics of the discharge at the treated	The pH range of the discharge at the treated effluent outlet of the WLC AWTF must not exceed 6.5-8.5 Nitrite in the discharge at the treated	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Operational and Receiving Environment Monitoring Data; Operational Data N/A - Reported in the Annual Water Treatment Report for 2020 under the West
Section 4B1.2	effluent outlet of the WLC AWTF must not exceed the limits specified.	effluent outlet of the WLC AWTF must not exceed 3.0 mg/L.	Yes	Line Creek Active Water Treatment Faciliy, Section: Operational and Receiving Environment Monitoring Data; Operational Data
Section 4B1.2	The characteristics of the discharge at the treated effluent outlet of the WLC AWTF must not exceed the limits specified.	Total Phosphorus in the discharge at the treated effluent outlet of the WLC AWTF must not exceed 0.3 mg/L.	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Operational and Receiving Environment Monitoring Data; Operational Data

_{Date:} March 31, 2021

CONDITION NUMBER			COMPLIANT? (Yes/No/ND)	ACTION TAKEN
Section 4B1.2	The characteristics of the discharge at the treated effluent outlet of the WLC AWTF must not exceed the limits specified.	Total Selenium in the discharge at the treated effluent outlet of the WLC AWTF must not exceed 20 μg/L, monthly average.	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Operational and Receiving Environment Monitoring Data; Operational Data
3601011 461.2	The characteristics of the discharge at the treated effluent outlet of the WLC AWTF must not exceed	lotal Suspended Solids in the discharge at the treated effluent outlet of the WLC AWTF must not	163	N/A - Reported in the Annual Water Treatment Report for 2020 under the West Line Creek Active Water Treatment Faciliy, Section: Operational and Receiving
Section 4B1.2	the limits specified. The characteristics of the discharge at the treated	exceed 10.0 mg/L Antiscalant in the discharge at the treated effluent outlet of the WLC	Yes	Environment Monitoring Data; Operational Data N/A - Reported in the Annual Water Treatment Report for 2020 under the West
Section 4B1.2	effluent outlet of the WLC AWTF must not exceed the limits specified.	AWTF must not exceed 5 mg/L, two- minute time weighted average	Yes	Line Creek Active Water Treatment Faciliy, Section: Operational and Receiving Environment Monitoring Data; Operational Data
Section 4C1.2	The treated effluent discharged to Erickson Creek must not be acutely toxic as per Section 6.2.	The toxicity (96 hr rainbow trout single concentration, and 48 hr Daphnia magna single concentration) must not exceed 50% mortality Antiscalant in the discharge at the	Yes	N/A - Reported in the Annual Water Treatment Report for 2020 under the Elkview Operations Saturated Rockfill Phase 2, Section: Acute Toxicity
Section 4C1.2	The characteristics of the discharge at the Effluent Retention Pond Outlet (F2_BPO, E321812) must be equivalent to or better than:	treated effluent outlet of the EVO SRF must not exceed 10 mg/L, two- minute time weighted average	Yes	N/A - Not required at this time due to commissioning period.
Section 4C1.2	The characteristics of the discharge at the Effluent Retention Pond Outlet (F2_BPO, E321812) must be equivalent to or better than:	Ammonia in the discharge at the treated effluent outlet of the EVO SRF must not exceed 1.2 mg/L.	Yes	N/A - Not required at this time due to commissioning period.
	The characteristics of the discharge at the Effluent Retention Pond Outlet (F2_BPO, E321812) must be	Biochemical Oxygen Demand (BOD) in the discharge at the treated effluent outlet of the EVO SRF must		.,
Section 4C1.2	equivalent to or better than: The characteristics of the discharge at the Effluent Retention Pond Outlet (F2_BPO, E321812) must be equivalent to ac botter than:	not exceed 25 mg/L. Nitrite in the discharge at the treated effluent outlet of the EVO SRF must not exceed 0.4 mg/L.	Yes	N/A - Not required at this time due to commissioning period.
Section 4C1.2 Section 4C1.2	equivalent to or better than: The characteristics of the discharge at the Effluent Retention Pond Outlet (F2_BPO, E321812) must be equivalent to or better than:	not exceed 0.4 mg/L. Sulfide in the discharge at the treated effluent outlet of the EVO SRF must not exceed 0.01 mg/L.	Yes	N/A - Not required at this time due to commissioning period. N/A - Not required at this time due to commissioning period.
500000 401.2	The characteristics of the discharge at the Effluent Retention Pond Outlet (F2_BPO, E321812) must be	Total Phosphorus in the discharge at the treated effluent outlet of the EVO SRF must not exceed 0.10 mg/L,	103	Type root required at any arms due to commissioning period.
Section 4C1.2	equivalent to or better than: The characteristics of the discharge at the Effluent Retention Pond Outlet (F2_BPO, E321812) must be	monthly average. The pH range of the discharge at the treated effluent outlet of the EVO SRF	Yes	N/A - Not required at this time due to commissioning period.
Section 4C1.2	equivalent to or better than: The characteristics of the discharge at the Effluent Retention Pond Outlet (F2_BPO, E321812) must be	must not exceed 6.5-9.0 Dissolved Oxygen in the discharge at the treated effluent outlet of the EVO	Yes	N/A - Not required at this time due to commissioning period.
Section 4C1.2	equivalent to or better than: Water temperature measured at Erickson Creek at mouth (EV_EC1) must be managed to not exceed the upper temperature thresholds based on the	SRF must not exceed 5.0 mg/L. Temperature at EV_EC1 (0200097) must be managed to not exceed <7°C between January 1 to April 30 and	Yes	N/A - Not required at this time due to commissioning period.
Section 4C1.2	following Site Performance Objectives. Water temperature measured at Erickson Creek at mouth (EV_EC1) must be managed to not exceed	November 1 to December 31 Temperature at EV_EC1 (0200097)	Yes	N/A - Not required at this time due to commissioning period.
Section 4C1.2	the upper temperature thresholds based on the following Site Performance Objectives. Water temperature measured at Erickson Creek at mouth (EV_EC1) must be managed to not exceed	must be managed to not exceed <13°C between May 1 to August 31 Temperature at EV_EC1 (0200097) must be managed to not exceed	Yes	N/A - Not required at this time due to commissioning period.
Section 4C1.2	the upper temperature thresholds based on the following Site Performance Objectives. The permittee must develop and implement an	<13°C between September 1 to October 31 director 30 days prior to the end of	Yes	N/A - Not required at this time due to commissioning period.
	operational contingency plan (alarm strategy) to manage the parameters listed in Section 4C1.2	the commissioning period for the EVO SRF, and the permittee must notify the director at least 15 days prior to implementing any proposed changes		
Section 4C3.1 Section 4C3.1	environment. The permittee must develop and implement an operational contingency plan (alarm strategy) to manage the parameters listed in Section 4C1.2 related to operation of the EVO SRF that pose a risk of impacts to receptors in the receiving environment.	to the plan. The plan must include an operational monitoring program and thresholds that trigger management actions that will be implemented to mitigate the	Yes	N/A
30011403.1	The permittee must develop and implement an operational contingency plan (alarm strategy) to manage the parameters listed in Section 4C1.2 related to operation of the EVO SRF that pose a risk of impacts to receptors in the receiving	risk of impacts. If the onsite laboratory sample results are in exceedance of the limits specified in Section 4C1.2, the permittee must immediately collect samples for analysis at a CALA certified laboratory. These results must be included in the routine	Yes	N/A
Section 4C3.1	environment. The permittee must develop and track key metrics o	reports per Section 4A of Appendix 4.	Yes	N/A
Section 4C3.2	EVO SRF, including but not limited to remove	al of nitrate and selenium load.	Yes	N/A
Section 4C3.3	The performance metrics to be tracked must be sub the end of the commissioning period for the EVO SI director at least 15 days prior to implementing ar	RF, and the permittee must notify the	Yes	N/A
Section 4C3.3	The performance metrics must align with the l management object	tives.	Yes	N/A
Section 4C3.3	The permittee must present the performance metri and in routine reports per Section	n 4A of Appendix 4.	Yes	N/A - Reported in Triweekly, Quarterly, and Annual Performance updates and reports
Section 4C3.3	The permittee must develop and implement a disc discharge from the EVO SRF to		Yes	N/A

CONDITION NUMBER	CONDITION DESCRI	PTION	COMPLIANT? (Yes/No/ND)	ACTION TAKEN
Section 4C3.3	The plan must be submitted to the director 30 days period for the EVO SRF, and the permittee must noti implementing any proposed cha	fy the director at least 15 days prior to	Yes	N/A
Section 4C3.3	The plan must describe the actions and monitoring Teck will implement to minimize change in streamflow between upstream and downstream of the Erickson Creek intake/outfall structure and follow the Federal Department of Fisheries and Oceans Canada (DFO) guidance on allowable rates of change in streamflow to avoid adverse		Yes	N/A
5201011403.5	effects to fish hab The permittee must report the monitoring results fr		163	N/A - Reported in Triweekly, Quarterly, and Annual Performance updates and
Section 4C3.3	Section 4A of Apper The permittee must develop and implement the following studies under the Adaptive Management Plan (AMP) to resolve uncertainties regarding the water balance in Erickson Creek and potential unidentified mine contact water discharge	dix 4. Uncertainty: Erickson Creek water balance study. The study must resolve uncertainty related to the magnitude of total precipitation, evapotranspiration, surface flow and groundwater flow in the watershed. In completing the study, the permittee must demonstrate closure of the Erickson Creek water balance	Yes	reports
Section 4C3.4 Section 4C3.4	pathways. The permittee must develop and implement the following studies under the Adaptive Management Plan (AMP) to resolve uncertainties regarding the water balance in Erickson Creek and potential unidentified mine contact water discharge nathways	to the satisfaction of the director. Uncertainty: Michel Creek contaminant load balance study. The study must resolve uncertainty related to the potential existence of an unaccounted mine contact water discharge pathway from EVO to Michel Creek. The study must utilize measured water quality data from mine contact surface water and groundwater sources. If the mass balance for contaminant loadings cannot be adequately closed to the satisfaction of the director, then Teck must develop and implement an additional study to locate and characterize the missing contaminant load nathway(c)	Yes	N/A
	pathways. load pathway(s). The study designs must incorporate feedback from the Elk Valley Groundwater Working			
Section 4C3.4 107517	Group and be submitted to the director for		Yes	N/A
Approval Letter 2018-09-07 A.4 107517	The EVO SRF buffer pond must maintain a minimum for the Project Ine Project Operational Documents Instea Delow must be prepared by a qualified professional, submitted to the director and to the Ktunaxa Nation		Yes	
Approval Letter 2018-09-07 B.2	Council (KNC), and implemented prior to commencement of the Project Ine Project Operational Documents Isted Delow must be prepared by a qualified professional,	The EVO SRF Commissioning Plan	Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 B.2 107517	submitted to the director and to the Ktunaxa Nation Council (KNC), and implemented prior to commencement of the Project Ine rroject uperational uccuments instea below must be prepared by a qualified professional, submitted to the director and to the Ktunaxa Nation	The EVO SRF Operations Plan	Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
Approval Letter 2018-09-07 B.2	Sourniel (KNC), and implemented prior to commencement of the Project Ine Project operational bocuments listed below must be prepared by a qualified professional,	The EVO SRF Alarm Strategy Plan	Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 B.2	submitted to the director and to the Ktunaxa Nation Council (KNC), and implemented prior to commencement of the Project ine project uperational uccuments instea below must be prepared by a qualified professional,	The EVO SRF Sample and Monitoring Plan	Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter	submitted to the director and to the Ktunaxa Nation Council (KNC), and implemented prior to	The EVO SRF Effluent Quality		N/A - No Deviation. Authorization is now superceeded with the March 11, 2021
2018-09-07 B.2 107517	commencement of the Project The Project Operational Documents listed below must be prepared by a qualified professional, submitted to the director and to the Ktunaxa Nation	Monitoring Plan	Yes	amendment to 107517
Approval Letter 2018-09-07 B.2	Council (KNC), and implemented prior to commencement of the Project Ine Project Operational Jocuments instee below must be prepared by a qualified professional,	The EVO SRF Maintenance Management Plan	Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 B.2	submitted to the director and to the Ktunaxa Nation Council (KNC), and implemented prior to commencement of the Project The Project Operational Documents Instea below	The EVO SRF Communication and Reporting Plan	Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 B.2	must be prepared by a qualified professional, submitted to the director and to the Ktunaxa Nation Council (KNC), and implemented prior to commencement of the Project	The EVO SRF Emergency Response Plan	Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 B.3	The Permittee must implement the Water Managem the Project application "Elkview Operations Saturate 30, 2017)".		Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517

March 31, 2021

CONDITION NUMBER	CONDITION DESCR		COMPLIANT? (Yes/No/ND)	ACTION TAKEN
107517 Approval Letter 2018-09-07 B.4	Only reagents used as tracers and carbon sources a Operations Saturated Rock Full Scale Trial Project (SRF. Notification must be provided to the directo	Aarch 30, 2017)" may be added to the	Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter	If nutrient addition is required to improve system p assessment of upper bound concentrations, associat be provided to the director at least 15 da	erformance, notification, including an ed risk, and proposed monitoring must		N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
2018-09-07 B.4 107517 Approval Letter	Monitoring is to be conducted in accordance with the deviation which results in reduced number of sample	e monitoring plan in Appendix A. Any es or parameters must be approved by	Yes	N/A - Authorization is now superceeded with the March 11, 2021 amendment
2018-09-07 C.1 107517 Approval Letter	the director prior to impl Data collected to evaluate the performance of the P upon request. Collected data must include field pa major ions, nutrients, dissolved metals, total met selenium speciation, on at least a monthly frequency.	roject must be provided to the director irameters, conventional parameters, als, low level mercury, selenium and	Yes	to 107517 N/A - Authorization is now superceeded with the March 11, 2021 amendment
2018-09-07 C.1	outlet	at the break tank and the burler pond	Yes	to 107517
107517 Approval Letter 2018-09-07 C.2	For the purposes of evaluating the Project, Teck mu buffer pond outlet at a mini	num quarterly	Yes	N/A - toxicity monitoring at the buffer pond outlet at a minimum quarterly and results were submitted as per the EVO SRF Quarterly reports. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter	Teck must develop and implement a Calcite Surveil the Project before discharge commences. The Calc must include a schedule for visual monitoring of cal	ite Surveillance Monitoring Program		
2018-09-07 C.3	the project. All observations n A Quarteriy Summary Report must be submitted		Yes	N/A
107517 Approval Letter 2018-09-07 D.1a	electronically to the director and the Ktunaxa Nation Council within 30 days after the end of the quarterly period in which samples were collected, that includes the following:	Flow rates for influent and effluent at the EVO SRF	Yes	N/A - Flow rates for influent and effluent at the EVO SRF were submitted as per the EVO SRF Quarterly Reports. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.1b	A Quarterly Summary Report must be submitted electronically to the director and the Ktunaxa Nation Council within 30 days after the end of the quarterly period in which samples were collected, that includes the followine:	effluent concentrations for: Total selenium and Selenium species; Nitrate and nitrite, Dissolved oxygen, DOC and COD, Bromide and Chloride (tracers), and aluminum, ammonia, antimony, arsenic, beryllium, cadmium, chromium, cobalt, molybdenum, nickel, sulphate, sulphide, total dissolved solids, uranium and zinc	Yes	N/A - Comparision between influent and effluent concentrations for: Total selenium and Selenium species; Nitrate and nitrite, Dissolved oxygen, DOC and COD, Bromide and Chloride (tracers), and aluminum, ammonia, antimony, arsenic, beryllium, cadmium, chromium, cobalt, molybdenum, nickel, sulphate, sulphide, total dissolved solids, uranium and zinc were submitted as per the EVO SRF Quarterly Reports. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.1	A Quartery Summary Report must be submitted electronically to the director and the Ktunaxa Nation Council within 30 days after the end of the quartery period in which samples were collected, that includes the following:	Summary of operational and/or performance highlights and trends from the quarter	Yes	N/A - Summary of operational and/or performance highlights and trends were submitted as per the EVO SRF Quarterly Reports. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.1	A Quartery summary keport must be submitted electronically to the director and the Ktunaxa Nation Council within 30 days after the end of the quarterly period in which samples were collected, that includes the following:	toxicity monitoring results from the Buffer Pond Outlet	Yes	N/A - Toxicity monitoring results were submitted as per the EVO SRF Quarterly Reports. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.1 107517	Results from samples collected in the last month o the quarterly report must be included in th		Yes	N/A - Authorization is now superceeded with the March 11, 2021 amendment to 107517
Approval Letter 2018-09-07 D.1	Any deviation from the information listed in this s quarterly report and include ratio	nale for the changes	Yes	N/A - No Deviation. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.2	A final report evaluating the performance of the field study must be submitted to the director and the Ktunaxa Nation Council within six (6) months of completing the Project. The report must include:	A summary and evaluation or key operational and receiving environment monitoring data associated with the Project and all analytical results from the monitoring	Yes	N/A - Condition met with submission of the 2019 EVO SRF Fst Performance Report. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.2	A final report evaluating the performance of the field study must be submitted to the director and the Ktunaxa Nation Council within six (6) months of completing the Project. The report must include:	An evaluation of selenium and nitrate removal in treated water effluent, including selenium speciation data;	Yes	N/A - Condition met with submission of the 2019 EVO SRF Fst Performance Report. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.2	A final report evaluating the performance of the field study must be submitted to the director and the Ktunaxa Nation Council within six (6) months of completing the Project. The report must include:	A summary of the visual observations recorded as a part of the Calcite Surveillance Monitoring Program referenced in Section C.3	Yes	N/A - Condition met with submission of the 2019 EVO SRF Fst Performance Report. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.2	A final report evaluating the performance of the field study must be submitted to the director and the Ktunaxa Nation Council within six (6) months of completing the Project. The report must include:	A summary of learnings related to key risks, scientific questions, and engineering uncertainties oulined in the Application; A summary or tracers and carbon	Yes	N/A - Condition met with submission of the 2019 EVO SRF Fst Performance Report. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.2	A final report evaluating the performance of the field study must be submitted to the director and the Ktunaxa Nation Council within six (6) months of completing the Project. The report must include:	sources used in the treatment process, including types and trade names, concentrations and volumes of each type dosed, and frequency and duration of dosing; A summary or neurents used in the	Yes	N/A - Condition met with submission of the 2019 EVO SRF Fst Performance Report. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.2	A final report evaluating the performance of the field study must be submitted to the director and the Ktunaxa Nation Council within six (6) months of completing the Project. The report must include:	treatment process, including types and trade names, concentrations and volumes of each type dosed, and frequency and duration of dosing; and,	Yes	N/A - Condition met with submission of the 2019 EVO SRF Fst Performance Report. Authorization is now superceeded with the March 11, 2021 amendment to 107517
107517 Approval Letter 2018-09-07 D.2	A final report evaluating the performance of the field study must be submitted to the director and the Ktunaxa Nation Council within six (6) months of completing the Project. The report must include:	A summary of non-compliances with approval conditions including interpretation of significance, and the status of corrective actions and/or ongoing investigations.	Yes	N/A - Condition met with submission of the 2019 EVO SRF Fst Performance Report. Authorization is now superceeded with the March 11, 2021 amendment to 107517

Authorized Person Initial:______

Appendix B

This appendix contains the monitoring data for the WLC AWTF monitoring data required in Table 4B3 of Permit 107517 and the EVO SRF P2 monitoring data required in Table 4C4 of Permit 107517 for 2020.

Appendix C

This appendix contains acute toxicity test results conducted for the WLC AWTF and EVO SRF P2 in 2020 on Rainbow Trout (*Oncorhynchus mykiss*) and water flea (*Daphnia magna*).



Acute Toxicity Test Results

Sample collected January 6, 2020

Final Report

January 23, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

		Dates				
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 10°C test initiation	Daphnia magna 20°C test initiation	Daphnia magna antiscalant test initiation
WL_BFWB_OUT_SP 21_2020-01-06_N / 1920-0715	6-Jan-2020 at 0900h	7-Jan-2020 at 1030h	8-Jan-2020 at 1505h	7-Jan-2020 at 1420h	7-Jan-2020 at 1410h	7-Jan-2020 at 1435h

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_OUT_SP21_202 0-01-06_N	2.3°C	841	189

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test
- Daphnia magna 48-h single concentration screening test (conducted at 10°C)
- *Daphnia magna* 48-h single concentration screening test (conducted with 2 mg/L antiscalant)

RESULTS

Toxicity test results

	Percent survival in 100% (v/v) sample				
Sample ID	Rainbow trout	Daphnia magna 10°C	Daphnia magna 20°C	<i>Daphnia magna</i> antiscalant	
WL_BFWB_OUT_SP21_2020- 01-06_N	100	100	97	100	



	Perc	ent Immobility in 100 (%	v/v)
Sample ID	Daphnia magna 10°C	Daphnia magna 20°C	<i>Daphnia magna</i> antiscalant
WL_BFWB_OUT_SP21_2020- 01-06_N	0	7	3

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-01-	Rainbow trout	None	None
06_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.1 (2.8-3.5) g/L KCl ¹	6.4 (6.2-6.6) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.7 (2.8-4.9) g/L KCl	6.0 (5.1-7.1) g/L NaCl
Reference toxicant CV	9.5%	5.6%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, December 29, 2019; ² Test Date January 6, 2020

LC = Lethal Concentration; CL = Confidence Limit



un thiesen

Report By: Sara Thiessen, BSc Biologist

Reviewed By: Kayla Knol, BSc Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Control/dilution water for antiscalant test	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μ g/L), Na ₂ SeO ₄ (2 μ g Se/L) and 2 mg/L antiscalant
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



-	
Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 $\mu g/L$) and Na2SeO4 (2 μg Se/L)
Test solution renewal	None
Test temperature	10 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 3.Summary of test conditions: 48-h Daphnia magna survival test at 10°C



APPENDIX B – Toxicity test data



Trout Bench Sheet

lethod	TRS Client	TEC164	Reference	1920-0715		Chamber	
est Log						Sample Inform	nation
					Daily Data		1.
Day	Date	Time	Initial	Chem. Cart	Review	Initial pH:	7.4
0	2020/01/08	1505 *	AW	1	S	Initial EC (µS/c	m): 1632
1	2020/01/09	(nem)	KM	-	MM	Initial DO (mg/	
2	2020/01/10	0810	C	-	-71	Initial Temp (°C	
3	2020/01/11	0815			1.E	Salinity (ppt):	
4	2020/01/12	0012	AS QUI	1	1 the	- Saminy (ppt).	d
4	2020/01/12	1000-	NIFIE		FIL		
		Note: " ; time	when the test w	vas loaded with	itisn	00	00/ 1000/
mple Pre-						DO in mg/L (7	0% - 100%
ration rate	adjusted to 6.5 +/- 1 mL/r	nin/L : yes/no				saturation)**	
eaeration ti	me	0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg/	Lat 14°C
(mg/L) of	100%	10.1	0,6	0.9		6.1 mg/L - 8.8 mg/	'L at 15°C
						6.0 mg/L - 8.6 mg/	
st Chemist	ry and Biology					**corrected for alt	and the second se
Conc.	CTL 100	1	1	1	1	conected for all	itutie
CONC.							
				5 5 0 F)			
	1 1 1 1 1 1		pH (units) (r	ange: 5.5-8.5)			
Day 0	7.6 7.3						
Day 4	8.1 8.7						
			EC (L	IS/cm)			
Day 0	479 ICRI			1	1		
Day 4	4710 121	1					
Day 4	L'IL X			1			
		DO (mg	/L) (70-100% s	aturation at te	st temp.)		
Day 0	89 99				1		
Day 4	80 88						
Duy	0.0 0.0		1	1	1		
		-			0.000		
			emperature (°C) (range: 14-16	C)		
Day 0	14 14						
Day 4	15 15						
	l				-		
		Numb	er Alive (In brad	ckets number st	tressed)		
Day 0	10	10	T	1	1		
Day 1	10 10						
Day 2		/					
Day 3	10 10						
Day 4	1010	·					
	Validity Criteria: must k	e ≤ 10% mortality	and/or stressed	behavior in th	e control		
	Unless otherwise noted,	pehavior is consider	red to be norma	al			
ntrol Orga	nism Data				Test Organis	m Information	
Control	Length Weigh	t					
Fish	(cm) (g)				Batch	20191114TR-A	
1	23 01	Loading Densi	tu (0/1):	0.2	Course	Troutladay	
	20 0.2				Source	Troutlodge	
2	2.2 0.7	(must be ≤0.5 g/l	-}		-	-	
3	32 0.4			224	Tank #	8	
4	3.3 0.4	Mean Length	(cm):	3.64	ANF		
5	3. MF 0.3		1.0	2	Days Held at	15± 2°C	2
6	3.90 0.3	Length Range	(cm): 3	.0-3.9	(must be ≥14 d		
7	32 00			VO 2 . V	1		
8	30 0 2	Mean Weight	(a):	OUNG	Percent stock	mortality	0.3
9	24 0.7		19/-		1		0.5
	2. 0.7	(Must be ≥0.3g)			uays prior to t	test, must be ≤2%)	
10	5.10.3			205	-	0.5	
		Weight Range	: (g): 🛛 🖸	.3-0.5	Test Volume	(L)	1
mments :	O house	0.02					
	O hr: No						
	yehr: no	sppt					
	Pavious	By: 10			Data Rouiowas	10001	12
	ILEVIEWE	<u> </u>		-			(L)



Daphnia Bench Sheet

Method	DAS	C	lient	TEC164		Reference	1920)-0715	_
Test Log							Samula I	- (
Day	Date	Time T	echnician	Chem. Cart	Daily Da	ta Review		nformatio	n
0	2020/01/07	1410	0-10-	L			Initial pH:		44
1	2020/01/08			3	M	F	Initial EC (µS/cm):	632
2		1040	AW,	-	TI	~	Initial DO	(mg/L):	11.3
2	2020/01/09	1055	M	3	A	iW	Initial Terr		13
			2				Salinity (p	nt)· 2	
Lab Code	CTL A CTL B	CTL C	100 A	100 B	100 C		canney (p	J	
day			pH (uni	ts) (range: 6.	0-8 5)				
0	82 81	Q1 -	10		10	1	[1	
2	02 82	8.2.	202	78	48				
-	The all of the	Did	8.7	8.1	8:3				
	The pH of th	e sample was not ac	justed prior	to test setting, u	unless noted	in the comme	nts below		
0				EC (uS/cm)					
0	457 459	460 1	611	1620	1028				
2	462 470	466	1580	1616	1610				
			1300	1010	1010				
		DC	(ma/l)	10-100% cot	uration of		、 、		
0	21 01			10-100% sat	uration at	test temp.)		
2	So OL	82	8.2	8.2	8.2	-			
2	7.8 7.8	7.9	7.9	7.9	29				
						·			
		Te	emperatur	e (°C) (range:	18-22 °C)			
0	8 18	(8)	18	18	(8)	, 			
2	19 19	19	19	10	10				
					19				
				N.L.	A.12				
				Number					
0	10 10			(I, immob	oile)				
	10 10	10	10	10	10				
1	0 0	D	10	10	10				
2	10 10	0	16	10(17)	a				
	Validity Crit	eria: must be ≤ 1	10% morta	lity and/or al	normalh	havia in th			
	Notes: Imm	obile; daphnid d	can't swim	after 60 cos	normal be	enavior in th	e control		
	Unless othe	erwise noted, be	baulourie	alter ou sec	. even it ai	ntenna still i	nove		
Culture	Official official	i wise noted, be	naviouris	considered t	to be norn	nal			
Young jar	e	la s(s) and s lite is					-		
roung jui		Jar(s) mortality	/ days pric	or to test (mu	ist be ≤25	5%)	OI.		
0.0						_			
QA (previou		Ø)				Control Val	idity Crite	ria	
Days to first	brood (≤12 days)	Ø				Mean % mo	rtality at 40	2 hours	0-1
Average nur	mber of young produced	(≥15 young)		24		must be <1	00/)	s nours	01-
Were test tr	eatments randomized or	test trav? V	es / No			(must be ≤1	0%)		
		rest tray:	es / No						
Sample									
		1260	./						
DO % of san	nple prior to aeration:	1250	0 1	aeration rec	wirod (A	00/ 100	0(1)2		
1								les or No	
Duration of	aeration (37.5 +/- 12.5 m	L/min/L) : 20	MINF	iltered with 1	10um scr	een prior to	testing V	es or No	
Hardness (m	ig CaCO ₃ /L) of 100% :	841	19	hardness ac	liustmont	roquired (0
				- naraness ac	justment	required (<,	25 mg CaC	O_3/L)?	les or No
i la	sample after adjustment	(must be betw	een 25 - 3	0 mg CaCO ₃	/L)	-			
D'I					_				
Dilution Wa			D	O Levels (40)-100% ca	turation)	corrected a	for altitud	
Pail label / p	reparation date	:12/31	2	3 to 8.2 mg/	1 at 10°C				
Hardness of	dilution water (mg/L)	201					.1 to 7.7 mg		
		405		2 to 8.1 mg/		3.	0 to 7.6 mg	g/L at 22°C	
Commente /	Observations:		3.	2 to 7.9 mg/	Lat 20°C				
connents/		: no po	24						
	110 1	. no pp							
	48 / 0	NO OOF							
		1 1							
Re	eviewed By:		Date F	Reviewed: 1	MAN	112			
			- all I		UVIIV				



Daphnia 10°C Bench Sheet

Method	DAS 10	-		Client	TEC164		Reference	1920-0715	5	_
Test Log								Comple In		_
Test Log		- 4 -	τ'	T			<u> </u>	Sample In		n
Day		ate	Time	Technician		Daily Dai	a Review	Initial pH:		7.4
0		01/07	1470	SC/ST	3	MI		Initial EC (1632
1	2020/	01/08	2050	AW	-	TN		Initial DO	(mg/L):	11.3
2	2020/	01/09	1115	Mir	3	A	N	Initial Tem	np (°C):	13
								Salinity (p		
Lab Code	CTL A	CTL B	CTL C	100 A	100 B	100 C				1
			CILC	1.0071	1000	100 C	l	1	1	1
day				nH (un	ita) (ranga) 6	0.0.5)				
day		1 (0 -	0 -	рп (ип	its) (range: 6.	.0-0.5)		1		
0	812	6,2	6.7	36	57	37				
2	S.I	8.2	8-2	8.3	8.3	8.3				
		The pH of the	sample was n	ot adjusted prio	r to test setting,	unless noted	in the comme	ents below		
					EC (uS/cm)					
0	455	UFZ	450	1000	1625	1638		1	1	1
2	1150	1127	100	1240		1930				
2	470	41>	470	1655	1645	1640				
				DO (mg/L) (4	40-100% sat	turation at	test temp	.)		
0	9.4	Gy	9.4	9.4	4.4	9.4				
2	ay	93	92	a'2	QU	0.4				
			1.00	1.		01.1			1	
				Tomporati	10 (°C) (rang	0 13 °C				
0	10		10	Temperatu	ire (°C) (rang	e. o-12 C)				
0	12	12	12	1L	12	12				
2			11	1)	11	18				
					Numbe	r Alive				
					(I, immo					
0	10	10	10	10						
0	10	10	10	10	10	10				
1	10	10	10	10	10	10				
2	10	10	10	10	10	10				
		Validity Crit	eria: must b	e ≤ 10% mor	tality and/or	abnormal k	ehavior in t	the control		
				nid can't swi						
				d, behaviour				i illove		
Culture		omess our	i wise notes		is considered		mai			
	C4						500			
Young jar	04	-	Jar(s) morta	ality 7 days p	rior to test (i	must be ≤2	5%)	01.		
QA (previo	ous month)		0				Control Va	alidity Crite	eria	m-1
Days to firs	st brood (≤12	2 days)	0					ortality at 4		O_{-}
	umber of you		1/>15 VOUR		24		(must be ≤		io notifo	01-
	treatments ra						(11050 50 3	1070)		
vvere test i	treatments ra	indomized o	n test tray?	Yes X N	0					
Sample									3	
DO % of a	ample prior to	aperation	1 1	240/0	le poration -	oquirad (100/ 00 10	100/12	Vac	
1			[2	- 1 00	Is aeration r				Yes or No	
Duration o	f aeration (37	7.5 +/- 12.5 1	mL/min/L) :	70 min	Filtered with	110um sc	reen prior t	o testina	Yes or No	
	mg CaCO ₃ /L)			CO I TO	Is hardness					Yes or No
		-				-	. required (<25 mg Ca	$CO_3/L)$	res of No
Hardness o	of sample afte	er adjustmer	t (must be	between 25	- 30 mg CaC	$O_3/L)$	-			
					5					
Dilution W	Vater				DO Levels (40-100%	aturation	- corrector	for altitu	
		data l'	0121							
	preparation		14/21		4.1 to 10.3 r	J.		3.8 to 9.6 r		
Hardness c	of dilution wa	iter (mg/L)	203		4.0 to 10.0 r	ng/L at 9°C		3.7 to 9.4 r	ng/L at 12	°C
			e		3.9 to 9.8 m	g/L at 10°C				
Comment	s/Observatio	ons:								
		~ 1	. 000	pt						
		Hehrl	· no p	Df						
L,	Deview	1-107	· / · · ·		Deline	4 a at	1.0			
1	Reviewed By:	N		Date	e Reviewed:	(VAN)	110			



Daphnia Antiscalant

Bench Sheet

Method	DAS AS	-	Client	TEC164		Reference	192	0-0715	-
Test Log	Data	T:		Character Cont	Della Det			nformation	
Day 0	Date 2020/01/07	Time	SMSC	Chem. Cart 3	Daily Dat	a Review	Initial pH: Initial EC (44
1	2020/01/08	1040	AW	-	- H	F	Initial DO		1052
2	2020/01/09	1100	Mi	3	AV	N	Initial Terr		13
			, , ,				Salinity (p		
Lab Code	CTLA CTLB	CTLC	100A	100B	100C				
day				nits) (range: 6	.0-8.5)				
0	8.2 8.2	8.2	7.8	7.8	7.8				
2	8.2 8.2 The structure	8.3	8.3	8.3	8.3				
	The pH of the	sample was i	not adjusted pr	ior to test setting EC (uS/cm)	g, unless note	d in the comr	nents below		
0	460 460	46	1607	1610	1620				
2	458 464	466	1600	1604	1587				
			DO(ma/l)	(40-100% s	aturation	at toot tom			
0	79 20	8.6	8.2	8,2	8.2		(p .)		
2	7.9 7.8	7.8	7.9	7,9	7.9				
			т						
0	8 18	12	1 emperatu	re (°C) (range	: 18-22 °C))		1	
2	18 18	18	18	18	18				
							1		
				Number					
0	10 10	10	10	(I, immo 10	T			1	
1	10 10	10	10	10	10				
2	10 10	10	10(II)	10	10				
	Validity Cri	teria: must	be ≤ 10% mo	ortality and/o	r abnormal	behavior in	the contro	bl	
				wim after 60 s			ill move		
Culture	Uniess oth	erwise note	a, penaviou	r is considere	ed to be no	ormai			
Young jar	CI	Jar(s) mort	ality 7 days	prior to test	(must be ≤	25%)	0-1-		
						_		-	
QA (previo	us month) st brood (≤12 days)	8				Control Va Mean % m			01
	umber of young produce	d (>15 vou		24		(must be ≤		40 110015 -	01-
Were test t	reatments randomized o	n test tray?	Yes /	No		()		
Sample		17	50/0					$\overline{\mathbf{O}}$	
1	mple prior to aeration:			Is aeration re				ves or No	
	f aeration (37.5 +/- 12.5		Comin				-	Yes or No	2
1	mg CaCO $_3$ /L) of 100% :		-	Is hardness a	-	required (<25 mg Ca	$(CO_3/L)?$	Yes or No
Hardness o	of sample after adjustmer	nt (must be	e between 2	5 - 30 mg Ca	CO ₃ /L)	-			
Dilution W	/ater			Antiscalant			-	11	
	preparation date	123)	Final Concer	ntration in S	Sample:	Lm	9/L fantiscalant:	10 00 0
Hardness o	of dilution water (mg/L)	203	_	Volume of sa	ample:	500mL	Volume of	antiscalant:	15.8 ML
			6	DO Levels (10-100% c	aturation)	- corrector	d for altitude	
Comments	s/Observations: Oh 43473	: Nol	pt	3.3 to 8.2 mg				mg/L at 21°C	
	Liela	2 01		3.2 to 8.1 mg				mg/L at 22°C	
	~0m2	5 100 6	74	3.2 to 7.9 mg	g/L at 20°C				
F	Reviewed By: 10		Date	e Reviewed: (adhil	13			

Nautilus Environmental (Calgary)



APPENDIX C – Chain-of-custody form

PROJECT/CLIENTINFO Facility Name WLC AWTF Project Manager Thomas Davidson Email thomas davidson@teck.com Address 15 Km North HWY 43	2020	-01-06	2020-01-06 Toxicity SP21	160	TURN	AROUN	TIRNAROUND TIME	REGITLAR	AR			DICH			
Facility Name WLC AWTF Project Manager Thomas Davidson Email thomas davidson Address 15 Km North HW	NT INFO	00-10-	I OXICITY 21	17,1	IUK	NAKUUN	LABORATORY	KEGUL	AK		100 100 100 100 100 100 100 100 100 100	RUSH: OTHER INFO		and the second	170100
Project Manager Thomas Davidson Email thomas davidson Address 15 Km North HW						ab Name	Lab Name Nautilus Environmental	ivironmenta			Report	Report Format / Distribution	Excel	PDF	EDD
Email thomas davidson@ Address 15 Km North HW	-				La	th Contact	Lab Contact Jacklyn Pool	10			Email 1:	DL-WLC-Lab@teck.com	×	X	X
Address 15 Km North HW	@teck.com					Email	Email Jacklyn@NautilusEnvironmental.ca	lautilusEnvi	ronmental.c	8	Email 2:	Thomas.Davidson@teck.com	×	X	×
	VY 43				_	Address	Address #4, 6125 - 12 Street SE	12 Street SE			Email 3:	TeckCoal@equisonline.com			×
					-						Email 4:	Tricia.Hill@teck.com	×	X	X
City Sparwood					-	City	City Calgary		Province AB	B	Email 5:	Sudong. Yin@teck.com	x	X	x
Postal Code V0B 2G0			Country Car	Canada	Pc	ostal Code	Postal Code T2H 2K1		Country C	Canada	Email 6:	Marty.Hafke@teck.com	x	x	x
					_					-	Email 7:				101.5
					-						Email 8:				12
Phone Number (250) 603 - 9417					Phon	Phone Number	+1.403.253.7121	.7121		T		PO number	VPO0	VPO00676571	
SAMP	SAMPLE DETAILS	-			16 - N						ANALYSIS	ANALYSIS REQUESTED			
		-							A	case indicat	e below Filte	Please indicate below Filtered, Perserved or both (F, P, F/P)	F/P)		
							iti	JR.	202	18			10 10 M		
		(oN/sə)						Rutusono2_		4 841022002					
		Y) laterial (Y					AVALYS SYJANA SYJANA SYJANA SYJANA SYJANA	OM_Single OM_Single		500 @ 150					
Sample ID Sample Location		Field Matrix Hazardous M	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	A_1H3Q_TUAN 9.9647UAN 9.7737207_n0	H84_TUAN MAUT_48Hr_D	D_1H81_TUAN T viisixoT_no	AUT_488hr_D oT_ticity_Tc on_toxicity_Tc fastent	EXTRA				
WL_BFWB_OUT_SP21_2020-01-06_N WL_BFWB_OUT_SP21		s	1/6/2020	0060	0	-	×	X	-	/	×				
0-0715	-	-													
10/10		+								+					
anitaulia anitaulia		-											-		
		-								1	-				
carbenjo, Sxil botyles															
Pondition/		+								+	-				
		-													
		_								1	+				
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	SNOL		RELINQUISHED BY/AFFILIATION	HED BV/A	FFILIATIO	N	Date	te	Time		Accepted	Accepted By/Affiliation	Date	Ti	Time
			Cilmi	hon	1 Sraw	1									
SERVICE REQUEST (rush - subject to availabilit	ility)														191
Priority (2-3 business day	Regular (default) X vs) - 50% surcharge	X	Sampler's Name	ame		~	Rudy Brown	_ (Mobile #					
Emergency (1 Business Day) - 100% surcharge For Emergency (1 Dun, ACAD or Washing Contrast A12	 /) - 100% surcharg 		Sampler's Signature	lature	V	Z		V-	1	Date/Time		6-Ian-20	-20		



END OF REPORT



Acute Toxicity Test Results

Sample collected January 13, 2019

Final Report

January 28, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

			Da	tes		
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 10°C test initiation	<i>Daphnia magna</i> 20°C test initiation	Daphnia magna antiscalant test initiation
WL_BFWB_OUT_SP 21_2020-01-13_N / 1920-0750	13-Jan-20 at 0900h	14-Jan-20 at 0940h	14-Jan-20 at 1530h	14-Jan-20 at 1435h	14-Jan-20 at 1400h	14-Jan-20 at 1450h

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_OUT_SP21_202 0-01-13_N	0.5°C	902	229

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test
- *Daphnia magna* 48-h single concentration screening test (conducted at 10°C)
- *Daphnia magna* 48-h single concentration screening test (conducted with 2 mg/L antiscalant)

RESULTS

Toxicity test results

	Percent survival in 100% (v/v) sample			
Sample ID	Rainbow trout	Daphnia magna 10°C	Daphnia magna 20°C	Daphnia magna antiscalant
WL_BFWB_OUT_SP21_2020- 01-13_N	100	100	100	100

	Percent Immobility in 100 (% v/v)		
Sample ID	Daphnia magna 10°C	Daphnia magna 20°C	Daphnia magna antiscalant
WL_BFWB_OUT_SP21_2020- 01-13_N	0	0	0



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-01-	Rainbow trout	None	None
13_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.0 (2.7-3.4) g/L KCl ¹	6.4 (6.2-6.6) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.6 (2.6-5.0) g/L KCl	6.0 (5.1-7.1) g/L NaCl
Reference toxicant CV	10.8%	5.6%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, January 16, 2020; ² Test Date January 6, 2020 LC = Lethal Concentration; CL = Confidence Limit



M. Frit

Report By: Michelle Fritz, BSc Biologist

thiessen

Reviewed By: Sara Thiessen, BSc Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Control/dilution water for antiscalant test	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μ g/L), Na ₂ SeO ₄ (2 μ g Se/L) and 2 mg/L antiscalant
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



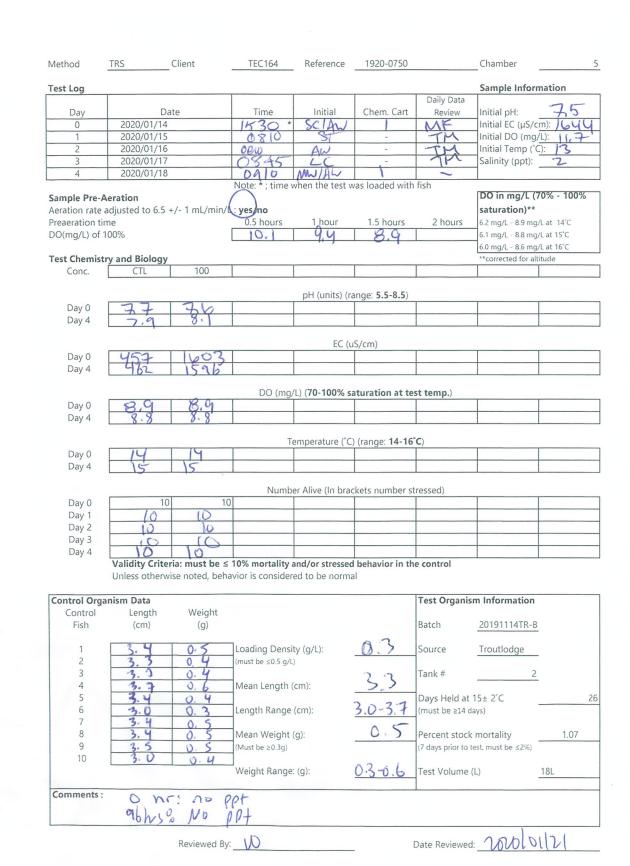
-	
Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 $\mu g/L$) and Na2SeO4 (2 μg Se/L)
Test solution renewal	None
Test temperature	10 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 3.Summary of test conditions: 48-h Daphnia magna survival test at 10°C



APPENDIX B – Toxicity test data





JAUTILUS

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Daphnia Bench Sheet

Test Log Sample Information Date Time Technician Chem. Carl Daily Data Review Initial pH: Initial DC (mg/L): Initial Temp (C): Initial Temp	Method	DAS	Client	TEC164	R	eference	1920-	0750	_
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		Dette			0.1.0			ormatio	
1 222020/01/15 CG320 MF Initial Temp (C): Initi					/			S(cm)	7.5
2 2220/01/16 Initial Temp PC: Salinity (pp): Lab Code CTLA CTLB CTLC 100A 100B 100C day 0 Image: CTLA CTLB CTLC 100A 100B 100C day 0 Image: CTLA CTLB CTLC 100A 100B 100C day 0 Image: CTLA CTLB CTLC 100A 100B 100C 2 Image: CTLA CTLB CTLC 100A 100B 100C Image: CTLB Image: CTLB <td< td=""><td></td><td></td><td></td><td>-</td><td>TM</td><td></td><td></td><td></td><td>1099</td></td<>				-	TM				1099
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			TPO METSC	3	VI				13
$\begin{array}{c c c c c c c c c c c c c c c c c c c $									2
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Lab Code	CTLA CTLB	CTLC 100A	100B	100C				
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	dav		pH (ur	ita) (ranga) (0.0.5)				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		PURU		T 7 9	.0-0.5)		1		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		a.7 83	R3 42	Q.Z	33				
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		The pH of the	sample was not adjusted prio	r to test setting,	unless noted in	the commer	its below		
2 409 470 471 1008 1029 1020 D0 (mg/L) (40-100% saturation at test temp.) 2 10 10 10 10 10 10 10 10				EC (uS/cm)					`
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		458 459	468 1619		1645				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	2	469 470	471 408	1929	1020				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			DO(ma/l)	(40-100% sat	turation at to	oct tomn			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0	Q2 02							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		8.1 8.1		82	RZ				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0			1 1 12					
Number Alive Number Alive 0 10 10 10 10 1 10 10 10 10 10 2 10 10 10 10 10 10 2 10 10 10 10 10 10 10 2 10 10 10 10 10 10 10 10 2 10 10 10 10 10 10 10 10 10 10 2 10		16 16	10 18	1B	10				
(l, immobile) $(l, immobile)$ $(l, immobile$	2	BB	18 18	18	18				
(l, immobile) $(l, immobile)$ $(l, immobile$				Numbe	r Alive				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $									
2 Validity Criteria: must be ≤ 10% mortality and/or abnormal behavior in the control Notes: Immobile; daphnid can't swim after 60 sec. even if antenna still move Unless otherwise noted, behaviour is considered to be normal Culture Young jar Jar(s) mortality 7 days prior to test (must be ≤25%) QA (previous month) Days to first brood (≤12 days) Average number of young produced (≥15 young) Were test treatments randomized on test tray? Each filtered with 100m screen prior to testing Yes or No Sample D0 % of sample prior to aeration: D_mvn Hardness (mg CaCO ₃ /L) of 100% : Is aeration required (<40% or >100%)? Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) Dilution Water Pail label / preparation date A: b)/OB Hardness of dilution water (mg/L) D: b)/OB Hardness of dilution water (mg/L) A: b)/OB Hardness of dilution water (mg/L) D: b)/OB Hardness of dilution water (mg/L)	0	10 10	10 10	1					
Validity Criteria: must be $\leq 10\%$ mortality and/or abnormal behavior in the control Notes: Immobile; daphnid can't swim after 60 sec. even if antenna still move Unless otherwise noted, behaviour is considered to be normal Culture Young jar Maintenna still move Unless otherwise noted, behaviour is considered to be normal Culture Young jar Jar(s) mortality 7 days prior to test (must be $\leq 25\%$) Control Validity Criteria Mean % mortality at 48 hours - Mean % mortality at 48 hours - (must be $\leq 10\%$) QA (previous month) Days to first brood (≤ 12 days) Average number of young produced (≥ 15 young) Were test treatments randomized on test tray? Control Validity Criteria Mean % mortality at 48 hours - (must be $\leq 10\%$) Sample DO % of sample prior to aeration: Duration of aeration (37.5 +/- 12.5 mL/min/L): Hardness (mg CaCO ₃ /L) of 100%: Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) Filtered with 110um screen prior to testing Yes or for Is hardness adjustment required (<25 mg CaCO ₃ /L)? Yes or for Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) Do Leveis (40-100% saturation) - corrected for altitude - 3.3 to 8.2 mg/L at 18°C A to 7.9 mg/L at 20°C Comments/Observations: Obs: No protein Obs: No protein		10 15	10 10	10	10				
Notes: Immobile; daphnid can't swim after 60 sec. even if antenna still move Unless otherwise noted, behaviour is considered to be normal $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	2		10 10	10	10				
Unless otherwise noted, behaviour is considered to be normal Culture Young jar Jar(s) mortality 7 days prior to test (must be $\leq 25\%$) \int_{-}^{-} QA (previous month) Days to first brood (≤ 12 days) O Control Validity Criteria Mean % mortality at 48 hours $O^{-}/_{-}$ (must be $\leq 10\%$) $O^{-}/_{-}$ Were test treatments randomized on test tray? $O^{-}/_{-}$ No Sample No D0 % of sample prior to aeration: $O^{-}/_{-}$ Is aeration required (<40% or >100%)? Yes or No Duration of aeration (37.5 +/- 12.5 mL/min/L): $O^{-}/_{-}$ Filtered with 110um screen prior to testing Yes or No Duration of aeration (37.5 +/- 12.5 mL/min/L): $O^{-}/_{-}$ Filtered with 110um screen prior to testing Yes or No Hardness (mg CaCO ₃ /L) of 100% : $O^{-}/_{-}$ Is hardness adjustment required (<25 mg CaCO ₃ /L)? Yes or No Dilution Water $O^{-}/_{-}$ $O^{-}/_{-}$ $O^{-}/_{-}$ $O^{-}/_{-}$ Pail label / preparation date $O^{-}/_{-}$ $O^{-}/_{-}$ $O^{-}/_{-}$ $O^{-}/_{-}$ Hardness of dilution water (mg/L) $O^{-}/_{-}$ $O^{-}/_{-}$ $O^{-}/_{-}$		Validity Crit	eria: must be ≤ 10% mor	tality and/or	abnormal beh	avior in th	e control		
Culture Young jar Jar(s) mortality 7 days prior to test (must be $\leq 25\%$) Image: Control Validity Criteria Mean % mortality at 48 hours QA (previous month) Days to first brood (≤ 12 days) Average number of young produced (≥ 15 young) Were test treatments randomized on test tray? Image: Control Validity Criteria Mean % mortality at 48 hours Sample Image: Control Validity Criteria Mean % mortality at 48 hours Image: Control Validity Criteria Mean % mortality at 48 hours D0 % of sample prior to aeration: Image: Control Validity Criteria Mean % mortality at 48 hours Image: Control Validity Criteria Mean % mortality at 48 hours D0 % of sample prior to aeration: Image: Control Validity Criteria Mean % mortality at 48 hours Image: Control Validity Criteria Mean % mortality at 48 hours Duration of aeration (37.5 +/- 12.5 mL/min/L): Image: Control Validity Criteria Mean % mortality at 48 hours Is aeration required (<40% or > 100%)? Yes or Mo Duration of aeration (37.5 +/- 12.5 mL/min/L): Image: Control Validity Criteria Mean % mortality at 48 hours							move		
QA (previous month) Days to first brood (≤ 12 days) Average number of young produced (≥ 15 young) Were test treatments randomized on test tray?QSControl Validity Criteria Mean % mortality at 48 hours	Culture	e d	intibe fibred, bendriour	is considered					
Days to first brood (≤ 12 days) Mean % mortality at 48 hours - (must be $\leq 10\%$) Average number of young produced (≥ 15 young) No Sample No D0 % of sample prior to aeration: Is aeration required ($<40\%$ or >100\%)? Duration of aeration ($37.5 + /- 12.5$ mL/min/L): Do mm Hardness (mg CaCO ₃ /L) of 100%: Filtered with 110um screen prior to testing Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) Is hardness adjustment required ($<25 mg CaCO_3/L$)? Ves or (M Do Levels (40-100% saturation) - corrected for altitude - 3.3 to 8.2 mg/L at 18°C 3.1 to 7.7 mg/L at 21°C Dilution Water Dilution water (mg/L) DS Do Levels (40-100% saturation) - corrected for altitude - 3.2 to 8.1 mg/L at 19°C Barber Are so f dilution water (mg/L) DS DS Do Levels (40-100% saturation) - corrected for altitude - 3.2 to 7.9 mg/L at 20°C Comments/Observations: DM : No ppl + 40 mr: model DM : No ppl + 40 mr: model	Young jar	<u> </u>	Jar(s) mortality 7 days p	rior to test (n	nust be ≤25%	5)	01-	4	
Days to first brood (≤ 12 days) Mean % mortality at 48 hours - (must be $\leq 10\%$) Average number of young produced (≥ 15 young) No Sample No D0 % of sample prior to aeration: Is aeration required ($<40\%$ or >100\%)? Duration of aeration ($37.5 + /- 12.5$ mL/min/L): Do mm Hardness (mg CaCO ₃ /L) of 100%: Filtered with 110um screen prior to testing Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) Is hardness adjustment required ($<25 mg CaCO_3/L$)? Ves or (M Do Levels (40-100% saturation) - corrected for altitude - 3.3 to 8.2 mg/L at 18°C 3.1 to 7.7 mg/L at 21°C Dilution Water Dilution water (mg/L) DS Do Levels (40-100% saturation) - corrected for altitude - 3.2 to 8.1 mg/L at 19°C Barber Are so f dilution water (mg/L) DS DS Do Levels (40-100% saturation) - corrected for altitude - 3.2 to 7.9 mg/L at 20°C Comments/Observations: DM : No ppl + 40 mr: model DM : No ppl + 40 mr: model						-			
Average number of young produced (≥ 15 young) Were test treatments randomized on test tray? Sample DO % of sample prior to aeration: Duration of aeration (37.5 +/- 12.5 mL/min/L): Hardness (mg CaCO ₃ /L) of 100%: Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) Dilution Water Pail label / preparation date Hardness of dilution water (mg/L) Pail Comments/Observations: Do Marker Pail Comments/Observations: Do Marker Do Marker Do Marker Do Levels (40-100% saturation) - corrected for altitude - 3.3 to 8.2 mg/L at 18°C 3.2 to 7.9 mg/L at 20°C Do Marker Do Marker			R						0-1
Were test treatments randomized on test tray? (e? / No Sample DO % of sample prior to aeration: Duration of aeration (37.5 +/- 12.5 mL/min/L): Hardness (mg CaCO ₃ /L) of 100% : Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) Dilution Water Pail label / preparation date Hardness of dilution water (mg/L) Pail Comments/Observations: Comments/Observations: Mee' / No Sample Is aeration required (<40% or >100%)? Filtered with 110um screen prior to testing Is aeration required (<25 mg CaCO ₃ /L)? Filtered with 110um screen prior to testing Yes or (No Is hardness adjustment required (<25 mg CaCO ₃ /L)? Do Levels (40-100% saturation) - corrected for altitude - 3.3 to 8.2 mg/L at 18°C 3.2 to 8.1 mg/L at 19°C 3.2 to 7.9 mg/L at 20°C Comments/Observations: Mee' No product Comments/Observations:			(>15 young)	25				3 hours -	01.
Sample Is aeration required (<40% or >100%)? Yes or No Duration of aeration (37.5 +/- 12.5 mL/min/L): Is aeration required (<40% or >100%)? Yes or No Filtered with 110um screen prior to testing Yes or No Hardness (mg CaCO ₃ /L) of 100%: Is hardness adjustment required (<25 mg CaCO ₃ /L)? Yes or No Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) - - Dilution Water Is all label / preparation date Is all 0/08 Is as 2 mg/L at 18°C 3.1 to 7.7 mg/L at 21°C A to 1/08 Is a 2 to 8.1 mg/L at 19°C 3.0 to 7.6 mg/L at 22°C 3.2 to 7.9 mg/L at 20°C Comments/Observations: O hr: No pp/H How parts How parts				0	(11	iust be si	070)		·
DO % of sample prior to aeration: Duration of aeration $(37.5 + /- 12.5 \text{ mL/min/L})$: Hardness (mg CaCO ₃ /L) of 100% : Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) Dilution Water Pail label / preparation date Hardness of dilution water (mg/L) Comments/Observations: DO Levels (40-100% saturation) - corrected for altitude - 3.3 to 8.2 mg/L at 18°C 3.1 to 7.7 mg/L at 21°C 3.2 to 8.1 mg/L at 19°C 3.0 to 7.6 mg/L at 22°C 3.2 to 7.9 mg/L at 20°C									
Duration of aeration (37.5 +/- 12.5 mL/min/L): Image: Control of the second	Sample								
Duration of aeration (37.5 +/- 12.5 mL/min/L): Image: Control of the second	DO % of sa	mple prior to aeration:	115%	ls aeration r	equired (<40	% or >100)%)?	les or No	
Hardness (mg CaCO ₃ /L) of 100% : Q2 Is hardness adjustment required (<25 mg CaCO ₃ /L)? Yes or Ves or	Duration of	aeration (37.5 +/- 12.5 m	nL/min/L):	-				les or No	
Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L)			902	-			9		-
Dilution Water Dilution Water Pail label / preparation date Dilution water (mg/L) Hardness of dilution water (mg/L) Dilution Comments/Observations: Ohr: Noppi Understand Here to the toppi		-	t (must be between 25					- 5, -, .	
Pail label / preparation date 'd:01/00 Hardness of dilution water (mg/L) 3.3 to 8.2 mg/L at 18°C 3.3 to 8.2 mg/L at 18°C 3.1 to 7.7 mg/L at 21°C 3.2 to 8.1 mg/L at 19°C 3.0 to 7.6 mg/L at 22°C 3.2 to 7.9 mg/L at 20°C 3.0 to 7.6 mg/L at 22°C			e (mase se sectoen 25	so mg cuco					
Pail label / preparation date 12:01/06 Hardness of dilution water (mg/L) 352 Comments/Observations: 3.3 to 8.2 mg/L at 18°C 0 hC: No ppJ 430 hC: No ppJ 430 hC: No ppJ	Dilution W	ater	0 1/2	DO Levels (40-100% sat	uration)	- corrected	for altitud	de -
Comments/Observations: 0 hV: Noppt 48 hr: noppt			19:01/06	3.3 to 8.2 m	g/L at 18°C	3	3.1 to 7.7 m	g/L at 21	°C
Comments/Observations: Ohr: Noppt 48 hr: noppt	Hardness o	f dilution water (mg/L)	352				3.0 to 7.6 m	g/L at 22	°C
43 hr: noppt	Commonte	Observations		3.2 to 7.9 m	g/L at 20°C				
48 hr: noppt	Comments		hr: No 002						
Reviewed By: D Date Reviewed: 1000121		42	hr: no pot						
Reviewed By: 10 Date Reviewed: 7000121		.0			1. 1				
	I	Reviewed By: 🚺	Dat	e Reviewed:	2020101	121			



Daphnia 10°C Bench Sheet

Method	DAS 10		Client	TEC164	R	eference	1920-0750		_
Test Log							Sample In	formatio	n
Day	Date	Time	Technician	Chem. Cart	Daily Data I	Review	Initial pH:		75
0	2020/01/14	1435	MFIPW	3	SC		Initial EC (IS/cm).	TIQUE
1	2020/01/15	0930	MK		ol		Initial DO (1077
2		4050	MIL		-1-1				15
2	2020/01/16	1300	60	1	-		Initial Tem		13
							Salinity (pp	ot):	2
Lab Code	CTLA CTL	_B CTLC	100A	100B	100C				
							•		
day			pH (un	its) (range: 6.	0-8.5)				
0	R.4 RC	1 QU	120	RO	ROT				1
2	8 7 8	3 8 3	0.0	0.5	0.0				
2	18.318.	3 33	183	8.3	0.51				
	The pH	of the sample was n	ot adjusted prio	r to test setting,	unless noted in	the comme	ents below		
		4		EC (uS/cm)					
0	404 409	B 470	11043	1660	1057				
2	VICE II	TTUTS	EXA	11,22	1638				
-	- WOLY	14-110	1201	1622	14501				
				10 1000/					
~			DU (mg/L) (40-100% sat	turation at te	st temp	.)		
0	Q.4 4.4	1 9.4	4.4.	9.4	9.4				
2	G.U D.	y Q.y	9.9	QU	qui				
			Tomporati	ure (°C) (rang	0.0 13 °C)				
0			Temperatu		e. o-12 ()				
0	14 14	12	12	2	12				
2	12 12	- 12	12	17/	12				
		t		······	t				
				Numbe	r Alive				
0				(I, immo	obile)				
0	10 10) 10	10	10	10				
1	10 10) (O	10	1.5	10				
2	10 11	112	10	ID					
	Validit	y Criteria: must k	10 < 10% mor	tality and/or	abnormal beh	avior in t	he control		I
		Immobile; dapł					I move		
	Unless	otherwise note	d, behaviour	is considered	d to be norma	al			
Culture	07								
Young jar	C3	Jar(s) mort	ality 7 days p	rior to test (r	nust be ≤25%	5)	O_{-}		
55			and) i dajo p				-1-		
QA (previo		0			Co	ontrol Va	alidity Crite	eria	N-1
	st brood (≤12 days)	0			M	ean % m	ortality at 4	8 hours -	01-1
Average nu	umber of young prod	duced (≥15 you	ng)	25	(m	nust be ≤	10%)		
	treatments randomiz			10	(,		
		ica on cost day.							
Sample		1							
DO % of s	ample prior to aeration	on 100)	Is aeration r	equired (<409	% or \10	0% 12	Yes or No	5
								1 23 01 140	X
Duration o	f aeration (37.5 +/- '	12.5 mL/min/L) :		Filtered with	110um scree	en prior t	o testing	Yes or No) ((c
Hardness (mg CaCO ₃ /L) of 100 ⁴	%: 902			adjustment re			50-/112	Yes or No
			•			.quireu (Ly mg cut	LO 3/ L/.	ies of the
Hardness d	of sample after adjus	stment (must be	between 25	- 30 mg CaC	:O ₃ /L)	-			
Dilution V	Vater			DO Levels (40-100% sat	uration)	- corrected	for altitu	
	preparation date	7:01/~	>						
		4.010		4.1 to 10.3 n			3.8 to 9.6 m	0	
Hardness o	of dilution water (mg	/L) .652		4.0 to 10.0 n			3.7 to 9.4 m	ng/L at 12	°C
		25	2	3.9 to 9.8 m	g/L at 10°C				
Comment	s/Observations:	Obrigg							
		Un no	PPF						
	1	Rinhow	24						
		10h mp			10-10	1			
	Reviewed By: 🕠		Date	e Reviewed:	IKINI	121			



Daphnia Antiscalant

Bench Sheet

Method	DAS PS	Client	TEC164		Reference	1920	0-0750	_
Test Log						Sample In	formation	
Day	Date		Chem. Cart		a Review	Initial pH:		7.5
0		150 MFIAW	3	S	С	Initial EC (1644
1	202010115 0	BSO ME	-	T	1	Initial DO		11-7
2	12290110 110	DSO MF	3	¥	4	Initial Tem		13
Lab Code	CTLA CTLB	CTLC 100A	100B	100C		Salinity (pp	5t).	L
			1000	1000	1			
day		pH (ur	nits) (range: 6	.0-8.5)				
0	B.4 8.4 E	3.4 8.0	B.O	8.0				
2	8.3 8.3 8	3.3 8.3	8.3	8.3				
	The pH of the san	nple was not adjusted pri	EC (uS/cm)	g, unless note	ed in the comn	nents below		
0	CLOS R4L	108 10051	1030	11028				
2	467 470 4	13 609	Hollo	ILOTT				
2		DO (mg/L)	(40-100% s		at test tem	p .)		
0 2	8.6 8.2 9	3.4 8.4	8.4	8.4				
2	B. 1 B. 1 E	5.1 8.1	D-1	DI				
		Temperatu	re (°C) (range	18-22 °C)			
0	13 13 1	3 1B	18	18				
2	19 19	19 19	19	19				
	V							·
			Number					
0	10 10	10 10	(I, immo					
1	10 10	10 10	10	10				
2		0 10	10	10				
	Validity Criteri	a: must be ≤ 10% mo	ortality and/o	r abnormal	behavior in	the contro		
		ile; daphnid can't sv				ill move		
	Unless otherw	ise noted, behaviou	r is considere	ed to be no	ormal			
Culture		(c) mortality 7 days	prior to tost	(manuat lan a	250()	01		
Young jar		(s) mortality 7 days	prior to test	(must be s	25%)	01-		
QA (previo	ous month)				Control Va	lidity Crite	eria	
Days to firs	st brood (≤12 days)	8	05		Mean % m			01.
Average n	umber of young produced (2	≥15 young)	25		(must be ≤	10%)		
Were test	treatments randomized on te	est tray? (Yes)/	No					
Sampla								
Sample	male aries to senti-	115	la ann 2		100/ 10	00(1)0	5	
	ample prior to aeration:		Is aeration re	1			Yes or No	
	f aeration (37.5 +/- 12.5 mL/					-	Yes of No	
	mg CaCO ₃ /L) of 100% :		Is hardness a	-	required (<25 mg Ca	$CO_3/L)?$	Yes or No
Hardness of	of sample after adjustment (must be between 2	5 - 30 mg Ca	CO ₃ /L)	-			
Dilution V	Votor		Anticcolout					
	preparation date 2:4	21108	Antiscalant Final Concer	tration in	Sampla:	Zmg	IL	
	of dilution water (mg/L)	237MF	Volume of sa			-	antiscalant:	15.811
	, <u>, , , , , , , , , , , , , , , , , , </u>	252	. stanic or st	- ipici		. siance of	antiscalant.	in da
		c-10	DO Levels (4	40-100% s	aturation)	- corrected	l for altitude	-
Comment	s/Observations: Ohr :		3.3 to 8.2 mg	g/L at 18°C			ng/L at 21°C	
	48hr-n	Not	3.2 to 8.1 mg			3.0 to 7.6 n	ng/L at 22°C	
	10111-1	-pp:	3.2 to 7.9 mg	g/L at 20°C				
	Reviewed By: <u></u>	Date	e Reviewed:	2001	14/10			



APPENDIX C – Chain-of-custody form

Teck						Page	e 1	of	1										
		2020-01-	13_T	oxicity	SP21	TURN	AROUN			REGU	LAR					RUSH:	-	-	
	PROJECT/CLIENT INFO		(Second	Section 201		185. COM		-	ABORA		S. 15. 5	a de la come	4		Calle Server	OTHER IN	FO		Sec. 1
Facility Name			-			1	.ab Name	-			al		Rep	ort Fo	ormat / Dis	stribution	Excel	PDF	EDD
Project Manager	Thomas Davidson				Long Street Street	La	b Contact	Jac	klyn Pool				Email	1:	DL-WLC-	-Lab@teck.com	X	X	X
Email	thomas.davidson@teck.com						Email	Jac	klyn@Na	utilusEnv	ironmenta	l.ca	Email	2:	Thomas.D	Davidson@teck.c	om X	x	x
Address	15 Km North HWY 43						Address	#4,	6125 - 12	Street S	E		Email	3:	TeckCoal	@equisonline.co	m	1. 19 5 2	x
													Email	4.			x	X	x
City	Sparwood		-	Province	BC		City	Cal	leary		Province	AR	Email			l@teck.com	x	x	X
Postal Code	V0B 2G0				Canada	Po	stal Code	-				Canada				in@teck.com		(A. 87 201-202	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
		and an and a second	-	country	Cunada	10	star code	121	IT ZICI		Country	Canada	Email		Marty.Hat	fke@teck.com	X	X	X
		- Indend					-	-					Email	7:			121.00		
								-					Email	8:			1. 20		
	the state of the s		-																
Phone Number	(250) 603 - 9417	C	La Strackson			Phone	e Number	+1.	403.253.7	121) number	VPO	00676571	
	SAMPLE DETAIL	S		111111111111		100000000							ANALY	SIS RI	EQUESTI	D			
									Contractor of the	20000440000	a Martinese an	Please in	dicate below	Filtered	d. Perserve	d or both (F, P,	F/P)	and the second second	
												a second	A. Way a Star	1.1.1		the same so		1 2 3 5	1.
							1		itrat	ntra	ntrat	atra							
			Hazardous Material (Yes/No)						NAUT_96Hr_RT_Single_Concentrati on_Toxicity Test	nce	VAUT_48Hr_DM_Single_Concentrat on_Toxicity Test @ 20C	ncei							
			Yes					SIS	C	Ŭ	CC	Ŭ, +							
			al (ANALYSIS	ngle	ingle 10C	ingle 20C	20C							
1			iteri					AN	r_si	M_S t @	M S t a	d S t a							
			M						r_R ^T	Tes	Tcs	Tes							
			ous						6H1 city	8Hn city	8Hr city	8Hr city							
		Field	zarc		Time	G=Grab	# Of		Loxi	Tox.	TOXI	Toxi Scal	RA						
Sample ID	Sample Location	Matrix	На	Date		C=Comp			NAL 0n_	NAUT_48Hr_DM_Single_Concentrat ion_Toxicity Test @ 10C	NAL Ion	NAUT_48Hr_DM_Single_Concentrat ion_Toxicity Test @ 20C + Antiscalant	EXTRA						
_BFWB_OUT_SP21_2020-01-13_N	WL_BFWB_OUT_SP21	WS		1/13/20	20 0900	G	8		х	х	X	X	X				-		
120-0750																			
20/01/14																			+
2-40							-			-				-					-
antonin									-					-				-	4
P.	1			in the second second						-									
	1.1																		
LUL CARDON/S, DUILD	TTIES																		
e 201 carboys, Ballbo 05/Noz 062 Condition 5°C																			
obd Condition											_							1	
.5°C																	-		-
											-							-	
ADDITIONAL COMMENTS/SPE	CIAL INSTRUCTIONS	a all the set	1.142	RELINQ	UISHED BY/AF	FILIATIO	N		Date		Ti	me	Acces	oted By	y/Affiliatio	on	Date	т	ïme
				1ch	a John	son		1	3 30	0							Duit		mie
SERVICE REQUEST (rush - s	ubject to availability)	1.1.1.1.1.1		Sec. State			1.1.1.1.1					Sec. 1						100000	
	Regular (c	default) X		Samel.	Name			1.0								1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			
	y (2-3 business days) - 50% sur			Sampler'	s Name		Mar	rk G	aizauska	S		Mob	ile #						
	cy (1 Business Day) - 100% sur							_			and the state of the					and the second se			



END OF REPORT



Acute Toxicity Test Results

Sample collected January 20, 2020

Final Report

February 7, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

			Da	tes		
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 10°C test initiation	<i>Daphnia magna</i> 20°C test initiation	Daphnia magna antiscalant test initiation
WL_BFWB_OUT_SP21_ 2020-01-20_N / 1920-0772	20-Jan-20 at 0900h	21-Jan-20 at 1000h	21-Jan-20 at 1530h	21-Jan-20 at 1425h	21-Jan-20 at 1405h	21-Jan-20 at 1425h

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_OUT_SP21_202 0-01-20_N	6.7°C	910	212

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test
- *Daphnia magna* 48-h single concentration screening test (conducted at 10°C)
- *Daphnia magna* 48-h single concentration screening test (conducted with 2 mg/L antiscalant)

RESULTS

Toxicity test results

	Percent survival in 100% (v/v) sample								
Sample ID	Rainbow trout	Daphnia magna 10°C	Daphnia magna 20°C	Daphnia magna antiscalant					
WL_BFWB_OUT_SP21_2020-01-20_N	100	100	100	100					

	Percent Immobility in 100 (% v/v)							
Sample ID	Daphnia magna 10°C	Daphnia magna 20°C	<i>Daphnia magna</i> antiscalant					
WL_BFWB_OUT_SP21_2020-01-20_N	0	0	0					



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-01-20_N	Rainbow trout	None	None
VVL_DFVVD_OU1_3P21_2020-01-20_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.0 (2.7-3.4) g/L KCl ¹	6.3 (5.8-6.7) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.6 (2.6-5.0) g/L KCl	6.1 (5.1-7.1) g/L NaCl
Reference toxicant CV	10.8%	5.5%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, January 16, 2020; ² Test Date January 20, 2020 LC = Lethal Concentration; CL = Confidence Limit



Michael Ulrubleshi

Report By: Michael Wrubleski, BSc Biologist

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Reviewed By: Tamara McClure, BSc Quality Assurance Manager

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μ g/L) and Na ₂ SeO ₄ (2 μ g Se/L)
Control/dilution water for antiscalant test	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μ g/L), Na ₂ SeO ₄ (2 μ g Se/L) and 2 mg/L antiscalant
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



-	
Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 $\mu g/L$) and Na2SeO4 (2 μg Se/L)
Test solution renewal	None
Test temperature	10 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 3.Summary of test conditions: 48-h Daphnia magna survival test at 10°C



APPENDIX B – Toxicity test data





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7 3.6 0.7 Mean Weight (g): 0.7 Percent stock mortality 1.57 9 3.7 0.7 Mean Weight (g): 0.7 Percent stock mortality 1.57 9 3.7 0.7 Mean Weight (g): $0.6 - 0.8$ Percent stock mortality 1.57 10 3.7 0.7 Mean Weight (g): $0.6 - 0.8$ Test Volume (L) 18 omments : 0 VS3 N 0 Percent stock mortality 1.57 0 N 0 Percent stock mortality 1.57 18	6	3-6	0.6	Length Range ((cm):	5.6-2.9				
8 9 10 3.7 0.7 Mean Weight (g): (Must be $\geq 0.3g$) Weight Range: (g): 0.6-0.8 Test Volume (L) 18 0.6-0.8	7	3.8	0.7			~	1			
9 10 3.7 0.7 Weight Range: (g): 0.6-0.8 Test Volume (L) 18 0.5 0.6-0.8	8	37		Mean Weight (g):	0.7	Percent stock	mortality	1.57	
10 3.7 0.7 Weight Range: (g): 0.6-0.8 Test Volume (L) 18 omments: 0.45% Nb /lft 0.6-0.8 Test Volume (L) 18	9	3.9	0		-					
Weight Range: (g): $0.6 - 0.8$ Test Volume (L) 18 Dimments: DimS3 Nb //f 0b/S3 Nb //f		3.7	A			61		,		
omments: Ows3 No 1Pt 9625 No Fet			<u> </u>	Weight Range:	(g):	0.6-0.8	Test Volume	(L)	18	
96LSS NO PPT				- 3						
	omments :		Ow?	Alp 10	F					
			all		1					
			TONSO	ND	60+					
Reviewed By: D Date Reviewed: 700000					+ +			2011	0	
			Reviewed Bv:	10		[Date Reviewed	IDDIAN	M	



Daphnia Bench Sheet

Method	DAS20	Client	TEC164	Reference	e1920-0772	
Test Log					Sample Information	1
Day	Date	Time Techniciar	h Chem. Cart	Daily Data Review	Initial pH:	7.2
0	2020/01/21	405 MELKK	3	M	Initial EC (µS/cm):	Igo
1		920 YK	-	TM	Initial DO (mg/L):	10.0
2	2020/01/23	030 Mu	3	KK	Initial Temp (°C):	13
					Salinity (ppt):	2
Lab Code	CTLA CTLB	CTLC 100 A	100 B	100 C		
	•			0.05		
day		pH (u	nits) (range: 6	.0-8.5)		
0	80 8001	9.0 7.7	7.8	7.8		
2	82 8.2	8.2 8.3	8.3	8-3		
	The pH of the sar	nple was not adjusted pri	or to test setting,	unless noted in the comm	ents below	
			EC (uS/cm)			
0	430 443 1	441 1586	2 1580	1588		
2	441 445 4	144 (57)	1584	1590		
					-	
		DO (mg/L)	(40-100% sa	turation at test tem	p.)	
0	81 81	8.1 8.2	8.2	8.2		
2	8.0 8.0	8.0 8.0	0.0	8,0		
		-	(86) (1000	a. 10 22 °C		
			ture (°C) (rang			
0	19 19	19 18	(8)	18		
2	8 8	18 18	18	18		
			Numb	er Alive		
			(I, immo			
		10 10		10		
0	10 10	10 10	10			
1	16 10	(0 10	10	10		
2	10 10	10 10	10	abnormal behavior in	the control	
	Validity Criter	hilo: daphpid cap't si	wim after 60 s	ec. even if antenna st	ill move	
	Notes: Immo	wise noted, behaviou	ir is considere	d to be normal		
Culture	Offiess other	wise noted, benaviou	ar is considere			
Culture	C) 12	ar(s) mortality 7 days	nrior to test (must be $\leq 25\%$)	0-1-	
Young jar		ii(s) mortailty 7 days	phor to test (11030 30 22370)		
OA (provic	ous month)			Control	Validity Criteria	-1
	st brood (≤12 days)	G			mortality at 48 hours -	01-
	umber of young produced (≥ 15 yound)	25	(must be		
	treatments randomized on t			_		
were test						
Sample						
	ample prior to aeration:	110	ls peration	required (<40% or >	100%)? (Yes or N	lo
Duration c	of aeration (37.5 +/- 12.5 mL	/min/L): 20mir	L Filtered with	th 110um screen prio	5	Yes of No
Hardness	(mg CaCO ₃ /L) of 100% :	910	Is hardness	s adjustment required	$d (< 25 \text{ mg CaCO}_3/L)?$	TESUINO
Hardness	of sample after adjustment	(must be between 2	25 - 30 mg Ca			
	1					
Dilution V	Vater	1	DO Levels	(40-100% saturatio	 n) - corrected for altitude 	
Pail label /	preparation date	01/14	3.3 to 8.2 r	ng/L at 18°C	3.1 to 7.7 mg/L at 2	
	of dilution water (mg/L)	708	3.2 to 8.1 r	ng/L at 19°C	3.0 to 7.6 mg/L at 2	2°C
			3.2 to 7.9 r	ng/L at 20°C		
Comment	s/Observations:	in a mt				
		Phil Phil				
	-ISWS 0	No PPt				
				1 1 1		
	Reviewed By: 🕠	E	Date Reviewed	ediolaras:		
	VV					



Daphnia 10°C Bench Sheet

Method	DAS 10	Client	TEC164	Ret	ference 192	20-0772		
Test Log					Sar	nple Info	rmation	
Day	Date	Time Techniciar	Chem. Cart	Daily Data Re		tial pH:		12
0	2020/01/21	1425 MF/KK		im		ial EC (µS/	/cm):	Kalo
1	2020/01/22	GG40 CIL		TM		ial DO (mo		1000
2			7	1.				10.8
۷	2020/01/23	1040 MW	5	KIL		ial Temp (13
					Sali	inity (ppt):		7
Lab Code	CTLA CTLB	CTLC 100 A	100 B	100 C				L
day		pH (u	nits) (range: 6	.0-8.5)				
0	PU PU	B11 710	7.7	77				
2	Q Q.	8.1 91	81	8.2				
2	The pH of the	e sample was not adjusted pri	or to tost sotting	0				
	the pri of the	e sample was not aujusted pri	EC (uS/cm)	, unless noted in th	le comments t	Jelow		
0		1112 1/11		167	1			
0	450 445	4441011	1610	1602				
2	448 450	450 1596	1619	605				
		DO (ma/L)	(40-100% sa	turation at tes	t temp.)			
0	gu gu	9.49.6	9.6	Gila				
2	az au	AIL OF	a.6					
2	9.0 9.9	9.9 9.)	1.6	9.6				
		Tomporat	turo (°C) (rano	0.0 13 °C)				
0		Temperar	ture (°C) (rang	e. o-12 C)				
0		211	<u> </u>	.11				
2	ID 10	0 10	0	10				
			Numbe	er Alive				
			(I, immo	obile)				
0	10 10	10 10	10	10				
1	10 10	10 10	(0)	0				
2		10 10	10	12				
L	Validity Cri	teria: must be ≤ 10% mo			vior in the c	ontrol		
		nobile; daphnid can't sv			nna suii mo	ive		
	Unless oth	erwise noted, behaviou	r is considere	d to be normal				
Culture	122				_	1.1		
Young jar	02	Jar(s) mortality 7 days	prior to test (must be ≤25%)		7-1.		
QA (previo	ous month)	C.		Cor	ntrol Validi	ty Criteria	а	
Days to fir	st brood (≤12 days)	8		Mea	an % morta	lity at 48 l	hours -	OI-
	umber of young produce	d (≥15 vouna)	35		ist be ≤10%			
	treatments randomized of		No	,		/		
were test	treatments fundomized (in test truy.	110					
Comple								
Sample						<u> </u>	2	
DO % of s	ample prior to aeration:	113	Is aeration i	required (<40%	or >100%)? Ye	or No	
Duration o	of aeration (37.5 +/- 12.5	ml(min/l): 20arda	- Filtered with	n 110um screen	prior to to	cting Vo	es or No	
						0		6
Hardness	(mg CaCO ₃ /L) of 100% :	40	Is hardness	adjustment rec	juired (<25	mg CaCO	$V_{3}/L)?$ Y	es or No
Hardness	of sample after adjustme	nt (must be between 2	5 - 30 mg Ca	$O_3/L)$	-			
			5					
Dilution V	Nater		DO Levels	40-100% satu	ration) - co	priected fo	or altitude	-
	preparation date	LOUIH	4.1 to 10.3 i					
						-	/L at 11°C	
naroness	of dilution water (mg/L)	200	4.0 to 10.0 r		3.7	to 9.4 mg,	/L at 12°C	
			3.9 to 9.8 m	g/L at 10°C		120	1	
Comment	s/Observations:	hr:no ppt						
	196	· AL DAL						
	Ow,s	· No PPf		1	1			
	Reviewed By: \\	Da	te Reviewed:	1010101	129			
				IVI				



Daphnia Antiscalant

Bench Sheet

Method	DAS AS	Client	TEC164		Reference	192	0-0772	
		-						-
Test Log						Sample In	formation	
Day	Date	Time Technicia	n Chem. Cart	Daily Da	ta Review	Initial pH:		77
0	2020/01/21	1425 MEIKIK	3	٨٨	m	Initial EC (µS/cm):	1000
1	2020/01/22	6915 VIL	-	-1	PC	Initial DO	(mg/L):	10.5
2	2020/01/23	1015 MW	3		XX	Initial Tem		120
						Salinity (p		
Lab Code	CTLA CTLB	CTLC 100A	100B	100C	1			
							1	J]
day		pH (u	nits) (range: 6	5.0-8.5)				
0	EI BI	PIL TP	1.0	7.8				
2	82 8.2	8.7 8.3	8.3	8:5	1			
	The pH of the	sample was not adjusted p	rior to test settin	g, unless note	ed in the comr	nents below	1	
			EC (uS/cm)	-				
0	431 440	UMI KAR	ISEN	1592	1			
2	446 446	448 1576	1582	177				
				1.1.1.	1		1	
		DO (mg/L) (40-100% s	aturation	at test tem	ip.)		
0	PIL PI	B.1 p.7	87	67				
2	7.9 80	8.0 8.0	8.0	8.1				
					1	1	1	L]
		Temperatu	ire (°C) (range	: 18-22 °C)			
0	9 19	19 10	(8)	IP				
2	18 18	18 18	18	IB				
				10	1		1	
			Numbe	r Alive				
			(I, imm					
0	10 10	10 10	10	10		1		
1	10 10		61	10				
2	10 10	10 10		0				
2		teria: must be ≤ 10% m	Ortality and/o		 hohovior ir	the contro		
	Notes: Imm	nobile; daphnid can't s	wim after 60		f antonna st	ill movo	1	
		erwise noted, behavior				in move		
Culture	Unless Util	erwise noted, benavior	ur is considere	ed to be no	Junai			
Young jar	172	lar(c) mortality 7 days	prior to tast	(must be	250/1	-11		
roung jai	14	Jar(s) mortality 7 days	prior to test	(must be s	25%)	·		
A (provid	ous month)				Cantural M	I de cate		
	st brood (≤12 days)	6				alidity Crit		NI
			25			ortality at 4	8 hours -	01-
	umber of young produce		2		(must be ≤	10%)		
vere test	treatments randomized o	n test tray? Yes /	No					
ample							5	
00 % of s	ample prior to aeration:	110	Is aeration re	equired (<-	40% or >10	0%)? (Yes or No	
Duration o	of aeration (37.5 +/- 12.5 i	mL/min/L): 2000	- Filtered with	110um sc	reen prior t	o testina	Yes or No	
	(mg CaCO ₃ /L) of 100% :		Is hardness a					Vacantia
					() equiled	<25 mg Car	$(U_3/L)!$	Yes or No
lardness (of sample after adjustmer	nt (must be between 2	25 - 30 mg Ca	$CO_3/L)$	-			
Dilution V			Antiscalant			-		
	preparation date	.01/14	Final Concer	ntration in	Sample:	12 ma	716	~
Hardness of	of dilution water (mg/L)	208	Final Concer Volume of s	ample: 🗧	Dome	Volume of	antiscalant:	5.BUL
			DO Levels (40-100% s	aturation)	- corrected	for altitude	-
Comment	s/Observations: Ohr	: NO DOL	3.3 to 8.2 mg				ng/L at 21°C	
	lini	- YYI	3.2 to 8.1 m				ng/L at 22°C	
	4865	GNOPPT	3.2 to 7.9 mg				31-11-12-0	
			1	,				
	Reviewed By: 🕠		e Reviewed:	1000	0179			



APPENDIX C – Chain-of-custody form

Teck						Pa	ge	l of 1											
		2020-01	-20_7	oxicity_S	P21	TUR	NAROUN	DTIM	E:	REGUI	LAR				DI	SH:			
	PROJECT/CLIENT INFO							LAB	ORAT	ORY				S. June		THER INFO)		
	WLC AWTF						Lab Name	Nautili	us Envi	ronmen	tal		Rep	ort Form	nat / Distrib		Excel	PDF	I
Project Manager	Thomas Davidson	dina.				L	ab Contact	Jackly	n Pool				Email		DL-WLC-Lab		x	x	
Emai	thomas.davidson@teck.com						Email	Jacklyr	Nau	tilusEnv	ironmen	tal.ca	Email	2: 1	Thomas David	son@teck.com	1 - 1 - 1	x	-
Address	15 Km North HWY 43						Address	#4, 612	25 - 12	Street S	E		Email		FeckCoal@equ		-	A	2
						1		-				-	Email 4						
City	Sparwood			Province BC			City	Calgar	2	-	Dentis				ricia Hill@tee	ck.com	X	X	
Postal Code	V0B 2G0			Country Ca		D	ostal Code	-	_		Provinc	-	Email 5	0	sudong.Yin@to		X	X	
				country Ca	nada	P	ostal Code	12H 2H	CI		Country	Canada	Email (-	Marty.Hafke@	teck.com	X	X	
			-				-						Email 7	7:					A STATE
	and the second					-		-					Email 8	3:			Sec. 1	125.1	
						10.000											-		-
Phone Number	(250) 603 - 9417					Phor	ne Number	+1.403	253.71	21					PO nun	nber	VPO00	676571	1
	SAMPLE DETAI	LS	-			8			COP.OR DO		Lines		ANALYS	IS REQ	UESTED				
										an shire	Sec. 2					and the second			
												Please ind	icate below F	iltered, I	Perserved or I	both (F, P, F)	P)	Cart	23
Sample ID WL_BFWB_OUT_SP21_2020-01-20_N 1920-0772 2020/01/21	Sample Location WL_BFWB_OUT_SP21	Field Matrix WS	Hazardous Material (Yes/No)	Date 1/20/2020	Time (24hr) 0900		# Of	ANALYSIS ANALYSIS ANALYSIS NAUT_96Hr_RT_Single_Concentratio		× NAUT_48Hr_DM_Single_Concentrati on_Toxicity Test @ 10C	X NAUT_48Hr_DM_Single_Concentrati on_Toxicity Test @ 20C	× NAUT_48Hr_DM_Single_Concentrati on_Toxicity Test @ 20C + Antiscalant	X EXTRA						
262 10:00					-	-		-	-						-	-			-
Manitoulin																-			-
Azelo:00 Manitoulin 3c 3x20L carbozo,5x1LL No3/Nob Good Condition	oottles																		
6.10				-															
ADDITIONAL COMMENTS/SPE	CIAL INSTRUCTIONS			RELINQUISI	IED RV/AI	CELLIATIO	N	_	Date]			_				_	
			Br	eth	as.	2		1/2		م	Tir	ne	Accepto	ed By/A	ffiliation	D	ate	Ti	ne
		•																	_
SERVICE REQUEST (rush - s		1.0.10													1. 1			1.1.4	-
		default) X		Sampler's Na	ime		L	es Tipto	n			Mobil	e #						-
Emergen	y (2-3 business days) - 50% su cy (1 Business Day) - 100% su	urcharge						1.0				widdi	C #						
				ampler's Sign															



END OF REPORT



Acute Toxicity Test Results

Sample collected January 27, 2020

Final Report

February 14, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

			Da	tes		
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 10°C test initiation	<i>Daphnia magna</i> 20°C test initiation	Daphnia magna antiscalant test initiation
WL_BFWB_OUT_SP 21_2020-01-27_N / 1920-0809	27-Jan-20 at 0900h	28-Jan-20 at 1000h	29-Jan-20 at 1445h	28-Jan-20 at 1405h	28-Jan-20 at 1355h	28-Jan-20 at 1400h

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_OUT_SP21_202 0-01-27_N	8.3°C	860	213

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test
- Daphnia magna 48-h single concentration screening test (conducted at 10°C)
- *Daphnia magna* 48-h single concentration screening test (conducted with 2 mg/L antiscalant)



RESULTS

Toxicity test results

		Percent survival in	100% (v/v) sample	9
Sample ID	Rainbow trout	Daphnia magna 10°C	Daphnia magna 20°C	Daphnia magna antiscalant
WL_BFWB_OUT_SP21_2020- 01-27_N	100	100	100	100

	Percent Immobility in 100 (% v/v)		
Sample ID	Daphnia magna 10°C	Daphnia magna 20°C	<i>Daphnia magna</i> antiscalant
WL_BFWB_OUT_SP21_2020- 01-27_N	0	0	0

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-	Rainbow trout	None	None
01-27_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	4.0 (3.5-4.4) g/L KCl ¹	6.3 (5.8-6.7) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.5-4.9) g/L KCl	6.1 (5.1-7.1) g/L NaCl
Reference toxicant CV	11.0%	5.5%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, January 28, 2020; ² Test Date January 20, 2020 LC = Lethal Concentration; CL = Confidence Limit



thiesen

Reviewed By: Sara Thiessen, BSc Biologist

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.

Report By: Adam Wilson, BSc Biologist



APPENDIX A – Summary of test conditions



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μ g/L) and Na ₂ SeO ₄ (2 μ g Se/L)
Control/dilution water for antiscalant test	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μ g/L), Na ₂ SeO ₄ (2 μ g Se/L) and 2 mg/L antiscalant
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



-	
Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 $\mu g/L$) and Na2SeO4 (2 μg Se/L)
Test solution renewal	None
Test temperature	10 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 3.Summary of test conditions: 48-h Daphnia magna survival test at 10°C



APPENDIX B – Toxicity test data



Trout Bench Sheet

Method	Client	TEC164	Reference	192	0-0809	Chamber	5
Test Log						Sample Info	rmation
					Daily Data		-
Day	Date	Time	Initial	Chem. Cart	Review	Initial pH:	7.3
0	2020/01/29	1445 *	MF	1	St.	Initial EC (µS/	(cm): 1570
1	2020/01/30	0900	SC	-	TM	Initial DO (m	g/L): 2.1
2	2020/01/31	0750	0	-	TPL	Initial Temp (°C): 19
3	2020/02/01	0845	M	-	15	Salinity (ppt):	
4	2020/02/02	0901	Ŭ=	1	CB		
Preaeration ti DO(mg/L) of	adjusted to 6.5 +/- 1 mL/m	Note: * ; time v note: * ; time v no 0.5 hours	1 hour	1.5 hours	2 hours	DO in mg/L saturation)** 6.2 mg/L - 8.9 m 6.1 mg/L - 8.8 m 6.0 mg/L - 8.6 m **corrected for a	¢ g/L at 14°C g/L at 15°C g/L at 16°C
Conc.	CTL 100					T	
					1		1
			pH (units) (ra	nge: 5.5-8.5)			
Day 0	7879		(3	1		1
Day 4	8.2 82	-	*****				1
,		I			1	1	1
			EC (u	S/cm)			
Day 0	472 1559	31 1					1
Day 4	483 1502						
1		I			1	1	
	- 0	DO (ma/l	.) (70-100% s a	turation at te	st temp.)		
Day 0	8.9100		,			1	1
Day 4	81. 98						
,	0.4 0.0				1		
		То	mporaturo (°C)	(range: 14 16			
Day 0	19 10		mperature (°C)	(range. 14-10		1	1
Day 4					1		
Day 4	L 15 15						
		Numbe	r Alive (In brac	vote number et	raccad		
Day 0	\square	I T		cets number st	Tesseu)	1	1
Day 1	10 10						
Day 2							
Day 3							
	10 10						
Day 4							
	Validity Criteria: must be	$\leq 10\%$ mortality an	nd/or stressed	behavior in th	e control		
	Unless otherwise noted, be	enavior is considere	d to be normal				
ontrol Orga	nicm Data						
Control	Length Weight				rest Organisr	n Information	
Fish				-	Patel	2020011177	
. 1311	(cm) (g)			84. 27	Batch	20200114TR	-
1	27 01	Londing Dansit	(~/)	0.3	Courses	Canala T	
2	34 84	Loading Density	(g/L):	0.0	Source	Smoky Trout F	arms
3	21 22	(must be ≤0.5 g/L)			T 1 <i>u</i>		
	36 0.5	Mandala		21-	Tank #	3	-
4	32 0.4	Mean Length (ci	n): -	3.6			
5	35 82			2	Days Held at 1		15
6	33 0.5	Length Range (c	:m):	3.23.7	(must be ≥14 da	ys)	
7	3.5 0.6			0			
8	3.7 0.6	Mean Weight (g):	0.5	Percent stock	mortality	0.25
9	3.7 0.6	(Must be ≥0.3g)	-		(7 days prior to te	st, must be ≤2%)	
10	36 0.5			nd ni			
	¢ co	Weight Range: (g): (17-0.0	Test Volume (L	.)	18
			-				
omments :	O but an and			1			
	Onr: no ppt						
	Alph no not						
	the second secon				~		
	Reviewed I	BV TM			ato Poulouro de	2020	10710:
	increaved i			L	ate neviewed:		10010



Daphnia Bench Sheet

Method	DAS	_		Client	TEC164		Reference	1920)-0809	
Test Log								Sample I	nformatio	on
Day	D	ate	Time	Technician	Chem. Cart	Daily Da	ta Review	Initial pH		73
0	2020/	01/28	1355	ST/MF	3	X	X_	Initial EC		15.76
1	2020/	01/29	0945	28	-	-11	Ă	Initial DO		17.1
2		/01/30	1202	AW	2	M	E	Initial Ter		161
			1,000	1100		1011	`	Salinity (p		19
Lab Code	CTLA	CTLB	CTLC	100A	100B	100C	1		ipu).	
Lub couc				TUUA	100B	1000	1			
dav				24/112	ita) (ranges C	0.0.5)				
day	00	100	100	pH (un	its) (range: 6	.0-8.5)				
0	S.L	0.2	B.2	18.1	18.1	18.2				
2	6.9	0.2	9.1	8.3	0.3	0.3				
		The pH of the	e sample was n	ot adjusted prior	to test setting,	unless noted	in the comme	nts below		
					EC (uS/cm)					
0	421	UB	1411	LEQE	1003	KOUS	1			
2	16	107	1105	1511	1KIT					
<u></u>	Lyon	1907	140)	1246	1567	1599				
				DO (//) (10 1000/					
0				DO (mg/L) (t test temp	.)		
0	B.L	8.2	18:2	8.2	82	8.2				
2	e-)	0.1	6.)	P.)	0.1	8.1				
				0				*		
				Temperatu	re (°C) (range	e: 18-22 °C	2)			
0	12	12	12	112	12	10	1		1	
2	19	19	19	16	19	16				
-				17	19					
					Number					
					Numbe					
					(I, immo	bile)				
0	10	10	10	10	10	10				
1	10	10	61	10	(0)	10	1			
2	G	10	16	10	10	10				
		Validity Cri	teria: must b	e ≤ 10% mort			ehavior in t	he control	1	
		Notes: Imp	nobile: danh	nid can't swir	mafter 60 cc	c oven if a	ontonno ctill	movo		
		Liploce oth	nobile, dapri	d, behaviour i	naiter ou se	c. evenna		move		
Culture		Unless Oth	erwise noted	a, penaviour i	s considered	to be nor	mai			
	01							1		
Young jar			Jar(s) morta	ality 7 days pr	rior to test (n	nust be ≤2	5%)	GI	-	
									-	
QA (previo	us month)						Control Va	alidity Crit	eria	
Days to firs	t brood (≤12	days)	8				Mean % m			6-1
	Imber of you		d (>15 youn		28		(must be ≤	10%)	io notio	-01-
	reatments rai			Yes No	20		(1100100 2	1070)		
were test t	reatments rai	luonnizeu o	intest tray:	(res) in						
C				\smile						
Sample									1-	
DO % of sa	mple prior to	aeration:	142	2	Is aeration r	equired (<	40% or >10	0%)?	Yes or N	0
	faeration (37								Yes or N	0)
Hardness (r	mg CaCO ₃ /L)	of 100% :	860		Is hardness	adjustmen	t required (<25 mg Ca	$CO_3/L)?$	Yes or No
Hardness o	f sample afte	r adjustmer	t (must be	hatwaan 25 -	30 mg CaCl			-		
i la la le si c	i sumple une	ruujustinei	it (must be	between 25	so my caco	J3/L)				
D'1				,						
Dilution W			S. a. d		DO Levels (- corrected	d for altitu	ide -
	preparation o		1.01/1	(3.3 to 8.2 m	g/L at 18°C	-	3.1 to 7.7	mg/L at 2	1°C
Hardness o	f dilution wat	er (mg/L)	200	2	3.2 to 8.1 m	g/L at 19°C	-	3.0 to 7.6	mg/L at 22	2°C
					3.2 to 7.9 m	-			J	
Comments	/Observatio	ns: 🔿				9, - 4, - 0, 0	-			
	, 5856174000	Uhr	: no p	pt						
				•						
		yon	ri No p	pr						
			M			712	102/02			
1	Reviewed By:	-		Date	e Reviewed:	100	0/02/03			



Daphnia 10°C Bench Sheet

Method	DAS 10		Client	TEC164		Reference	1920-0809)		
Test Log							Sample In	formatio	n	
Day	Date	Time	Technician	Chem. Cart	Daily Dat	a Review	Initial pH:		7.3	
0	2020/01/28	1405	ST/MF	3	V	V	Initial EC (IS/cm).	1576	
1	2020/01/29			5	-1	<u> </u>	Initial DO			
		0945	SC			M			12.1	
2	2020/01/30	1030	AW	2	M	-	Initial Tem		14	
							Salinity (p	ot): 5		
Lab Code	CTLA CTLB	CTLC	100A	100B	100C					
day			pH (un	its) (range: 6	0-8.5)					
0	0107	182	170	170	70	1	1			
2	01 0.0	0.6	01	62	1.0					
2	B.1 B.1	18.1	10.2	6.7	6.9					
	The pH of the	sample was n	ot adjusted prio		unless noted	l in the comm	ents below			
				EC (uS/cm)						
0	400 410	410	1001	1019	1017					
2	396 400	402	1560	1589	1594				1	
		1 10 a	1360			1	1	1		
	ay au		DO(mall)(40-100% sat	uration of	tort tom				
0	C AMEL C Fall	an		-10-100% Sa		test temp	1	1		
0	Dun Rum	1.4	9.9	4.4	9.9					
2	9.4 9.4	9.4	9.4	9.4	9.4					
	12 MF, 12 MF	12 MF	Temperatu	ure (°C) (rang	e: 8-12 °C)					
0	12112		12	12	12	1	1			
2			K	16	10					
2	10 13	6	1 12	0	Ya	1				
				Numbe	r Alive					
				(I, immo	bile)					
0	10 10	10	10	10	10	1	1			
1	0 0	(0	(0	(0)	(0					
2	10 10	10	D	0	10					
	Validity Crit	teria: must l	oe ≤ 10% mor	tality and/or	abnormal k	behavior in	the control			
	Notes: Imn	nobile; dapł	nnid can't swi	m after 60 se	ec. even if a	antenna sti	ll move			
	Unless oth	erwise note	d, behaviour	is considered	d to be nor	mal				
Culture			a, sonarioai							
	PI	lor(c) no ort	alita 7 daya w	view to toot (and have a	50()	0-1			
Young jar	FI	Jar(s) more	ality 7 days p	nor to test (r	nust be ≤ 2	(5%)	07-			
	ous month)					Control V	alidity Crite	eria	53	
Days to first	st brood (≤12 days)	9				Mean % m	nortality at 4	18 hours	MX I	
	umber of young produce	d (>15 you	- na)	30		(must be s				
	treatments randomized o					(11401.00.	21070)			
were test	treatments randomized c	on test trays	Yes / N	10						
			\sim							
Sample										
DO % of a	ample prior to aeration:	12	5	Is aeration r	oquired (-	10% 01 - 11	000/12	Vacion		
								Yes or N	U	
Duration o	of aeration (37.5 +/- 12.5	mL/min/L) :	20min	Filtered with	110um sc	reen prior	to testina	Yes or N		
	(mg CaCO ₃ /L) of 100% :			Is hardness					Yes or No	
			-			requieu	(- 25 my Cd	CO3/L):	165 01 000	
Hardness o	of sample after adjustme	nt (must be	e between 25	- 30 mg CaC	:O ₃ /L)	-				
				-			-			
Dilution V	Vater		1	DO Levels (40-100%	aturation	- corrector	for altitu	ide -	
		1:010	1							
	preparation date	1.011	.1	4.1 to 10.3 r			3.8 to 9.6 r	-		
Hardness of	of dilution water (mg/L)	ZDB		4.0 to 10.0 r			3.7 to 9.4 r	ng/L at 1	2°C	
				3.9 to 9.8 m	g/L at 10°C					
Comment	s/Observations:	NV ·			<i>,</i>					
Connent		NY: no	ppt							
	UP	3hr: No	0017							
L	11	Jon 2 INS	YVY							
	Reviewed By:	M	. Date	e Reviewed:	7020	0/02/03	3			
			-	-						



Daphnia Antiscalant

								peuc	n Sne	et
Method	DAS		Client	TEC164		Reference	192	0-0809		
		857							-	
Test Log							Sample Ir	nformation		
Day	Date	Time	Techniciar	Chem. Cart	Daily Dat	ta Review	Initial pH:		73	
0	2020/01/28	1400	ST/MF	3	Č	K	Initial EC (1576	
1	2020/01/29	0945	se	-	TH	1	Initial DO		12.1	
2	2020/01/30	1000	AW	3	ME	<	Initial Tem		14	
							Salinity (p	pt): ⋜		
Lab Code	CTLA CTLB	CTLC	100A	100B	100C					
day			nH (ur	nits) (range: 6	0-8 5)					
0	Q.1 81	Q.1	187		8.7	1		1		
2	0.0 0.1	ai	83	0.2	8.2	1				
L	The pH of the	sample was n	ot adjusted pr	ior to test settin		d in the com	nents below			
	the prior die	sumple was n	or adjusted pr	EC (uS/cm)	g, unicss note	com and com	nents below			
0	406 409	410	1580	15910	lar	1				
2	397 399	399	1562	1584	1591					
		·						1	-1	
-		00	DO (mg/L)	(40-100% s	aturation	at test tem	np.)			
0	8.2 8.2	Bil	B.L	8:2	82					
2	0.1 0.1	9.1	0.1	6.)	R.1					
			Tomporativ	ro (°C) (room-	10 33 00	``				
0	12 112	1.2		re (°C) (range	10-22 1	.)	1	1		
0 2		19	10	10	10					
2	19 19	17		1	14	1	1			
				Numbe	r Alive					
				(I, imm						
0	10 10	10	10	10	10					
1	10 (0	10	10	10	(D					
2	10 10	112	10	10	10					
		teria: must k		ortality and/o		behavior i	n the contro			
	Notes: Imn	nobile; dapł	nnid can't s	wim after 60	sec. even i	f antenna s				
-	Unless oth	erwise note	d, behaviou	ir is consider	ed to be no	ormal				
Culture	C 1					0.50()	01			
Young jar		Jar(s) mort	ality 7 days	prior to test	(must be ≤	≤25%)	01-			
OA (provis	ous month)					Controlly	alidity Cale	orio		
	ous month) st brood (≤12 days)	8					alidity Crit nortality at 4		mil	
	umber of young produce	d (>15 vou		38		(must be ≤		+o nours -	07.	
	treatments randomized c			No		(must be 2	1070)			
Sample								\geq		
DO % of s	ample prior to aeration:	14	5	Is aeration r	equired (<	40% or >1()0%)?	Yes or No		
	of aeration (37.5 +/- 12.5			-				Yes or No		
	(mg CaCO ₃ /L) of 100% :		arin	Is hardness					Yes or No	
		0	-			(iequiieu (sed my ca	CO3/L/:		
Hardness	of sample after adjustme	nt (must be	between 2	.5 - 30 mg Ca	(CO_3/L)	-	-			
Dilution V	Nator			Antiscalant						
	preparation date	1.01/1L	-			Compley	Zon	211		
	of dilution water (mg/L)			Final Concer Volume of s		Sample.	Volume of	antiscalant	15.8n	(
i lai ulless (or unution water (mg/L)	208		volume of S	ampie.	Sconl	volume of	antiscaldrit.	sight	
				DO Levels	40-100%	saturation	- correcter	d for altitude		
Comment	s/Observations: Oh	() NO	tot	3.3 to 8.2 m				mg/L at 21°C		
connent			-	3.2 to 8.1 m				ng/L at 22°C		
	yehr:	NO OPT		3.2 to 7.9 m			5.5 (67.01			
		21.		1010 10 1.0 111	9, - 4, 20 0	-				
	Reviewed By:	TM	Dat	e Reviewed:	702	0/02/0	3			



APPENDIX C – Chain-of-custody form

Teck							Page	. 1	of	1											
	COC I		2020-01-	27_T	oxicity_SP2	21	TURN	AROUN				(default)					RUSH:				
Facility Name		LIENT INFO					L	ab Nama	-	ABORA	TORY nvironme	ntal					OTHEI	R INFO	Engl	PDF	EDD
Project Manager								Contact	-			intai		Email 1			tribution		Excel X	PDF X	EDD
							Lau		-		-	vironmenta									X
		dson@teck.com							+				i.ca	Email 2			avidson@		X	X	X
Address	15 Km North	h HWY 43						Address	#4,	, 6125 -	12 Street	SE		Email 3			aequisonli				X
								01	0					Email 4			ateck.cor		X	X	X
	Sparwood				Province BC				-	lgary		ProvinceA		Email 5		larty.Haf	fke@teck.c	com	Х	X	X
Postal Code	√0B 2G0				Country Can	ada	Pos	tal Code	T2	H 2K1		Country Ca	anada	Email 6							
										_											
Phone Number (Phone	Number	403	3 253 71	21						number		VPO00	676571	
		SAMPLE DETAI	LS	1					-		1 Martin			ANALYS	SREQ	UESTEI	D	Section 1	C.C.C.C.		-
												Pl	ease indi	cate below Fi	Itered, P	erserved	or both (F	, P, F/P)	and another state	_	
														1000		1 1 1			Ser La		
				0						Onc	Con									1	
				Hazardous Material (Yes/No)					2	le le	st a										
				(Ye					ANALYSIS	Sing	Sing Te										
				rial					AL	E A	Micity										
				Aate					AN	r_R oxic	r_D										
				I sno						H96 T_n	48H 0n_										
			Field	ardo		Time	G=Grab	# Of		atio	rati										
Sample ID	Sample	e Location	Matrix	Haz	Date	(24hr)	C=Comp			NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @ 20C									1	
L_BFWB_OUT_SP21_2020-01-27_N		B_OUT_SP21	WS		1/27/2020	9:00	G	6		X	X										
1970-0012-																					
10:00 0809																					
Tozco																					-
Acces																					-
3, 20, COVIDOUS																					
Exact Carloy																					
DXILLOTTES																					-
your corki																					
5.3-0																					
V10 5/10)																					<u> </u>
20101178																-					
ADDITIONAL COMMENTS/SPE	CIAL INSTR	RUCTIONS			RELINQUISH			N		Date	and the second se	Time		Accep	ed By/A	Affiliation	n	Da	te	Ti	ime
					Ju	lia Johnso	n			1/27/2	020										
				<u> </u>																	
SERVICE REQUEST (rush - su	ubject to avai									T.S.S.R	12016	i na shut									
			default) X		Sampler's Na	me		J	ulia	Johnson			Mobile	e #							
		s days) - 50% su	0			-															
Emergency (1 Business Day) - 100% surcharge For Emergency <1 Day, ASAP or Weekend - Contact Nautilus			S	Sampler's Signature Date			Date/Ti	e/Time 27-Jan-20													



END OF REPORT



Acute Toxicity Test Results

Sample collected February 10, 2020

Final Report

March 2, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Semula ID/	Dates								
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation					
WL_BFWB_OUT_SP 21_2020-02-10_N /	10-Feb-20 at 0900h	11-Feb-20 at 1000h	11-Feb-20 at 1540h	11-Feb-20 at 1420h					
1920-0853									

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020- 02-10_N	4.6°C	915	239

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID —	Percent survival in 100% (v/v) sample						
	Rainbow trout	Daphnia magna 20°C					
WL_BFWB_OUT_SP21_2020-02-10_N	100	100					

Sample ID ———	Percent Immobility in 100 (% v/v)
Sample ID	Daphnia magna 20°C
WL_BFWB_OUT_SP21_2020-02-10_N	0



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-02-	Rainbow trout	None	None
10_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	4.0 (3.5-4.4) g/L KCl ¹	6.3 (6.0-6.5) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.5-4.9) g/L KCl	6.1 (5.2-7.1) g/L NaCl
Reference toxicant CV	11.0%	5.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, January 28, 2020; ² Test Date February 17, 2020 LC = Lethal Concentration; CL = Confidence Limit



that lee.

Report By: Shae Cole, BSc Biologist

achay

Reviewed By: Jacklyn Poole, BSc Laboratory Supervisor

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data



Trout Bench Sheet

Method	TRS Client	TEC164	Reference	1920-0853		Chamber	
Test Log						Sample Infor	mation
					Daily Data		
Day	Date	Time	Initial	Chem. Cart	Review	Initial pH:	16
0	2020/02/11	540	* AW SL		MAF	Initial EC (µS/d	cm): 1712
1	2020/02/12	0900	SC	-	NE	Initial DO (mg	
2	2020/02/13	0900	50	-	ST	Initial Temp (°	(<u>L): 10.6</u>
3	2020/02/14	Dave	AU		-11		<u>.</u>
4	2020/02/15	000	ATE	(Ve	Salinity (ppt):	- 4
Sample Pre- Aeration rate Preaeration t DO(mg/L) of	adjusted to 6.5 +/- 1 mL/ı ime	K	1 hour	1.5 hours	2 hours	DO in mg/L (saturation)** 6.2 mg/L - 8.9 mg 6.1 mg/L - 8.8 mg	g/L at 14°C g/L at 15°C
Test Chemis	try and Biology					6.0 mg/L - 8.6 mg	
Conc.	CTL 100		1	1	1	**corrected for al	titude
conc.							
			pH (units) (ra	ange: 5.5-8.5)			
Day 0	0.0 t.P						
Day 4	8.3 8.9						
	-		EC (u	S/cm)			
Day 0	468 1653						
Day 4	4118 1001	9					
			1	1			
		DO (ma	/L) (70-100% s a	aturation at te	st temn)		
Day 0	B.B B9					1	
Day 4	2200						
	0.0000						
		10	emperature (°C)	(range: 14-16	(C)		
Day 0	15 14						
Day 4	15 15						
		Numbe	er Alive (In brac	kets number st	ressed)		
Day 0	0 11						
Day 1	10 17						
Day 2	10 10						
Day 3							
,	10 15						
Day 4							
	Validity Criteria: must be	e ≤ 10% mortality a	and/or stressed	behavior in the	e control		
	Unless otherwise noted, b	ehavior is considere	ed to be norma	I			
ontrol Orga	nism Data				Test Organis	m Information	
Control	Length Weight				5		
Fish	(cm) (g)				Batch	20200114TR	
				~ ~			
1	3.9 0.8	Loading Densit	$v(\alpha/l)$	0.3	Source	Conclus Track Fr	
2	3.5.0.5	(must be ≤ 0.5 g/L)			Source	Smoky Trout Fa	Irm
3	1 0	(11050 50 20.5 9/0)			T 1 4		
4		Manulasit		37.	Tank #	3	
	3.8 0.7	Mean Length (d	cm):	3.1			
5	3.7 0.6			2 2 2 2	Days Held at 1	5± 2°C	28
6	3.7 0.6	Length Range (cm):	3.3-3.9	(must be ≥14 da	vs)	
7	3.9 0.7		-	- (-			
8	3.9 0.7	Mean Weight (g):	0.6	Percent stock	mortality	1.7
9	3.3 0.4	(Must be $\geq 0.3g$)	-		(7 days prior to te		1.7
10	3.6 0.5	_		00	(, days prior to te	31, INUST DE 3270)	
		Weight Range:	(a):	S-AR	Test Volume /	1	
		in eight nunge.		20.0	Test Volume (L	-) _	18
omments :	AL - ···			H			
	U hr: NA	POT	C	1.7			
	Qlohr: no	Lint					
		PPT					
		. A .					
	Reviewed	By: Mb		D	ate Reviewed:	2020/0	7118
							-110



Daphnia Bench Sheet

Method	DAS 20	Client	TEC 164	Reference	1920-0853	
-						
Test Log					Sample Informat	tion
Day	Date Time	2 212 - 2		Daily Data Review	Initial pH:	7.60
0		O COLVIC	3	SC	Initial EC (µS/cm):	1712
1	2020/02/12	S ST	-	MF	Initial DO (mg/L):	10.10
2	2020/02/13	OMF	3	KK	Initial Temp (°C):	4 + 16
					Salinity (ppt):	U
Lab Code	CTLA CTLB CTLC	C 100A	100B	100C		
day		pH (un	its) (range: 6.0-	8.5)		
0	82 82 5	2-81	18 T	X		
2	8.3 87 90	1 24	QU P	Pat		
	The pH of the sample w	as not adjusted prior	r to test setting up	less noted in the comme	nts holow	
		as not adjusted prior	EC (uS/cm)	less noted in the comme	its below	
0	203 304 201	1 II Cel		1400		
2	207 1122 120	1638	178/1	1090		
-	1941 1900 190	11090	1 100 1	102		
		DO(ma(l))	40 1000/		,	
0		DO (mg/L) (40-100% satu	ration at test temp	.)	
0	Pit Dit Di	5.2	8.2	8.2		
2	D.1 D.1 D.1	8.1	8.1	8.1		
		Temperatu	re (°C) (range: 1	18-22 °C)		
0	18 18 18	18	8	18		
2	19 19 19	18	12	18		
			Number A	Alive		
			(I, immobil	e)		
0	10 10 10	10	10	10		
1	10 10 10	1.0		()(II)		
2		10				
-	Validity Criteria: mu	ct ho < 10% more	tality and (an also	normal behavior in t		
	Notos: Immobile: d	st be ≤ 10% mor	tailty and/or ab	normal behavior in t	he control	
				even if antenna still	move	
Culture	Unless otherwise no	oted, behaviour	is considered to	be normal		
	0.7				5-1	
Young jar	Jar(s) m	ortality 7 days p	rior to test (mu	st be ≤25%)	() 1-	
QA (previo		C		Control Va	alidity Criteria	ani
Days to firs	t brood (\leq 12 days)			Mean % m	ortality at 48 hours	s - 0%
Average nu	imber of young produced (≥15 yo	oung)	21	(must be ≤		
Were test t	reatments randomized on test tra	ay? Yes / N	0			
Sample		\smile				
	mple prior to aeration:	122	1			
		LL	Is aeration req	uired (<40% or >10	0%)? Yes or	No
Duration of	aeration (37.5 +/- 12.5 mL/min/l): 20 min S	Filtered with 1	10um screen prior t	o testing Yes or	No
Hardness (r	mg CaCO ₃ /L) of 100% : Q^4	5	Is hardness ad	justment required ($< 25 \text{ mg} (aCO_2/L)?$	Yes or No
Hardness	f sample after adjustment (must	he hetween 25			g cuco ₃ ,	
l la	i sample alter aujustment (must	be between 25	$-30 \text{ mg CaCO}_3/$	·L) -		
Dilution W						
		100		-100% saturation)		
		1:01129	3.3 to 8.2 mg/l		3.1 to 7.7 mg/L at	21°C
Hardness o	f dilution water (mg/L)	e	3.2 to 8.1 mg/l		3.0 to 7.6 mg/L at	22°C
			3.2 to 7.9 mg/l	Lat 20°C	-	
Comments	/Observations:					
	O hr: NO PPT.					
	48 hr: no ppt					
F	Reviewed By: MG	Date	e Reviewed:	070/02/18		



APPENDIX C – Chain-of-custody form

Teck					ţ.	Page		of									_		
	COC ID:	2020-02-1	10_Tc	oxicity_SP2	1	TURNA	ROUN				(default)				RUSH:	INFO			
	PROJECT/CLIENT INFO							-	ABORAT		nt al						Excel	PDF	EDD
Facility Name	WLC AWTF							-		vironmen	ntal	_		ormat / Dis	-Lab/a/teck		X	X	X
Project Manager	Thomas Davidson					Lab		-	nara Por			Ema			-			X	X
Email	thomas.davidson@teck.com							-			vironmental.ca	Ema			Davidson@t		X	X	-
Address	15 Km North HWY 43					1	Address	#4,	6125 - 1	2 Street	SE	Ema	il 3:	TeckCoal	aequisonli	ne.com			X
												Ema	il 4:	Tricia.Hil	lateck.con	n	Х	X	X
City	Sparwood			Province BC			City	Cal	gary		Province AB	Ema	il 5:	Marty Ha	fke/a/teck.c	com	X	X	X
Postal Code				Country Cana	da	Post	al Code	T21	H 2K1	-	Country Cana	da Ema	il 6:				1		
Fostar Code	V0D 200			country cund				-											
						-			-										
					-	Dhana	Number	103	3 253 71	21		-		PC	number		VPO0	0676571	
	(250) 603 - 9417 SAMPLE DETAI	10				Phone	Number	40.	5 255 71	21	and the state of the second	ANAI	YSIS F	REQUESTE	ED				
1020/02/11 10:00 Monitoulin 30:20Learboys, 5x1L VGS/NGI MOSINGI MOSINGI MOSINGI MOSINGI MOSIC	SAMPLE DETAI	LS					ais and and		同時期的		I HANKIN AT H		1993年		行為認定で	PUSADE	御 相談		
0210211									IN STREET, STRE	Constant of the local of	Pleas	e indicate belo	w Filter	ed, Perserve	d or both (F	F, P, F/P)		Contraction of the	2 15 18
0.00									2	C Strand				THE REAL PROPERTY.	all and the set	Edeaud Lineau	0.20203030	C CALLS BULK	
Monitoulin			0					1	Con	Cor									
JC	1		Hazardous Material (Yes/No)					S	NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @									
2m201 earbone 5x11	hotor		Yes					ANALYSIS	Tes	Te									
SALUL MIDO 10, UNIL	NUTING		ial (5	AL	TS	Mcity									
V60/11/06 1-1-			ater					AN	r_R oxic	Loxi									
grocal Condition			IS M						H90	H8H									
H.GeC			nop.						T_9	T_4 atio									
	the second se	Field	azaı		Time	G=Grab	# Of		AU	AU	3								
Sample ID	Sample Location	Matrix	H	Date	(24hr)	C=Comp			X	X	<u> </u>		-						
WL_BFWB_OUT_SP21_2020-02-10_N	WL_BFWB_OUT_SP21	WS		2/10/2020	9:00	G	6	-		-		-		-				1	
920-0853								-				-		-		-		-	-
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													1	_		-			Time
ADDITIONAL COMMENTS/SI	ECIAL INSTRUCTIONS			RELINQUIS	HED BY/A	FFILIATIO	N		and the second second second	ate	Time	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	Accepte	d By/Affilia	tion	D	ate	1 1 10	Time
Shipment includes 2 extra 20 L	bladders and 2 extra	alL		Va	nessa Tur	ner		+	2/10/	2020	-						i i i and	-	la la contra
plastic bottles.			-			and an and a	_	+											
stabile cottles.			-					+			-	-							
SERVICE REQUEST (rush	subject to quali-billed							1											
SERVICE REQUEST (rush		(default) X				1			0.1			M.L.9. #	T						
Priority	(2-3 business days) - 50% st		1	Sampler's N	ame		N	/ark	Gaizau	skas		Mobile #							
	y (1 Business Day) - 100% s			Sampler's Sig				I.				Date/Time				10-Feb-2	20		
					afure	1						Jate Inne					and a line of the		



END OF REPORT



Acute Toxicity Test Results

Sample collected February 24, 2020

Final Report

March 5, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

		Da	ates	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation
WL_BFWB_OUT_SP21_2020- 02-24_N /	24-Feb-20 at	25-Feb-20 at	25-Feb-20 at	25-Feb-20 at
1920-0900	0900h	1100h	1550h	1435h

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity	
	temperature	(mg/L CaCO3)	(mg/L CaCO3)	
WL_BFWB_OUT_SP21_2020-02-24_N	4.6°C	818	208	

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Samula ID	Percent survival in 100% (v/v) sample					
Sample ID —	Rainbow trout	Daphnia magna 20°C				
WL_BFWB_OUT_SP21_2020-02-24_N	100	100				

Sample ID	Percent Immobility in 100 (% v/v) Daphnia magna 20°C
WL_BFWB_OUT_SP21_2020-02-24_N	0



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-02-24_N	Rainbow trout	None	None
WL_DFWD_OU1_3F21_2020-02-24_IV	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	4.2 (3.8-4.7) g/L KCl ¹	6.3 (6.0-6.5) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.6 (2.5-5.1) g/L KCl	6.1 (5.2-7.1) g/L NaCl
Reference toxicant CV	11.5%	5.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, February 19, 2020; ² Test Date February 17, 2020 LC = Lethal Concentration; CL = Confidence Limit



Report By: Adam Wilson, BSc Biologist

Reviewed By: Tamara Pomeroy, BSc Quality Assurance Manager

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data





Method	TRS	Client	TECILOY	Reference	1920 -	0700	Chamber	5
Test Log							Sample Info	rmation
Day		Date	Time	Initial	Chem. Cart	Daily Data Review	Initial pH:	
0	2020102	125	1550 *	KLICB		M	Initial EC (µS)	(cm): (82 1
1	202010	2726	6800	SC	-	TP	Initial DO (m	g/L): 10.3
2	2020/02/	27	0830	AW	-	TO	Initial Temp (°C): 1
3	2030/03/		0830	AW	-	TP	Salinity (ppt):	
. 4	20201071	29	0845	AWIME		1		
Sample Pre- Aeration rate	Aeration e adjusted to 6.5	+/- 1 mL/min/l	Note: * ; time w	hen the test w	as loaded with	fish	DO in mg/L saturation)**	(70% - 100% *
Preaeration t			0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 m	
DO(mg/L) of	100%		11.2	10.10	10.3	0.1	6.1 mg/L - 8.8 m	
					- yest		6.0 mg/L - 8.6 m	
	try and Biology						**corrected for a	
Conc.	CTL	i CO i						
				pH (units) (ra	inge: 5.5-8.5)			
Day 0	7.7	7.4						
Day 4	6.1	8.2						
David	1.10			EC (us	S/cm)			
Day 0 Day 4	441	1614						
Day 4	977	1630						
				70 1000				
Day 0	00		DO (mg/L	.) (70-100% sa	turation at tes	st temp.)	1	
Day 4	Rid	Pip						
Duy 4	0.0	0.0						
			Tor	1°C)	4 4 4 69			
Day 0				nperature (C)	(range: 14-16°	C)		
Day 4	16	17						
			Number	Alive (In brack	kets number sti	(accord)		
Day 0	(()	10		Alive (III black		essed)	1	Ţ
Day 1	18	0						
Day 2	12	(0						
Day 3	10	10						
Day 4	10	10						
	Validity Criter	ia: must be ≤ 1	10% mortality an	d/or stressed l	behavior in the	control		
	Unless otherwi	se noted, behav	vior is considered	to be normal		control		
Control Orga						Test Organisn	n Information	
Control	Length	Weight				-		
Fish	(cm)	(g)				Batch	2020020	572
1		00			67			
1	30		Loading Density	(g/L):	0.0	Source	Lynde	n
3	5.7	22	(must be ≤0.5 g/L)					
4	20	V.Z			22 .	Tank #	4	
5	3.0	22	Mean Length (cn	n):).)			
6	3.7	Q.Z.)		Days Held at 1		20
7	27	82	Length Range (cr	n):	1-3.2	must be ≥14 day	/s)	
8	24	0.2	Moon Maight (g)		611			
9	36	(m)	Mean Weight (g)	· _		Percent stock r		1.14
10	3E	32	(Must be ≥0.3g)		C	7 days prior to tes	st, must be ≤2%)	
			Weight Range: (g		0.3-0.5			
		,	Gigne Nange. (g	. <u> </u>	1.1-012	Fest Volume (L) .	iBL
Comments :								
	G							
	96 m	No pot						
		16.					1	
		Reviewed By:	TP		D	ate Reviewed	202010	302
		_					2-2-14	



Daphnia Bench Sheet

Method	DAS-20	Client	TEC 164		Reference	. 1920-	0900	_
-								
Test Log	D :					Sample Inf	ormatio	n
Day	Date	Time Technici			a Review	Initial pH:		7.5
0	2020/02/25	1435 AW/MF	3	M]Initial EC (µ		1321
1	2020/02/26	1000 AW	-	TP	·	Initial DO (I	mg/L):	KD.3
2	2020/02/27	1040 MFIRE	03	M	11	Initial Temp	o (°C):	14
		the second	T		V	Salinity (pp		-3
Lab Code	CTLA CTLB	CTLC 100 A	100 B	100 C			-//	
						11		
day		nH (units) (range: 6	(0-8.5)				
0	82 02		8.0			1 1		1
2	23 8.9	6.2 0.0	0.0	0.0				
2	812 815	8, 2 8, 9	8,9	8,4				
	The pH of the	e sample was not adjusted p		unless noted	in the comme	ents below		
			EC (uS/cm)					
0	282 337	401 1668	1691	1711				
2	406 408	408 65	6 1670	1686				
		DO (ma/l	.) (40-100% sa	turation at	test temp	.)		
0	Q7 Q7	6.3 6.3	03	8.2				1
2	39 78	79 78	7.8	73				
2	41 771	11 48	1 + 0	410				
		т	1 (0.6) (10 00 00				
			ture (°C) (rang					
0	10 18	16 16	I IB	18				
2	10 10	20 20	70	20				
				·				
			Numbe	er Alive				
			(I, immo	bile)				
0	10 10	10 10	10	10		1		
1								
	10 10	10 10	10	10				
2	0 10	1010	10	10				
		teria: must be ≤ 10% m						
		nobile; daphnid can't s				l move		
	Unless oth	erwise noted, behaviou	ur is considered	d to be norr	nal			
Culture	0.0					0.11		
Young jar	12	Jar(s) mortality 7 days	prior to test (r	nust be ≤2	5%)	01.		
55		., , , ,	1					
QA (previou	is month)				Control V	alidity Crite	ria	
	t brood (≤12 days)	9	21			nortality at 4		0%
			- 51				5 nours -	010
	mber of young produced		10		(must be ≤	10%)		
Were test ti	reatments randomized o	n test tray? Yeg /	No					
Sample								
DO % of sa	mple prior to aeration:	124	Is aeration i	equired (10% or > 10%	10%12	vesor No	
		10 '					1	-
Duration of	aeration (37.5 +/- 12.5 r	mL/min/L):	Filtered with				Yes or No	0)
Hardness (r	ng CaCO ₃ /L) of 100% :	818	Is hardness	adjustment	required (<25 mg CaC	:0,/L)?	Yes or No
						g ene		
Hardness of	f sample after adjustmer	it (must be between 2	5 - 30 mg CaC	0 ₃ /L)	-	-		
Dilution W		0.210	DO Levels	(40-100% s	aturation)	- corrected	for altitud	de -
Pail label / I	preparation date	6:03/17	3.3 to 8.2 m	g/L at 18°C		3.1 to 7.7 m	ig/L at 21	°C
Hardness o	f dilution water (mg/L)	243	3.2 to 8.1 m	g/L at 19°C		3.0 to 7.6 m	ig/L at 22	°C
	()		3.2 to 7.9 m				9/ L 41 LL	
Commente	/Observations:			9, - at LO C				
Somerits	OHrs: No	0 DX						
	48Hrs: 00							
	48HIS: 14	- PPI						
	-0				22/22			
F	Reviewed By:	D	ate Reviewed:	2020	USIDE	-		



APPENDIX C – Chain-of-custody form

Teck						Page	1	of	1										
		2020-02-2	24_T	oxicity_SP2	21	TURN.	AROUN				r (default))			RUSI				
Facility Name	PROJECT/CLIENT INFO	- ingline and				1.	ab Name	-	BORAT	the second second second second	ntal		D			IER INFO	Eval	PDF	ED
Project Manager							Contact	-			intai		Email 1		t / Distributi WLC-Lab a.t	on	Excel	PDF X	ED
	thomas.davidson@teck.com					1540		-			vironmen	tal ca	Email 2		omas.Davidsor		X	X	+
	15 Km North HWY 43					-	Address					ituneu -	Email 3		ckCoal a equise		^	~	+
Autos	15 Kill Hortin 11 w 1 45						71001033	11-1,	0120 - 1	2 Stitet	012		Email 4		icia Hill a teck.		x	X	-
City	Sparwood	and been like		Province BC		-	City	Calg	arv		Province	AB	Email 5		arty.Hafke/a.teo		X	X	
Postal Code				Country Can	ada	Pos	tal Code				Country		Email 6			.k.com	A	~	+
Postar Coue	100 200			Country Can	aua	FOS		121			Country	Canada	Ellian 0.						
Phone Number	(250) 603 - 9417					Phone	Number	403	253 712	21					PO numb	er	VPO00	0676571	-
	SAMPLE DETA	ILS				1							ANALYSI	S REQU	JESTED				
Phone Number 2020/02/25 Whice Maniton I'm DC 202, carbogs Batt bottles, 5a. 12 bott NoS/NoI Bood Condition Sample ID 1920-090								-	And		RET	Please in	icate below Fi	tored P	erserved or both	(E P E/P)	中的心理	1. 1. 15	
11:00.									7			T lease me	icate below II				1.		-
Manitonlin			-						onc	uo									
JC 201, carbogs	1		No					6	J.	t a									
Batt Kottlee, 5all Kott	185		(Yes					NALYSIS	ingl	Tes									
NGSINOL			rial (AL'	I_S ity]	M_city									
Readition			later					AN	-R'	D'ixio									
Bood Condition			V St						6Hr	aHr n_T									
			Irdoi						T_9	T_4									
Sample ID 1920-090	O Sample Location	Field Matrix	Hazardous Material (Yes/No)	Date	Time (24hr)	G=Grab C=Comp			NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @ 20C									
WL_BFWB_OUT_SP21_2020-02-24_N	WI. BFWB OUT SP21	WS	- Ha	2/24/2020	9:00	G	6		X	X	4.6	or							+
			-								100	5							-
								14		-								-	-
				and a start of the												-			+
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	· · · · · · · · · · · · · · · · · · ·				10.000			1.12										-	+
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ADDITIONAL COMMENTS/SP	and the second	11		RELINQUIS	lia Johnso	and the second second	and the second second	-	Date 2/26/20	and the second	Ti	me	Accep	tea By/A	ffiliation	Da	ite	1	Time
Shipment includes 2 extra 20 L l	bladders and 2 extra	1 I L		30	ina oomist			-	2,20,20										
plastic bottles.																		-	
SERVICE REQUEST (rush -	and fand an ann Dad Black	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1. 1.4		A 4		1. 2. M. M.	1			1.999 H- 104_2	1. N. N. N. N.	7. 12 A. F. S. M.	25.6.22		_			
SERVICE REQUEST (rush -		(default) X	10.22	a Barran		1	and the second	115 1						the second	the second second	And Surgelle			ile and
Priority	(2-3 business days) - 50% s			Sampler's Na	ame		Nie	chola	s Lagaro	de	-	Mob	ile #						
Emergency	(1 Business Day) - 100% s	urcharge	0	ampler's Sign	ature		0	/	1	1	/	Date/	Time			24-Feb-20	0		
E E di D di	SAP or Weekend - Contact	Mautiluc	0	ampier's sign	ature	1 /	N		a	1	/	Date/	inne			24-1.60-50	,		



END OF REPORT



Acute Toxicity Test Results

Sample collected March 3, 2020

Final Report

March 19, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC



SAMPLE INFORMATION

		Da	tes	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation
WL_BFWB_OUT_SP21_2020 -03-03_N_1140 / 1920-0940	3-Mar-20 at 1140h	4-Mar-20 at 1100h	5-Mar-20 at 1510h	4-Mar-20 at 1645h

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_OUT_SP21_2020- 03-03_N_1140	4.4°C	969	215

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Samala ID	Percent survival in 100% (v/v) sample						
Sample ID ——	Rainbow trout	Daphnia magna 20°C					
WL_BFWB_OUT_SP21_2020- 03-03_N_1140	100	100					

Percent Immobility in 100 (% v/v)
Daphnia magna 20°C
0
-



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-03-	Rainbow trout	None	None
03_N_1140	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	2.7 (2.2-3.2) g/L KCl ¹	6.1 (5.8-6.4) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-5.0) g/L KCl	6.1 (5.3-7.1) g/L NaCl
Reference toxicant CV	12.0%	5.0%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, March 9, 2020; ² Test Date March 2, 2020 LC = Lethal Concentration; CL = Confidence Limit



that lef.

Report By: Shae Cole, BSc Biologist

thiesen

Reviewed By: Sara Thiessen, BSc Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

Trout Bench Sheet



Method	TRS	Client	TEC164	Reference	1920-0940		Chamber	5
Test Log							Sample Infor	mation
						Daily Data		
Day		Date	Time	Initial	Chem. Cart	Review	Initial pH:	74
0	20	20/03/05	PT.01510 *	STIMW	1	AW	Initial EC (µS/d	
1	20	20/03/06	1145	MF/MM	-	Se	Initial DO (mg	
2		20/03/07	1100	SC	-	1	Initial Temp (°	
3		20/03/08	6825	Min		1	Salinity (ppt):	
4		020/03/09			-	ME	- Samily (ppt).	2
4		120/03/09	Notort	AWAAM TANK				
Sample Pre- Aeration rate Preaeration t DO(mg/L) of	e adjusted to 6 time	6.5 +/- 1 mL/min/l	~	1 hour	1.5 hours	2 hours	DO in mg/L (saturation)** 6.2 mg/L - 8.9 mg 6.1 mg/L - 8.8 mc	g/Lat 14°C
e e (g, =) e.						1	6.0 mg/L - 8.6 mg	
Tost Chamic	stry and Biolo						**corrected for al	
Conc.			1	1		1	corrected for al	
Conc.	CTL	100	1					
				pH (units) (ra	nge: 5.5-8.5)			
Day 0	7.3	7.4						
Day 4	91	8.2						
				EC (us	S/cm)			
Day 0	1170	111.25	T		5, (11)	1		T]
	200	1000						
Day 4	21	115/6				1		
			DO (mg,	/L) (70-100% s a	turation at te	st temp.)		
Day 0	8.9	8,9						
Day 4	0.8	02						
		4.0	I	11		1	1	
			т	ompositure (°C)	(reason 14 1C			
			1	emperature (°C)	(range. 14-16	C)	1	
Day 0	14	15						
Day 4	15	15						
			Numb	er Alive (In bracl	kets number st	ressed)		
Day 0	10	, 10				1	1	
Day 1	10							
Day 2	10	10						
Day 3	10	10						
Day 4	15	10						
	Validity Cri	iteria: must be ≤	10% mortality a	and/or stressed	behavior in th	e control		
	Unless othe	erwise noted, beha	vior is consider	ed to be normal				
Control Orga	anism Data					Test Organis	m Information	
Control	Length	Weight					7	
Fish	(cm)	(g)				Batch	2020 011	472
					0		1.	
1	21	0.3	Loading Densit	$t_{\alpha(1)}$	(). d .	Source	Troutla	100
2	3.2	0.3	(must be ≤ 0.5 g/L)		0	oource		A
3	32		(mast be 10.5 g/c,		2	Tank #	4	
	<u> </u>	6.4	March		3.0	Idlik #		
4	1.9	0.5	Mean Length (cm): _			and a second	16
5	2.0	0.3		-	37	Days Held at		10
6	5.3	0.4	Length Range	(cm):	.5-3.3	(must be ≥14 da	ays)	0
7	3.0	6.3						0.38
8	27	0.2	Mean Weight (a):	0.3	Percent stock	mortality	0.00
9	2.5	0.2	(Must be ≥0.3g)	-	~ /		est, must be ≤2%)	
10	27	Xii	,					1.0
	3	10.7	Meight Panga	(0):	1-2-0.4	Toct \/clum= /		8
			Weight Range:	(g).	0.1	Test Volume (L)	10
Comments :	Ohr	. NOPPY						
GI	1 UNI							
96	hrs 1	no pot						
		00,					1	
		Reviewed By:	W		[Date Reviewed	UNDING	3/10



Daphnia Bench Sheet

Method	DAS	Client	TEC164	Reference	1920-0940	
Test Log					Sample Information	1
Day	Date	Time Technician	Chem. Cart	Daily Data Review	Initial pH:	T.Y
0	2020/03/04	13105 4	3	SC	Initial EC (µS/cm):	1792
1	2020/03/05	0900 SF	-	ME	Initial DO (mg/L):	(0.3)
2	2020/03/06	1130 IF	3	Sc	Initial Temp (°C):	13
					Salinity (ppt):	3
Lab Code	CTLA CTLB	CTL C 100 A	100 B	100 C		
day		pH (un	its) (range: 6.0	0-8.5)		
0	7.0 1.0	1.0 77	7.0	10		
2	8.2 8.2	8.2 5.5	8.4	8.4		
	The pH of th	e sample was not adjusted prio		unless noted in the comme	ents below	
		1100 1000	EC (uS/cm)	1-1-2	1	
0	409 400	420 1123	110	102		
2	948 442	44 13	7831	140		
			(40 1000/	wetien at tost toma		
			(40-100% sat	uration at test temp)	1
0	BI BI	8.1 81	0.1	<u>e1</u>		
2	8.1 8.1	8-1 8.1	8-1	8.1		
		Tamparati	100 (°C) (rango	10 22 °C		
0			ure (°C) (range	. 10-22 ()		
0	19 19	19 19	19	13		
2	19 19	9 9	9	19		
			Number	r Alivo		
			(I, immol			
0	10 10	10 10	1	1		
0	10 10	10 10	10	10		
1	0 0	0 10	(0)	10		
2	10 10	1010		hnormal habauiar in	the control	I
		iteria: must be ≤ 10% mor mobile; daphnid can't sw				
					II IIIOVE	
Culture	Unless of	herwise noted, behaviour	is considered			
Culture	00100	lar(c) mortality 7 days	rior to tost (m	pust be $< 25\%$	N.	
Young jar	_2123	Jar(s) mortality 7 days p	nor to test (ii	iust be 22370)		
	auc month)			Control	alidity Criteria	
	ous month)	Ø			nortality at 48 hours -	DI
	st brood (≤12 days)		25	(must be		
	umber of young produce			(must be	21070)	
vvere test	treatments randomized	on test tray? / res in	10			
Comple						
Sample		201				
	ample prior to aeration:	SUT	_ Is aeration r	equired (<40% or >1		
Duration o	of aeration (37.5 +/- 12.5	mL/min/L): 70,000	Filtered with	110um screen prior	to testing Yes or N	
	(mg CaCO ₃ /L) of 100% :	965	Is hardness	adjustment required	(<25 mg CaCO ₃ /L)?	Yes or No
		ent (must be between 25				$\mathbf{\mathbf{\nabla}}$
naruness (of sample after adjusting	ent (must be between 25	- so my cace		_	
Dilution V	Notor		DO Lovols (40-100% saturation) - corrected for altitu	de -
	preparation date	1:00/2121	3.3 to 8.2 m		3.1 to 7.7 mg/L at 21	
	of dilution water (mg/L)	1:02/26	3.2 to 8.1 m		3.0 to 7.6 mg/L at 22	
naturiess	of unution water (mg/L)	-212	3.2 to 7.9 m		5.0 to 7.0 mg/L at LL	
Commont	s/Observations:	OHr: NO PPT	5.2 10 7.5 11	yrate c		
Comment	s/observations:					
		48 Hr: no ppt				
		۷.				
	Reviewed By: 10	Da	te Reviewed:	applozin		
	Neviewed by. W	Da		MANNE		



APPENDIX C – Chain-of-custody form

Teck						Page	1	of	1								
ICCK	COC ID:	2020-03-0	03_Tc	oxicity_SP2	1	TURNAROUND TIME: Regular (default)						RUSH: OTHER INFO					
Eaglin: Name	PROJECT/CLIENT INFO	And States				La	b Name	-	ABORAT utilus Env		ntal		Paport F	Format / Distribution	Excel	PDF	EDD
	r Thomas Davidson							-	mara Por				Email 1:	DL-WLC-Lab a teck.com	X	X	X
	1 thomas.davidson@teck.com		-			Buo		-			vironmental.		Email 2:	Thomas Davidson a teck.co	m X	X	X
the second s	s 15 Km North HWY 43				1.	-		-	6125 - 1				Email 3:	TeckCoal a equisonline.com			X
Addres	s 13 Km North Hw 1 43						/ Idui ess						Email 4:	Tricia Hill a teck com	X	X	X
0.5	Saamuaad			Province BC	-		City	Cal	lgary		Province AB		Email 5:	Marty Hafke a teck.com	X	X	X
	y Sparwood				4.	Des	tal Code				Country Ca		Email 6:	intervention and a second com			-
Postal Code	e V0B 2G0			Country Cana	ida	Pos	tal Code	121	H 2K1		Country Ca	inaua	Linan 0.				
						- In the		-				-					
	(250) (02 0417		-			Dhana	Number	103	3 253 712	21				PO number	VPO	0676571	-
Phone Numbe	r (250) 603 - 9417 SAMPLE DETA	II S				Phone	Number	40.	5 2 5 5 7 1 2	. 1			NALYSIS	REQUESTED			
	SAMPLE DETA					T											
						1.1			and the second	1000	Pl	ease indicat	e below Filte	red, Perserved or both (F, P, F/	P)		
						2			U	ce						11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	
			-						VAUT_96Hr_RT_Single_Conce ntration_Toxicity Test	NAUT_48Hr_DM_Single_Conce ntration_Toxicity Test @ 20C							
			s/No			1		SIS	le	ale_a							
			(Ye:					NALYSIS	Sing	Sing							
			crial					NA	E T.	DM ity 1							
			Mate					V	Hr_H	Ir_I oxic							
			sno						96ł n_T	481 - 481 - 481						1	
		Field	Hazardous Material (Yes/No)		Time	G=Grab	# Of		NAUT_96Hr_RT_Sing ntration_Toxicity Test	UT							
Sample ID	Sample Location	Matrix	Ha:	Date	(24hr)	C=Comp	Cont.		NA	NA		-				<u> </u>	
_BFWB_OUT_SP21_2020-03-03_N_1140	WE BEWB OUT 3P21	11/2		3/3/2020	11:40	G	4		X	X					-	4	_
120-0940								-							_		_
020/03/61) 1:00										1							
1:60								1									
Controutin										6							
Sc																	
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1201 marboys, 2x111	CITICS					1	1	1.									
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1.7 0				in the second second	-	-	-						-		-		1
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ADDITIONAL COMMENTS/S	PECIAL INSTRUCTIONS	1	1.000	RELINOUIS	TED BY/A	FEILIATIO	N	-	Dat	c	Time		Accepte	d By/Affiliation	Date		Time
nipment includes 1 extra 20 L		11			nessa Tur			-	3/3/2	and the second second						_	
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SERVICE REQUEST (rush	and the second	(default) X			1	1							1	e an an Salan an an an Arrandia. An an Arrandia			
Priori	ty (2-3 business days) - 50% s		1	Sampler's N	ame		Jocelyn	Trav	verse/Brya	an Ogde	n	Mobile	#				
	ncy (1 Business Day) - 100% s	0	1		atur-							Date/Tir	ne	3-Ma	r-20		
For Emergency <1 Day	ASAP or Weekend - Contact	Nautilus	1 2	Sampler's Sigr	ature	1						Date II		2.000			



END OF REPORT



Acute Toxicity Test Results

Sample collected March 9, 2020

Final Report

March 24, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, AB

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Semula ID/	Dates							
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation				
WL_BFWB_SP21_20 20-03-09_N /	9-Mar-20 at 0900h	10-Mar-20 at 1120h	11-Mar-20 at 1530h	10-Mar-20 at 1430h				
1920-0962								

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_SP21_2020- 03-09_N	6.4°C	1002	234

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID	Percent survival in 100% (v/v) sample				
	Rainbow trout	Daphnia magna 20°C			
WL_BFWB_SP21_2020- 03-09_N	100	100			

Sample ID	Percent Immobility in 100 (% v/v) Daphnia magna 20°C	
WL_BFWB_SP21_2020- 03-09_N	0	



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WI REWR CD21 2020 02 00 N	Rainbow trout	None	None
WL_BFWB_SP21_2020-03-09_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	2.7 (2.2-3.2) g/L KCl ¹	6.1 (5.8-6.4) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-5.0) g/L KCl	6.1 (5.3-7.1) g/L NaCl
Reference toxicant CV	12.0%	5.0%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, March 9, 2020; ² Test Date March 2, 2020 LC = Lethal Concentration; CL = Confidence Limit



M. Fritz

Report By: Michelle Fritz, BSc Biologist

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Reviewed By: Jacklyn Poole, BSc Laboratory Supervisor

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APPENDIX A – Summary of test conditions



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO4 (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

Trout Bench Sheet



Method	TRS	Client	TEC164	Reference	192	20-0962	Chamber	9
Test Log							Sample Infor	mation
						Daily Data		
Day		Date	Time	Initial	Chem. Cart	Review	Initial pH:	7.4
0		0/03/11	1530 *	MM/MF/ A	1	1 80	Initial EC (µS/	cm): 110109
1		0/03/12	0030	AW	-	TP	Initial DO (mg	1/L):
2	202	0/03/13	0900	AW	-	10	Initial Temp (C): 10
3	2020	0/03/14	0230	SC	-		Salinity (ppt):	
4	2020	0/03/15	0900	MWILF		0	- Summy (ppt).	
Sample Pre Aeration rat Preaeration	e adjusted to 6.5	5 +/- 1 mL/min/	Note: * ; time	when the test w	as loaded wit	h fish 2 hours	DO in mg/L (saturation)** 6.2 mg/L - 8.9 mg	
DO(ma/L) o	f 100%		10.4		20	2 110013		
(LIV! I	Siy	0,-1		6.1 mg/L - 8.8 mg	
Tost Chami	stry and Biology						6.0 mg/L - 8.6 mg	
			1				**corrected for al	titude
Conc.	CTL	100						
				nH (units) (ra	inge: 5.5-8.5)			
Day 0	81	777	1		inge. J.J-0.J)	1	1	
Day 4	2.7	0.7						
Day 4	5.0	811						
		1100		EC (us	S/cm)			
Day 0	403	1550						
Day 4	459	1524						
		,]
	00	-00	DO (mg/	L) (70-100% sa	turation at te	est temp.)		
Day 0	BID	8.9						
Day 4	88	8.8						
				L				
			Te	emperature (°C)	(range: 14-16	°C)		
Day 0	15	4	<u></u>		(sugar to to			
Day 4	IF	15						
,		12	11					
			Numbe	er Alive (In brack	oto number o	traccad		
Day 0	10	10		Allve (III DIACE	cets number s	(ressed)	1	
Day 1								
-	10	1D						
Day 2	VS	10						
Day 3	10	10						
Day 4	10	10						
	Validity Crite	ria: must be ≤ '	10% mortality a	nd/or stressed	behavior in th	e control		
	Unless otherw	ise noted, beha	vior is considere	d to be normal		e control		
				to be normal				
Control Orga	anism Data					Tost Ormania	- 1- f f	
Control	Length	Weight				Test Organisr	n Information	
Fish	(cm)							
11511	(((11)	(g)				Batch	20200117TR	
1	32	0.3	Loading Density		0.3	Caura	T	
2	31		(must be ≤ 0.5 g/L)	- (g/L).	0.5	Source	Troutlodge	
3	21	0.2	(must be sols g/L)					
	39	0.5			22	Tank #	3	
4	3.0		Mean Length (c	:m):	3.3			
5	3.4	0.4				Days Held at 1	5± 2°C	22
6	13.4	0.5	Length Range (d	cm):	3.0-36	(must be ≥14 day	vs)	
7	3.3	0.4		-				
8	3.1	0.3	Mean Weight (g	a):	0.4	Percent stock r	mortality	0
9	3.5		(Must be $\geq 0.3g$)		- 1	(7 days prior to te	/	0
10	3.0	03	(must be 20.5g)			(7 days prior to te	st, must be $\leq 2\%$)	
10	0.0		Waish D	0	7.3-0.5			
			Weight Range: ((g): <u>(</u>	1.00.0	Test Volume (L)	16
Comunit	01						-	
Comments :	Ohr:	NO PO	74					
	alithe		4					
	TURIT	· NO PP	4					
	MF	**	0					
		Reviewed By:	TP		Г	ate Reviewed	20201	22/110
		J			L		20201	-SIV

Nautilus Environmental (Calgary)



Daphnia Bench Sheet

Method	DAS 20			Client	TEC164		Reference	1920	-0962	
Test Log									oformation	1
Day	Date	2	Time	Technician	Chem. Cart	Daily Dat	a Review	Initial pH:		7.4
0	2020/03	/10	1430	LF/KK	3	AV	J	Initial EC (µS/cm):	1609
1	2020/03	/11	0850	Mu	-	DP"		Initial DO	(ma/L):	11.0
2	2020/03		1100	YV	2	SC		Initial Tem		10
	1 2020/00	712	100			50		Salinity (p		-12
Lab Code		CTL D	CTLC	100 4	100 D	100 C	1	Samily (p	J().	1
Lab Coue	CTL A	CTL B	CTL C	100 A	100 B	100 C				
						-				
day				pH (uni	ts) (range: 6	.0-8.5)				
0	8.1	8.2	8-1	7.9	7.9	79				
2	e.c	PD	8.1	8.1	9-7-	0.7				
				t adjusted prior			in the comme	I helow		
		ie pri or the	sumple trus no	e dajastea prior	EC (uS/cm)	unicity noted	in the confine	into below		
0	1-1-1	ALF		10/ -		160	1	1	1	
0	412	415	415	1065	1074	1668				
2	410	420	416	1050	1054	1642				
				DO (mg/L) (4	40-100% sa	turation at	test temp	.)		
0	8.1	8.1	8.1	8.1	01	8.1		[
2	01	61	0.1	7.9)	7.0	7.0				
2		BI	En	1.0	1.0	1.0		I		
				T		10.00.00				
				Temperatu	re (°C) (range	e: 18-22 °C)			
0	9	19	19	19	19	19				
2	19	19	19	19	10	19				
					11			1		
					Numbe	r Alive				
0					(l, immo					
0	10	10	10	10	10	10				
1	10	10	10	0	10	D				
2	10	10)	()	10	(1)	10				
	V	alidity Crit	eria: must be	e ≤ 10% mort	ality and/or	abnormal h	ehavior in t	he control		
	N	lotos: Imm	obile: danh	nid can't swir	n after 60 se	ac even if a	ntonna still	movo		
								move		
	0	mess othe	erwise noted	, behaviour i	s considered	a to be nori	nai			
Culture								1		
Young jar	(2		Jar(s) morta	lity 7 days pr	ior to test (r	nust be ≤2	5%)	0 /.		
QA (previo	us month)						Control V	alidity Crit	eria	
	t brood (≤12 da	avc)	9					ortality at 4		DJ I
			1/2 15		30				to nours -	UT.
	imber of young				00		(must be ≤	10%)		
Were test t	reatments rand	omized or	n test tray?	Yes / No	0					
				C						
Sample										
				1	-			1	5	
DO % of sa	mple prior to a	eration:	118-	1.	Is aeration r	equired (<-	40% or >10)0%)? (Yes or No	
Duration of	faeration (37.5	+/_ 125 n	ml/min/l):	Denta	Filtered with	110um cc	roop prior t	to torting	Yes or No	
								0		
Hardness (I	mg CaCO ₃ /L) of	100% :	1002		Is hardness	adjustment	t required (<25 mg Ca	CO ₃ /L)?	Yes or No
Hardness	of sample after a	adiustmen	t (must he h	petween 25 -	30 mg CaC	$O_{2}(I)$	-			
	i sumple after e	ajastmen	(mase be i	Jetween 25	so mg cuc	03/2/				
				,						
Dilution W			1.0.0		DO Levels (- corrected	t for altitud	le -
Pail label /	preparation dat	te	2:03/04		3.3 to 8.2 m	g/L at 18°C		3.1 to 7.7 r	ng/L at 21°	°C
Hardness o	f dilution water	(mq/L)	776		3.2 to 8.1 m	g/L at 19°C		3.0 to 7.6 r	ng/L at 22°	°C
			1		3.2 to 7.9 m				J, - 4,	-
Commerte	Obcorretio	0h:	noopt	l	5.2 10 7.9 11	9/L 01 20 C				
comments	oloservatio	Un:	TI	2						
		48h:	noior	1						
						2				
	Reviewed By:	TP		Date	e Reviewed:	202010	3110			
						-				



APPENDIX C – Chain-of-custody form

Teck						Page	. 1	lof	1										
i d di c	COC ID:	2020-03-	.09 T	oxicity_SP	21	TURN	AROUN	D T	IME	Regula	r (default)			RUSH				
	PROJECT/CLIENT INFO	2020-03-		Oxicity_31	21	TORN	AROOI		ABORA		(ucraun		1. A. P. P.			R INFO		1. A. A. A.	1.2
Facility Name	WI C AWIF					L	ab Name	-		nvironme	ental		Report	Format	/ Distributio		Excel	PDF	E
Project Manager	Thomas Davidson					Lab	Contac	Tan	nara Por	merov			Email 1:		-WLC-Lab a tec		X	X	+
	thomas.davidson@teck.con	1				-		-			vironme	ntal.ca	Email 2:		omas.Davidson/a		X	X	+
	15 Km North HWY 43						Address	-					Email 3:			-	~	13	+
Address	15 Idii Norui 11 v 1 45						Audres	<i>m</i> -4,	0125 -	12 5000	. SL				kCoal a equisor		-		+
			-								1		Email 4:		cia.Hill@teck.co		X	X	+
	Sparwood			Province BC		1		Cal			Provinc	AB	Email 5:	Mar	rty.Hafke@teck	.com	X	×	+
Postal Code	V0B 2G0			Country Car	nada	Pos	stal Code	T2	H 2K 1		Country	Canada	Email 6:			-			
								-								1		-	-
Phone Number	(250) 603 - 9417	-				Phone	Number	403	253 71	21					PO number		VPO00	676571	1
		ILS	1 Mary	7.6					1	Sec.			ANALYSI	S REQUI					
2020/03/10																		1	T
11:20										1		Please ind	icate below Fil	tered, Per	served or both (F, P, F/P)			-
azo/03/10 Hizo Maniteulín 302 3x20Learboys, 3x1Lb No5/N65 Good Condition									c	-									Ŧ
			(0)						96Hr_RT_Single_Conc on_Toxicity Test	Single_Con y Test @									
7 201 1 7 11 1	sield		es/N			1		IS	st e	gle									
5x202 corpo9/5, 3x12 b	6TT/ES		(Xe					ANALYSIS	Tes	Te									
NOO/NGL			rial					IAI	T_ ity	Micity									
Good Consition			late					AN	r_R	D N									
croca contract			IS N						T(HI8 H-I									
			lop						r_9 tion	L_4 atio									
Sample ID 1926 - 096	0	Field	Hazardous Material (Yes/No)	Long Land	Time	G=Grab	# Of		NAUT_96I entration_	NAUT_48Hr_DM_Si centration_Toxicity T	2								
		Matrix	Ŧ	Date	(24hr)	C=Comp			Z 5	Zez	0 110								+
WL_BFWB_OUT_SP21_2020-03-09_N	WE REWROLD SPEE	11.2		3/9/2020	9:00	G	6		Х	X	Call	C							+
		dan sal												_					
																			+
																			+
		-	-				-				-							-	+
			-			1	1.11.11.1		****	1.1.1.1									+
			-											-					4
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	and the second second second second																		
																			+
ADDITIONAL COMMENTS/SPI	ECIAL INSTRUCTIONS		1.1	RELINQUIS	HED BY/AI	FILIATIO	N		Dat	e	Т	ime	Accept	ed By/Af	filiation	D	ate	1	Tin
Shipment includes 2 extra 20 L b	ladders and 2 extr	a 1 I		Ju	ulia Johnso	n			3/9/2	020								1	
plastic bottles.	raduers and 2 extra	aib																	T
plastic bottles.																			
												_					-		_
SERVICE REQUEST (rush -				1. <u>19</u> 19 19	Charles I.	Sec. Sec. 1			an air						. Same	an a			
	· · · · ·	(default) X		Sampler's N	ame		D	avid	Crichto	n		Mobi	ile #						
	(2-3 business days) - 50% s (1 Business Day) - 100% s		-					_	->	-	-	12							_



END OF REPORT



Acute Toxicity Test Results

Sample collected March 23, 2020

Final Report

April 6, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Semula ID/		Da	tes		
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 20°C test initiation	
WL_BFWB_OUT_SP 21_2020-03-23_N / 1920-1007	23-Mar-20 at 0900h	24-Mar-20 at 1145h	25-Mar-20 at 1500h	24-Mar-20 at 1700h	

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_OUT_SP21_202 0-03-23_N	6.1	933	196

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Samula ID	Percent survival in 100% (v/v) sample					
Sample ID ——	Rainbow trout	Daphnia magna 20°C				
WL_BFWB_OUT_SP21_2020- 03-23_N	100	100				

Sample ID	Percent Immobility in 100 (% v/v)	
	Daphnia magna 20°C	
WL_BFWB_OUT_SP21_2020- 03-23_N	0	

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination	
WL_BFWB_OUT_SP21_2020-03-	Rainbow trout	None	None	
23_N	Daphnia magna	None	None	



QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	2.7 (2.2-3.2) g/L KCl ¹	6.2 (5.6-6.9) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-5.0) g/L KCl	6.1 (5.3-7.1) g/L NaCl
Reference toxicant CV	12.0%	4.9%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, March 9, 2020; ² Test Date March 16, 2020

LC = Lethal Concentration; CL = Confidence Limit



M. Frit

Report By: Michelle Fritz, BSc Biologist

thiessen

Reviewed By: Sara Thiessen, BSc Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO4 (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data



Trout Bench Sheet

Method	TRS	Client	TEC164	Reference	1920	-1007	Chamber	5
Test Log							Sample Inform	mation
						Daily Data	1	
Day	Da		Time	Initial	Chem. Cart	Review	Initial pH:	7.3
0	2020-	03-25	1500 *	MF/ KIL	1	AW	Initial EC (µS/c	
1	2020	193/2.6	0835	MM	-	AW	Initial DO (mg,	
2	2020/	03127	CHE CHE SMM	m	-	tp	Initial Temp (°C	
3	202010	129	0900	SC	-	CB	Salinity (ppt):	2
4	2020/03/	29	DAVE	AWIKK		TP		
Sample Pre-	Aeration		Note: * ; time v	when the test w	as loaded with	fish	DO in mg/L (70% - 100%
	adjusted to 6.5 +	/ 1 ml /min/l	(Washing				saturation)**	10070
Preaeration ti			0.5 hours	1 hour	1.5 hours	2 hours		
DO(mg/L) of 1				T nour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg	
DO(IIIg/L) OI	100%		0.0				6.1 mg/L - 8.8 mg,	
Tost Chamist	mu and Biology						6.0 mg/L - 8.6 mg	
Conc.	ry and Biology	100					**corrected for alt	itude
Conc.	CTL	100						
				pH (units) (ra	ange: 5.5-8.5)			
Day 0	8.1	7.7	1		(inge. 5.5 0.5)			
Day 4	02	0.3						
		0.7						
				EC (u	S/cm)			
Day 0	446	1518						
Day 4	UNI	1522						
,		194	1					
		0	DO (mg/	/L) (70-100% s a	aturation at tes	st temp.)		
Day 0	8.9	8.8						
Day 4	B.B	R.B						
							•	
	-		T	emperature (°C)	(range: 14-16°	C)		
Day 0	14	15						
Day 4	15	15						
		<i>.</i>						
David	10	10	Numb	er Alive (In brac	kets number st	ressed)		
Day 0 Day 1	10							
	$\left(O(1) \right)$	10						
Day 2	10	01						
Day 3	60	10						
Day 4	Validity Criter	10	100/					
			10% mortality a vior is considered			control		
	Official Official	se noted, bena	vior is considere	eu to be norma	I			
Control Orga	nism Data					Test Organis	m Information	
Control	Length	Weight						
Fish	(cm)	(g)				Batch	20200117TR	
			_					-
1	3:1	0.4	Loading Densit	ty (g/L):	0.2	Source	Troutlodge	
2	3.4	0.4	(must be ≤0.5 g/L)					-
3	3.6	0.5]			Tank #	3	
4	31	0.3	Mean Length (cm):	3.4			-
5	3.0	0.2				Days Held at	15± 2°C	36
6	3.5	U.C	Length Range	(cm):	3.0-3.6	(must be ≥14 da	ays)	
7	3.5	D.Y						
8	35	0.3	Mean Weight ((g):	0.4	Percent stock	mortality	0.36
9	3.3	0.4	(Must be ≥0.3g)			(7 days prior to t	est, must be ≤2%)	
10	3.4	0.5]		-			
			Weight Range:	(g):	0.2-0.5	Test Volume	(L)	16
Comments :		pt						
	96 Hr: NO 005							
	1 - 44.							
		De la la	570				lacoo	(22122)
		Reviewed By:	JE			Date Reviewed	: 2020	05130



Daphnia Bench Sheet

Method	DAS 20	Client	TEC 164	Ref	erence 1920	-1007	_
_							
Test Log					Sample In	formatio	n
Day	Date	Time Techniciar	Chem. Cart	Daily Data Re	view Initial pH:		73
0	2020/03/24	1700 KK	3	AW	Initial EC (µS/cm):	1024
1	2020/03/25	1210 MF	-	54	Initial DO		1007
2	2020/03/26	IOSO MW	2	2	Initial Tem		Lug
			2	51			
Lab Code	CTLA CTLB		1000	1000	Salinity (p	50	
Lub couc	CILA CILB	CTLC 100A	100B	100C			
dav				0.0.5			
day			nits) (range: 6	.0-8.5)			
0	1.9 7.9	7.9 7.9	1.8	7.9			
2	8.2 8.2	8-2 82	8.3	8.3			
	The pH of the	sample was not adjusted pric	or to test setting,	unless noted in the	comments below		
			EC (uS/cm)				
0	40 449	451 11000	11015	[10]]			
2	486 474	470 1549		1588			
	406 110	910 134	1570	12 28			
		$DO(m\pi/l)$	(40 1000/				
0			(40-100% sa	turation at test	t temp.)		
0	8.1 8.1	81 81	8.1	61			
2	7.7 7.7	7.7 7.6	7.7	7.8			
	19	Temperatu	ure (°C) (range	e: 18-22 °C)			
0	igan 19	19 IQ	IG	19			
2	14 19	19 19	19	19			
			Number	n A live			
			Numbe				
0			(I, immo	bile)			
0	10 10	10 10	10	10			
1	0 0	10 10	10	10			
2	10 10	12 10	10	10			
	Validity Crit	eria: must be ≤ 10% mor	tality and/or	abnormal behav	ior in the control		
	Notes: Imm	obile; daphnid can't swi	im after 60 se	c even if anten	na still move		
	Unless othe	erwise noted, behaviour	is considered	to be normal	na still move		
Culture	official official	invise noted, benaviour	13 considered	to be normal			
Young jar	CY				01		
roung jai		Jar(s) mortality 7 days p	prior to test (n	nust be ≤25%)	04.		
QA (previo		- 2			trol Validity Crite		~1
	st brood (≤12 days)	e)		Mea	in % mortality at 4	8 hours -	01.
Average nu	umber of young produced	(≥15 young)	30		st be ≤10%)		
	reatments randomized or						
Sample							
DO % of sa	ample prior to aeration:	17.01.	Is aeration r	equired (<40%	or >100%)?	Yes or No	, , , , , , , , , , , , , , , , , , , ,
Duration o	f aeration (37.5 +/- 12.5 n	L/min/L · 200			prior to testing	Voc ar NI-	0
Hardnore (mg CaCO ₃ /L) of 100% :	CI22					
		400			uired (<25 mg Ca	$CO_3/L)?$	Yes or No
Hardness c	of sample after adjustmen	t (must be between 25	- 30 mg CaC	$D_3/L)$	-		
			5				
Dilution W	/ater		DO Levels	40-100% catur	ation) - corrected	for altiture	
	preparation date	2:02/12					
	of dilution water (mg/L)	2110	3.3 to 8.2 m		3.1 to 7.7 r		
l andress d	- unution water (mg/L)	CMI	3.2 to 8.1 m		3.0 to 7.6 r	ng/L at 22°	
	(0)		3.2 to 7.9 m	g/L at 20°C			
Comments	s/Observations:						
	Ohr:no ppt						
	48 hr: NO PPI						
				1			
	Reviewed By: TP	Dat	e Reviewed:	2020/0	230		
				202010			



APPENDIX C – Chain-of-custody form

Teck						Pag	e	1 of	1										
	COC ID: 2020-03-23 Toxicity SP21					TURM	AROU	ND '	TIME:	Regul	ar (defau	lt)			RU	SH:			
	Facility Name WLC AWTF							1	LABOR/	TORY			1			THER INFO)		1999 B
		I	.ab Nam	e Na	autilus E	Environm	ental		Repor	Report Format / Distribution Exce					EDD				
Project Manager	Thomas Davidson					Lab Contact Tamara Pomeroy Email tamara@nautilusenvironmental.ca						Email 1	ail 1: DL-WLC-Lab@teck.com				X	X	
Email	thomas.davidson@teck.com											Email 2	: The	mas.David	son a teck co	om X	X	X	
Address	15 Km North HWY 43						Address			#4, 6125 - 12 Street SE			Email 3		kCoal@equisonline.com		-		X
											Email 4		cia Hill a ter		X	X	X		
City	Sparwood			Province BC		City Calgary Province A					CAR		Email 5: Marty Hafke a teck.com						
Postal Code	V0B 2G0			Country Can	ada	Postal Code 7						y Canada			пу.наткеа	teck.com	X	X	X
						1.0	star cou				Counti	yCanada	Email 6						
	(250) (02 0417				_							_							
	(250) 603 - 9417 SAMPLE DETA	II E				Phone Number 403 253 7121					PO number VPO00676571								
2000/02/201	SAMPLE DETA	ILS		T	T	1	1	-		1	1	1	ANALYS	S REQU	ESTED				
2020/03/24 11:45 Manitoulin SC 33:20L carkonys, to 5x11 NoS/NGZ Good Condition												Please in	dicate below Fi	Itered, Per	served or be	oth (F. P. F/F	2)	- Andrews	
And d'a										-									
Manitocilit									NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @									
Se I FI	N 131		Hazardous Material (Yes/No)					0	e C	t a									
3x20L carbons, the ball	-loctifies		(Ye					ANALYSIS	ingl	Tes									
NOSING			rial					AL	L'S Ity]	M_S ity									
George Comption			late					AN	R	Dixio									
Good Longing			us N						6Hr To	8Hr n_T									
		1.00	rdo						L_9 tion	L_4									
Sample ID 1920 - 1007	Sample Location	Field Matrix	Iaza	Dete	Time	G=Grab			AU	AU	2								
WL BFWB OUT SP21 2020-03-23 N	WL BFWB OUT SP21	WS		Date 3/23/2020	(24hr) 9:00	C=Comp									-	-		-	-
		H G	-	,	9:00	G	6		X	X	610								L
					-		-				-	-							
	the state of the s																		
	and the second sec																		
																		1.1	-
															-		1	1	1
																	-		-
									-									-	-
							1										1	-	-
																		_	4
											1.1								
ADDITIONAL COMMENTS/SP	FCIAL INSTRUCTIONS			DELINOUTO	IED DY//	THE LATER CO.													
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS RELIN Shipment includes 2 extra 20 L bladders and 2 extra 1 L				and the second se	RELINQUISHED BY/AFFILIATION Julia Johnson			Date Time 3/23/2020			ime	Accepted By/Affiliation D					1	lime	
	naduers and 2 extra	IL		Ju	na Johnso			-	3/23/2	020	1.1							-	
plastic bottles.																			
SERVICE REQUEST (rush -	subject to availability)																		
SERVICE REQUEST (rush -		default) V			1		1.1	1				1				1. S. B.			
Regular (default) X Priority (2-3 business days) - 50% surcharge							J	ulia .	Johnson			Mobi	le #						
Emergency (1 Business Day) - 100% surcharge																			
	SAP or Weekend - Contact !		S	ampler's Sign	ature							Date/1	ime			23-Mar-	20		



END OF REPORT



Acute Toxicity Test Results

Sample collected April 6, 2020

Final Report

April 21, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC



SAMPLE INFORMATION

Comple ID/	Dates								
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation					
WL_BFWB_OUT_SP 21_2020-04-06_N / 1920-1055	6-Apr-20 at 0900h	7-Apr-20 at 1140h	8-Apr-20 at 1550h	7-Apr-20 at 1455h					

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity		
	temperature	(mg/L CaCO3)	(mg/L CaCO3)		
WL_BFWB_OUT_SP21_2020- 04-06_N	6.1°C	1015	220		

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID ——	Percent survival in 100% (v/v) sample						
	Rainbow trout	Daphnia magna					
WL_BFWB_OUT_SP21_2020- 04-06_N	100	100					

	Percent Immobility in 100 (% v/v)			
Sample ID	Daphnia magna			
WL_BFWB_OUT_SP21_2020- 04-06_N	0			



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-04-	Rainbow trout	None	None
06_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	4.0 (3.5-4.4) g/L KCl ¹	5.3 (5.0-5.5) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-5.0) g/L KCl	6.0 (5.0-7.2) g/L NaCl
Reference toxicant CV	11.9%	6.0%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, March 18, 2020; ² Test Date April 2, 2020

LC = Lethal Concentration; CL = Confidence Limit



Michael Ulrublesti

Report By: Michael Wrubleski, BSc Biologist

acham

Reviewed By: Jacklyn Poole, BSc Laboratory Supervisor

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data





Method	TRS	Client	TEC164	Reference	192	20-1055	Chamber	5
Test Log							- Comple Infe	
						Daily Data	Sample Infor	mation
Day		Date	Time	Initial	Chem. Cart		Initial pH:	-710
0		0-04-08	1550 *	ME/MW	1/2		Initial EC (µS/d	1.0
1	20201	04109	0805	MF	-		Initial DO (mg	m): 2010
2	197010		6840	Min	-	TP	Initial Temp ("	/L): 0.7
3	2020/04		0400	((-	SC	Caliaity (and)	
4	702010	U112	1040	VYIST	1	MF	Salinity (ppt):	- 4
			Note: * ; time v	when the test w	loaded with	Aw		
Sample Pre	-Aeration		-		and the second second	1 11311	DO in mg/L (70% - 100%
Aeration rate	e adjusted to 6.5	+/- 1 mL/min/L	: yes/no				saturation)**	10070
Preaeration	time		0.5 hours	1 hour	1.5 hours	2 hours		
DO(mg/L) of	f 100%		0.0	10.8	199	19.5	6.2 mg/L - 8.9 mg	/Lat 14 C
				10.0		1,5	6.1 mg/L - 8.8 mg	
Test Chemis	stry and Biology	,					6.0 mg/L - 8.6 mg	
Conc.	CTL	100			1		**corrected for alt	itude
				pH (units) (ra	ange: 5.5-8.5)			
Day 0	8.0	7.8		1 (111)			1	
Day 4	9.0	8.2						
				EC (u	S/cm)			
Day 0	Sdo	1854		(4				
Day 4	513	10(10						
		1000						
			DO (ma/	L) (70-100% s a	turation at te	st tomp)		
Day 0	8.9	9.5		-/ (st temp.)		
Day 4	0.7	Q.I			1			
		U.T			-			
			Te	mperature (°C)	(range: 14-16	°C)		
Day 0	14	L		inperature (C)	(runge. 14-10			
Day 4	14	15						
			Numbe	r Alive (In bracl	kets number st	rossed		
Day 0	10	10			kets number si	(lessed)		
Day 1	10	10						
Day 2	10	0						
Day 3	10	10						
Day 4		10						
	Validity Criter	ia: must be < 1	0% mortality an	d/or strossed	halter to the			
	Unless otherwis	se noted, behav	ior is considered	to be permal	behavior in the	e control		
			ion is considered	a to be normal				
Control Orga	anism Data					Test Ormenia	1.6	
Control	Length	Weight				Test Organism	Information	
Fish	(cm)	(g)				Datab	2020000000	
		(9)				Batch	20200303TR	
1	3,4	0.5	Loading Density	(0/1):	0.3	c		
2	3.5		(must be ≤0.5 g/L)	(g/L). –	V . /	Source	Sam Livingston	
3	21	0.4	(must be 20.5 g/L)			T I "		
4	3.6		Mean Length (cr		3,4	Tank #	6	
5	3,6	0.6	wear Length (cr	n): –	21			
6	3.1		Length Range (c		2022	Days Held at 15		36
7	32	0.4	cengui Range (c		3.0-3.8	(must be ≥14 day	s)	
8	3.8		Moon Mainht (0.5			
9	3.0		Mean Weight (g)			Percent stock m		0.06
10			Must be ≥0.3g)			(7 days prior to test	t, must be ≤2%)	
10	3.7	0.6	Mainh: D		1207			
		1	Weight Range: (g	g): <u>C</u>).3-0.7	Test Volume (L)		16
Comments :	- 1						_	
connents :	Ohr:no	ppt						
900		00						
7011	12 MO	ppt						
			0.70					

Reviewed By:

Date Reviewed: 2020104113



Daphnia Bench Sheet

Method	DAS	_		Client	TEC164		Reference	1920	-1055	
Test Log								Sample In	formation	
Day		ate	Time		Chem. Cart	Daily Dat	a Review	Initial pH:		7.6
0		04/07	1455	AW	3	SS		Initial EC (2010
1		04/08	0930	SC	-	TP		Initial DO		10.7
2	2020/	04/09	0000	SC	3	(B		Initial Tem		16
			0					Salinity (p	ot):	4
Lab Code	CTL A	CTL B	CTL C	100 A	100 B	100 C				
day				pH (un	its) (range: 6.	0-8.5)				
0	0.)	8.)	0.1	7.0	7.8	7.8				
2	79	79	29	8.1	BI	RZ				
		The pH of the	sample was n	ot adjusted prior	r to test setting,	unless noted	in the comme	ents below	LL	
					EC (uS/cm)					
0	424	427	431	1893	1921	1940			1	
2	410	425	010	IRRS	1890	1908			++	
_	100	100	130	100)	10101	1900		1	<u> </u>	
				DO(ma/l)	40-100% sat	uration at	tost tomp)		
0	Pul		0	B.7	40-100 % sat	~ ~	test temp	.)		
2	1	0.1	0.1		5.2	6.9				
2	TY	147	29	79	141	47				
				-		10.00.00				
				Temperatu	re (°C) (range)			
0	19	19	19	10	16	10				
2	20	120	70	10	10	ŽO				
			00							
					Numbe	r Alive				
					(l, immo	bile)				
0	10	10	10	10	10	10				
1	10	10	(0)	(0	(0	(0				
2	10	10	10	10	10	10				
-		Validity Cri	toria: must h	$e \le 10\%$ mor	tality and/or	abnormal h	abaylor in t	the control		
		Notos: Imp	achilo: daph	nid can't swi	m offer 60 co		atoppo still	me control		
				d, behaviour i				move		
Culture		Uniess Utin	erwise noted	a, penaviour i	s' considered	to be non	lidi			
and the second second second second	()		1					()		
Young jar	L d	-	Jar(s) morta	ality 7 days p	rior to test (n	nust be ≤ 2 :	5%)	0		
							-			
QA (previo			9	1			Control Va			
	t brood (≤12		1	-	21		Mean % m		18 hours -	()
	Imber of you			g)	0 T		(must be ≤	10%)	_	
Were test t	reatments ra	ndomized o	n test tray?	(Yes)/ N	0					
				\bigcirc						
Sample									-	
DO % of sa	mple prior to	apration.	10	9L	Is aeration r	aquirad (10% or > 10	00/ 12	Yes or No	
			10						\sim \sim	
	faeration (37			ZOMIN	Filtered with	110um sci	reen prior t	o testing	Yes or No	
Hardness (I	mg CaCO ₃ /L)	of 100% :	1015		Is hardness	adjustment	required (<25 mg Ca	$CO_3/L)?$	es or No
				between 25 -				9		\mathcal{A}
				-	Ju nig cace	J3/L)				
Alkalinity o	f 100% samp	le (mg CaCC	⊃ ₃ /L):	330						
Dilution W			0 7	61	DO Levels (40-100% s	aturation)			
Pail label /	preparation of	date	2:031	123	3.3 to 8.2 m	g/L at 18°C		3.1 to 7.7 r	mg/L at 21°C	2
Hardness o	f dilution wat	ter (mg/L)	204	- 10	3.2 to 8.1 m	g/L at 19°C			ng/L at 22°C	
					3.2 to 7.9 m				5.	
Comments	/Observatio	ns:								
		C	shr: No	1995						
		44	Shr n	0 pat						
L				- PPI						
1	Reviewed By:	CIA		Dat	e Reviewed:	2000		. 7		
	.stretted by.	10		- Dat	e nevieweu.	ad	1041	15.		



APPENDIX C – Chain-of-custody form

Teck						Page	. 1	l of	1										
	COC ID:	2020-04-	06 T	oxicity SP	21	TURN	AROUN	UD T	CIME.	Regula	r (default)				DUGU				
	PROJECT/CLIENT INFO	2020-04-	00_1	Oxienty_51	21	TORN	AROUN		ABORA				Sec. Col		RUSH:	R INFO	ALCONTRACT		
Facility Name	WLC AWTF					L	ab Name	Na	utilus E	nvironme	ental		Report Fe	ormat / Di			Excel	PDF	EDD
Project Manager	Thomas Davidson					Lat	Contact	Ta	mara Po	meroy			nail 1:		C-Lab a tec		X	X	X
Email	thomas.davidson@teck.com						Email	tar	mara@n	autilusen	vironmental.c	a En	nail 2:	Thomas.	Davidson/a	iteck.com	X	X	X
Address	15 Km North HWY 43						Address	#4,	6125 -	12 Street	SE		nail 3:		al@equison				X
													nail 4:		ill@teck.co		X	X	X
City	Sparwood	-		Province BC			City	Ca	lgary		Province AB		nail 5:	-	afke/a teck		X	X	X
Postal Code				Country Can	ada	Pos	tal Code				Country Can		nail 6:	Marty.11	alke a leek.		~	^	1
							un couc				[Country]Can		nan o.						<u> </u>
Phone Number	(250) 603 - 9417					Phone	Number	103	2 252 71	21				De) number		VPOO	0692115	
		LS	-		-		rumber	40.	233 11	121	Sector States	ANA	ALVSIS R	EQUESTI		1999 M. 199	VFOOL	092113	1.1.1.1.1.1.1
1026/04/07								13	1				10 - E	1 1 A 14	L. Sail			5 3	1
1246										3	Plea	se indicate be	low Filtere	d, Perserve	d or both (F, P, F/P)		1	
2020/04/07 Wi40 Manitoullin SC 320Learbons, 5x W NoS/NoL Good Condition Sample ID									JC	E		24. J	e Bandina						and and
Manifornin			No)						Col	a C									
	1 Mil		Hazardous Material (Yes/No)					SIS	NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @ 20C									
Barbons, bark	- bottles		al ()					ANALYSIS	y Te	IN T									
VSINGI			ateri					NNA	RT	DM									
PUP T-Ling			s Ma					4	Toy	"T									
good Londition			nop						-96 ion	_48 tion									
5.100		Field	azar		Time	G=Grab	# Of		NUT trat	NUT ntra									
Sample ID NL BFWB OUT SP21 2020-04-06 N	Sample Location WL_BFWB_OUT_SP21	Matrix WS	H	Date	(24hr)	C=Comp	Cont.		_			-							<u> </u>
1920-1055		113		4/6/2020	9:00	G	6		Х	X		-		-		_			
M20-N00													-						
			-																
and the second		1																	
												-							-
																			-
									-				-			-		-	
										1.1		-	-						<u> </u>
ADDITIONAL COMMENTS/SP				RELINQUISI	IED BY/AF	FILIATION	1		Dat	e	Time	1	Accepted I	By/Affiliati	on	Da	ite	Т	ime
Shipment includes 2 extra 20 L	bladders and 2 extra	1 L		Ju	lia Johnso	n			4/6/20	020									
plastic bottles.																			
			-	1. d. 1.				-	deres a										
SERVICE REQUEST (rush -	subject to availability)						Paris Constant	211212	an and	1. 1860 A. 1979	A STATE OF A	_					Santa a serie		
		default) X		0					~			19.20	T	a state of the	1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -				1000
	(2-3 business days) - 50% su	rcharge		Sampler's Na	ime		1	Bell	a Chen		N	lobile #							
	y (1 Business Day) - 100% su		G	ampler's Sign	ature							to T:							
For Emergency <1 Day, A	SAP or Weekend - Contact N	lautilus		ampier s orgi	ature						D	te/Time			(6-Apr-20			



END OF REPORT



Acute Toxicity Test Results

Sample collected April 20, 2020

Final Report

May 5, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Comula ID/	Dates								
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation					
WL_BFWB_OUT_SP 21_2020-04-20_N / 1920-1114	20-Apr-20 at 0900h	21-Apr-20 at 1000h	22-Apr-20 at 1550h	21-Apr-20 at 1435h					

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)			
WL_BFWB_OUT_SP21_202 0-04-20_N	7.9°C	1320	192			

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID —	Percent survival in 100% (v/v) sample						
Sample ID	Rainbow trout	Daphnia magna 20°C					
WL_BFWB_OUT_SP21_2020-04-20_N	100	100					

Sample ID	Percent Immobility in 100 (% v/v)
Sample ID	Daphnia magna 20°C
WL_BFWB_OUT_SP21_2020-04-20_N	0



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-04-	Rainbow trout	None	None
20_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.4 (2.9-3.9) g/L KCl ¹	5.9 (5.6-6.2) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-5.0) g/L KCl	6.0 (5.0-7.2) g/L NaCl
Reference toxicant CV	11.8%	6.0%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, April 17, 2020; ² Test Date April 13, 2020;

LC = Lethal Concentration; CL = Confidence Limit



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Report By: Sara Thiessen, BSc Biologist

acham

Reviewed By: Jacklyn Poole, BSc Laboratory Supervisor

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

✓ NATITUTIC

Trout Bench Sheet

	TRS Client	TEC164	_ Reference	1920-1114		Chamber
est Log						Sample Information
Day	Date	Time	Initial	Chem. Cart	Daily Data Review	Initial pH: 73
0	2020-04-22	1550*	SC/NW	1	CB	Initial EC (µS/cm):
1	2020-04-23	TOHE	MÉ	-	59	
2	2020-04-24	0815	I I I F		75	
3	2020-04-25	280	N TE	-	dr	Initial Temp (°C):
4	2020-04-26	0935	M	-	10	Salinity (ppt):
	2020-04-20		when the test w		LF	
ample Pre-	Aeration	Note. , time	when the test w	vas loaded with	nsn	DO in mg/L (70% - 100%
	adjusted to 6.5 +/- 1 mL/	(min / Luna)				
reaeration ti						saturation)**
		0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg/L at 14°C
O(mg/L) of	100%	9.0	1.5	8.9		6.1 mg/L - 8.8 mg/L at 15°C
						6.0 mg/L - 8.6 mg/L at 16°C
	try and Biology					**corrected for altitude
Conc.	CTL 100)				
Day 0	20121	-	pH (units) (ra	ange: 5.5-8.5)		
Day 0 Day 4		0			l	
Day 4	DO DO					
			50 (C (
Dave	670	2	EC (u	S/cm)		
Day 0	210 103	2				
Day 4	247 162	1				
D	0000	DO (mg/	/L) (70-100% s a	turation at te	st temp.)	
Day 0	B' B'	1				
Day 4	8.6 8.9					
		Те	emperature (°C)	(range: 14-16	C)	
Day 0	14 14					
Day 4	IS NY					
	1.					
		Numbe	er Alive (In brac	kets number st	ressed)	
Day 0	10 10					
Day 1	10 10					
Day 2	ID IF					
Day 3	0 10					
Day 4						
Day 4	10 10					
Day 4		be ≤ 10% mortality a	nd/or stressed	behavior in the	e control	
Day 4	Validity Criteria: must	be ≤ 10% mortality a behavior is considered	and/or stressed	behavior in the	e control	
	Validity Criteria: must Unless otherwise noted,	be ≤ 10% mortality a behavior is considere	and/or stressed ed to be normal	behavior in the	e control	11
ontrol Orga	Validity Criteria: must Unless otherwise noted, nism Data	behavior is considere	and/or stressed ed to be normal	behavior in the		m Information
ontrol Orga Control	Validity Criteria: must Unless otherwise noted, nnism Data Length Weig	behavior is considere	and/or stressed and to be normal	behavior in th	Test Organis	n Information
ontrol Orga	Validity Criteria: must Unless otherwise noted, nism Data	behavior is considere	and/or stressed ed to be normal	behavior in th		m Information _20200303TR
ontrol Orga Control Fish	Validity Criteria: must Unless otherwise noted, nnism Data Length Weig	behavior is considere	ed to be normal	I	Test Organis	20200303TR
Ontrol Orga Control Fish 1	Validity Criteria: must Unless otherwise noted, nism Data Length Weig (cm) (g)	ht Loading Densit	ed to be normal		Test Organis	
Control Orga Control Fish 1 2	Validity Criteria: must Unless otherwise noted, nnism Data Length Weig	behavior is considere	ed to be normal		Test Organis Batch	20200303TR
Control Orga Control Fish 1 2 3	Validity Criteria: must Unless otherwise noted, nism Data Length Weig (cm) (g)	ht Loading Densit	ed to be normal	0.4	Test Organis Batch	20200303TR Sam Livingston
Control Orga Control Fish 1 2 3 4	Validity Criteria: must Unless otherwise noted, nism Data Length Weig (cm) (g)	ht K (must be ≤0.5 g/L)	ed to be normal	0.4	Test Organis Batch Source	20200303TR
Control Orga Control Fish 1 2 3	Validity Criteria: must Unless otherwise noted, anism Data Length Weig (cm) (g) 4.0 (), 3.9 (), 4.1 ()	behavior is considered ht Loading Densit	ed to be normal		Test Organis Batch Source Tank #	20200303TR Sam Livingston 5
Control Orga Control Fish 1 2 3 4	Validity Criteria: must Unless otherwise noted, Length Weig (cm) (g) 4.0 (). 3.9 (). 4.1 () 3.5 () 4.1 ()	behavior is considered ht Loading Densit (must be ≤0.5 g/L) .4- Mean Length (c	ed to be normal	0.4	Test Organisr Batch Source Tank # Days Held at 1	<u>20200303TR</u> <u>Sam Livingston</u> <u>5</u> 15± 2°C 50
Control Orga Control Fish 1 2 3 4 5	Validity Criteria: must Unless otherwise noted, inism Data Length Weig (cm) (g) 4.0 () 3.9 () 4.1 () 3.5 ()	behavior is considered ht Loading Densit (must be ≤0.5 g/L) 4 Mean Length (c	ed to be normal	0.4	Test Organis Batch Source Tank #	<u>20200303TR</u> <u>Sam Livingston</u> <u>5</u> 15± 2°C 50
Control Orga Control Fish 1 2 3 4 5 6 7	Validity Criteria: must Unless otherwise noted, Length Weig (cm) (g) 4.0 (). 3.9 (). 4.1 (). 3.5 () 4.1 ().	behavior is considered ht Loading Densit (must be ≤0.5 g/L) .4 Mean Length (d Length Range (ed to be normal 	0.4	Test Organisr Batch Source Tank # Days Held at 1 (must be ≥14 da	20200303TR Sam Livingston 5 15± 2°C 50
Control Orga Control Fish 1 2 3 4 5 6 7 8	Validity Criteria: must Unless otherwise noted, Inism Data Length Weig (cm) (g) 4.0 (). 3.9 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 3.5 ().	ht Loading Densit (must be ≤0.5 g/L) 4 Mean Length (a Length Range (4 Mean Weight (ed to be normal 	0.4 3.9 3.5.4.1 0.8	Test Organisr Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock	_20200303TR 5 5 I5± 2°C50 ws) mortality 0
Control Orga Control Fish 1 2 3 4 5 6 7 8 9	Validity Criteria: must Unless otherwise noted, Inism Data Length Weig (cm) (g) 4.0 (). 3.9 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 ()	behavior is considered ht Loading Densit (must be ≤0.5 g/L) .4 Mean Length (d Length Range (ed to be normal 	0.4 3.9 3.5.4.1 0.8	Test Organisr Batch Source Tank # Days Held at 1 (must be ≥14 da	20200303TR Sam Livingston 5 15± 2°C 50 mortality 0
Control Orga Control Fish 1 2 3 4 5 6 7 8	Validity Criteria: must Unless otherwise noted, Inism Data Length Weig (cm) (g) 4.0 (). 3.9 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 3.5 ().	behavior is considered ht Loading Densit (must be ≤0.5 g/L) A Mean Length (Length Range (Mean Weight ((Must be ≥0.3g))	ed to be normal	0.4 3.9 3.5.4.1 0.8	Test Organisr Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te	20200303TR <u>Sam Livingston</u> <u>5</u> 15± 2°C <u>50</u> 15± 2°C <u>50</u> wys) mortality <u>0</u> SC
Control Orga Control Fish 1 2 3 4 5 6 7 8 9	Validity Criteria: must Unless otherwise noted, Inism Data Length Weig (cm) (g) 4.0 (). 3.9 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 (). 4.1 (). 3.5 ()	ht Loading Densit (must be ≤0.5 g/L) 4 Mean Length (a Length Range (4 Mean Weight (ed to be normal	0.4 3.9 3.5.4.1 0.8	Test Organisr Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock	_20200303TR 5 15± 2°C50 mortality0 sst, must be ≤2%)
Control Orga Control Fish 1 2 3 4 5 6 7 8 9 10	Validity Criteria: must Unless otherwise noted, inism Data Length Weig (cm) (g) 4.0 (). 3.9 (). 4.1 (). 3.5 () 4.1 (). 3.5 () 4.1 () 3.5 () 4.1 () 3.5 () 4.1 () 3.5 () 3.	behavior is considered ht Loading Densit (must be ≤0.5 g/L) A Mean Length (Length Range (Mean Weight ((Must be ≥0.3g))	ed to be normal	0.4 3.9 3.5.4.1 0.8	Test Organisr Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te	20200303TR <u>Sam Livingston</u> <u>5</u> 15± 2°C <u>50</u> 15± 2°C <u>50</u> wys) mortality <u>0</u> SC
Control Orga Control Fish 1 2 3 4 5 6 7 8 9	Validity Criteria: must Unless otherwise noted, inism Data Length Weig (cm) (g) 4.0 (), 3.9 (), 4.1 (), 3.5 () 4.1 (), 3.5 () 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (),	behavior is considered ht Loading Densit (must be ≤0.5 g/L) A Mean Length (Length Range (Mean Weight ((Must be ≥0.3g))	ed to be normal	0.4 3.9 3.5.4.1 0.8	Test Organisr Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te	20200303TR <u>Sam Livingston</u> <u>5</u> 15± 2°C <u>50</u> 15± 2°C <u>50</u> wys) mortality <u>0</u> SC
Control Orga Control Fish 1 2 3 4 5 6 7 8 9 10	Validity Criteria: must Unless otherwise noted, inism Data Length Weig (cm) (g) 4.0 (). 3.9 (). 4.1 (). 3.5 () 4.1 (). 3.5 () 4.1 () 3.5 () 4.1 () 3.5 () 4.1 () 3.5 () 3.	behavior is considered ht Loading Densit (must be ≤0.5 g/L) A Mean Length (Length Range (Mean Weight ((Must be ≥0.3g))	ed to be normal	0.4 3.9 3.5.4.1 0.8	Test Organisr Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te	20200303TR <u>Sam Livingston</u> <u>5</u> 15± 2°C <u>50</u> 15± 2°C <u>50</u> wys) mortality <u>0</u> SC
Control Orga Control Fish 1 2 3 4 5 6 7 8 9 10	Validity Criteria: must Unless otherwise noted, inism Data Length Weig (cm) (g) 4.0 (), 3.9 (), 4.1 (), 3.5 () 4.1 (), 3.5 () 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (),	behavior is considered ht Loading Densit (must be ≤0.5 g/L) A Mean Length (Length Range (Mean Weight ((Must be ≥0.3g))	ed to be normal	0.4 3.9 3.5.4.1 0.8	Test Organisr Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te	20200303TR <u>Sam Livingston</u> <u>5</u> 15± 2°C <u>50</u> 15± 2°C <u>50</u> wys) mortality <u>0</u> SC
Control Orga Control Fish 1 2 3 4 5 6 7 8 9 10	Validity Criteria: must Unless otherwise noted, inism Data Length Weig (cm) (g) 4.0 (), 3.9 (), 4.1 (), 3.9 (), 4.1 (), 3.5 (), 3.5 (), 3.5 (), 3.5 (), 3.5 (), 3.6 ()	behavior is considered ht Loading Densit (must be ≤0.5 g/L) A Mean Length (ange) Length Range (Mean Weight ((Must be ≥0.3g) Weight Range:	ed to be normal	0.4 3.9 3.5.4.1 0.8 0.4-1.0	Test Organisi Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te Test Volume (I	_20200303TR 5 I5± 2°C50 mortality0 est, must be ≤2%)
ntrol Orga Control Fish 1 2 3 4 5 6 7 8 9 10	Validity Criteria: must Unless otherwise noted, inism Data Length Weig (cm) (g) 4.0 (), 3.9 (), 4.1 (), 3.5 () 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (), 3.5 (), 3.5 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 3.5 (), 4.1 (), 4.1 (), 3.5 (), 4.1 (),	behavior is considered ht Loading Densit (must be ≤0.5 g/L) A Mean Length (ange) Length Range (Mean Weight ((Must be ≥0.3g) Weight Range:	ed to be normal	0.4 3.9 3.5.4.1 0.8 0.4-1.0	Test Organisi Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te Test Volume (I	20200303TR <u>Sam Livingston</u> <u>5</u> 15± 2°C <u>50</u> 15± 2°C <u>50</u> wys) mortality <u>0</u> SC



Daphnia Bench Sheet

Method	DAS20	(Client	TEC164		Reference	1920-	4	
Test Log					-			formation	
Day	Date	Time	Technician	Chem. Cart		ta Review	Initial pH:		7.3
0	2020/04/21	1435	LF	3	V	er	Initial EC (11092
1	2020/04/22	0955	MF	-	V	P	Initial DO		121
2	2020/04/23	0830	SC	3	C	B	Initial Tem	p (°C):	10
	CTL	BCTLC	100 A	1003		c	Salinity (p	ot):	2
Lab Code	CTLA 6	+ 12 **	25	50 MA	100-	A			
		· · · ·							
day			pH (uni	ts) (range: 6.	.0-8.5)				
0	8.2 8.2	8.2	7.6	7.6	7.6				
2	8.0 B.C	B.O	8.2	8.2	8:2				
	The pH of	the sample was not	adjusted prior	to test setting,	unless noted	I in the comm	ents below		-
				EC (uS/cm)					
0	40 41	415	1691	1700	1696				
2	424 428	423	1693	1684	1677	-			
		1	1015						
	-	C	DO (mg/L) (•	40-100% sat	turation at	t test temp	.)		
0	8.1 8-1	5.)	1.8	8.1	8.1	1			
2	49 29	70	79	30	79				
					- 11 -	1		1	I
			Temperatur	re (°C) (range	e: 18-22 °C	:)			
0	19 19	19	19	19	19	Í			
2	20 20	20	20	20	20				
			e U			1			
				Numbe	r Alive				
				(I, immo					
0	10 10	10	10	10	10	1			
1		10	1.0	10	10				
2	10 10	[0]	10	10	IC				
-		Criteria: must be	< 10% mort	tality and/or	abnormal	hohaviorin	the control		
		nmobile; daphni							
		therwise noted,					move		
Culture	011633 0	therwise noted,	Denaviouri	sconsidered	to be non	IIIdi			
Young jar	CI	Jar(s) mortali	ty 7 days pr	ior to tost (n	auct bo <2	E 0/)	21		
roung jai		Jar(s) mortai	ty / uays pr	ior to test (II	nust be sz	570)	01		
QA (previo	us month)					Control M		!-	
	st brood (≤12 days)	7					alidity Crite		\cap
		/		77			ortality at 4	+8 nours -	0
	Imber of young produ			4		(must be ≤	10%)		
vvere test t	reatments randomized	on test tray?	Yes / No	0					
Sample			- 1					<u> </u>	
DO % of sa	imple prior to aeration	115	5/.	Is aeration r	equired (<	40% or >10)0%)? (Yes or No	
Duration of	f aeration (37.5 +/- 12.	5 ml /min/l) · 1	long of	Filtered with	110um sc	reen prior t	o testing	Yes or No	
	mg CaCO ₃ /L) of 100%						0		
				Is hardness		t required (<25 mg Ca	$CO_3/L)$?	Yes or No
Hardness o	of sample after adjustm	ent (must be be	etween 25 -	30 mg CaC	⊃ ₃ /L)	-			
Alkalinity o	f 100% sample (mg Ca	CO ₃ /L):	192						
Dilution W	ater		[DO Levels (40-100%	saturation)	- correcter	for altitud	ρ
	preparation date	2:04/08		3.3 to 8.2 m		,		ng/L at 21°	-
	of dilution water (mg/L)			3.2 to 8.1 m				ng/L at 22°	
	in anation match (mg/ L)	211		3.2 to 7.9 m			5.0 10 7.0 1	ng/ L dt ZZ	
Commente	Observations:		l	5.L (0 7.5 III	9/201201	-			
Connerto	Oh: NO	ppt							
	48h: nc	1							
	4011.710	- FFI							
	Reviewed By:	A	Date	e Reviewed:	0-70	10U			
	Interferred by. 1		Date	nevieweu.	ad	104	150		



APPENDIX C – Chain-of-custody form

Teck						Page	1	of	1											
	COC ID:	21	TURNAROUND TIME: Regular (default))	RUSH:					-					
	PROJECT/CLIENT INFO			在学校会相同 "正式的		T.	ah Nama	-	ABORAT		ntol				969 A. D. S.		R INFO	E al	DDE	ED
Facility Name			-					-	mara Por		ntai				mat / Dis				PDF	EDI
	Thomas Davidson					Lao		-	mara Por mara@na		vironmo	ntoloo	Email		DL-WLC			X	X	
	thomas.davidson@teck.cor	n						-				ntal.ca	Email			Davidson		X	A	
Address	15 Km North HWY 43						Address	5 #4.	, 6125 - 1	2 Street	SE		Email			aequison	_	v	v	
	C and I		T	D i DC			City	C	1	1	D	LAD	Email			lateck.co		X X	X X	
	Sparwood			Province BC	1	D	-	+	lgary		Provinc		Email		Marty.Ha	fke@teck.	com		л	-
Postal Code	V0B 2G0			Country Cana	ada	Pos	tal Code	12	H 2KI		Country	Canada	Email	1 6:					L	_
								+							-				<u>alatel</u>	
Phone Number	(250) 603 - 9417					Phone	Number	r 40	3 253 71	21			_		PO	number		VPO00	692115	_
	SAMPLE DET	AILS		· · · · · · · · · · · · ·	N. M.S. Martin							an a	ANALY	YSIS RE	QUESTE		5.00 B	-		123.95
020/041/21								3463		C. C. C.	1.1	DI		E.L.	TT.					
0:00 Vanitedlin 10 10 10 10 10 10 10 10 10 10 10 10 10									TER STATE	1000000		Please ind	licate below	Filtered	I, Perservee	or both (F, P, F/P)		Contraction of	
motorilin									nc	u										T
IC,			No)						NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @ 20C										
want enchoses and h	rither		Hazardous Material (Yes/No)					SIS	ngle	Irest										
ALOL WILDINS, OWILD			al (NEV	Si Si	A_S ity										
ONOL			ateri					N	RT	DN										
ood Condition			Ma						Hr	T.T.										
			nop						ion	45-14										
1006 111		Field	azar		Time	G=Grab		104	AUT	AUT ntra										
Sample ID 1920 - 111		Matrix	Ĥ	Date	(24hr)	C=Comp						10/			-					+-
L_BFWB_OUT_SP21_2020-04-20_N	WL_BFWB_OUT_SP21	WS		4/20/2020	9:00	G	6		X	X	7.9°	V								+-
														_						_
									-								_			-
																			-	
ADDITIONAL COMMENTS/SI	PECIAL INSTRUCTIONS		1992	RELINQUISH	HED BY/A	FFILIATIO	N		Dat	e	Т	ïme	Ace	cepted E	By/Affiliati	on	D	ate	T	Time
hipment includes 2 extra 20 L	bladders and 2 extr	all		Ta	ara Genti	le			4/20/2	020										
lastic bottles.		-						+												
		-						+				-				-				_
SERVICE REQUEST (rush	- subject to availability)	N. M. Marsteller		100-0978-2		e					het state					14/122	Fire Manutes	and the second	8-1528 B	and a second
		(default) X		Convert 1 N			×1.	iah	los L	da			1.4		187 A.L.					
Priority	(2-3 business days) - 50%			Sampler's Na	ame		INI	icno	las Lagai	ue 7	-2	Mob	ne #							
	y (1 Business Day) - 100%	-	S	ampler's Sign	ature	-	1	1	1	11		Date/	Time			1	20-Apr-2	0		
For Emergency <1 Day	ASAP or Weekend - Contac	t Nautilue	50	mpier o orgi			1-11		109	//		1 Dail						1		



END OF REPORT



Acute Toxicity Test Results

Samples collected April 23, 2020

Final Report

May 8, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

	_			Dates		
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 10°C test initiation	<i>Daphnia magna</i> 20°C test initiation	Daphnia magna antiscalant test initiation
WL_WLC1_SP01_20 20-04-23_N_1100 / 1920-1132-01	23-Apr-20 at 1100h	24-Apr-20 at 1020h	25-Apr-20 at 1300h	24-Apr-20 at 1350h	24-Apr-20 at 1400h	24-Apr-20 at 1615h
WL_LC1_SP02_2020 -04-23_N_1100 / 1920-1132-02	23-Apr-20 at 1100h	24-Apr-20 at 1020h	25-Apr-20 at 1300h	24-Apr-20 at 1350h	24-Apr-20 at 1400h	24-Apr-20 at 1615h
WL_BFWB_OUT_SP 21_2020-04- 23_N_1100 / 1920-1132-03	23-Apr-20 at 1100h	24-Apr-20 at 1020h	25-Apr-20 at 1300h	24-Apr-20 at 1530h	24-Apr-20 at 1515h	24-Apr-20 at 1550h
LC_LC3_2020-04- 23_N_1100 / 1920-1132-04	23-Apr-20 at 1100h	24-Apr-20 at 1020h	25-Apr-20 at 1300h	24-Apr-20 at 1525h	24-Apr-20 at 1510h	24-Apr-20 at 1545h

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)			
WL_WLC1_SP01_2020-04- 23_N_1100	3.8°C	1610	288			
WL_LC1_SP02_2020-04- 23_N_1100	4.7°C	540	189			
WL_BFWB_OUT_SP21_2020- 04-23_N_1100	3.6°C	924	189			
LC_LC3_2020-04- 23_N_1100	4.6°C	610	194			



TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test
- Daphnia magna 48-h single concentration screening test (conducted at 10°C)
- *Daphnia magna* 48-h single concentration screening test (conducted with 2 mg/L antiscalant)

RESULTS

Toxicity test results

	Percent survival in 100% (v/v) sample			
Sample ID	Rainbow trout	<i>Daphnia magna</i> 10°C	Daphnia magna 20°C	Daphnia magna antiscalant
WL_WLC1_SP01_2020-04- 23_N_1100	100	100	57	100
WL_LC1_SP02_2020-04- 23_N_1100	100	100	100	100
WL_BFWB_OUT_SP21_2020- 04-23_N_1100	100	100	100	100
LC_LC3_2020-04- 23_N_1100	100	100	100	100

	Percent Immobility in 100 (% v/v)			
Sample ID	Daphnia magna 10°C	Daphnia magna 20°C	<i>Daphnia magna</i> antiscalant	
WL_WLC1_SP01_2020-04- 23_N_1100	0	100	0	
WL_LC1_SP02_2020-04- 23_N_1100	0	0	0	
WL_BFWB_OUT_SP21_2020- 04-23_N_1100	0	0	0	
LC_LC3_2020-04- 23_N_1100	0	0	0	



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
	Rainbow trout	Precipitate observed on the test vessel	None
WL_WLC1_SP01_2020-04- 23_N_1100	Daphnia magna	Precipitate observed on the of test vessel and sample surface of the 20-degree test	Precipitate observed on carapace in the 20- degree test
WL_LC1_SP02_2020-04-	Rainbow trout	None	None
23_N_1100	Daphnia magna	None	None
WL_BFWB_OUT_SP21_2020-04-	Rainbow trout	Precipitate observed on the test vessel	None
23_N_1100	Daphnia magna	None	None
LC LC2 2020 04 22 N 1100	Rainbow trout	None	None
LC_LC3_2020-04-23_N_1100	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.5 (3.0-3.8) g/L KCl ¹	6.2 (5.9-6.5) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-5.0) g/L KCl	6.1 (5.1-7.3) g/L NaCl
Reference toxicant CV	11.9%	6.0%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, April 7, 2020; ² Test Date April 27, 2020

LC = Lethal Concentration; CL = Confidence Limit



acham

Reviewed By: Jacklyn Poole, BSc Laboratory Supervisor

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.

Report By: Adam Wilson, BSc Biologist



APPENDIX A – Summary of test conditions



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended witl 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO4 (2 μg Se/L)
Control/dilution water for antiscalant test	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μ g/L), Na ₂ SeO ₄ (2 μ g Se/L) and 2 mg/L antiscalant
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



-	
Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 $\mu g/L$) and Na2SeO4 (2 μg Se/L)
Test solution renewal	None
Test temperature	10 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 3.Summary of test conditions: 48-h Daphnia magna survival test at 10°C.



APPENDIX B – Toxicity test data

) NALITILIC

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Trout Bench Sheet

-	TRS C	lient	TEC164	Reference	1920-1132-01		Chamber	5
est Log							Sample Informa	ation
steg						Daily Data		
Day	Date	e	Time	Initial	Chem. Cart	Review	Initial pH:	8.1
0	2020/04/25		1300 *	CB/MF	1	50	Initial EC (µS/cı	2370
1	2020/04/26		0900	AW	-	Ve	Initial DO (mg/	10.3
2	2020/04/27		0930	AW	-	TP	Initial Temp (°C):	15
3	2020/04/28		0930	AW	-	OP,	Salinity (ppt):	2
	2020/04/28		1970	an		AW		
4	2020/04/29		Note: * ; time v	when the test v	vas loaded with fi		DO in mg/L (70	% - 100%
mple Pre-Ae	eration							10070
eration rate a	djusted to 6.5 +/	/- 1 mL/min//	: yes/no				saturation)**	
eaeration tim		C	0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg/L	
D(mg/L) of 10	00%		10.0	9.8	Q.	9.6	6.1 mg/L - 8.8 mg/L	at 15°C
s(6.0 mg/L - 8.6 mg/L	at 16°C
et Chemistr	y and Biology						**corrected for altitu	ude
Conc.	CTL	100						
Conc.	CIL	100						
David	- 11	70		pH (units) (ı	ange: 5.5-8.5)			
Day 0 Day 4	7.8	17						
				EC.(···E (cm)			
David	(193)	2430	I		uS/cm)		1	
Day 0 Day 4	448	730						
				(I) (70-100%	saturation at tes	t temp.)		
Day 0	80	00	I DO (mg					
	89	21						
Day 4	010	10						
			-	Temperature (°	C) (range: 14-16 °	C)		
D 0		111	1	T				
Day 0	19	17						
Day 4	15	15						
			Num	her Alive (In br	ackets number st	ressed)		
David	10	1(
Day 0								
Day 1		10						
	10							
Day 2	10	10						
Day 2 Day 3								
		10/21						
Day 3	LD LD Validity Criter	10 10 (0(Z) ia: must be ≤	10% mortality	and/or stresse	d behavior in the	e control		
Day 3		10 10 (0(Z) ia: must be ≤	10% mortality avior is conside	and/or stresse red to be norm	d behavior in the			
Day 3 Day 4	Validity Criter Unless otherwi	10 10(Z) ia: must be ≤ ise noted, beha	10% mortality avior is conside	and/or stresse red to be norm	d behavior in the		ism Information	
Day 3 Day 4 Control Orga Control	Validity Criter Unless otherwi	10 10 (O(Z) ise noted, beha Weight	10% mortality avior is conside	and/or stresse red to be norm	d behavior in the	Test Organi		x T()
Day 3 Day 4	Validity Criter Unless otherwi	10 10(Z) ia: must be ≤ ise noted, beha	10% mortality avior is conside	and/or stresse red to be norm	nal		sm Information	STR
Day 3 Day 4 Control Orga Control Fish	Validity Criter Unless otherwi	10 10 (O(Z) ise noted, beha Weight	10% mortality avior is conside	red to be norm	d behavior in the nal	Test Organi		stre 1
Day 3 Day 4 Control Orga Control Fish 1	Validity Criter Unless otherwi	LO(Z) ia: must be ≤ ise noted, beha Weight (g)	avior is conside	red to be norm	nal	Test Organi Batch		8TR 1
Day 3 Day 4 Control Orga Control Fish 1 2	Validity Criter Unless otherwi Length (cm)	$\frac{10}{10(Z)}$ ise noted, behavior Weight (g) 015 015	avior is conside	red to be norm	03	Test Organi Batch		stre N
Day 3 Day 4 Control Orga Control Fish 1 2 3	Validity Criter Unless otherwi	$\frac{10}{10(Z)}$ ise noted, behavior (g) $\frac{015}{013}$	Loading Den: (must be ≤0.5 g,	sity (g/L):	03	Test Organi Batch Source		STR
Day 3 Day 4 Control Orga Control Fish 1 2 3 4	Validity Criter Unless otherwi Length (cm)	$\frac{10}{102}$ ia: must be \leq ise noted, behave (g) 0.6 0.2 0.4 0.4	avior is conside	sity (g/L):	03 34	Test Organi Batch Source Tank #	2020031 Lyndar 7	8TR 1 35
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5	Validity Criter Unless otherwi Length (cm) 3.3 3.2 3.4 3.6	$\frac{10}{10(Z)}$ ise noted, behavior (g) $\frac{015}{013}$	Loading Den: (must be ≤0.5 g, Mean Length	sity (g/L): /L)	03 34	Test Organi Batch Source Tank # Days Held a	2020031 Lyndar 7 t 15± 2°C	8TR 1 35
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5 6	Validity Criter Unless otherwi anism Data Length (cm) 3.3 3.2 3.2 3.4 3.4 3.4	$\frac{10}{10}$ ia: must be size noted, behavior (g) 0.6 0.4 0.4 0.4	Loading Den: (must be ≤0.5 g,	sity (g/L): /L)	03	Test Organi Batch Source Tank #	2020031 Lyndar 7 t 15± 2°C	дте 1 35
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5 6 7	Validity Criter Unless otherwi anism Data Length (cm) 3.3 3.2 3.4 3.4 3.4 3.4 3.4 3.4	$\frac{10}{102}$ ia: must be \leq ise noted, behave (g) 0.6 0.2 0.4 0.4	Loading Den: (must be ≤0.5 g, Mean Length Length Rang	sity (g/L): /L) n (cm): e (cm):	03 34	Test Organi Batch Source Tank # Days Held a (must be ≥14	2020031 t 15± 2°C days)	8TR 1 35
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5 6	Validity Criter Unless otherwi anism Data Length (cm) 3.3 3.1 3.4 3.1 3.5	0.5 Weight (g) 0.5 0.4 0.4 0.4 0.4	Loading Den: (must be ≤0.5 g) Mean Length Length Rang	sity (g/L): /L) n (cm): e (cm): t (g):	03 34	Test Organi Batch Source Tank # Days Held a (must be 214 Percent stor	2020031 Lyndor T t 15± 2°C days) ck mortality	δTR 1 35 0-05-
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5 6 7	Validity Criter Unless otherwi anism Data Length (cm) 3.3 3.1 3.4 3.1 3.5	$\frac{10}{10}$ ia: must be size noted, behavior (g) 0.6 0.4 0.4 0.4	Loading Den: (must be ≤0.5 g, Mean Length Length Rang	sity (g/L): /L) n (cm): e (cm): t (g):	03 34	Test Organi Batch Source Tank # Days Held a (must be 214 Percent stor	2020031 t 15± 2°C days)	8TR N 35 0-05-
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5 6 7 8	Validity Criter Unless otherwi anism Data Length (cm) 3.3 3.2 3.4 3.4 3.4 3.4 3.4 3.4	0.5 Weight (g) 0.5 0.4 0.4 0.4 0.4	Loading Den: (must be ≤0.5 g) Mean Length Length Rang	sity (g/L): /L) n (cm): e (cm): t (g):	03 <u>34</u> <u>31-38</u> 0.6	Test Organi Batch Source Tank # Days Held a (must be ≥14 Percent stor (7 days prior to	$\frac{2020031}{4}$	8TR 1 35 0.05
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5 6 7 8 9	Validity Criter Unless otherwi anism Data Length (cm) 3.3 3.1 3.4 3.1 3.5	0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5	Loading Den: (must be ≤0.5 g) Mean Length Length Rang	red to be norm sity (g/L): /L) n (cm): e (cm): t (g):	03 34	Test Organi Batch Source Tank # Days Held a (must be 214 Percent stor	$\frac{2020031}{4}$	8TR 1 35 0-05- 18
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5 6 7 8 9 10	Validity Criter Unless otherwiter Unless otherwiter (cm) Comparison Data Length (cm) Comparison Data Length (cm) Comparison Data Comparison Da	0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5	Loading Den: (must be ≤0.5 g, Mean Length Length Rang Mean Weigh (Must be ≥0.3g)	red to be norm sity (g/L): /L) n (cm): e (cm): t (g):	03 <u>34</u> <u>31-38</u> 0.6	Test Organi Batch Source Tank # Days Held a (must be ≥14 Percent stor (7 days prior to	$\frac{2020031}{4}$	8TR 1 35 0.05 18
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5 6 7 8 9 10	Validity Criter Unless otherwiter Unless otherwiter (cm) 3.3 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4 3.4	0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5	Loading Den: (must be ≤0.5 g, Mean Length Length Rang Mean Weigh (Must be ≥0.3g) Weight Rang	red to be norm /L) h (cm): e (cm): t (g): ge: (g):	0.3 <u>34</u> <u>3,1-3,8</u> 0.5 0.3-0.6	Test Organi Batch Source Tank # Days Held a (must be 214 Percent stor (7 days prior to Test Volume	$\frac{2020031}{4}$	8TR 1 35 0.05 18
Day 3 Day 4 Control Orga Control Fish 1 2 3 4 5 6 7 8 9	Validity Criter Unless otherwiter Unless otherwiter (cm) Comparison Data Length (cm) Comparison Data Length (cm) Comparison Data Comparison Da	0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5	Loading Den: (must be ≤0.5 g, Mean Length Length Rang Mean Weigh (Must be ≥0.3g)	red to be norm /L) h (cm): e (cm): t (g): ge: (g):	03 <u>34</u> <u>31-38</u> 0.6	Test Organi Batch Source Tank # Days Held a (must be ≥14 Percent stoo (7 days prior to Test Volume Jaw	$\frac{2020031}{4}$	n 35 0-05- 18

Written by SG on 1995/05/12 Revised by LO on 2020/02/11 Nautilus Environmental (Calgary)

Trout Bench Sheet

Method	TRS	Client	TEC164	Reference	1920-1132-02		Chamber		5
Test Log							Sample Inform	nation	
						Daily Data		()	8
Day		Date	Time	Initial	Chem. Cart	Review	Initial pH:		88
0	2020/04/		1300 *	CB/MF		32	Initial EC (µS/ci	114	7
	2020/04/			AW		à			_
1			0900		-	TP	Initial Temp (°C		4
2	2020/04/		0930	AW	-			<u>.</u> 14	5
3	2020/04/		0930	AW	-	TP	Salinity (ppt):		3
4	2020/04/	29	0920	ST		An			
	e adjusted to 6.	5 +/- 1 mL/min/L	: yes/no		vas loaded with f		DO in mg/L (7 saturation)**]
Preaeration	time		0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg/		
DO(mg/L) o	f 100%		16.0	9.8	9.1	9.6	6.1 mg/L - 8.8 mg/		
							6.0 mg/L - 8.6 mg/	/L at 16°C	
Test Chemi	stry and Biolog	av					**corrected for alt	itude	
Conc.	CTL	100							٦
conc.		100							
				pH (units) (r	ange: 5.5-8.5)				
Day 0	74	7.9							
Day 4	40	13	1						1
Day 4	TIS	4.0							_
				EC (uS/cm)				
		1 SALLE		EC (uS/cm)				Г
Day 0	501	1045							_
Day 4	453	909							
			D0 ((1) (70 1000)					
	ant		DO (mg	J/L) (70-100% s	saturation at tes	st temp.)		1	
Day 0	Dil	9.6							-
Day 4	8,4	8.4							
			Т	lemperature (°C	C) (range: 14-16°	C)			_
Day 0	U								
Day 4	10	161							
24)	- 43								_
			Numb	per Alive (In bra	ackets number st	ressed)			
Day 0		10 10							٦
Day 1	10	0							-
	10								-
Day 2	10	10							-
Day 3	12	12							-
Day 4	10	10							
	Validity Cri	iteria: must be ≤	10% mortality	and/or stresse	d behavior in the	control			
	Unless othe	rwise noted, beha	ivior is consider	red to be norm	al				
Control Or	ganism Data					Test Organi	sm Information		٦
Control		Weight							
	(cm)					Batch	202003	1812	
Fish	(CIII)	(g)				batch	NUU		
	- 94	* /	7		0.3		BLYDOL	malan	
1	Sit	Orb	Loading Dens	sity (g/L):	0.5	Source	BEYOUL	gricori	
2	31	0.3	(must be ≤0.5 g/l	L)			7		
3	3.3	0.5	1		3.5	Tank #	1	_	
4	3.2	Oh	Mean Length	(cm):	Ju)			ar	
5	24	R.C.			0.0	Days Held at	: 15± 2°C	:55	
6	30	819	Length Range	(cm)	3.1-3,7	(must be >14)	(ave)		-
1	31	013		c (cm).		(indicide E14)	30437		
7	3.6	0,5			0.5		l	0.05%	
8	514	0.5	Mean Weight	: (g):	009	Percent stoc		0.0.01	_
9	516	0.5	(Must be ≥0.3g)			(7 days prior to	test, must be ≤2%)		
10	3,3	0.4			1201			18	
			Weight Range	e: (g):	0,3-0,6	Test Volume	(L)	10	
Comments			1						
	GGL	r: Nop	ont						
	ven		1	2			1	- Inl	
		Reviewed By	r. C	3		Date Reviewe	ed: 2020	05 10	
		,							

Nautilus Environmental (Calgary)

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Trout Bench Sheet

Daily Data	lethod	TRS Client	t _	TEC164	Reference	1920-1132-03		Chamber	
Date Time Initial Chem. Carl Review Initial PC (uS/cm) 1 2020704/26 1302 Au/ - Au/ - Au/ - Initial PC (uS/cm) 11	est Log							Sample Infor	mation
0 2020704/25 300 * Ch /M/F 1 C Initial DC (s/c) IC 4 2020704/28 crists hup - Velocity Initial DC (s/c) IC Salinty (ppt): Initial DC (s/c) IC Initial DC (s/c) IC Icity I									
1 2020/4/25 60x0 Au - Vitilial Temp (C): C 3 2020/4/28 OA30 Au - Vitilial Temp (C): C a 2020/4/28 OA30 Au - Vitilial Temp (C): C mple Pre-Acration ration rate adjusted to 6.5 +/-1 mt/mint/L yes/no Shours 1 hour 1.5 hours 2 hours SampL at Stock Store Toto Toto Toto Toto Shours 1 hour 1.5 hours 2 hours SampL at Stock Store Toto Toto Toto Toto SampL at Stock Sa							-	-	7
$\begin{array}{c c c c c c c c c c c c c c c c c c c $				300 *	CO/MF	1	10		
3 2020704/28 Or3 2 Au							Ve		
4 2020/04/29 Critical Stratul Color Note: * time when the test was loaded with fish male rescarding rate adjusted to 6.5 +/- 1 mL/min/L (vertical mark stratum)** Do in mg/L (70% - 100% stratum) searation time searation time of 100% 0.1 0.1 0.1 Stratul Conc. CIL 100 0.1 0.1 Stratul Stratul Day 0 0.0 0.1 0.1 0.1 Stratul Stratu Stratul Stratu				8930	AM	-	TP		c):
Note: *; time when the test was loaded with fish DO in mg/L (70% - 100%, saturation)* ration rate adjusted to 6.5 +/- 1 mL/min/L (restro Saturation (restro)* Saturation)* Saturation (restro) 2 mg/L as mg/L at MCC Saturation (restro)* St Chemistry and Biology				0930	AW	-	TP	Salinity (ppt):	
Imple Pre-Agration Do In mol (170% - 100%) saturation rate adjusted to 6.5 +/- 1 mL/min/L yes/no Saturation? saturation? I hour 1.5 hours 2 hours Saturation? I hour I hour I hour I hour Saturation? I hour I hour I hour I hour Saturation? I hour I hour I hour I hour Saturation? I hour I hour I hour I hour Saturation? I hour I hour I hour I hour Day 0 I hour I hour I hour I hour I hour Day 0 I hour I hour I hour I hour I hour I hour Day 0 I hour Day 0 I hour I hour I hour I hour I hour I ho	4	2020/04/29			STTAW		TAC		
aearation time Mrg(l) of 100% st Chemistry and Biology Conc. CTL 100 Day 0 Day 1 Day 1 Da	ample Pre-A	eration	N	Note: * ; time w	vnen the test w	as loaded with	risn	DO in mg/L (70% - 100%
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	eration rate	adjusted to 6.5 +/- 1 r	nL/min/L:	yes/no				saturation)**	
st Chemistry and Biology Conc. CTL 100 Day 0 Day 0 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 0 Day 4 EC (uS/cm) DO (mg/L) (70-100% saturation at test temp.) DO (mg/L) (70-100% saturation at test temp.) DO (mg/L) (70-100% saturation at test temp.) Day 0 DO (mg/L) (70-100% saturation at test temp.) Day 0 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 1 Day 1 Day 2 Day 1 Day 2 Day 2 Day 2 Day 2 Day 2 Day 2 Day 2 Day 2 Day 3 Day 4 Temperature (C) (range: 14-16 ^C C) Day 0 Day 4 Day 1 Day 2 Day 1 Day 2 Day 2 Day 2 Day 2 Day 2 Day 4 Length Weight (numt be s05 g/L) Source Lynchan Fish (cm) (g) Loading Density (g/L): (mat be s05 g/L) Must be s05 g/L Must be s05 g/L	eaeration tir	me	C	0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg	/Lat 14°C
st Chemistry and Biology $\begin{array}{c c c c c c c c c c c c c c c c c c c $	O(mg/L) of 1	00%		11.9	10.1	101	9.8	6.1 mg/L - 8.8 mg	/L at 15°C
** Corrected for altitude Conc. CIL 100 pH (units) (range: 5.5-8.5) Day 0 PH (units) (range: 5.5-8.5) Day 0 Conc. CC (uS/cm) DO (mg/L) (70-100% saturation at test temp.) Day 0 Conc. CC (uS/cm) DO (mg/L) (70-100% saturation at test temp.) Day 0 DO (mg/L) (70-100% saturation at test temp.) Day 0 Conc. C(uS/cm) DO (mg/L) (70-100% saturation at test temp.) Day 0 DO (mg/L) (70-100% saturation at test temp.) Day 0 Temperature (°C) (range: 14-16°C) Day 0 Number Alive (In brackets number stressed) Day 1 Do Lo Day 0 Temperature (°C) (range: 14-16°C) Day 1 Do Lo Day 1 Do Lo Day 1 Da						12.			
Conc. CTL 100 pH (units) (range: 5.5-8.5) Day 0 Bay 4 EC (uS/cm) EC (uS/cm) CON (mg/L) (70-100% saturation at test temp.) $Day 0Day 4EC$ (uS/cm) Day 0 Day 4 EC (uS/cm) DO (mg/L) (70-100% saturation at test temp.) Day 0 Day 4 EC (uS/cm) DO (mg/L) (70-100% saturation at test temp.) Day 0 DO (mg/L) (70-100% saturation at test temp.) Day 0 Day 4 EC (uS/cm) DO (mg/L) (70-100% saturation at test temp.) Day 0 Day 0 DO (mg/L) (70-100% saturation at test temp.) Day 0 Day 0 DO (mg/L) (70-100% saturation at test temp.) Day 0 Day 10 Day 10 Day 10 Day 10 Day 2 Day 10 Day 10 Day 10 Day 10 Day 10 Day 2 Day 10 Day 10 Day 4 Day 0 Day 10 Day 4 Day 0 Day 10 Day	st Chemist	ry and Biology							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			100						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $					nH (units) (re				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Day 0	7.3 -	1.2		pH (units) (ra	ange: 5.5-8.5)			
Day 0 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 6 Day 4 Day 6 Day 4 Day 6 Day 4 Day 0 Day 4 Day 0 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 1 Day 2 Day 1 Day 2 Day 1 Day 2 Day 3 Day 4 Day 3 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 4 Day 5 Day 4 Day 5 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 D		80 5	7.1						
Day 0 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 6 Day 4 Day 6 Day 4 Day 6 Day 4 Day 0 Day 4 Day 0 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 1 Day 2 Day 1 Day 2 Day 1 Day 2 Day 3 Day 4 Day 3 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 4 Day 5 Day 4 Day 5 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 Day 4 Day 4 Day 4 Day 4 Day 5 Day 4 Day 4 D					FC ((cm)			
Day 4 Day 0 Day 0 Day 0 Day 0 Day 0 Day 0 Day 1 Day 0 Day 1 Day 2 Day 2 Day 2 Day 2 Day 2 Day 2 Day 3 Day 4 Validity Criteria: must be \$ 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal ntrol Organism Data Control Fish (cm) (g) 1 2 3 3 5 0 5 3 4 0 2 3 5 0 5 7 3 5 0 5 7 7 3 5 0 5 7 7 3 5 0 5 7 7 3 5 0 5 7 7 3 5 0 5 7 7 3 5 0 5 7 7 3 5 0 5 7 7 3 5 0 5 7 7 3 5 0 5 7 7 3 5 0 5 1 1 1 1 1 1 1 1 1 1 1 1 1	Day 0	511	FRO		EC (U	IS/CM)		1	1
Day 0 Day 4 Day 0 Day 4 Day 0 Day 0 Day 4 Day 0 Day 0 Day 0 Day 4 Day 0 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 0 Day 1 Day 2 Day 1 Day 2 Day 0 Day 1 Day 2 Day 3 Day 4 Validity Criteria: must be s 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Trol Organism Data Control Length Weight Fish (cm) (g) 1 Tak 4 Tank 4 Tank 4 Tank 4 Tank 4 Tank 4 Tank 4 Tank 4 Source Langth Weight (g)t: (must be 205 g/t) Tank 4 Source Langth Mean Length (cm): Source Langth Anage (cm): Tank 4 Source Langth (cm): Days Held at 15± 2°C (must be 214 days) Percent stock mortality (7 days prior to test, must be 27%) Test Volume (L) <u>T</u> Test Volume (L) <u>T</u> Tes		416	283						
Day 0 Day 4 Temperature (°C) (range: 14-16°C) Day 0 Day 4 Temperature (°C) (range: 14-16°C) Day 0 Day 4 Number Alive (In brackets number stressed) Day 0 Day 1 Day 1 Day 1 Day 2 Day 1 Day 1 Day 2 Day 1 Day 1 Day 2 Day 1 Day 1 Day 2 Day 2 Day 1 Day 3 Day 3 Day 4 Validity Criteria: must be ≤ 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Test Organism Information Control Control Control (cm) G 3 Control (must be $s05 gA$) Tank # Tank # 1 2 3 Co. 4 Mean Length (cm): 3 Day 5 Day 5 Day 5 Day 5 Day 5 Day 5 Day 6 Day 5 Day 6 Day 6 <td></td> <td></td> <td>-120</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			-120						
Day 4 Temperature (°C) (range: 14-16°C) Day 0 Day 4 Percentation Day 0 Day 4 Percentation Day 0 Day 1 Day 1 Day 1 Day 1 Day 2 Day 1 Day 1 Day 1 Day 1 Day 1 Day 1 Day 1 Day 2 Day 2 Day 3 Day 4 Day 4 Day 4 Validity Criteria: must be \$ 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Test Organism Information Control Length Weight Test Organism Information Source Lynth Day 5 Day 4 Day 5 1 2 3 0 4 3 5 0 6 2 3 9 0 5 7 3 0 5 6 3 9 0 5 7 3 0 5 7 3 0 5 1 1 1 1 1 1 1 1 1 1 1 1 1 <	Day 0	50	081	DO (mg/	L) (70-100% s	aturation at tes	st temp.)		1
Number Alive (In brackets number stressed) Number Alive (In brackets number stressed) Day 0 Day 0 Day 0 Day 1 Day 0 Day 1 Day 10 Day 2 Day 3 Day 4 Validity Criteria: must be \$ 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Trol Organism Data Control Length Weight (g/L): To 0.4 Day 2.003/8 The Source Lymbox Test Organism Information Batch 202003/8 The Control Length Range (cm): 3 3 3 Q Q 3 Q Source Lymbox 10 3 Q 3		8.7	8 87		-				
Number Alive (In brackets number stressed) Number Alive (In brackets number stressed) Day 0 Day 0 Day 0 Day 1 Day 0 Day 1 Day 10 Day 2 Day 3 Day 4 Validity Criteria: must be \$ 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Trol Organism Data Control Length Weight (g/L): To 0.4 Day 2.003/8 The Source Lymbox Test Organism Information Batch 202003/8 The Control Length Range (cm): 3 3 3 Q Q 3 Q Source Lymbox 10 3 Q 3									
Number Alive (In brackets number stressed) Number Alive (In brackets number stressed) Day 0 10 10 10 Day 1 10 10 10 10 Day 2 10 10 10 10 10 Day 3 10 10 10 10 10 10 Day 3 10 10 10 10 10 10 10 Validity Criteria: must be \$ 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Test Organism Information Batch 202003/87/L Control Length Weight (g/L): Tak # Test Organism Information Batch 202003/87/L Source Lynded A Tak # Test Organism Information Batch 202003/87/L Source Lynded A Tak # Test Organism Information	Day 0		чт	le	emperature (°C) (range: 14-16	C)		
Number Alive (In brackets number stressed) Number Alive (In brackets number stressed) Number Alive (In brackets number stressed) Day 1 D D D D D Day 2 D Lo D D D D D Day 3 D Lo D <thd< th=""> <thd< th=""> D D <</thd<></thd<>	-	iu I	CP						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $,							1	I
Day 1 Day 2 Day 3 Day 3 Day 4 Validity Criteria: must be $\leq 10\%$ mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Test Organism Information	Day 0	10	10	Numbe	er Alive (In brad	ckets number st I	ressed)		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $									
Day 3Day 3Day 4Validity Criteria: must be \leq 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normalTest Organism Information BatchControl LengthLengthWeight (cm)13.30.4 (must be \leq 0.5 g/l.)13.40.5 (must be \leq 0.5 g/l.)23.50.6 (must be \leq 0.5 g/l.)33.50.6 (must be \leq 0.5 g/l.)43.50.6 (must be \leq 0.5 g/l.)33.50.6 (must be \leq 0.5 g/l.)43.50.6 (must be \leq 0.5 g/l.)33.40.5 (Must be \leq 0.5 g/l.)43.50.6 (must be \leq 0.5 g/l.)73.20.5 (Must be \leq 0.3 g)93.40.5 (Must be \geq 0.3 g)93.40.5 (Must be \geq 0.3 g)90.5 (Must be \geq 0.3 g)90.4 (Must be \geq 0.3 g)9101020 (Must be \geq 0.3									
Day 4 Validity Criteria: must be $\leq 10\%$ mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal ntrol Organism Data Control Length Weight Fish (cm) (g) 1 2 3 4 5 3 5 6 7 7 8 9 10 2 3 4 5 5 6 7 7 8 9 10 2 10 10 10 10 10 10 10 10 10 10									
Validity Criteria: must be $\le 10\%$ mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normalTotrol Organism DataTest Organism Information BatchControlLength (cm)Weight (g)1 $\overline{2}, \overline{3}, \overline{0}, \overline{4}$ $\overline{3}, \overline{5}, \overline{0}, \overline{5}$ $\overline{3}, \overline{5}, \overline{0}, \overline{5}$ Loading Density (g/L): (must be $\le 0.5 g/L$) $\overline{0}, \overline{3}$ $\overline{3}, \overline{5}, \overline{0}, \overline{5}$ 1 $\overline{2}, \overline{3}, \overline{0}, \overline{4}$ $\overline{3}, \overline{5}, \overline{0}, \overline{5}$ Mean Length (cm): $\overline{3}, \overline{9}, \overline{0}, \overline{5}$ $\overline{3}, \overline{4}, \overline{0}, \overline{5}$ $\overline{7}, \overline{3}, \overline{0}, \overline{5}$ 6 $\overline{3}, \overline{4}, \overline{0}, \overline{5}$ $\overline{7}, \overline{3}, \overline{0}, \overline{5}$ Length Range (cm): $\overline{7}, \overline{3}, \overline{0}, \overline{5}$ $\overline{3}, \overline{0}, \overline{5}, \overline{5}$ 8 $\overline{3}, 1, \overline{0}, \overline{4}$ $\overline{7}, \overline{3}, \overline{0}, \overline{5}$ Mean Weight (g): $\overline{10}, \overline{3}, \overline{4}, \overline{0}, \overline{5}$ Dercent stock mortality $\overline{7}, \overline{3}, \overline{0}, \overline{5}$ 9 $\overline{3}, \overline{5}, \overline{0}, \overline{5}$ Mean Weight (g): $\overline{10}, \overline{5}$ $\overline{18}$ 9 $\overline{3}, \overline{5}, \overline{0}, \overline{5}$ Mean Weight (g): $\overline{10}, \overline{5}$ $\overline{18}$ 9 $\overline{3}, \overline{5}, \overline{0}, \overline{5}$ Mean Weight (g): $\overline{10}, \overline{7}$ $\overline{18}$ Test Volume (L) $\overline{18}$ mments:96 M : Ppt on WWS + bothom of the form the control			2						
Unless otherwise noted, behavior is considered to be normal $\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Day 4		U the c 10	04	1/	habarda da da			
Control Length Weight Fish (cm) (g) 1 $3.3 0.4$ Loading Density (g/L): 3 $3.9 0.4$ Loading Density (g/L): 3 $3.9 0.4$ (must be ≤ 0.5 g/L) 3 $3.5 0.6$ (must be ≤ 0.5 g/L) 4 $3.5 0.6$ Mean Length (cm): 5 $3.5 0.5$ Length Range (cm): 7 $3.9 0.5$ Length Range (cm): 7 $3.9 0.5$ Mean Weight (g): 9 $3.5 0.5$ (Must be ≥ 0.3 g) 10 $3.9 0.7$ Mean Weight (g): 9 $3.5 0.5$ (Must be ≥ 0.3 g) Weight Range: (g): 9 $0.4-0.7$ Test Volume (L) (18 18 18 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 18 18 19 19 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 18 19 19 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 18 19 19 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 18 18 18 18							control		
Control Length Weight Fish (cm) (g) 1 $3.3 0.4$ Loading Density (g/L): 3 $3.9 0.4$ Loading Density (g/L): 3 $3.9 0.4$ (must be ≤ 0.5 g/L) 3 $3.5 0.6$ (must be ≤ 0.5 g/L) 4 $3.5 0.6$ Mean Length (cm): 5 $3.5 0.5$ Length Range (cm): 7 $3.9 0.5$ Length Range (cm): 7 $3.9 0.5$ Mean Weight (g): 9 $3.5 0.5$ (Must be ≥ 0.3 g) 10 $3.9 0.7$ Mean Weight (g): 9 $3.5 0.5$ (Must be ≥ 0.3 g) Weight Range: (g): 9 $0.4-0.7$ Test Volume (L) (18 18 18 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 19 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 18 18 19 19 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 18 19 19 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 18 19 19 10 $15 \pm 2^{\circ}$ C (18 18 18 18 18 18 18 18 18 18	ntrol Orga	nicm Data					Tost Organis	n Information	
Fish (cm) (g) 1 (2,3) (2,4) (3,4) (2,5) (3,4)			/eiaht				rescorganis	mormation	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		-	-				Batch	20200	SI8TR
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1	3.3 0	.4	oading Densit	y (q/L):	().3	Source	Iundu	\
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$								year	2
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	3	3.0 0.				2.1	Tank #	7	
$\frac{5}{6}$ $\frac{3}{2}$ $\frac{5}{2}$ $\frac{3}{2}$ $\frac{9}{2}$ $\frac{3}{2}$ $\frac{9}{10}$ $\frac{3}{2}$ $\frac{9}{2}$ $\frac{3}{2}$ $\frac{9}{2}$ $\frac{1}{2}$ $\frac{9}{2}$ $\frac{1}{2}$ $\frac{9}{2}$ $\frac{1}{2}$ $\frac{9}{2}$ $\frac{1}{2}$ $\frac{9}{2}$ $\frac{1}{2}$ $\frac{9}{2}$ $\frac{1}{2}$ 1	4			Aean Length (d	:m):	5.4			0.1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			5				Days Held at	15± 2°C	25
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			5 1	ength Range (cm):	5.0-3.9			
8 9 10 3. $\frac{1}{2}$ 0. $\frac{9}{2}$ Mean Weight (g): (Must be $\geq 0.3g$) Weight Range: (g): 9 10 $\frac{1}{2}$ $\frac{9}{2}$ 9				- guindige (1.22		1-1	
9 10 3.5 3.9 0.7 Weight Range: (g): 0.4-0.7 Test Volume (L) 18 mments: 96hf: PPF cn Wulls + bo Hem of Jank		1		lean Weight (u).	6.5	Percent stock	mortality	0,051
10 3.9 3.7 Weight Range: (g): $0.4-0.7$ Test Volume (L) [8] mments: 96 hr: PPt on Walls + bottem of tank		32			97-	0.9			10.0.1
Weight Range: (g): 0.4-0.7 Test Volume (L) [8] mments: 96 hr: PPt on Walls + bottem of touck		1.7 0		viust be 20.3g)			(r days prior to te	st, must be ≤2%)	
mments: 96 hr: ppt on walls + bottem of toule	10	1.1 0		Veight Range	(a):	0.4-0.7	Test Volume (L)	(8
96 hr: ppt on walls + bottem of toute			v	signe nunge.	(3).	V11-0-1	.est volume (-,	10
	mments :	Orlan a	21		1 .				
		76hr: Pf	of on	walls +	bo stem,	of tonle			
Date Reviewed: 105 101		Dent					Data Da	Danie	Th
		Kevi	ewea By:	US		- '	Jate Reviewed	1070 (15101

Nautilus Environmental (Calgary)

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Trout Bench Sheet

	TRS Clien	t _	TEC164	Reference	1920-1132-04		Chamber	
est Log							Sample Infor	mation
	Data		T '	La fata l	Characteria	Daily Data		-
Day 0	Date 2020/04/25		Time	Initial	Chem. Cart	Review	Initial pH: Initial EC (µS/o	7. 118
1	2020/04/25			CB/MF	- 1	VII.	Initial DO (mg	
2	2020/04/20		0900	AW	-	- M	Initial DO (Ing	
3	2020/04/27		0930	AW	-	20	Salinity (ppt):	<u>. 15 </u>
4	2020/04/29		0930	STAW	1	V.		
-	2020/04/20	N	- 0 / -		vas loaded with	fish		
ample Pre-A	eration		-				DO in mg/L (70% - 100%
	adjusted to 6.5 +/- 1 r	mL/min/	ves/no				saturation)**	
reaeration tir		C	0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg	/Lat 14°C
O(mg/L) of 1	00%		9.8	101	aa	9.8	6.1 mg/L - 8.8 mg	/L at 15°C
-							6.0 mg/L - 8.6 mg	/L at 16°C
est Chemist	ry and Biology						**corrected for al	titude
Conc.	CTL	100						
				nH (unita) (r				
Day 0	7.2	7.7			ange: 5.5-8.5)			1
Day 4	80	81						
D C		NO LAND		EC (u	uS/cm)		1	
Day 0	740	145						
Day 4	4.48	10141						
			DO (ma)	(1) (70-100% s	aturation at tes	t temp)		
Day 0	890	art	DO (mg/					
Day 4	35	210						
	0.0	100						
			Те	emperature (°C) (range: 14-16°	C)		
Day 0	14 1	U I						
Day 4	14	14						
			Numb					
Day 0	10	10	amuri	er Alive (în bra	ckets number st	ressed)	1	1
Day 1	10	10						
Day 2	10							-
Day 3	110	10						-
Day 4	10	16						
	Validity Criteria: m		% mortality a	nd/or stressed	behavior in the	control		
	Unless otherwise no							
ontrol Orga	nism Data					Test Organis	m Information	
Control		Veight				rest organis		
Fish	(cm)	(g)				Batch	202003	3187R
					~ 7			
1	3.1 0	.3 La	oading Densit	ty (g/L):	0.5	Source	Lyndor	1
2	3.6 0	, 5 (m	nust be ≤0.5 g/L)				7	-
3	3.5 0				3.4	Tank #	1	_
4	3.6 0	k 6 N	lean Length (cm):	5. 1			25
5	3.5 0	.5			2122	Days Held at		- 25
	3.3 0	. 4 Le	ength Range	(cm):	3.1-3.7.	(must be ≥14 da	ays)	10
6	3.3 0				A C			~ N72
6 7			lean Weight (g):	0.5	Percent stock		0.43
6 7 8	3.4 0		/ust be ≥0.3g)			(7 days prior to to	est, must be ≤2%)	
6 7 8 9	3.1 0		5.			1		
6 7 8	3.1 0	.6		()	AZ al		1.5	12
6 7 8 9	3.1 0	.6	/eight Range:	(g):	0.3-0.6	Test Volume ((L)	18
6 7 8 9	3.1 0	.6		(g):	0.3-0.6	Test Volume	'L)	18
6 7 8 9 10	3.7 8	, <u>6</u> w		(g):	0.3-0.6	Test Volume ('L)	18
6 7 8 9 10	3.1 0	, <u>6</u> w		(g):		1	L) 1: 2020	18



Daphnia Bench Sheet

Method	DAS 20	(Client	TEC164		Reference	e 1920	-1132-01	
Test Log									
Day	Date	Time	Task				Sample	Informatio	on
0	2020/04/24		Technician	Chem. Car	t Daily D	ata Review	Initial pH	:	21
1	2020/04/24		1F/JL	3	Λ	And	Initial EC		72-70
2		0000	SC	-	10	MF	Initial DC	$(\mu \sigma/l)$	LON
<u>L</u>	2020/04/26	0830	IF	3		VU	Initial Ter	(IIIg/L).	10.3
						LL		np (°C):	_15
Lab Code	CTLA CTLB	CTLC	100 A	100 B	100 C	1	Salinity (p	ppt):	2
				100 0	1000				
day			nH (uni	ts) (range: 6	0.0.5				
0	82 82	1Q71	O I	(ange. c	.0-8.5)				
2	20 80	0.0	Q.L	8.1	18.1				
	The plu of the	5.1	1.8	7.8	7.8				
	The pH of the	sample was not a	idjusted prior	to test setting.	unless noted	d in the comme	ents helow	1	
0				EC (uS/cm)					
2	416 414	420 2	430	2360	TEN	J		1	
2	435 434	432	2731	2110	2200				
				MAD.	2390				
		D	$\int (ma/l) / A$	0 1000/					
0	RIQI	010	3 (IIIg/L) (4	0-100% sat	turation at	t test temp.)		
2	7.9 7.8	0.1	3.8	8.8	8.8			1	
	1.9 1.8	7.8	7.8	7.8	7.8				
					0	11			
0		Te	emperature	e (°C) (range	18-22 %)			
0	9 9	19	18		10-22 0	/			
2	20 20	20		10	18				
		1	20	20	20				
				Number	Alive				
0				(I, immol					
0	10 10	10	10	10					
1	D $ D $	10 11		10	10				
2	10 10	10 10	P		10				
	Validity Crite	ria: must be		5(51)	5(5I)				
	Notos: Imme	ria: must be ≤	10% mortal	lity and/or a	bnormal b	ehavior in th	e control		
							love		
Culture	Unless other	wise noted, be	haviour is d	considered t	o be norm	al	1010		
	D I								
Young jar	DI Ja	ar(s) mortality	7 days prio	r to test (m	ist bo <2E	0()	0		
			adjo pilo	i to test (int	ist be szo	%)	12		
QA (previou	is month)								
Days to first	brood (≤12 days)	9			(Control Vali	dity Criter	ia	
Average nur	nber of young produced (1		77	r	Mean % mor	tality at 48	hours -	\sim
Were toct tr	iber of young produced (31	(must be ≤10	1%)		0,
Were test th	eatments randomized on t	est tray? (Y	es No		`		//0]		
Sample									
DO % of san	ple prior to aeration:	110							
	ipie prior to aeration:	10	ls	aeration rec	uired (<40	0% or >100%	612 1	2	
Duration of a	g CaCO ₃ /L) of 100% ·	(min/1) · 200	nin rit	have doubt d	10	1001 - 1007		es or No	
Hardness (m	g CaCO ₃ /L) of 100% :	1010		tered with I	10um scre	en prior to t	esting Y	es or No	
	5 5 7			hardnocc ad	ilicton ant .	equired (<2	5 mg CaCC	2/1/2	
Hardness of	sample after adjustment (must be betwe	een 25 - 30	ma CaCO	/1 \		e mg cucc	<i>v</i> ₃ /∟): ∎	es or No
Alkalinity of	100% sample (mg CaCO ₃ /I	1. 0	00	my caco ₃	L)				
	terre sumple (ing caco ₃ /i	-)L	88						
Dilution Wat	tax								
		NI MI	DO	Levels (40	-100% sat	turation) - c	0.000		
Pall label / pr	eparation date	24/16	33	to 8.2 mg/l	at 10°C		orrected to	or altitude	-
Hardness of o	dilution water (mg/L)	97	20	to 8.1 mg/l	- dl 10 C	3.1	to 7.7 mg	/L at 21°C	
		-10	3.2	to 8.1 mg/L	at 19°C	3.0	to 7.6 mg	/L at 22°C	
Comments/C	bservations: Ohr:	no ppt	3.2	to 7.9 mg/L	at 20°C		0		
	•								
	4811:1	pt prese	nt in w	essel ia	K. WH	er surfi	1 (p nu	AMAAI	icard
	10111	1 1.555		J	, vour	a good fi	and on	or yal	Luico
De								0	
Key	viewed By:		Date Re	viewed.	2000	105101			
					2020	10210			



Daphnia 10°C Bench Sheet

Method	DAS 10			Client	TEC164		Reference	e1920-	-1132-01	_
Test										
Test Log			1					Sample	nformatio	-
Day		Date	Time	Technician	Chem. Car	t Daily D	ata Review	Initial pH		n
0)/04/24	1350	MF/ SC	3	Ň	W.			8.1
1		0/04/25	OBOD	Se	-		M.	Initial EC	(µS/cm):	2370
2	2020	0/04/26	0855	IF	3		11F	Initial DO	(mg/L):	0.3
				1 11	5	K	L	Initial Ten	np (°C):	15
Lab Code	CTLA	CTLB	CTLC	100A	100B	1000	1	Salinity (p	pt):	2
			0.120	1004	TUUB	100C				
day				nH (uni	itc) (range) (
0	7.9	R.D	8.0		its) (range: 6	5.0-8.5)				
2	87	00	0.0	1.	1.9	8.0				
	0.1	The pH of the	8.2	5.5	8.3	8,3			1	
		the ph of the	sample was no	ot adjusted prior	to test setting	, unless noted	in the comme	nts below	1	
0	1771		1211		EC (US/CM)					
2	44	44	429	2380	2900	2410			1	
2	745	436	4-39	2370	2400	2380			+	
									1	
0				DO (mg/L) (4	10-100% sa	turation a	t test tomo)		
0	4.4	9.4	9.41	941	Q.U	a.u	T T)	1	
2	9,4	9.5	9.4	9.5	9,5					
					-1.9	9,5				
				Temperatu	re (°C) (rang					
0	12	12-1	0	12	10	e. 8-12 °C)				
2		FR	14	16	12	12				
						11				
					Number					
0	10	10			(I, immo	bile)				
1	10	10	10	10	10	10		1		
2	(0	10	10	ID	10	(0				
2	10	10	10	10	0	18				
		Validity Criter	ria: must be	≤ 10% morta	lity and/or a	hnormal h	abauian in th			
		i i o ceo. minino	Dife, uapilin	iu can i swim	atter bil co	c avon if a	Il'to an at 11	e control		
		Unless other	vise noted.	behaviour is	considered	to be norm		nove		
Culture					considered	to be nom	nai			
Young jar	PI	Ja	r(s) mortali	ty 7 days pric	or to tost (-		
			(e) mortun	cy r days pric	or to test (m	lust be ≤25	»%)	12		
QA (previou	is month)									
Days to first	brood (≤12 d	davs)	O			(Control Vali	dity Criter	ria	
Average nu	mber of youn	a produced (> 15	2	7	ſ	Mean % mor	tality at 48	hours -	D'/
Were test tr	eatments rand	domizad an t	215 young)	(S -		(must be ≤10)%)		0/
	connents ran	uomized on t	est tray?	(Yes)/ No				,		
Sample				\smile						
			1							
DO % of san	nple prior to a	aeration:	100	ls	apration ro	auirad (. A	20/		\bigcirc	
	aeration (37.5		(main (1)		deration ret	Julied (<40	0% or >100%	6)? Y	es or No	
Hardnoss (m		+/- 12.5 ML/	(min/L) :	Fil	Itered with	110um scre	en prior to t	testina v	es or No	
indiciness (III	g CaCO ₃ /L) o	1100%:	010	IS	hardness ac	liuctmont r	equired (<2	5 mg CoCC	2/112	
Hardness of	sample after	adjustment (must be be	tween 25 - 3	0 mg Caco	(1)	equired (12	sing cace	J ₃ /L): Ye	es or No
Alkalinity of	100% sample	(ma Caco /	1. 15	or neg	o mg caco	3/L)				
	a sub sumpre	(ing caco ₃ /i	_).	07 400)					
Dilution Wa	ter			G						
Pail label / pr		1		DO	D Levels (40	0-100% sat	turation) - c	Orrected for	or altitude	
Hardnoss of		te I-	54/16	4.1	to 10.3 mg	/L at 8°C	3.8	to 9.6 mg		-
Hardness of a	unution water	(mg/L)	92	4.0) to 10.0 mg	/L at 9°C	3.0	to 9.0 mg	/Lat 120C	
Comment		l.		3.9	to 9.8 mg/	Lat 10°C	5.7	to 9.4 mg	/L at 12°C	
Comments/(Observations	· Ohr:r	TO PP	+	, ing/					
		() · · · ·	PP							
		78h: n	O PD+							
Re	viewed By:	(B	1.0	Date Pr	eviewed:		NI-1			
				Date Re		2020	05101			



Daphnia Antiscalant Bench Sheet

Method	DAS AS	Client	TEC164	Re	eference	1920-1132-01	_
Test Log					ç	ample Information	
Day	Date	Time Technicia	n Chem. Cart	Daily Data R		nitial pH:	81
0	2020/04/24	ILOIS MEIMU		Sc		nitial EC (µS/cm):	2370
1	2020/04/25	0000 (C	-	ME		nitial DO (mg/L):	103
2	2020/04/26	0840 IF	3	VV		nitial Temp (°C):	15.0
						alinity (ppt):	
Lab Code	CTLA CTLB	CTLC 100A	100B	100C			
		CILC 100A	1000	1000	l		
day		pH (u	nits) (range: 6	50-8.5)			
0	82.82	82.121	181	81			1
2	01 01	80 84	01	\$ 4			
	The pH of the	sample was not adjusted p	prior to test setti	0.	in the comm	ants holow	
	the prior and	sumple was not adjusted p	EC (uS/cm)	ng, uness noted i	in the comm	ents below	
0	400 412	475 2460	22100	7400			T]
2	440 125	101 100	2200	2200			
2	190 905	436 2780	12050	65201			
		DO (ma/l) (10-100% a	aturation at t	tost tomn)	
0	RIGI	101 121	Q		test temp.	.)	11
2	7.9 7.9	9,9 9,8	0.1	0.1			
2	7.9 7.9	1.7	7.8	7.8			
		Tomporati	10 (°C) (range	10 22 %			
0			ire (°C) (range				
2	19 19	19 19	19	19			
2	20 20	20 20	20	20			
				A 1:			
			Numbe				
0			(l, imm	obile)			
0	10 10	10 10	10	10			
1	10 10	10 (0	10	10			
2	10 10	10 10	10	10			
		teria: must be ≤ 10% m					
		nobile; daphnid can't s				move	
	Unless oth	erwise noted, behavio	ur is consider	ed to be norm	nal		
Culture	00				1	-	
Young jar	24	Jar(s) mortality 7 days	s prior to test	(must be ≤25	%)		
QA (previo	us month)	0				dity Criteria	0-1
	t brood (≤12 days)	9	27			tality at 48 hours -	01.
	mber of young produce		31	(mi	ust be ≤10	1%)	
Were test t	reatments randomized o	n test tray? (Yes)/	No				
		\bigcirc					
Sample							
DO % of sa	mple prior to aeration:	110	Is aeration r	equired (<40%	6 or > 1009	%)? Yesor No	
			-				
	aeration (37.5 +/- 12.5						
	mg CaCO ₃ /L) of 100% :	And and a second s		-	quired (<2	.5 mg CaCO ₃ /L)?	Yes or No
Hardness o	f sample after adjustmer	nt (must be between a	25 - 30 mg Ca	aCO ₃ /L)	_		
1	f 100% sample (mg CaC						
	roovo sample (ing cac	200	-				
Dilution W	ater		Antiscalant				
		:04/16			nolor	2 mg/L	
	f dilution water (mg/L)	.0110		ntration in Sam	ipie.	olume of antiscalant:	IE O UN
Haruness 0	runution water (mg/L)	192	volume of s	ample: 500	VIL VO	plume of antiscalant:	12.8 hr
			DO Los Los	40 1000/		and the later of	
Comment	Observations: Ohr	· mont				corrected for altitude	
Comments	observations: Util	I PPI	3.3 to 8.2 m			1 to 7.7 mg/L at 21°C	
	18h	no ppt	3.2 to 8.1 m		3.	0 to 7.6 mg/L at 22°C	-
	7011	TP TP	3.2 to 7.9 m	g/L at 20°C			
_	· · · · · · · · · · · · · · · · · · ·	0		0-201	x LINI		
ŀ	Reviewed By:	Dat	e Reviewed:	2520	05101		



Daphnia Bench Sheet

Method	DAS 20			Client	TEC164		Reference	1920-1	132-02	-
Testiles								~	<i>.</i>	
Test Log	Data		T' 1	Tall		DILDI	D :	Sample In	formation	
Day	Date		Time		Chem. Cart		ta Review	Initial pH:		8.0
0	2020/04,		1400	MF/SC	3	M		Initial EC (1147
1	2020/04,		0800	22	-		MF	Initial DO (mg/L):	10.5
2	2020/04	/26	0850	IF	R	K	K	Initial Tem	p (°C):	14
			,					Salinity (pp	ot):	3
Lab Code	CTL A	CTL B	CTL C	100 A	100 B	100 C				
day				pH (uni	ts) (range: 6	.0-8.5)				
0	7.9 8	3.0	8.0	8.0	8.0	8.0				
2	82	87	82	S1	8	81				
10 m	Th	e pH of the		t adjusted prior	to test setting	unless noted	in the comme	nts below		L]
		e pri or tre .	sample was no	caujustea prior	EC (uS/cm)	uniess noteu	in the comme	nts below		
0		001	(1)2	10710		1.01-				,
0	411, -	LL	463	036	1059	1065				
2	444	438	446	1004	1025	1016				
	, ,									
0			011	DO (mg/L) (turation at	test temp)		
0	3.1	8.1	8.1	B.L	8:2	8:2				
2	7.9	7.9	7.9	7.9	7.9	7.8				
			/	_						
				Temperatur	re (°C) (range	e: 18-22 °C)			
0	9	9	19	18	18	18				
2	20	20	20	20	20	20				
				<u> </u>						L]
					Numbe (I, immo					
0	10	10	10	10						
	10	10	10	10	10	10				
1	10 (U	10	(0	10	10				
2		10	10	10 -	10	10				
	Va	lidity Crite	eria: must be	e ≤ 10% mort	tality and/or	abnormal b	pehavior in t	he control		
	N	otes: Imm	obile; daphr	id can't swin	n after 60 se	c. even if a	ntenna still	move		
	Ur	nless othe	rwise noted,	behaviour is	s considered	l to be norr	mal			
Culture										
Young jar	DI		lar(s) mortal	ity 7 days pr	ior to test (n	nust he <2	5%)	D		
l'oung jui				ity / duys pi	ior to test (i	nust be 32.		12		
QA (previo	us month)						Control Va	lidity Crite	ria	
			9							
	t brood (≤12 da				27		Mean % m		8 nours -	OL
	Imber of young				31		(must be ≤	10%)		
Were test t	reatments rando	omized on	test tray?	(Yes)/ No	C					
				\bigcirc						
Sample										
DO % of sa	mple prior to ae	eration.	110		Is aeration r	equired (<	40% or > 10	0%)? (Yes or No	.
		_								
	aeration (37.5								Yes or No	1 (~)
Hardness (r	mg CaCO ₃ /L) of	100% :	540		Is hardness	adjustment	t required (-	<25 mg Ca($CO_3/L)?$	Yes or No
Hardness o	f sample after a	diustment	(must be b	etween 25 -	30 mg CaC	O_{3}/L				\checkmark
					5	- 3/ -/				
Alkalinity 0	f 100% sample (mg Caco	3/L): -	189						
				r	DOI 1 (40 40004			<i>(</i>).1.1	
Dilution W			. SUIL		DO Levels (
Pail label /	preparation date	e	1:04/14		3.3 to 8.2 m	g/L at 18°C	-	3.1 to 7.7 n	ng/L at 21	°C
Hardness o	f dilution water	(mg/L)	192		3.2 to 8.1 m	g/L at 19°C		3.0 to 7.6 n	ng/L at 22	°C
					3.2 to 7.9 m	g/L at 20°C	•			
Comments	/Observations:	Ohr	: no pi	2+ .						
		Ash	no ppt							
		101)	no pp							
F	Reviewed By:	CE)	Date	e Reviewed:	2020	10512			



Daphnia 10°C Bench Sheet

Method	DAS 10		Client	TEC164		Reference	1920-1	132-02	_
Test Log							Sample In	formatior	1
Day	Date	Time		Chem. Cart	Daily Dat	a Review	Initial pH:		8.0
0	2020/04/24 2020/04/25	350	MF/SC	3	M	ME	Initial EC (Initial DO		1141
2	2020/04/25	0850	IF	7		I CIF	Initial Tem		14
			1 4				Salinity (p		3
Lab Code	CTLA CTLE	CTLC	100A	100B	100C				
day	a.		pH (un	its) (range: 6	0-85)				
0	9.2 8.2	- 18.2	17.8	7.8	1.8				
2	8. 8.	8.1	8.3	8.3	8.3				
	The pH o	the sample was	not adjusted prior		unless noted	in the comme	nts below		
0	4110 422	Inu	1052	EC (uS/cm)	1074				
2	444 43	5 430	1010	1071	1068				
0		Inu	DO (mg/L) (40-100% sa	turation at	t test temp	.)	1	
2	9.5 9.5	9.4	9.4	9,5	9.5				
				*				1	
0			Temperatu	ure (°C) (rang				1	,
0 2	12 12	1L	12	12	12				
2		11			11				
				Numbe					
0			1	(I, immo	1				
0 1	10 10 10	10	10	10	10				
2	10 10	10	10	10	18				
			be ≤ 10% mor						L]
			hnid can't swi				move		
Culture	Unless	otherwise note	ed, behaviour	is considered	d to be nor	mal			
Young jar	DI	Jar(s) mor	tality 7 days p	rior to test (I	must be ≤2	5%)	12		
QA (previor	us month) t brood (≤12 days)	d				Control Va			0-1
	imber of young prod	iced (>15 you		37		Mean % m (must be ≤		18 nours -	01.
Were test t	reatments randomize	d on test tray	Yes / N	0		(11001 00 2	1070)		
		,	\bigcirc						
Sample		100	2					6	
	mple prior to aeratio)	Is aeration r				Yes or No	2
	aeration (37.5 +/- 12			Filtered with				Yes or No	\sim
	mg CaCO ₃ /L) of 100%			Is hardness		t required (·	<25 mg Ca	CO ₃ /L)?	Yes or No
	f sample after adjusti		e between 25	- 30 mg CaC	CO ₃ /L)	-			
Alkalinity o	f 100% sample (mg C	aCO ₃ /L):	189						
Dilution W	later			DO Levels (40-100%	aturation)	- corrector	for altitur	10 -
	preparation date	1:041	16	4.1 to 10.3 r			3.8 to 9.6 r		
	f dilution water (mg/		_	4.0 to 10.0 r			3.7 to 9.4 r	0	
6	(Ohannation		2.01	3.9 to 9.8 m	g/L at 10°C				
Comments	Observations:	hr: no	ppt						
	48	h: no o	of						
ŀ	Reviewed By:	CQ	Dat	e Reviewed:	2020	105101			



Daphnia Antiscalant Bench Sheet

Method	DAS AS		Client	TEC164	-	Reference	1920-	1132-02	-
Test Log								nformation	
Day	Date	Time		n Chem. Cart		ta Review	Initial pH:		8.0
0	2020/04/24	1615	MEIM	V 3		sc	Initial EC (THIT
2	2020/04/25	0800		-	V	1F	Initial DO		10.5
۷	2020/04/26	084-5	L	B	Y Y	s_	Initial Tem		14
Lab Code	CTLA CTL	.B CTLC	100A	100B	100C	1	Salinity (p	pt): 1	2
Lab couc			TUUA	TUUB	1000				
day			pH (u	nits) (range:	6.0-8.5)				
0	7.0 8.1	0 8.0	18.0	18.0	18.0				
2	8.2 8:	2 8.2	8.3	84	8.4				
	The pH	of the sample was i	not adjusted p	prior to test sett	ing, unless no	ted in the con	ments below		JJ
				EC (uS/cm)					
0	410 419	5 425	1051	1003	1001				
2	443 44	1 442	1039	105)	1046				
			DO (//						
0	\square			.) (40-100% :	saturation	at test ten	1p.)		
0 2	0.1 0.	1 8.1	8.1	8.1	8.1				
2	5.0 14.0	1.0 1.9	7.9	7.9	7.9				
			Tomporati	ire (°C) (rang	o. 18-22 °C	")			
0	10 10	19	IIA	Ia		-)	1	1	
2	9 20	20	20	20	20				
			120		20		1	1	L]
				Numbe	er Alive				
				(I, imm					
0	10 10	10	10	10	10	1		1	
1	(0) (0	0 10	10	10	10				
2	10 10	10	10	10	10				
		y Criteria: must l						İ	
		Immobile; dapl					till move		
	Unless	otherwise note	ed, behavio	ur is conside	red to be n	ormal			
Culture	DY		1. 7 1			0.500	1-7		
Young jar	PI	Jar(s) mort	tality / days	s prior to test	(must be :	≤25%)	<u> </u>		
OA (provio	us month)					Controlly	11-11-1-0-14	•	
QA (previo	t brood (≤12 days)	9					alidity Crite ortality at 4		21
	imber of young proc	luced (>15 you	na)	37		(must be ≤		+0 110015 -	07.
	reatments randomiz			No		(must be 3	1070)		
		ed on test day.		140					
Sample									
	mple prior to aeratio	on: 110		Is aeration i	roquirod /c	10% or > 10	1006 12	Yes or No	
			-	-					
Duration of	faeration (37.5 +/- 1	2.5 mL/min/L) :	arin						
	mg CaCO $_3$ /L) of 1009		_	Is hardness		t required (<25 mg Ca	CO ₃ /L)?	Yes or No
Hardness o	f sample after adjus	tment (must be	e between i	25 - 30 mg C	aCO ₃ /L)				
Alkalinity o	f 100% sample (mg	CaCO ₃ /L):	189						
				_					
Dilution W	ater			Antiscalant			•		
1	preparation date	1.0-111	φ	Final Conce	ntration in	Sample:	Zmgl	L antiscalant:	
Hardness o	f dilution water (mg,	(L) 192	_	Volume of s	ample: 🗧	SOME	Volume of	antiscalant:	5.8 pl
									•
			t					d for altitude	
Comments	/Observations: O			3.3 to 8.2 m				ng/L at 21°C	
	48	n no pot		3.2 to 8.1 m	0.		3.0 to 7.6 r	ng/L at 22°C	
	151	FP J		3.2 to 7.9 m	g/L at 20°C	~			
F	Reviewed By:	CB	Dat	e Reviewed:	2021	510510	1		



Daphnia Bench Sheet

Method	DAS 20		Client	TEC164		Reference	1920-1	132-03	
Test Log	,						Sample In	formation	
Day	Date	Time	Technician	Chem. Cart		ta Review	Initial pH:		7.3
0	2020/04/24	1212	MW/MF	3		56	Initial EC (1666
1	2020/04/25	OBOD	SC	-		ME	Initial DO		11.9
2	2020/04/26	0915	KK	3	f	1W	Initial Tem		14
Lab Cada		CTLC	100.4	100 0	100 C	1	Salinity (p	pt):	3
Lab Code	CTL A CTL B	CTL C	100 A	100 B	100 C				
day			pH (uni	its) (range: 6.	0-8.5)				
0	8.2 8.2	8.2	7.8	7.8	7.8			1	
2	8.2 8.7	8.2	0.3	8.3	0.3	1			
	The pH of the	sample was r	not adjusted prior	5	unless noted	I in the comme	ents below		
0	424	1,2,1	1 stlis	EC (uS/cm)	(175	1	1	1	
2	410 424	424	1604	1675	1675				
-		1900	1000	INDE	1451	1	1		
			DO (mg/L) (40-100% sat	turation at	t test temp	.)		
0	9.2 8.2	8.2	8.6	8.7	8.7				
2	7.9 7.9	7.9	7.8	7.8	7.0				
)	Tananata	(90)	10 22 00	•			
0	6 10		1 emperatu	re (°C) (range		.)	1	1	
2	20 20	18	18	20	18				
-					0	1	I	1	
				Numbe	r Alive				
				(I, immo	bile)				
0	10 10	10	10	10	10				
1	10 10	10	10	10	10				
2	Validity Cri		be ≤ 10% mor	tolity and (ar		hebouierin	the control		
			hnid can't swir						
			d, behaviour i						
Culture	2018								
Young jar	02	Jar(s) mort	ality 7 days p	rior to test (r	nust be ≤2	5%)	0%.		
						c			
QA (previo	us month) st brood (≤12 days)	9					alidity Crit	eria 48 hours -	24
	Imber of young produce	d (>15 your	na)	27		(must be ≤		+0 110015 -	0.
	reatments randomized o			0		(,		
		,							
Sample			1 5					~	
DO % of sa	imple prior to aeration:	1	30	Is aeration r	equired (<	40% or >10)0%)?	Yes or No	
Duration o	f aeration (37.5 +/- 12.5	mL/min/L) :	20	Filtered with	110um sc	reen prior t	o testing	Yes or No	
	mg CaCO ₃ /L) of 100% :	924		Is hardness	adjustmen	t required (<25 mg Ca	$CO_3/L)?$	Yes or No
Hardness c	of sample after adjustmer	nt (must be	between 25 -	- 30 mg CaC	$O_3/L)$	-	-		-
	f 100% sample (mg CaC		189	5					
Dilution W			17	DO Levels (40-100%	saturation)	- corrected	d for altitud	e -
	preparation date	1:04/	16	3.3 to 8.2 m				mg/L at 21°	
Hardness c	of dilution water (mg/L)	192	_	3.2 to 8.1 m			3.0 to 7.6 i	mg/L at 22°	C
Commont	s/Observations: OHR	10 ALA	ORL	3.2 to 7.9 m	g/L at 20°C	-			
Commente		· //0							
4	Bhr: nopp	+							
					0000	Jarla	ł		
	Reviewed By:	5	Dat	e Reviewed:	204	00510			



Daphnia 10°C Bench Sheet

Method	DAS 10	Client	TEC164	Reference	e 1920-1132-03	_
Test Log					Sample Information	1
Day	Date		Chem. Cart	Daily Data Review	Initial pH:	7.3
0	2020/04/24	1530 MW/CB	3	MF	Initial EC (µS/cm):	1666
1	2020/04/25	DROD SC	-	MF	Initial DO (mg/L):	11.9
2	2020/04/26	0925 KK	3	AW	Initial Temp (°C):	14
					Salinity (ppt):	3
Lab Code	CTLA CTLB	CTLC 100A	100B	100C		
day		pH (uni	ts) (range: 6.	0-8 5)		
0	8,1 8.1	8.171	7.6	76		
2	01 81	8.1 9.2	8-7-	8.7		
	The pH of the s	ample was not adjusted prior		00	ents below	
			EC (uS/cm)			
0	423 424	424 1678	1693	1695		
2	440 438	435 1071	1000	1091		
		DO(ma/l)/4	10-100% sat	uration at test temp		
0	9,4 9,4	9.4 9.6	9.6	9.6)	
2	9.0 9.0	9.0 9.6	G.S	9.5		
					-II	L]
0			re (°C) (rang	e: 8-12 °C)		
0 2	12 12	12 11	16	11		
2						
			Numbe	r Alive		
			(I, immo			
0	10 10	10 10	10	10		
1		0 10	(0)	10		
2		10 10	10	10		
		ria: must be ≤ 10% mort				
		bile; daphnid can't swir			l move	
Culture		wise noted, behaviour i	s considered	I to be normal		
Young jar	Dz 2018	ar(s) mortality 7 days pr	rior to test (n	nust be <25%)	DY.	
l'é ang jan		an(b) moreancy i days pr		1000000000		
QA (previou	us month)	~		Control V	alidity Criteria	
	t brood (≤12 days)	9	0-	Mean % n	nortality at 48 hours -	OF
	mber of young produced		31	(must be s		
Were test tr	reatments randomized on	test tray? Yes / No	0			
Sample						
	and a view to constinue	11-7	1			
	mple prior to aeration:	0		equired (<40% or >10		
	aeration (37.5 +/- 12.5 m			110um screen prior	5	
Hardness (n	ng CaCO ₃ /L) of 100% :	924	Is hardness a	adjustment required (<25 mg CaCO ₃ /L)?	Yes or No
Hardness of	f sample after adjustment	(must be between 25 -	30 mg CaC	$O_3/L)$		
	100% sample (mg CaCO	1 - 0	9		-	
Dilution W		1.14	DO Levels (4	40-100% saturation	- corrected for altitud	le -
	preparation date	:04/16	4.1 to 10.3 m	ng/L at 8°C	3.8 to 9.6 mg/L at 11	°C
Hardness of	f dilution water (mg/L)	192	4.0 to 10.0 m	ng/L at 9°C	3.7 to 9.4 mg/L at 12	°C
Commente	Observations:	RSSNO PPL	3.9 to 9.8 mg	g/L at 10°C		
connents,						
6	90hr: no opt					
R	leviewed By:	B Date	Reviewed:	202010510		



Daphnia Antiscalant Bench Sheet

Method	DAS AS	Client	TEC164	Refer	ence 1920-1132-0)3
Test Log					Sample Informa	
Day	Date		n Chem. Cart			7.7
0	2020/04/24	1550 MW/MF	- 2	SC	Initial EC (µS/cm Initial DO (mg/L)	
1	2020/04/25	0000 50	3	NIF.	Initial Temp (°C):	
2	2020/04/26	0920 102	5	1	Salinity (ppt):	.2
			100B	100C		
Lab Code	CTLA CTLB	CTLC 100A	TUUB	1000		
day		nH (I	inits) (range:	6 ()-8 5)		
day	02 02	8.3 7.9		7.9		
0 2	8.2 8.4		8-11	8.4		
2	0.3 0.5 The pH of the	e sample was not adjusted	prior to test sett		he comments below	
	The prior th	e sample was not adjusted	EC (uS/cm)			
0	420 424	425 650	14hh	1169		
2	(120) 421	430 1025	1020	icus		
2	430 431	950 10,55	TUSU	110-10-1	I	
		DO (ma/	L) (40-100%	saturation at tes	st temp.)	
0	91 91	8.1 8.7	8.7	8.7		
2	19 70	79 79	7.6	7-8		
2						
		Temperat	ure (°C) (rand	e: 18-22 °C)		
0	19 19	19 18	R	18		
2	10 70	70 70	20	20		
2						
			Numb	er Alive		
			(I, imr	nobile)		
0	10 10	10 10	10	10		
1	10 10	10 10	10	(O)		
2	(1) (0)	10 10	01			
2	Validity Cr	iteria: must be ≤ 10% I	nortality and	or abnormal beha	vior in the control	Reconcernence of Provide Landson and Provide Lands
	Notes: Im	mobile; daphnid can't	swim after 6	0 sec. even if ante	enna still move	
	Unless oth	nerwise noted, behavi	our is conside	ered to be normal		
Culture	2018				17 11 0	
Young jar	nu	Jar(s) mortality 7 day	ys prior to tes	st (must be ≤25%	1 6.70	
lioungju						
OA (previo	ous month)	<u>A</u>			trol Validity Criteria	-
	st brood (≤12 days)	9	0-	Mea	n % mortality at 48 ho	urs - 📿 🚬
Average n	umber of young produc	ed (≥15 young)	57	(mus	st be ≤10%)	
Were test	treatments randomized	on test tray?	/ No			
Sample					•	
	ample prior to aeration:	130	Is aeration	required (<40%	or >100%)? Yes	or No
DU % 01 S						
Duration of	of aeration (37.5 +/- 12.5	mL/min/L): 20 M(Filtered wi	ith 110um screen	ind (125 mg CaCO /	L)? Yes or No
	(mg CaCO ₃ /L) of 100% :				uired (<25 mg CaCO ₃ /	L): Yes or No
	of sample after adjustme		n 25 - 30 mg	CaCO ₃ /L)		
	of 100% sample (mg Ca					
Aikannity	or roove sumple (ing ca		+			
Dilution	Water		Antiscala	nt		
	/ preparation date	7:04/16		centration in Sam	ple: <u>2.mg/L</u> Volume of antis	
Hardnord	of dilution water (mg/L)	197-	Volume o	f sample: 5	Com Volume of antis	scalant: 15.8 LL
Inaruness	or unution water (mg/t)	11-				
			DO Level	s (40-100% satur	ration) - corrected for	altitude -
Common	ts/Observations:	» (I_ 00)		mg/L at 18°C	3.1 to 7.7 mg/L	
Commen	ts/Observations:	· NOVYT		mg/L at 19°C	3.0 to 7.6 mg/L	
	98hr: no	DOL		mg/L at 20°C	<i>.</i> ,	
	14111.110	PPF-				
	Reviewed By:	B	Date Reviewe	d: 20201	05 0	



Daphnia Bench Sheet

Method	DAS 20			Client	TEC164		Reference	1920-1	132-04	_
_										
Test Log					-			Sample Ir	formatio	า
Day	Date		Time	Technician	Chem. Cart	Daily Dat	ta Review	Initial pH:		7.4
0	2020/04	1/24	1510	MW/MF	3	C	C.	Initial EC (µS/cm):	1186
1	2020/04	1/25	nen	SC	-		1F	Initial DO		10.4
2	2020/04	1/26	CONC	VX	2	A		Initial Tem		15
		1/20	0113	KP		//~				3
I ala Carda		CTL D		100.1			1	Salinity (p	51).	>
Lab Code	CTL A	CTL B	CTL C	100 A	100 B	100 C				
day				pH (uni	ts) (range: 6	0-8.5)				
0	8.0	8.1	8.1	8.0	8.0	8.0	1		1	
2	all	07	82.7	0.3	89.7	0.11				
2	DU	5.0		0.1	0.2	8.4				
	TI	he pH of the s	sample was no	t adjusted prior	to test setting,	unless noted	in the comme	ents below		
			1		EC (uS/cm)					
0	419	425	425	1178	1178	1175			1	
2	422	1127	437	illion	1103	1170				
-		JOLI	AUL	mu	110	1110	1			
				00/ 01/	10 1000/					
-	- A				40-100% sa		test temp	.)		
0	8.2	8.2	8.2	8.2	0.2	8-2				
2	79	7.9	7.9	7.9	7.8	79				
				1.0			1		1	11
				Tomporatu	ro (°C) (rong	10 22 %	`			
0					re (°C) (range)		,	
0	18	18	18	18	18	18				
2	20	70	20	20	20	20				
					Numbe	r Alive				
					(I, immo					
0		10	10	1.0						
0	10	10	10	10	10	10				
1	10	10	10	10	10	10				
2	in	10	00	01	10	10				
	V	alidity Crite	ria: must h	< 10% mor	tality and/or	abnormal	havior in t	the control		
	N	lotos: Imm	abilo: danbr	aid cap't quir	n after 60 se	c oven if a	stoppo still	ine control		
								move		
	0	inless other	wise noted	, benaviour i	s considered	to be norr	mal			
Culture	2018							61	1	
Young jar	D2	J	ar(s) morta	lity 7 days pr	ior to test (n	nust be ≤2	5%)	O		
				, , ,	,		,			
QA (previou	(c month)						ControlVa	lidite Cuite		
			a				Control Va	indity Criti	eria	mi
	t brood (≤12 d		-1		27		Mean % m	ortality at 4	18 hours -	OT-
Average nu	mber of young	produced	(≥15 young	g)	51		(must be ≤	10%)		
Were test t	reatments rand	lomized on	test trav?	Yes / N	0					
-			,	0						
Sample										
Sample			101						0	
DO % of sa	mple prior to a	eration:	12		Is aeration r	eauired (<-	40% or >10	0%)?	Yes or No	
1		-							-	
	aeration (37.5		L/min/L) :	lom.n	Filtered with	110um sc	reen prior t	o testing	Yes or No	
Hardness (r	ng CaCO ₃ /L) of	100% :	610		Is hardness	adiustment	required (<25 mg Ca	$(O_2/1)$?	Yes or No
			(25				g cu		
Inaraness of	f sample after a	adjustment	(must be b		30 mg CaCO	J ₃ /L)	-			
Alkalinity of	100% sample	(mg CaCO	/L):	194						
			-							
Dilution W	-				DO Louis la (40 1000/				
			1:04/16		DO Levels (•			
	preparation dat		1.0 11 10	2	3.3 to 8.2 m	g/L at 18°C	-	3.1 to 7.7 r	ng/L at 21	°C
Hardness of	f dilution water	(mg/L)	192		3.2 to 8.1 m	g/L at 19°C		3.0 to 7.6 r	ng/L at 22	°C
		_			3.2 to 7.9 m				5.	
Commente	/Observations	HRI	NO P	Pt	to 7.5 m	3, - 4, 20 C	-			
- Somerica	observations	. 0100								
	48hrz	NOP	pt							
							010510	1		



Daphnia 10°C Bench Sheet

Method	DAS 10		Client	TEC164		Reference	1920-1	132-04	_
Test Log							Sample In	formation	ı
Day	Date	Time		Chem. Cart		ta Review	Initial pH:		7.4
0	2020/04/24	1525	MW/CB	3	MF		Initial EC (1186
1	2020/04/25	OPOD	SC	-	M	F	Initial DO		10.4
2	2020/04/26	0925	KK	3	AV	V	Initial Tem	p (°C):	15
					(Salinity (p	ot):	3
Lab Code	CTLA CTLB	CTLC	100A	100B	100C				
day				ts) (range: 6.	0_8 5)				
0	0 0	8.	S. T. MW	(ange. o.	and the second se	1	1	1	· · · · · · · · · · · · · · · · · · ·
2	8.1 8.1		Silver	7.9	7.9				
2	0.6 0.0	8.2	0.3	93	83				
	The pH of the	sample was n	ot adjusted prior		unless noted	in the comme	ents below		
0		1101		EC (uS/cm)					
0	425 426	426	1182	1194	1190				
2	434 436	433	172	1185	1179				
					1 1				
			DO (mg/L) (4	40-100% sat	turation at	t test temp	.)		
0	Q.4 94	9.4	9.6	9.6	9.6		Í		
2	910 910	9.6	9.5	9.5	9.5				
			-1.)		7.7		1	L	
			Tomporatu	re (°C) (rang	0. 0 13 °C				
0			Temperatu	re (C) (rang	e. o-12 C)				
2	12 12	12	1)	11	11				
2		11	()	11	()				
				Numbe	r Alive				
				(I, immo	bile)				
0	10 10	10	10	10	10				
1	10 10	10	10	10	10				
2	10 10	11)	10	10	10				
	Validity Crit	teria: must h	e ≤ 10% mort		abnormal h	abavior in t	the control		L]
	Notes: Imm	obile dank	nid can't swii	m after 60 se	a even if a	entoppo still	movo		
			d, behaviour i				move		
Culture		erwise noter	a, penaviour i	s considered	to be nor	mai			
	2018		1. 7 1			500	OY.		
Young jar	02	Jar(s) morta	ality 7 days pi	rior to test (n	nust be ≤2	5%)	01.		
QA (previo		0					alidity Crite		
	t brood (≤12 days)	(25			ortality at 4	8 hours -	Ot.
Average nu	imber of young produced	d (≥15 your	ng)	2/		(must be ≤	10%)		
Were test to	reatments randomized o	n test tray?	Kes / No	0					
		5							
Sample									
		1	11					2	
	mple prior to aeration:			Is aeration re				Yes or No	
Duration of	aeration (37.5 +/- 12.5 r	mL/min/L):	man	Filtered with	110um sc	reen prior t	o testina	Yes or No	
Hardness (r	ng CaCO ₃ /L) of 100% :	610	with	Is hardness a	adjustment	required ((25 mg Col		Yes or No
	-					. required (<23 mg Cat	LO3/L):	res or NO
Hardness o	f sample after adjustmen	it (must be	between 25 -	- 30 mg CaC	O ₃ /L)	-			
Alkalinity o	f 100% sample (mg CaCC	D_{3}/L):	194						
			1 1						
Dilution W	ater		Г	DO Levels (10-100%	aturation)	corroctod	for altitud	
	preparation date	1:0411		4.1 to 10.3 n					
		\$(10					3.8 to 9.6 n	0	
Indianess o	f dilution water (mg/L)	190		4.0 to 10.0 n			3.7 to 9.4 n	ng/L at 12°	C
	(O)	AC A I	10 001	3.9 to 9.8 mg	g/L at 10°C				
Comments	/Observations: OH	RS 8 1	N PPF						
40	heing mit								
	Reviewed By:)	Dete	Powiewood	20221	AFIAL			
r	Reviewed By:	2	Date	e Reviewed:	20201	05101			



Daphnia Antiscalant Bench Sheet

Method	DAS AS	Client	TEC164	_ Refe	rence 1920-	1132-04	
Test Log					Sample In	nformation	
Day	Date	Time Technic	ian Chem. Car	Daily Data Rev			7.4
0	2020/04/24	1545 MW/M			Initial EC (
1	2020/04/25		F	SC	Initial DO		1186
2		0810 70	- 2	MIF			10.4
2	2020/04/26	0915 KV	5	1 AW	Initial Tem		15
					Salinity (p	pt):	3
Lab Code	CTLA CTLB	CTLC 100A	100B	100C			
day		pH	(units) (range:	A			
0	8.1 8.1	8.2 8.0	8.0	8.D			
2	P.7 82	92 9.2	184	8.4			
	The pH of the	sample was not adjuste	d prior to test sett	ing, unless noted in th	he comments below		
			EC (uS/cm)				
0	422 426	125 117	4 1175	1174			
2	455 430	432 110	5 11/02	1170			
_	-105 900		61105			11	
			(1) (40-100%	saturation at tes	t tomn)		
0	07 07	ba 107			it temp.)		
	8.5 8.2	82 8.2	8.2	8.2			
2	1.7 1.7	7.9 7.4	2 7-7	1.6			
			ature (°C) (rang	e: 18-22 °C)			
0	18 18	18 18	18	18			
2	20 20	20 20	020	26			
						I L]
			Numbe	er Alive			
			(I, imm				
0	10 10	10 10			1	1	
	10 10	10 10	10	10			
1	10 10	10 1	0 10	(0			
2		(0) (1))	10			
		eria: must be ≤ 10%				I	
	Notes: Imm	obile; daphnid can'	t swim after 60	sec. even if anter	nna still move		
	Unless othe	rwise noted, behav	iour is conside	red to be normal			
Culture	2018				A .		
Young jar		Jar(s) mortality 7 da	avs prior to tes	t (must be ≤25%)	0У.		
						-	
QA (previo	us month)			Cont	rol Validity Crit	oria	
1	st brood (≤12 days)	a.			n % mortality at 4		AL
	umber of young produced	1(>15 100000)	27			+o nours -	OF-
			1	- (IIIUS)	t be ≤10%)		
vvere test t	reatments randomized o	n test tray? (reg	/ NO				
Sample		101				-	
DO % of sa	ample prior to aeration:	121	Is aeration	required (<40% o	r > 100% 12	Yes or No	
	f aeration (37.5 +/- 12.5 r	nL/min/L): Lomi					-
Hardness (I	mg CaCO ₃ /L) of 100% :	610	Is hardness	adjustment requi	ired (<25 mg Ca	CO3/L)?	es or No
Hardnoss	of sample after adjustmen	t (must be between					
		10.0	11 25 - 50 mg C	.dCU ₃ /L)	-		
Alkalinity o	f 100% sample (mg CaCC	$D_3/L):$ 199					
Dilution W	/ater	1.4	Antiscalan	t			
	preparation date	1:04/16	Final Conce	ntration in Samples	e Lmall		
	of dilution water (mg/L)	100	Volume of	cample: 500	Volumo of	antiscalant:	5846
la uness u	· · · · · · · · · · · · · · · · · · ·	10	volume of a		volume of		
			DO	(40.4000)	4*	1.6	
-	101	110 ODL		(40-100% satura			
Comments	s/Observations: OW > 8	NUPPI		ng/L at 18°C		ng/L at 21°C	
den	la c			ng/L at 19°C	3.0 to 7.6 r	ng/L at 22°C	
76	thr: no opt		3.2 to 7.9 m	ng/L at 20°C			
	Reviewed By:	B	ate Reviewed:	2020 0	5101		



APPENDIX C – Chain-of-custody form

Teck	and the state of the			10.0 million (10.0 million)		I	-	_	-											
	COC ID:	2020-04-	23_T	oxicity_EFS		TURNA	ROUN		IME:	-	(default)					RUSH:	INFO			1
	PROJECT/CLIENT INFO					La	b Name	-	tilus Env		ntal		Pe	aport Fo	rmat / Dis		1	Excel	PDF	EDD
Facility Name									nara Pom			-	Ema			-Lab@teck.c		x	X	X
	Thomas Davidson				-	Euc					vironmen	tal.ca	Ema		Thomas.E	Davidson a te	ck.com	X	X	X
	thomas.davidson@teck.com								6125 - 1				Ema			aequisonlin			1-	X
Address	15 Km North HWY 43			11 I.I. 1			Taureos						Ema		Tricia.Hil	la teck.com		X	X	X
	Comment of			Province BC			City	Cal	gary		Province	AB	Ema	ail 5:	Marty Ha	fke a teck co	m	X	X	X
	Sparwood			Country Cana	da	Post	al Code	_			Country		Ema							
Postal Code	V0B 2G0			Country Cana	ua	103	ai couc				[county]								· · · ·	
	and the second second							-		-										
	(250) (02) 0417	1.1.1.1.1.1.1	-			Phone	Number	403	3 253 712	21		-			PO	number		VPO00	0692115	
	(250) 603 - 9417 SAMPLE DETAI	LS			-	Thome							ANA	LYSIS R	EQUESTI	ED			_	_
62.0/04/24									- (A. 1. d.)	1.22		Please in	dicate beli	ow Filter	ed Perserve	d or both (F,	P F/P)	and the second		1. 1.
020/04/24 0:26 Maniteulín 6x20L carbonys, 20x1 VoSINOS NoSINOS									Constant of		State Providence	r rease in	alcate bell	Interest						
Anoitocalin.									ce	nce	nce	nce +								
			(0)						_Single_Conce	NAUT_48Hr_DM_Single_Conce ntration_Toxicity Test @ 20C	L_Single_Conce Test @ 10C	NAUT_48Hr_DM_Single_Conce ntration_Toxicity Test @ 20C + Antiscalant								
La 201 cartage 2601	1 hottios		Hazardous Material (Yes/No)					SIS/	ngle_	L_Single_Test @	ngle st @	st @								
Check Nor 5, 200 1	Laurio		al (Y					ANALYSIS	Sir Tes	A_Si Tes	A_Si v Tes	A_Si								
VOSINOS			ateria					AN	RT icity	DN	DN	DN								
and Condition			s Ma						6Hr Tox	8Hr Tox	Tox	Tox								
			rdou						T_9	T_4	NAUT_48Hr_DM_ ntration_Toxicity	VAUT 4								
Sample ID 1920-113	Sample Location	Field Matrix	Haza	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.		NAUT_96Hr_RT_ ntration_Toxicity ⁷	NAUT_48Hr_DM ntration_Toxicity	NAUT_48Hr_DM ntration_Toxicity	NAI ntra Anti								
L_WLCI_SP01_2020-04-23_N_1100 -0(WL WLCI SP01	WS		4/23/2020	11:00	G	9		x	x	x	X		°C/						
L_LCI_SP02_2020-04-23_N_1100 ~02	WL LCI SP02	WS		4/23/2020	11:00	G	9		x	x	X	x	9,2	°C/						
L_BFWB_OUT_SP21_2020-04-23_N_1100	WL_BFWB_OUT_SP21	WS		4/23/2020	11:00	G	9		x	X	X	X	3.6	90		_				
C_LC3_2020-04-23_N_1100	LC_LC3	WS		4/23/2020	11:00	G	9		x	x	X	x	4.6	×			—			
							0													
			-																	
		-																		
ADDITIONAL COMMENTS/SF	PECIAL INSTRUCTIONS	1		RELINQUIS			N		Dat	te	· T	ime		Accepted	H By/Affilia	tion	I	Date		Time
hipment includes 2 extra 20 L		alL		Rud	YE	nuun			4/23/2	2020		-	-						-	
astic bottles.					I			+			-							_	-	
			-					-												
SERVICE REQUEST (rush -	subject to availability)							-				-		_						
		(default) X		Sampler's N	ame	6	2.1	11	A	501	NA	Mo	bile #							
	(2-3 business days) - 50% su		-	Sampler a to		-	7-00	m	+	~~~~	2			-		-	-			
	y (1 Business Day) - 100% su SAP or Weekend - Contact			Sampler's Sign	nature	1 is	5-	_	/	251	2	Dat	e/Time			2	23-Apr-	-20		



END OF REPORT



Acute Toxicity Test Results

Sample collected May 4, 2020

Final Report

May 18, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Samula ID/		Da	ites	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation
WL_BFWB_OUT_SP21_ 2020-05-04_N_0900 / 1920-1188	4-May-20 at 0900h	5-May-20 at 1150h	6-May-20 at 1245h	5-May-20 at 1540h

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_OUT_SP21_202 0-05-04_N_0900	6.1°C	843	187

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Samala ID	Percent survival in 100% (v/v) sample				
Sample ID ——	Rainbow trout	Daphnia magna 20°C			
VL_BFWB_OUT_SP21_2020- 05-04_N_0900	100	100			
Samula ID	Percent Immob	ility in 100 (% v/v)			
Sample ID ———		ility in 100 (% v/v) magna 20°C			



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-05- 04 N 0900	Rainbow trout	Precipitate observed on the sides of test vessel	None
	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.5 (3.0-3.8) g/L KCl ¹	6.2 (5.9-6.5) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-5.0) g/L KCl	6.1 (5.1-7.3) g/L NaCl
Reference toxicant CV	11.9%	6.0%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, April 7, 2020; ² Test Date April 27, 2020

LC = Lethal Concentration; CL = Confidence Limit



M. Frit

Report By: Michelle Fritz, BSc Biologist

thiesen

Reviewed By: Sara Thiessen, BSc Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

MALITILIC

Trout Bench Sheet

Method	TRS	Client	TEC164	Reference	1920-1188		Chamber	5
Test Log							Sample Infor	mation
						Daily Data	1	
Day		Date	Time	Initial	Chem. Cart	Review	Initial pH:	71
0	2020/05/0	06	1245 *	CBNAF		1 60	Initial EC (µS/o	cm): 1569
1	2020/05/0	07	6815	NW	-	4 -	Initial DO (mg	
2	2020/05/0		080	CB.	-	F		
3	2020/05/0		0850	MW	-		Initial Temp (°	C): 0.7
4	2020/05/				-	CB	Salinity (ppt):	
4	2020/03/	10	1030	STIAL		X SI		
Sample Pre Aeration rate Preaeration	e adjusted to 6.	5 +/- 1 mL/min/L	-	vhen the test 1 hour	was loaded with 1.5 hours	fish 2 hours	DO in mg/L (saturation)**	
DO(mg/L) of			12.0	10.0	0.5	8.8	6.2 mg/L - 8.9 mg	
00(119/2)01	10070		12.0	10.0	4.5	0.0	6.1 mg/L - 8.8 mg	
Test Chami							6.0 mg/L - 8.6 mg	
	stry and Biolog						**corrected for all	titude
Conc.	CTL	100						
				pH (units) ((range: 5.5-8.5)			
Day 0	1.3	7.2						
Day 4	28	5.8						
		012					_	
				FC	(uS/cm)			
Day 0	211	11111				1	1	
Day 4	964	112-FG						
Duy 4	527	15/0						
	e i	a d	DO (mg/	L) (70-100%	saturation at te	st temp.)		
Day 0	8.10	2.2						
Day 4	8.5	8.8						
			Te	emperature (°	C) (range: 14-16	°C)		
Day 0	10	15			, (sign for the	_/		
Day 4	16	12						
		15						
			Niccostra					
Devid		0 10		er Alive (in bra	ackets number st	ressed)		
Day 0		0 10						
Day 1	10	10						
Day 2	10	10						
Day 3	10	10						
Day 4	10	10						
,	Validity Crite	eria: must be ≤ 1	0% mortality a	nd/or stresse	d behavior in the	control		
	Unless other	vise noted, behav	ior is considere	d to be norm		control		
	Officas Otherv	vise noted, benav	nor is considered	u to be norm	dl			
Control Orga	nim Data							
						Test Organis	m Information	
Control	Length	Weight						
Fish	(cm)	(g)				Batch	20200318TR	
								.
1	3.8	0.7	Loading Density	y (g/L):	0.4	Source	Lyndon	
2	3.9		(must be ≤0.5 g/L)					-
3	3.9	0. 8			0	Tank #	6	
4	3. 1		Mean Length (c	m).	3.7		0	-
5		0.6	iviean Length (C		9.1			
	3.3				2220	Days Held at 1		46
6	3.8		Length Range (cm):	3.3-3.9	(must be ≥14 da	ys)	
7	3.7	0.6						(0)
8	3, 8	0.7	Mean Weight (g	g):	6.7	Percent stock	mortality	0.10
9	3,5	0.6	(Must be ≥0.3g)			(7 days prior to te		
10	2 2	0.7					,	
	1. 1		Weight Range: ((a):	0.S-0.B	Test Volume (I	N	18
			reight Kange.	(g).	0.0.0.0	l lest volume (l	_)	10
Commente		1						
comments :	Ohr:n	Oppt						
	Or () as	1 11	o l	1 1	· · all-			
	96hr:	Light	pot on	tank	walls			
							10-1-	1.2
		Reviewed By:	10			Date Reviewed	2020/0S	110
		-					00.0100	(.



Daphnia Bench Sheet

Method	DAS 20	Client	TEC164	Refer	ence 1920-1	188
Test Log		mo Tochnician	Chara Cart	Doily Data Davi	Sample Info	
Day 0		me Techniciar			ew Initial pH: Initial EC (µS	7.1
1		O AW/ST	3	VIL	Initial DO (m	
2	2020/05/07 09	-	2-	VE	Initial Temp	
<u>_</u>	2020/03/01 109			10	Salinity (ppt	
Lab Code	CTLA CTLB C	LC 100A	100B	100C		<u>· </u>
davi		pH (u)	nita) (ranga: E	0.9.5)		
day 0	Bo BD P.		nits) (range: 6.	<u>(0-8.5)</u>		
2	8.1 8.1 8.	1 8.4	8.4	8.4		
	The pH of the sampl	e was not adjusted priv		unless noted in the c	omments below	I
0		11 160	EC (uS/cm)			
0 2	465 460 4	11 122	1563	DEL		
2	481 100 91	1940	1504	151001		
0	RIPIT		(40-100% sa	turation at test t	emp.)	
0 2	79 79 -	19 7.9	0.6	8.6		
-				$\mathbf{P} \mathbf{O}$		I
0			ure (°C) (range	-0		
0 2	9 19	19 10	10	18		
2	20 20 2	0 20	120	20		
			Numbe	er Alive		
			(l, immo	bile)		
0		10 10	10	10		
1 2		2 10	10	10		
2		must be ≤ 10% mo	ortality and/or	abnormal behavio	or in the control	
	Notes: Immobile	; daphnid can't sw	im after 60 se	c. even if antenna	still move	
	Unless otherwise	noted, behaviour	r is considered	l to be normal		
Culture	C.5 Jar(s)	mortality 7 days	prior to tact (n	$put = b_0 < 2E_0$	o'l	
Young jar		mortality 7 days j	prior to test (r	nust be ≤25%)		
QA (previo	ous month) 🗸	7		Contr	ol Validity Criter	ia
	st brood (≤12 days)	T	21	Mean	% mortality at 48	hours - O
	umber of young produced (\geq 19			(must	be ≤10%)	
Were test	treatments randomized on test	tray? (res) / I	No			
Sample						
DO % of sa	ample prior to aeration:	130%	Is aeration r	required (<40% or	r >100%)?	es or No
	of aeration (37.5 +/- 12.5 mL/m			n 110um screen p		es or No
	mg CaCO ₃ /L) of 100% : 81				red (<25 mg CaC	
	of sample after adjustment (mi		5 - 30 mg CaC	0 ₃ /L)		
Alkalinity o	of 100% sample (mg CaCO ₃ /L):	107				
Dilution	Notor		DOL	40 100%	tion) occurrents (
Dilution W		1/22	3.3 to 8.2 m		tion) - corrected f 3.1 to 7.7 m	
		<u>4/22</u> 83	3.2 to 8.1 m		3.0 to 7.6 m	
li araness (0.5	3.2 to 7.9 m		5.0 10 7.0 11	J/ L 01 22 C
Comment	s/Observations:		L	-		
	Ohr: NO PPt					
	48hr: NO ppt					
	Reviewed By: 10	Da	ate Reviewed:	2020/05/17	/	



APPENDIX C – Chain-of-custody form

					Page	1	of 1									
Teck	COC ID:	2020-05-04	Toxicity_SP2	1	TURNA	ROUN	D TIME	Regula	(default)				RUSH:			
	PROJECT/CLIENT INFO	2020 02 01						ATORY					OTHER INFO	Excel	PDF	EI
Facility Name	WLC AWTF				and the second se			Environme	ntal			Format / Dis	-Lab@teck.com	X	X	
Project Manager	Thomas Davidson				Lab (Tamara				Email 1:				X	+
	homas.davidson@teck.com							nautiluser		tal.ca	Email 2:		Davidson@teck.con		-	+
Address	15 Km North HWY 43				P	Address	#4, 6125	- 12 Street	SE		Email 3:		@equisonline.com	X	X	+
									_		Email 4:		ll@teck.com	X	X	+
City	Sparwood		Province BC				Calgary		Provinc		Email 5:	Marty.Ha	afke@teck.com	~		+
Postal Code	V0B 2G0		Country Can	ada	Posta	tal Code	T2H 2K	1	Country	Canada	Email 6:		1		1	_
Phone Number	(250) 603 - 9417				Phone ?	Number	403 253	7121) number	VPO0	069211	5
	SAMPLE DETAI	LS		6	ž.	-		AND AND ADMINISTER	No. of Concession, Name	Internetal	ANALYSIS	REQUESTI	ED			
1020/05/05 11:50 Monitoxlin										Please in	licate below Filt	ered, Perserve	d or both (F, P, F/F	2)		
0311							2	the states					THE REAL PROPERTY AND INCOME.		Calify August	COLUMN T
Monitorlin			0				ANALYSIS NAUT_96Hr_RT_Single_Conc	entration_Toxicity Test NAUT_48Hr_DM_Single_Con centration_Toxicity Test @								
TOC .			Hazardous Material (Yes/No)				IS	st igle_ est (
2-4201 carbon 5 Gr 11	hattles		(Ye				Sing	Sin Te								
OC 3xH2OL carbon/5,5x H NoSINOL Good Condition			erial				ANALYSIS RT_Single	DM								
NODINOS 1-1			Mat	1			Hr	Tox								
Good Condition			ous		8		96	ion 48								
		Field	Izard	Time	G=Grab			AUT	2							
Sample ID 020-188				(24hr)	C=Comp	Cont.			5	00				-	1	
WL_BFWB_OUT_SP21_2020-05-04_N_0900	WL_BFWB_OUT_SP21	WS	5/4/2020	9:00	G	0			201			-		-		-
				-					-	+						-
				-			-		-			-				-
					-		-			-				-		_
							-			+		-			+	-
				-		-		-	-	-				-	+	-
	and and a strength of the stre					-			-					-	+	
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						1			-		A	oted By/Affili	ation	Date		Т
ADDITIONAL COMMENTS/SI				and the second se	AFFILIATIO	ON		Date 5/4/2020	-	Time	Acce	dea byranna	ation			
Shipment includes 2 extra 20 L	bladders and 2 extr	alL -		Tara Gent	ale		+	51412020					10.00 L			
plastic bottles.															_	
									_						_	
SERVICE REQUEST (rush	- subject to availability)				1					1.00						
		(default) X	Sampler's	Name			Mark Gai	zauskas		M	obile #					
Dist	y (2-3 business days) - 50% :	urcharge			1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A 1 A									-		
	cy (1 Business Day) - 100%		Sampler's Si		144	11	im		N		e/Time		4-Ma	v-20		



END OF REPORT



Acute Toxicity Test Results

Sample collected May 18, 2020

Final Report

June 1, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC



SAMPLE INFORMATION

Semale ID/	Dates							
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 20°C test initiation				
WL_BFWB_OUT_SP21_ 2020-05-18_N / 1920-1248	18-May-20 at 0900h	19-May-20 at 0821h	20-May-20 at 1400h	19-May-20 at 1530h				

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_OUT_SP21_202 0-05-18_N	13.3°C	997	261

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Samula ID	Percent survival in 100% (v/v) sample				
Sample ID ——	Rainbow trout	Daphnia magna 20°C			
WL_BFWB_OUT_SP21_2020- 05-18_N	100	100			
Comula ID	Percent Immob	ility in 100 (% v/v)			
Sample ID ———		ility in 100 (% v/v) magna 20°C			



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-05-	Rainbow trout	None	None
18_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.8 (3.3-4.2) g/L KCl ¹	6.9 (6.6-7.2) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-4.9) g/L KCl	6.1 (5.0-7.4) g/L NaCl
Reference toxicant CV	11.5%	6.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, May 8, 2020; ² Test Date May 25, 2020

LC = Lethal Concentration; CL = Confidence Limit



Report By: Adam Wilson, BSc Biologist

thiesen

Reviewed By: Sara Thiessen, BSc Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

Trout Bench Sheet

Method	TRS Clier	nt _	TEC164	Reference	1920-1248		Chamber	5
Test Log							Sample Inform	mation
						Daily Data		
Day	Date		Time	Initial	Chem. Cart	Review	Initial pH:	7.7
0	2020/05/20		1400 *	GISC	1	INF	Initial EC (µS/c	m): 1728
1	2020/05/21		0840	LO DE	-		Initial DO (mg)	
				NIF	-	C.F		
2	2020/05/22		0845	(IS	-	ME	Initial Temp (°C	<u>): 13:9 11</u>
3	2020/05/23		O(0)	(B	-	Mi	Salinity (ppt):	1
4	2020/05/24		1010		1			•
Sample Pre Aeration rate Preaeration DO(mg/L) o	e adjusted to 6.5 +/- 1 time		6	when the test v 1 hour	vas loaded with 1.5 hours	fish 2 hours	DO in mg/L (saturation)** 6.2 mg/L - 8.9 mg, 6.1 mg/L - 8.8 mg,	/L at 14°C
00(119/2)0	110070	I	0.1				6.0 mg/L - 8.6 mg	
	stry and Biology						**corrected for alt	titude
Conc.	CTL	100						
				nH (unita) (r				
Day 0	7.7	81			ange: 5.5-8.5)		1	
Day 4	7.9	8.1						
,		0						
				FC (uS/cm)			
Day 0	281	11000						
Day 0	200	1663						
Day 4	33 3	636						
			DO (ma	/l) (70-100% s	aturation at te	st temp.)		
David	C	8-1	DO (ing					
Day 0	Sle	0-1						
Day 4	8.7 4	8.8						
			Т	emperature (°C	(range: 14-16	°C)		
Day 0	K	15				I		
		12						
Day 4	15	12						
						D.		
			Numb	per Alive (In bra	ckets number st	(ressed)		
Day 0	10	10						
Day 1	10	0						
Day 2	LX	10						
Day 3		10					-	
	10	10					_	
Day 4		10						
	Validity Criteria: Unless otherwise n					e control		
	onicss otherwise h	iotea, seria						
	ganism Data	M/-1-1-4				Test Organis	m Information	
Control Fish	Length (cm)	Weight (g)				Batch	202003	ITO
					02		- 1	1
1	3.8 0	5.6	Loading Densi		0.5	Source	- Wout Do	ME
2	3.5	0.4	(must be ≤0.5 g/L	_)				1
3	30 /	5.3	1			Tank #	Ч	
4	20	2 10	Mean Length	(cm):	3.5			-
5	350	1.8		().		Days Held at	15+ 2°C	200
	2.2 (.4	Longth Dans-	(cm):	3.0-3.8	(must has start		- Le
6	2.20	1.2	Length Range	(cm).	2.0 9.0	(must be ≥14 d	ays)	
7	3.5 (×
8	35 1	3.4	Mean Weight	(g):	0.4	Percent stock	mortality	()
9	34 (D.A	(Must be ≥0.3g)			(7 days prior to t	test, must be ≤2%)	0
10	21	OK	1					16-
10	2.6		J Weight Range	e: (g): C	1.3-0.6	Test Volume	(L)	lle
Comments	s: ohr: nop	pt						
	96 hr:no	pot						
		eviewed By:	(M)			Data D	d: 10000	115
	R	eviewed By:	VV			Date Keviewee		200



Daphnia Bench Sheet

Method	DAS	Client	TEC164		Reference	1920-	1248	-
Test Log						Sample In	formation	
Day	Date	Time Techni	cian Chem. Cart	Daily Dat	a Roview	Initial pH:	Tormation	27
0	2020/05/19	1530 KK A		Cully Dut	a Review	Initial EC (µ	S/cm)	1720
1	2020/05/20	0815 M		T	0	Initial DO (110
2	2020/05/21	N320 (P	2	N C	ĉ	Initial Tem		-19
L	2020/03/21	0150 0		8	C			
Lab Code	CTLA CTLB	CTLC 100,	A 100B	1000		Salinity (pp	<i>I</i> ().	
Lab Coue	CILA CILB		A TUUB	100C				
day		pН	l (units) (range: 6	.0-8.5)				
0	80 80	8.0 7-	7 7.7	77				
2	8.0 8.0	8.0 8.	3 8.3	8.2				
	The pH of the	sample was not adjusted		unless noted	in the comme	nts below		
0			EC (uS/cm)					
0	346 344	345 101	0 1628	1623				
2	353 350	351 159	0 1596	600				
			(1) (10 100% co	turation at	toot tomm	`		
0	79 70		g/L) (40-100% sa	8.0	test temp)		
2	18 18	78 90	9 9.3	9.0				
2	1.0 4.0	(0)	0 1 1.0	40				
		Tempe	erature (°C) (rang	e: 18-22 °C)				
0	201 70	70 70	120	70				
2	20 20	20 10	20	20				
			Numbe	er Alive				
			(I, immo	bile)				
0	10 10	10 10	10	10				
1	OI CI	10 10	10	10				
2	10 0	10 10	10	10				
		teria: must be ≤ 10%						
		nobile; daphnid can't				move		
C	Unless othe	erwise noted, behavi	our is considered	to be norn	nal			
Culture	01				-043	07.		
Young jar		Jar(s) mortality 7 da	ys prior to test (r	nust be ≤25		07.		
QA (previo	us month)				ControlVa	lidite Crite	nia	
	st brood (≤12 days)	9				lidity Crite ortality at 4		<u>^!</u> .
	umber of young produced	1 (>15 young)	20		(must be ≤		o nours -	0'
	treatments randomized o		/ No		(must be 2	1070)		
		in cost (ruy).						
Sample								
	ample prior to aeration:	1811.	Is aeration r	equired (2)	10% or > 10	0% 12	Yes or No	
							/ /	1
	f aeration (37.5 +/- 12.5 r						Yes or No	
Hardness (mg CaCO ₃ /L) of 100% :	997	Is hardness	adjustment	required (<25 mg Ca($CO_3/L)?$	Yes or No
Hardness o	of sample after adjustmer	t (must be between	25 - 30 mg CaC	0 ₃ /L)	~			
Alkalinity o	of 100% sample (mg CaCC	$D_{3/L}$: 7.0	ol					
	, , , ,							
Dilution W	/ater	AW	DO Levels	40-100% s	aturation)	- corrected	for altitud	le -
Pail label /	preparation date D	rum 1 / 05/19 14	3.3 to 8.2 m	g/L at 18°C		3.1 to 7.7 n	ng/L at 21	°C
Hardness o	of dilution water (mg/L)	154	3.2 to 8.1 m	9		3.0 to 7.6 n	5.	
			3.2 to 7.9 m				-	
Comments	s/Observations:							
	Ohr: NO DD	-						
	48hr: NO 001							
				Apple	120			
	Reviewed By: 10		Date Reviewed:	20000	>163			



APPENDIX C – Chain-of-custody form

Teck						Page		of 1						DUCU			
	COC ID:	2020-05-18	Tox	vicity SP21	l	TURNA	ROUN				(default)			RUSH: OTHER INFO		-	east the second
	PROJECT/CLIENT INFO	and the second second				a de la come		-	BORAT		- 1				Excel	PDF	EDD
Facility Name	WLC AWTF							-		vironmen	ntal		Format / Dis		X	X	X
	Thomas Davidson					Lab C			nara Pon			Email 1:		-Lab@teck.com		X	X
	thomas.davidson@teck.com						Email	tam	ara@na	utilusen	vironmental.ca	Email 2:	Thomas.I	Davidson/a/teck.cor	n X	X	
	s 15 Km North HWY 43					A	ddress	#4,	6125 - 1	2 Street	SE	Email 3:	TeckCoa	l'ajequisonline.com	-	-	X
Address	S 13 KIII NOTULEI W 1 43							1				Email 4:	Tricia.Hi	ll/a/teck.com	X	X	X
	and the second s	and the second second	1		-	-	City	Cal	aarv.		Province AB	Email 5:	Marty H	afke/a/teck.com	X	X	X
	/ Sparwood			Province BC		-		-			Country Canada	Email 6:				1.1	
Postal Code	e V0B 2G0		0	Country Cana	da	Posta	al Code	121	1261		Country Canada	Email 0.			_		
								-							-		
	(250) (02 0417					Phone N	Number	403	253 71	21				O number	VPO	0069211	5
	r (250) 603 - 9417 SAMPLE DETAI	18							9 V.			ANALYSIS	REQUEST	ED	Carl Contractor		and Constanting
2010/06/A 08:21 R&V Hotshot 30 3020L carboys, 3%1L1 No6/NOL Good Condition	SAMPLE DETAI		-						No. Start			Easte balance Eile	arad Barcara	ed or both (F, P, F/	P)	and second	
2010/00/M									an destroyed	No.	Please in	dicate below Fin	ered, reiserv				定は思え
08,21									J	-	A REPORT AND A REPORT OF	The second second second second					
R&V Actshot									NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @							
A.			Hazardous Material (Yes/No)					S	t le	gle st @							
a chi - kane 2.11	1, this		Yes					NALYSIS	Tes	Te							
Bastor candons, salin			al (AL	IT'S	City							
NES/NOL			teri					Z	R	Divi		1 1					
Fondition			Ma					1	Hr	H							
GOOD CONSTITUT			SUIC						96 10	48 ion							
12.300			urdo		T	C-Crob	# Of		UT	UT							
		Field	laza	Data	Time (24hr)	G=Grab C=Comp		1.000	NAI	VAI	202						-
Sample ID	Sample Location	Matrix WS	<u> </u>	Date 5/18/2020	9:00	G	6		X	X							
WL_BFWB_OUT_SP21_2020-05-18_N	WL_BFWB_OUT_SP21	ws		5/18/2020	9:00	G	0	-									
1926-1248				Lawrence of the				_									
										1.00	a franciska franciska se		-			-	-
													-			-	-
			_												_	_	
			-														
A CONTRACTOR OF A CONTRACTOR O	and the second sec		-		-	1000	-	-		-							
	A CONTRACTOR OF A CONTRACTOR O			land and				-				+ +	-				
										-		+				-	-
							-			1.0					-	-	
																	-
			-	-			-									_	
	and the second s						-	-									
	A CONTRACTOR OF A CONTRACTOR O								D	ate	Time	Acce	pted By/Affil	iation	Date		Time
ADDITIONAL COMMENTS/				RELINQUIS			DN	-	and the second states	/2020	Time						
Shipment includes 2 extra 20 L	bladders and 2 extr	alL		1	`ara Gent	ile	-	+	3/10	12020							
plastic bottles.								+									
plastie bottles.		-						+									
			100000	2-40 Sec. 10 Sec. 10	and the second	and the second		100					1				
SERVICE REQUEST (rus		(default) X						T	C M	Ino		obile #					
Deiger	ity (2-3 business days) - 50% s			Sampler's N	ame			la	fi Mugao	IZa	Įvi		and services				
	ncy (1 Business Day) - 100%		-			5 N	A			0	Da	te/Time		18-N	1ay-20		
	ASAP or Weekend - Contact		1 8	Sampler's Sig	nature	P	2	4	ta	L							
Tor Emergency <1 Day,	riora of meetena Contact							(5								



END OF REPORT



Acute Toxicity Test Results

Sample collected May 26, 2020

Final Report

June 10, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC



SAMPLE INFORMATION

Semula ID/		Da	tes		
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 20°C test initiation	
WL_BFWB_OUT_SP 21_2020-05-26_N / 1920-1308	26-May-20 at 0900h	27-May-20 at 0900h	28-May-20 at 1600h	27-May-20 at 1355h	

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-05-26_N	8.6°C	1012	295

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID	Percent survival in 100% (v/v) sample					
Sample ID —	Rainbow trout	Daphnia magna 20°C				
WL_BFWB_OUT_SP21_2020-05-26_N	100	100				

Sample ID ——	Percent Immobility in 100 (% v/v)
Sample ID	Daphnia magna 20°C
WL_BFWB_OUT_SP21_2020-05-26_N	0

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL BFWB OUT SP21 2020-05-26 N	Rainbow trout	None	None
WL_DFWD_OU1_3F21_2020-05-20_N	Daphnia magna	None	None



QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.8 (3.3-4.2) g/L KCl ¹	6.9 (6.6-7.2) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-4.9) g/L KCl	6.1 (5.0-7.4) g/L NaCl
Reference toxicant CV	11.5%	6.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, May 8, 2020; ² Test Date May 25, 2020

LC = Lethal Concentration; CL = Confidence Limit



Report By: Kayla Knol, BSc Biologist

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Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

NALITILIC

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Trout Bench Sheet

1ethod	TRS	Client	TEC 164	Reference	e 1920-1308		Chamber	9
est Log							Sample Infor	mation
Devi			-			Daily Data		
Day 0		ate	Time	Initial	Chem. Cart		Initial pH:	1.5
1	2020/05/28 2020/05/29		1600 *	Mw 1 Sc		MIT	Initial EC (µS/	1. 1. 0 1 -
2	2020/05/29		1600	CB	-	STP	Initial DO (mg	
3	2020/05/30		0820	M	-	<u><u><u></u></u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u>	Initial Temp (°	<u>C): 19</u>
4	2020/05/51		0005	Ku	-	AW	Salinity (ppt):	-1
4	2020/06/01		1125		t was loaded wit	ST		
ample Pre-	Aeration		Note. ", time	when the tes	t was loaded wit	in tisn	DO in mg/L (70% - 100%
	adjusted to 6.5	+/- 1 ml /min/	L wooding					
reaeration ti		·/- · · · · · · · · · · · · · · · · · ·	0.5 hours	1 hour	1.5 hours	2 hours	saturation)**	
O(mg/L) of			97	9.5	1.5 hours	2 hours	6.2 mg/L - 8.9 mg	
0(119/2) 01	10070		9.7	~	-1.9	9.3	6.1 mg/L - 8.8 mg	
est Chemist	ry and Biology						6.0 mg/L - 8.6 mg	
Conc.	CTL	100	1			1	**corrected for al	titude
conc.		100						
				nH (unitc)				
Day 0	7.4	70	1	pri (units)	(range: 5.5-8.5)	1		1
Day 4	7-	78						
Duy 4	1.]							
				EC	(uS/cm)			
Day 0	402	168D	1			1		
Day 4	29	1504						
Duy	215	1207						
			DO (ma	(1) (70-100%	saturation at t	oct tomm)		
Day 0	1a	03	I DO (mg)		Saturation at t	est temp.)	1	
Day 4	6907	5.8						
Duy	878X	0.0						
	ST		т	omporaturo (°C) (range: 14.1)	6°C)		
Day 0	19	IL	· · · ·		°C) (range: 14-1			
Day 4	13	15						
ed) i								
			Numb	er Alive (In b	rackets number s	stressed)		
Day 0	10	10						
Day 1	0	10						
Day 2	10.	10						
Day 3	0	10						
Day 4	10	10						
			10% mortality	and/or stress	ed behavior in t	he control		
	Unless otherwi	ise noted, beha	avior is consider	ed to be nor	mal	ne control		
					nar			
ontrol Orga	nism Data					Test Organis	m Information	
Control	Length	Weight				gama		
Fish	(cm)	(g)				Batch	20200311TR	
						butter	LOLOODTIII	
1	3.3	0.5	Loading Densi	ty (g/L):	0.3	Source	Troutlodge	
2	3.3	0.4	(must be ≤0.5 g/L			-	noutiouge	
3	3.7	0-6	1		-	Tank #	8	
	3.4	0.4	Mean Length (cm):	3.4			
4	2.1	0.3	1			Days Held at	15± 2°C	34
4 5			1	(cm):	3.2-3.7	(must be ≥14 d		51
	3.3	0.5	Length Range	(CIII).	-	-		
5	3.3		Length Range	(ciii).				
5 6	3.3	0.5	Length Range Mean Weight		0.5	Percent stock	mortality	0
5 6 7	33 53 53 F	0.5	Mean Weight (0.5	Percent stock		0
5 6 7 8	う う う う う う 子 り り 子 り	0.5					x mortality test, must be ≤2%)	0
5 6 7 8 9	33 53 53 F	0.5	Mean Weight ((Must be ≥0.3g)	(g):		(7 days prior to 1	test, must be ≤2%)	
5 6 7 8 9	う う う う う う 子 り り 子 り	0.5	Mean Weight ((g):	0.5		test, must be ≤2%)	0
5 6 7 8 9	い、 い、 い、 い、 い、 い、 い、 い、 い、 い、	0.5 0.5 0.6 0.6	Mean Weight ((Must be ≥0.3g)	(g):		(7 days prior to 1	test, must be ≤2%)	
5 6 7 8 9 10	3.3 3.5 3.4 3.4 3.2 3.2 0 Hrs: NO PP1	0.5 0.5 0.5 0.4	Mean Weight ((Must be ≥0.3g) Weight Range:	(g):		(7 days prior to 1	test, must be ≤2%)	
5 6 7 8 9 10	3.3 3.5 3.4 3.4 3.2 3.2 0 Hrs: NO PP1	0.5 0.5 0.5 0.4	Mean Weight ((Must be ≥0.3g)	(g):		(7 days prior to 1	test, must be ≤2%)	



Daphnia Bench Sheet

Method	DAS 20	Client	t .	TEC164		Reference	1920-	-1308	_
Testies									
Test Log							Sample In	formatio	า
Day	Date	Time Tech	nician	Chem. Cart	Daily Dat	a Review	Initial pH:		7.5
0	2020/05/27	1355 S	TIC	_ 3	AU)	Initial EC (JS/cm):	1/32
1	2020/05/28	100 (10	-	- The	0	Initial DO (10 0
2	2020/05/29		IF	2					10.5
	1 1010/03/15	UTDD V	IF	2	Mu		Initial Tem		19
Lab Cada							Salinity (pp	ot):	
Lab Code	CTLA CTLB	CTLC 10	00A	100B	100C				
day		F T	oH (unit	s) (range: 6.	0-8.5)				
0	O'S SIC	042 7	X	48	7.8				
2	8.1 0.1	8.1 8.	4	8.9	8.4				
	The pH of the	sample was not adjust	ed prior	to test setting	unless noted	in the comme	ents helow		
				EC (uS/cm)	uniess noted	in the commu	citts below		
0	72(221	742 11	2111	17 5 1	(I MA		-		
	313 370	370 16	04	1697	1698				
2	361315	21016	31	64	1070				
		DO (m	na/L) (4	0-100% sat	uration at	test temn)		
0	76 79	7917		70	an	test temp	.)		
2	Ti Ti	Till XI	4	ter	XY				
2	1.9 7.9	1.97	.9	7.9	1.9				
		Tem	perature	e (°C) (range	· 18-22 °C)			
0	70 70	70 7	0	20	20	,			
2		22 4	0	00	10				
2	20 10	20 10	S	20	20				
				Number	r Alive				
				(I, immo					
0			6	(1, 111110	bile)				
	10 10	10 1	0	10	10				
1	10 10	(O)	0	10	10				
2	10 10	1.2 13	2	15	10				
	Validity Crit	eria: must be ≤ 10	% morta	ality and/or	abnormal	ehavior in t	the control		
	Notes: Imm	obile; daphnid car	't cuuino	offer 60 co			the control		
	Notes. IIIII	oblie, dapririlu car		aller ou se	c. even il al	ntenna still	move		
	Unless othe	rwise noted, beha	viour is	considered	to be norn	nal			
Culture	07						OH		
Young jar		Jar(s) mortality 7 c	lavs pri	or to test (m	nust be $<2^{\circ}$	5%)	Oh		
		.,	-)- [
QA (previou	(c month)	5							
		F					alidity Crite		
Days to first	t brood (≤12 days)			110		Mean % m	ortality at 4	8 hours -	01.
Average nu	mber of young produced	(≥15 young)		40		(must be ≤	10%)		
	reatments randomized or		No			,	,		
		rest day.	110						
Consta									
Sample		16201							
DO % of sa	mple prior to aeration:	155%	1	s aeration re	aquired (10% or > 10	00/12 /	Yes or No	
								res or inc	'
Duration of	aeration (37.5 +/- 12.5 n	nL/min/L) : 20 🗸	MAR	iltered with	110um scr	een prior to	o testing	Yes or No	
	C CO #11 (1000)	5101		s hardness a					
1	-					required (25 mg Cac	.U ₃ /L)?	Yes or No
Hardness of	f sample after adjustmen	t (must be betwee	en 25 - 3	30 mg CaCC	$D_3/L)$	6			
Alkalinity of	100% sample (mg CaCO	11. 70	95						
randominey of	ious sample (ing caco	3/L).	19						
			_						
Dilution W	ater		1	DO Levels (4	40-100% s	aturation)	- corrected	for altitud	e -
Pail label / r	preparation date D	rum 1, 05/21		3.3 to 8.2 mg					
	f dilution water (mg/L)						3.1 to 7.7 m		
I la uness of		167		8.2 to 8.1 mg			3.0 to 7.6 m	ng/L at 22°	°C
-			3	3.2 to 7.9 mg	g/L at 20°C				
Comments	Observations:	t							
	Ohr: NO	PPI							
	48hr: 000	int							
	4011. 10								
					0,0001	21.			
R	Reviewed By:		Date	Reviewed:	WW	VelDI			



APPENDIX C – Chain-of-custody form

Teck					Page	1 0	1 of 1							
		0-05-26	2020-05-26 Toxicity SP21	P21	TURNA	ROUND	TURNAROUND TIME: Re	Regular (default)	lt)		RUSH:			
Easility, Mama	PROJECT/CLIENT INFO				La	b Name	LABORATORY Lab Name Nautilus Environmental	onmental		Report F	Report Format / Distribution	Excel	el PDF	EDD
Project Manager	Project Manager Thomas Davidson				Lab	Contact 7	Lab Contact Tamara Pomeroy	, ko		Email 1:	DL-WLC-Lab@teck.com		1	1
Email	Fmail thomas.davidson@teck.com					Email t	Email tamara@nautilusenvironmental.ca	usenvironm	ental.ca	Email 2:	Thomas.Davidson a teck.com	mo	X X	
Address	Address 15 Km North HWY 43					Address #	Address #4, 6125 - 12 Street SE	treet SE		Email 3:	TeckCoal@equisonline.com	ne.com		
										Email 4:	Tricia.Hill@teck.com		X X	
City	City Sparwood		Province BC	c		City (City Calgary	Provi	Province AB	Email 5:	Marty.Hafke@teck.com		X X	
Postal Code V0B 2G0	V0B 2G0		Country Canada	anada	Post	Postal Code 1	T2H 2K1	Count	Country Canada	Email 6:				-
Dhone Nimher	Dhone Niumber (250) 603 - 9417				Phone	Number 4	Phone Number 403 253 7121				PO number	VP	VPO00692115	5
	SAMPLE DETAILS				1225-2					ANALYSIS	ANALYSIS REQUESTED			
									Please ind	cate below Filter	Please indicate below Filtered, Perserved or both (F, P, F/P)	P, F/P)		
		(oV/s9Y) [6					ty Test	(i) test (i)						
		Field azardous Materi		Time			ANA AUT_96Hr_PN i2ixoT_n0i1ari2i AUT_48Hr_DN	oixoT_noitento OC						
Sample ID	+	×	+	-	Ŭ	Cont.	uə	50	2				+	-
WL_BFWB_OUT_SP21_2020-05-26_N	WL_BFWB_OUT_SP21	SM	5/26/2020	00:6 0	e	9	×	x X					+	+
10-1-00 0-1-00								+					+	+
20,001 11														
in tould		-												
TOL CONDI	ov S													
od Cond										_			-	-
												-	+	
											A			
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	SPECIAL INSTRUCTIONS		RELINO	JISHED BY	RELINQUISHED BY/AFFILLATION	1 MAN	Date	_	Time	Accepted	1 by/Athliation	Date		Time
Shipment includes 2 extra 20 L bladders and 2 extra plastic bottles.	bladders and 2 extra 1	 	121	700			707/07/0							
SERVICE REOUEST (rush - subject to availability)	h - subject to availability)													
4	Regular (default)	fault) X	Sampler's Name	s Name		5	Grant Flewhing		Mobile #	lle #				
Emerger	Emergency (1 Business Day) - 100% surcharge	harge	Samuler's Signature	Signature			d		Date/Time	Time	26	26-Mav-20		
Eor Emerance /1 Day ASAD or Weekend - Contact Nautilus			Odilinici o	S Mature			11							



END OF REPORT



Acute Toxicity Test Results

Sample collected June 1, 2020

Final Report

June 16, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Somela ID/	Dates					
Sample ID/ – Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna test initiation		
WL_BFWB_OUT_SP21_2020-06-01_N / 1920-1352	1-Jun-20 at 0900h	2-Jun-20 at 1147h	3-Jun-20 at 1530h	3-Jun-20 at 1650h		

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-06-01_N	10.9°C	864	287

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID	Percent survival i	n 100% (v/v) sample
Sample ID ——	Rainbow trout	Daphnia magna 20°C
NL_BFWB_OUT_SP21_2020-06-01_N	100	100
Sample ID	Percent Immob	ility in 100 (% v/v)
Sample ID —		ility in 100 (% v/v) magna 20°C

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-06-01_N	Rainbow trout	None	None
WL_BFWB_001_3F21_2020-06-01_N	Daphnia magna	None	None



QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.8 (3.3-4.2) g/L KCl ¹	6.9 (6.6-7.2) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.4-4.9) g/L KCl	6.1 (5.0-7.4) g/L NaCl
Reference toxicant CV	11.5%	6.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, May 8, 2020; ² Test Date May 25, 2020

LC = Lethal Concentration; CL = Confidence Limit



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Report By: Sara Thiessen, BSc Biologist

Reviewed By: Kayla Knol, BSc Biologist

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APPENDIX A – Summary of test conditions



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data



Trout Bench Sheet

Method	TRS Client	TEC 164	Reference	1920-1352		Chamber	5
Test Log						Sample Inform	
					Daily Data		m
Day	Date	Time	Initial	Chem. Cart	Review	Initial pH:	7.7. 7.
0	2020/06/03	1530 *	NW 180		ME	Initial EC (µS/c	m): 2200 1414
1	2020/06/04	0900	AD	-	5P	Initial DO (mg	(L): 9.1. m. 10
2	2020/06/05				TP	Initial Tomp (°	<u></u>
		0830	AD	-): +5- 17 m
3	2020/06/06	1045	Mu	-	sc	Salinity (ppt):	mul
4	2020/06/07	0930	AD		XU.		
		Note: * ; time v	when the test w	was loaded with	fish		
Sample Pre-	Aeration	0				DO in mg/L (70% - 100%
Aeration rate	adjusted to 6.5 +/- 1 mL/mi	1 vesino				saturation)**	
Preaeration ti		0.5 hours	1 hour	1 F haven	2 6 4 4 4 4		
			1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg	
DO(mg/L) of '	100%	12.4	11.8	11.4	10.9	6.1 mg/L - 8.8 mg	/L at 15°C
						6.0 mg/L - 8.6 mg	/L at 16°C
Test Chemist	ry and Biology					**corrected for all	titude
Conc.	CTL 100						
conc.							
			pH (units) (r	ange: 5.5-8.5)			
Day 0	7.4 7.4						
Day 4	75 501						
c cy i	L 1. 1 0'6			1	1		
			FC /	(Class)			
			EC (I	uS/cm)		1	
Day 0	360 1378						
Day 4	375 1285		-				
		DO (ma/	(1) (70-100% s	aturation at te	st temp.)		
Day 0	00 100	DO (mg/			1	1	
	8.9 10.9						
Day 4	813 815						
	2						
		Τe	emperature (°C	c) (range: 14-16	°C)		
Day 0	14 4						
	15 15						
Day 4	17 17						
		Numbe	er Alive (In bra	ckets number st	tressed)		
Day 0	10 10						
Day 1	10 10						
Day 2	10 16						
-							
Day 3	0 0						
Day 4	10 10						
	Validity Criteria: must be	≤ 10% mortality a	and/or stresse	d behavior in th	e control		
	Unless otherwise noted, be	havior is consider	ed to be norm	al			
ontrol Orga	nism Data				Test Organis	m Information	
Control	Length Weight				l'est organis		
					Detel	2020021170	
Fish	(cm) (g)				Batch	20200311TR	
				0 0			
1	3.8 0.8	Loading Densit	ty (g/L):	0.3	Source	Troutlodge	
2	4.1 0.9	(must be ≤0.5 g/L)			1		-
3	4, 08				Tank #	8	
		-		3.7		0	-
4	3.5 0.5	Mean Length (cm):	J	-		44
5	3.5 0.5			0 2 11 1	Days Held at		Mu-39-40
6	3.7 0.0	Length Range	(cm):	3.3-4.1	(must be ≥14 d	ays)	
7	36 0.0				1		
8	30 0.5	Mean Weight	(a):	0.6	Percent stock	mortality	0
		-	97.	0 -	-	,	
9	3.3 0.4	(Must be ≥0.3g)			(7 days prior to t	est, must be ≤2%)	
10	3.5 0.5			0 11 0 0			
		Weight Range:	: (g):	0.4-0.9	Test Volume	(L)	18
		5			1		
Comments :	OHrs ND OOL				1		
connents :	OHrs ND PPT						
	APROT						
	96Hrs: NOPPT						
		0					1.1-02
	Reviewed	By: JP			Date Reviewed	: 20201	00/08
				-			



Daphnia Bench Sheet

Method	DAS 20			Client	TEC164		Reference	1920-	-1352	
-								c		
Test Log			T '				D .	Sample In	formation	
Day	Date		Time		Chem. Cart	Daily Dat	a Review	Initial pH:		22
0	2020/06		1650	SCM	F 3	M		Initial EC (1451
1	2020/06	/04	27.55	MF	-	TP		Initial DO ((mg/L):	10.1
2	2020/06	/05	GOD	SC	2	N	F	Initial Tem	p (°C):	17
			1000					Salinity (pp	ot):	i
Lab Code	CTLA	CTLB	CTLC	100A	100B	100C				
day				pH (uni	ts) (range: 6	.0-8.5)				
Ó	QI	RI	RI	710	110	17				
2	5.6	20	01	39	37	22				
2	41	0.0	80	6.5	0.7	0.7				
	1	he pH of the s	ample was no	ot adjusted prior		unless noted	in the comme	ents below		
	Huide	200	200	1.1.0	EC (uS/cm)					
0	405	398	384	1421	1420	1427				
2	363	362	3434	812450	1348	1352				
			~ ~ >	1224						
				DO(ma/L)	40-100% sa	turation at	test temp	.)		
0	701	201	76	07	07	8.2		.,		
2	1 DA	Tal	-701	20-	0.6	0.0				
2	24	27	27	11	79	27				
				Tomporatu	1°C) (rang	. 10 22 .0)			
0	201	2.2	7.0	Temperatu	re (°C) (range	e. 10-22 C)			
0	20	w	40	10	18	16				
2	6	70	10	20	20	20				
					Numbe	er Alive				
					(I, immo	obile)				
0	$ \cap $	$(\bigcirc$	IO	10	10	10				
1		10	12	100	10	100				
2	10	10	0		10	10				
2					,0	10				
				e ≤ 10% mor						
				nid can't swir				move		
	L	Inless other	wise noted	d, behaviour i	s considered	d to be nori	mal			
Culture								<u>.</u>	/	
Young jar	DM	J	ar(s) morta	ality 7 days p	rior to test (r	nust be ≤2	5%)	O		
				, , ,				(-	
QA (previo	us month)						Control V	alidity Crite	eria	
	t brood (≤12 d	21/5)	1				Moon % m	ortality at 4	18 hours	0
			1.15		29		Wear 70 m		to nours -	\sim
	Imber of young			- /	21		(must be ≤	10%)		
Were test t	reatments rand	lomized on	test tray?	Yes X N	0					
Sample									0	
DO % of co	mala prior to a	oration	17		le paration .	required (100/ 05 > 10	109/ 12	Yes or No	
	imple prior to a		100		Is aeration i	requirea (<	40% or > 10	JU%)?	ves or No	
Duration of	faeration (37.5	+/- 12.5 m	L/min/L) :	20 mm	Filtered with	h 110um so	reen prior t	to testing	Yes or No	
	mg CaCO ₃ /L) o		RIA	1	Is hardness			-		Yes or No
1	-		00	.~		-	(Tequired (<25 mg ca	CO3/L):	Tes of No
Hardness o	of sample after	adjustment	(must be	between 25	- 30 mg CaC	O₃/L)				
Alkalinity o	f 100% sample	(mg CaCO-	/1).	287	-			-		
	, recirc sumpre	(ing cucos	<i>y</i> = <i>j</i> .		-					
Dilution W	lator				DO Levels	(40-100%)	caturation)	- corrector	d for altitur	
the second second second		+ -	2 05 /24			-				
	preparation da		2:05/21	-	3.3 to 8.2 m				mg/L at 21	
Hardness c	of dilution wate	r (mg/L)	167		3.2 to 8.1 m			3.0 to 7.6	mg/L at 22	°C
					3.2 to 7.9 m	ng/L at 20°0	C			
Comments	/Observations		-							
	0hr:	JOPPT								
	48hr:		T							
L							1 .			
	Reviewed By:	TP		Dat	e Reviewed:	2020	20100108)		



APPENDIX C – Chain-of-custody form

Teck						Page	-	1 of 1									
		2020-06-01 Toxicity SP21	Toxic	ity SP21		TURNAROUND TIME:	ROUNI	TIME:		Regular (default)			R	RUSH: OTHER INFO			
Facility Name WLC AWTF	PROJECT/CLIENT INFO WLC AWTF					Lab	Name	Nautilus	Lab Name Nautilus Environmental	ental		Repor	Report Format / Distribution	bution	Excel	PDF	EDD
Project Manager	Proiect Manager Thomas Davidson					Lab (Contact	Lab Contact Tamara Pomeroy	omeroy			Email 1:		DL-WLC-Lab@teck.com	×	X	×
Email	Email thomas.davidson@teck.com						Email 1	tamara@	tamara@nautilusenvironmental.ca	vironmer	ntal.ca	Email 2:		Thomas.Davidson@teck.com	X	X	X
Address	Address 15 Km North HWY 43					A	Address	#4, 6125	Address #4, 6125 - 12 Street SE	t SE		Email 3:		TeckCoal/@equisonline.com			X
												Email 4:	Tricia.Hill@teck.com	teck.com	X	X	X
City	City Sparwood		Prov	Province BC			City	Calgary		Province AB	AB	Email 5:	Marty Hafke@teck.com	a teck.com	×	X	×
Postal Code V0B 2G0	V0B 2G0		Cou	Country Canada	63	Posta	al Code	Postal Code T2H 2K1	_	Country	Country Canada	Email 6:					-
														$\left \right $			
DLNiLu	2110 202 (050)					Phone N	Phone Number	403 253 712	7121				PO n	PO number	VPO0	VPO00692115	
Phone Number	Phone Number (200) 603 - 941 / SAMPLE DETAIL	S										ANALYS	ANALYSIS REQUESTED				
Manitoulin Sc Scoll carboys 3xill brities Noci/Not Bood Condition sample ID 1920-1362 sample wu. Brwu. Brwu. Brwu.	Strikes Sample Location WL_BFWB_OUT_SP21	Field Matrix WS	Hazardous Material (Yes/No)	Date 6/1/2020	Time 9:00	G=Grab C=Comp c	# Of Cont. 6	SISY.1ANA NOD_algni2_TA_TH80_TUAN ×		500	2						
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	ECIAL INSTRUCTIONS		RF	RELINQUISHED BY/AFFILIATION	ED BY/AFI	FILIATION	7		Date		Time	Acci	Accepted By/Affiliation	-	Date		Time
Shipment includes 2 extra 20 L bladders and 2 extra 1 L plastic bottles.	bladders and 2 extra	1 1 1		Ta	Tara Gentile			9	6/1/2020								
SERVICE REQUEST (rush - subject to availability)	· subject to availability)							1									
Priority	Regular (default) Priority (2-3 business days) - 50% surcharge	lefault) X rcharge	Sai	Sampler's Name	ne		M	Mark Gaizauskas	auskas		Mo	Mobile #					
Emergency	Emergency (1 Business Day) - 100% surcharge	rcharoe				N. 1	1					The second se		1 Imm-20	00		



END OF REPORT



Acute Toxicity Test Results

Sample collected June 15, 2020

Final Report

June 30, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Sample ID/ Internal ID		Da	ates	
• •	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> test initiation
WL_BFWB_OUT_SP21_2020-06-15_N / 1920-1429	15-Jun-20 at 0900h	16-Jun-20 at 1000h	17-Jun-20 at 1500h	16-Jun-20 at 1445h

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
WL_BFWB_OUT_SP21_202 0-06-15_N	9.7°C	715	205

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Comple ID	Percent survival in 100% (v/v) sample						
Sample ID —	Rainbow trout	Daphnia magna 20°C					
WL_BFWB_OUT_SP21_2020-06-15_N	100	100					
Sample ID —	Percent Immob	oility in 100 (% v/v)					
Sample ID	Daphnia magna 20°C						

	Daphnia magna 20 C	
WL_BFWB_OUT_SP21_2020-06-15_N	0	



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-06-15_N	Rainbow trout	None	None
WL_DFWD_OUT_3721_2020-00-15_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.6 (3.4-3.7) g/L KCl ¹	6.0 (5.6-6.3) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.4 (2.4-4.9) g/L KCl	6.1 (5.0-7.4) g/L NaCl
Reference toxicant CV	11.3%	6.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, June 8, 2020; ² Test Date June 8, 2020

LC = Lethal Concentration; CL = Confidence Limit



thiesen

Reviewed By: Sara Thiessen, BSc Biologist

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.

Report By: Adam Wilson, BSc Biologist



APPENDIX A – Summary of test conditions



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

NALITILIC

Trout Bench Sheet

Method	TRS Clie	ent	TEC164	Reference	1920-1429		_ Chamber _	5
Test Log							Sample Inform	ation
						Daily Data		27
Day	Date		Time	Initial	Chem. Cart	Review	Initial pH:	AC
0	2020-06-17		1500 *	SC/MF	MW B	Mu	Initial EC (µS/cn	n): 128
1	2020-06-18		0813	AD	-	TP	Initial DO (mg/L	
2	2020-06-19		0913	PID	-	TP	Initial Temp (°C)	16
3	2020-06-20		6855	Mu	-	SC	Salinity (ppt):	1
4	2020-06-21		1930	ADIST		LC		
			Note: * ; time v	when the test w	as loaded with	fish		
Sample Pre-			\frown				DO in mg/L (70	0% - 100%
Aeration rate	adjusted to 6.5 +/-	1 mL/min/l					saturation)**	
Preaeration ti	me		0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg/L	at 14°C
DO(mg/L) of	100%		11.5	9.5	RB		6.1 mg/L - 8.8 mg/L	
							6.0 mg/L - 8.6 mg/L	
Test Chemist	ry and Biology						**corrected for altit	
Conc.	CTL	100						uuc
e onte.		100						
				pH (units) (ra	nge: 5.5-8.5)			
Day 0	46 .	73						
Day 4	7.5	8.7						
		-						
	200			EC (u	S/cm)			
Day 0	589	345						
Day 4	390 1	21.5						
		141						
		0	DO (mg/	L) (70-100% s a	turation at tes	t temp.)		
Day 0	Big	O.B						
Day 4	84	8.8						
	0.1							
			Te	emperature (°C)	(range: 14-16°	C)		
Day 0	IY	15						
Day 4	5	15						
			Numbe	er Alive (In brac	kets number str	ressed)		
Day 0	10	10						
Day 1	10	10						
Day 2	ics	10						
Day 3	10	10						
Day 4	10	10						
	Validity Criteria: r		10% mortality a	nd/or stressed	behavior in the	control		
	Unless otherwise n							
	official official official official	lotea, bena	whom is considered					
Control Orga	nism Data					Test Organis	m Information	
Control		Weight				rest organis	in mormation	
Fish	(cm)	5				Batch	20200211TD	
11511	(cm)	(g)				battin	20200311TR	
1	20	0 7			0,5	Course	Troubledee	
1	20	0.7	Loading Densit		~	Source	Troutlodge	
2	415	1.1	(must be ≤0.5 g/L)					
3	39	0,7			41	Tank #	4	
4	39	0.7	Mean Length (cm):	111			
5	4.2	0.5			20115	Days Held at	15± 2°C	1
6	117	00	Longth Dange	()-	38.47	(must be >14 d		

Control Organ	nism Data				Test Organism Information	
Control	Length	Weight				
Fish	(cm)	(g)			Batch20200311TR	
1	3,8	0.7	Loading Density (g/L):	0,5	Source Troutlodge	
2	4.3	1.1	(must be ≤0.5 g/L)			
3	39	0.7	7	111	Tank # 4	
4	39	D.7	Mean Length (cm):	9.1		
5	4.2	0,5	7	20110	Days Held at 15± 2°C	54
6	4.2	09	Length Range (cm):	3.8-4.2	(must be ≥14 days)	
7	2.12	TiO	7	A	2	
8	4.1	0.9	Mean Weight (g):	0.7	Percent stock mortality	0
9	4.2	1.0	(Must be ≥0.3g)		(7 days prior to test, must be ≤2%)	
10	39	0.7	7			
		~ ~ ~ ~	Weight Range: (g):	0.7-1.1	Test Volume (L) 18L	
Comments :	0 hr: ND 6	PT				
	96 hr: NO P	OT				
	96 hr: NO Y	8 I				
		D	ne		landage 1	22
		Reviewed B	y: V		Date Reviewed: 200000	2)



Daphnia Bench Sheet

Method	DAS 20		Client	TEC164		Reference	1920-	1429	
Test Log							Sample Inf	ormation	
Day	Date	Time	Technician	Chem. Cart	Daily Da	ta Review	Initial pH:		7.2
0	2020/06/16	1445	AW/ ST	3		al	Initial EC (µ	S/cm):	1203
1	2020/06/17	6950	Mer	-		P	Initial DO (I	mg/L):	10.9
2	2020/06/18		AWV	R		-	Initial Temp		16
-	2020/00/10	0940			0	V	Salinity (pp		1
Lab Code	CTLA CTLB	CTLC	100A	100B	100C				
day			pH (un	its) (range: 6	.0-8.5)				
0	82 82	82	112	111	77				
2	8.0 8.1	8.1	8.3	8.3	83				
	The pH of th	ne sample was r	not adjusted prio		, unless noted	in the comm	ents below		
				EC (uS/cm)	1000				
0	367 365	3.64	1339	ISB	1372				
2	370 370	368	1335	1355	1344				
			DO (mg/L)	(40-100% sa	turation a	t test temp) .)		
0	B1 0.1	0.1	8.6	8.8	6.8				
2	7,9 7.9	7.9	7.9	7.9	7.9				
			Temperatu	ire (°C) (rang	e: 18-22 °C])			
0	19 19	19	18	18	18	Í			
2	20 20	20	20	20	20				
				Numbe (I, immo	er Alive obile)				
0	10 10	10	10	10	10				
1	10 10	0	10	10	0),				
2	10 10	10	1b	10	10				
	Validity C	riteria: must	be ≤ 10% mo	rtality and/or	abnormal	behavior in	the control		
			hnid can't swi ed, behaviour				I move		
Culture Young jar	DI /C2		tality 7 days p				2.5	7.	
QA (previou	us month)	B				Control V	alidity Crite	eria	
Days to first	t brood (≤12 days)	S		0.10		Mean % r	nortality at 4	8 hours -	0
Average nu	mber of young produc	ed (≥15 you	ng)	30		(must be			1
	reatments randomized			No	-				
Sample		1.	10-1					\sim	
	mple prior to aeration:		15-1.	Is aeration	required («	<40% or >1	00%)?	Yes or No	•
	aeration (37.5 +/- 12.5		· Domin			creen prior		Yes or No	Yes or N
	ng CaCO ₃ /L) of 100% :		_		-	required	(<25 mg Ca	CU3/L)!	ies or N
	f sample after adjustm			- 30 mg CaC	.O ₃ /L)	<u> </u>	_		
Alkalinity of	f 100% sample (mg Ca	CO₃/L):	205	_					
Dilution W	ater			DO Levels	(40-100%	saturation) - corrected	for altitud	e -
	preparation date	1:06/08		3.3 to 8.2 n			3.1 to 7.7 r		
	f dilution water (mg/L)	153	-	3.2 to 8.1 n			3.0 to 7.6 r		
			-	3.2 to 7.9 n					
Comments	Observations:	(
	Ohr: NO P	0.01							
	48hr: No	PPt							
	Reviewed By:		Da	te Reviewed:	9000	100/22	5		



APPENDIX C – Chain-of-custody form

Teals					1							1.45.1.55.55								
Teck						Page	1	of	1											
	COC ID:	2020-06-	15_T	oxicity_SP2	21	TURN	AROUN				r (default)				RUSH:		_			
	PROJECT/CLIENT INFO						1. 1.	_	ABORA							ER INFO	D 1	DDD	Inno	
Facility Name		in a glannal said								nvironme	intal			1	istribution		2 2 2 2 2 2 2	PDF	EDD	
	Thomas Davidson					Lab	Contact	-	mara Por				Email 1:	-	.C-Lab@tec		X	X	X	
Email	thomas.davidson@teck.com						Email	tan	nara@na	autilusen	vironmen	ital.ca	Email 2:	Thomas	Davidson	i)teck.com	X	X	X	
Address	15 Km North HWY 43						Address	#4,	6125 -	12 Street	SE		Email 3:	TeckCo	al@equison	line.com			X	
													Email 4:	Tricia.H	lill@teck.co	m	X	X	X	
City	Sparwood			Province BC			City	Cal	lgary		Province	AB	Email 5:	Marty.	lafke@teck	com	X	X	X	
Postal Code	V0B 2G0			Country Can	ada	Pos	tal Code	T2	H 2K1		Country	Canada	Email 6:				1.1.1.1.4.2.			
				[-		and the search		
															0 1	_	VPOOR	(02116	_	
Phone Number	(250) 603 - 9417					Phone	Number	403	3 253 71	21					O number		VPO00	692115	_	
100 (01 1)C	SAMPLE DETA	ils							REALESS		1		ANALYSIS	REQUEST	TED	1		-	T	
0/0106/16											Lange and the second	Please ind	licate below Filte	red, Perserv	ed or both (F, P, F/P)			and the second distance	
020/06/16 0:00 Manitoulin 2201. carboys, 3211.bottle 165/NGL 165/NGL												1.0	A Loss to fair as					3		
Nanitoulin									onc	uo										
	-		Hazardous Material (Yes/No)						NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @ 20C										
azoi carboys, sail bette	5		'es/]					NALYSIS	igle.	est										
16SINEL			10					LY	Sir	IV T										
and Readition			eria					NA	city .	DM dicit										
cod condition			Aat					A	oxi	L										
			IS N						H9	H8										
			10p.						L_9	I_4										
inter un		Field	azar		Time	G=Grab	# Of		AU [*] tra	AU'										
Sample ID 1920-1429		Matrix	H	Date	(24hr)	C=Comp	Cont.							-					+	
L_BFWB_OUT_SP21_2020-06-15_N	WL_BFWB_OUT_SP21	WS		6/15/2020	9:00	G	6		X	X	9.70								-	
					-					1	1				1				+	
										-				-				-	+	
							1.00						_	-	-			_	+	
										-										
													la se dine							
***			-								-				1				-	
			-				-			-	-			-	-			-	+	
and and the second s	Advantation (Construction)		-			1								-	distant and			<u> </u>	+	
ADDITIONAL COMMENTS/SP	ECIAL INSTRUCTIONS			RELINQUISI	IED BY/AI	FILIATION	N		Da	te	Ti	ime	Accepte	d By/Affilia	ation	D	ate	7	Fime	
hipment includes 2 extra 20 L	bladders and 2 extra	11L		Ju	lia Johnso	n			6/15/2	2020										
lastic bottles.												_								
lastic boules.																			_	
												_				1			_	
SERVICE REQUEST (rush -										197.19						-				
	and the second se	default) X		Sampler's Na	me		1	Гafi	Mugadz	a		Mob	ile #							
	(2-3 business days) - 50% si	-		Jumpier of th					ondi		-									
	y (1 Business Day) - 100% si	-	S	Sampler's Sign	ature							Date/	Time			15-Jun-2	0			
For Emergency <1 Day, A	SAP or Weekend - Contact	Nautilus		pitt c sign																



END OF REPORT



Acute Toxicity Test Results

Sample collected June 29, 2020

Final Report

July 16, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Sample ID/	Dates						
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation			
WL_BFWB_OUT_SP 21_2020-06-29_N /	29-Jun-20 at 0900h	30-Jun-20 at 1040h	3-Jul-20 at 1115h	1-Jul-20 at 1615h			
1920-1557							

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity		
	temperature	(mg/L CaCO3)	(mg/L CaCO3)		
WL_BFWB_OUT_SP21_2020- 06-29_N	11.3°C	696	210		

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Comple ID	Percent survival in 100% (v/v) sample				
Sample ID	Rainbow trout	Daphnia magna 20°			
WL_BFWB_OUT_SP21_2020- 06-29_N	100	100			
Samula ID	Percent Immob	ility in 100 (% v/v)			
Sample ID		ility in 100 (% v/v) magna 20°C			

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
LC_WTF_IN_2020-06-29_NP	Rainbow trout	None	None
LC_VV1F_IIV_2020-00-29_IVP	Daphnia magna	None	None



QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	2.9 (2.6-3.3) g/L KCl ¹	6.0 (5.6-6.3) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.4 (2.4-4.7) g/L KCl	6.1 (5.1-7.1) g/L NaCl
Reference toxicant CV	11.0%	5.6%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, July 3, 2020; ² Test Date June 22, 2020

LC = Lethal Concentration; CL = Confidence Limit



M. Fritz

Report By: Michelle Fritz, BSc Biologist

acham

Reviewed By: Jacklyn Poole, BSc Laboratory Supervisor

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data



Daphnia Bench Sheet

Method	DAS		Client	TEC164	_	Reference	e1920	0-1557	
Test Log									_
Day	Date	Time	Technician	Cham Carl			Sample In	nformatio	n
0	2020/07/0		MF/SC			ita Review	Initial pH:		72
1	2020/07/0	2		3	11	N	Initial EC (μ S/cm);	1507
2			SE	-		<u>, , , , , , , , , , , , , , , , , , , </u>	Initial DO	(ma/l)	1392
	2020/07/0	3 1040	M	3	G G		Initial Tem		4.5
						/		p(C):	19
Lab Code	CTLA (CTLB CTLC	100A	100B	1000	1	Salinity (p	pt):	
			TUCA	TUUB	100C				
day			pH (up	itc) (ranges C	0.05				
0	878	202		nits) (range: 6	.0-8.5)				
2			1.0	7.0	7.0				
-	01 8	.2 8.1	8.3	8.3	8.2			<u> </u>	
	The p	oH of the sample was r	not adjusted prior	r to test setting	unless noted	in the service			
-				EC (uS/cm)	unicas noteu	in the comme	nts below		
0	247 2	53 352	1000	1	1512				
2	245 21	8 920	1704	1514	1215				
	701 70	20 710	1510	1531	1520				
0	501		DO (mg/L) (40-100% sat	uration at	test temp			
0	1.97	97.9	9.9	O UI	QU	test temp.			
2	7.8 7	8 70	7.9		9.9				
			11-1	7.9	7.9				
			Ŧ						
0	22 2		Temperatu	re (°C) (range	: 18-22 °C)				
2	10 2	0 20	B	18	18				
2	20 20	> 20	20	20	20				
				20	Po				
				NI.					
				Number					
0	10 1	2		(l, immol	oile)				
1	10 1	0 10	10	10	10				
	0 0	2 10	10	10					
2	10 11		10		01				
	Validi	ty Criteria: must b	0 < 10% month	10	10				
	Note	ty Criteria: must b		ality and/or a	bnormal be	havior in th	e control		
							love		
Culture	Unles	s otherwise noted	, behaviour is	considered t	o be norma	al			
	n								
Young jar		Jar(s) morta	lity 7 days prid	or to test (m	ict be 2000		0%		
			y aayo pin		IST DE 2257	/0)	01.		
QA (previou	s month)								
Days to first	brood (≤12 days)	7			C	Control Vali	dity Criter	ia	
Average pur	nber of young prod			2	Ν	lean % moi	tality at 48	hours	O'
More test to	noer of young proc	duced (≥15 young		34	(must be ≤10	1%)		
were test tre	eatments randomiz	ed on test tray?	Yes / No		(1401 00 210	70)		
Sample									
DO % of car		100							
	ple prior to aeration	on: 135	19	s aeration rec	wired (0</td <td>% or > 1000</td> <td></td> <td></td> <td></td>	% or > 1000			
Duration of a	aeration (37.5 +/- 1	2.5 ml (min/l) · 🦿	Page 1		uncu (140	1007	6): Y	es or No	
Hardness (m	g CaCO ₃ /L) of 1009			iltered with 1	10um scree	en prior to t	estina Y	es or No	
indianess (iii	$g CaCO_3/L) \text{ of } 100\%$	»: <u> (09</u>]0		hardness ad	instrant .	equired (~2	5 ma CaCo		
Hardness of	sample after adjust	ment (must be b	atwoon 25 2	0		equireu (<2	sing caco	' ₃ /L)? Y	es or No
Alkalinity of	100% comments (etween 25 - 3	$0 \text{ mg CaCO}_3/$	Ľ)				
inculture of	100% sample (mg (aCO_3/L):	210						
Dilution Wa				O Lovala (40	1000/				
Pail label / pr	eparation date	2:0072		O Levels (40	-100% sat	uration) - c	orrected for	r altitude	-
Hardness of a	dilution water (mg/		5.	5 10 8.2 mg/l	Lat 18°C	3.1	1 to 7.7 mg	/L at 21°C	
	anation water (mg/	135	3.	2 to 8.1 mg/l	Lat 19°C	3 () to 7.6 mg	/L at 22°C	
omment	N		3.	2 to 7.9 mg/l	at 20°C	5.0	to no mg	/ L al 22 (
comments/(Observations:	phr:no pp	×	in g/i					
			- 1						
	4	Shis Alm	ont						
		10 × 6 × 1/ ()	PINT						
Ro	viewed By: 10								
i c	Werned by		Date F	Reviewed:	200107	108			



Trout Bench Sheet

Method	TRS Client	TEC164	Reference	1920-1557		Chamber	5
Test Log						Sample Informa	tion
		S			Daily Data		
Day	Date	NS Time	Initial	Chem. Cart	Review	Initial pH:	7.3
0	2020/07/03	10450*	CB INW	1	ME	Initial EC (µS/cm)	1392
1	2020107104	0955	ME	-	CB	Initial DO (mg/L):	
2	2020107105	0900	AW	-		Initial Temp (°C):	19
3				-	21	Salinity (ppt):	17
	2020107106	0900	AW		T	Samily (ppt).	1
4	2020/07/07	0930	MO/AW/		T		
Sample Pre- Aeration rate Preaeration t DO(mg/L) of	e adjusted to 6.5 +/- 1 mL/min/l time	17	1 hour	as loaded with 1.5 hours	2 hours	DO in mg/L (709 saturation)** 6.2 mg/L - 8.9 mg/L a 6.1 mg/L - 8.8 mg/L a	t 14°C
						6.0 mg/L - 8.6 mg/L a	t 16°C
Test Chemis	stry and Biology					**corrected for altitud	e
Conc.	CTL 100						
conc.							
			pH (units) (ra	ange: 5.5-8.5)			
Day 0	8.0 1.5						
Day 4	8.0 40						
			EC (u	S/cm)			
Day 0	764 141		20 (0	,			
Day 4	471 433						
		DO (mg/	/L) (70-100% s a	aturation at te	st temp.)		
Day 0	8.8 8.9						
Day 4	48 44						
		т	omporaturo (°C) (range: 14-16 °			
		1	I I I I I I I I I I I I I I I I I I I	(range. 14-10	()		
Day 0	15 14						
Day 4	13 15						
		Numb	er Alive (In brad	ckets number st	ressed)		
Day 0	10 1	0					
Day 1	10 10						
Day 2	10 10						
Day 3	10						
	10 10						
Day 4	10 10						
	Validity Criteria: must be ≤				e control		
	Unless otherwise noted, beh	avior is considere	ed to be norma	I			
Control Org	janism Data				Test Organis	m Information	
Control	Length Weight						
Fish	(cm) (g)				Batch	20200521TR	
11311	(citi) (g)			~	butch	LOLOOJETTIK	
	27 62			01	6	T	
1	2.7.0.5	Loading Densi		O.d	Source	Troutlodge	
2	29 015	(must be ≤0.5 g/L))				
3	3.2 0.3			AG	Tank #	8	
4	22 03	Mean Length ((cm):	2.9			
5	78 07	-			Days Held at	15± 2°C	14
6	1.0 0.3	Length Range	(cm):	2.6-3.2	(must be ≥14 da		
7	2.0 0.5		(0.11).	U	101031 DE 214 0	-1-1	
	5.0 0.7		(-).	0.3	Devenue	and a life	0.54
8	5.0 0.1	Mean Weight	(g).	0.)	Percent stock		0.54
9	24 0.7	(Must be ≥0.3g)			(7 days prior to t	est, must be ≤2%)	
10	3.1 0.3			07			10
		Weight Range	: (g):	0.2-0.3	Test Volume	(L)	18
		5 5			1	_	1
Comments	· · · · · · · · · · · · · · · · · · ·				1		
connents	ON- NO PPI						
	9(ch=NOPPT						
	-uen-porpi						
						a a la	1201
	Reviewed B	y: 00		_	Date Reviewed	1: WOOD ::	US



APPENDIX C – Chain-of-custody form

Teck						Page	1	of 1								
	COC ID:	2020-06-	29_To	oxicity_SP2	21	TURN	AROUN			ılar (default)			RUSH:		
	PROJECT/CLIENT INFO								DRATORY		NACOMPACT -			OTHER INFO		
Facility Name	and a second					La	ib Name	Nautilu	s Environ	mental		Report	Format / Dis	stribution	Excel	PDF
Project Manager	Thomas Davidson					Lab	Contact	Tamara	Pomeroy			Email 1:	DL-WLC	-Lab/@teck.com	X	X
Email	thomas.davidson@teck.cor	n				1	Email	tamara	@nautilu	environme	ntal.ca	Email 2:	Thomas.E	Davidson@teck.com	X	X
Address	15 Km North HWY 43						Address	#4, 612	5 - 12 Str	eet SE		Email 3:	TeckCoal	@equisonline.com	1000	
												Email 4:		lateck.com	x	x
City	Sparwood			Province BC			City	Calgary	,	Provinc	AD	Email 5:		fke/a/teck.com		1
						and shares							Marty.Ha	TKe a leck.com	X	X
Postal Code	V0B 2G0			Country Can	ada	Post	tal Code	12H 2F		Country	Canada	Email 6:				1.20
											_					
Phone Number	(250) 603 - 9417					Phone	Number	403 253	3 7121					number	VPO00	070776
1020/06/80	SAMPLE DET											ANALYSIS	REQUESTE	D		
0240 0240 Nonitaulin SC 3x202 carboys, 3x12 bot NoS/NoS Scool Condition											Please in	dicate below Filt	ered, Perserved	l or both (F, P, F/P)		
Maritailia												in the second second			Section of the section of	L. warden
SO.			()					One	entration_Toxicity Test NAUT_48Hr_DM_Single_Con centration_Toxicity Test @							
2 1 2111	lilan		N/S					s	t a)						
3x201 carbon/s, 3x11 bon	THES		Yes					IS/	est							
NISINGT_			al (Si	T S T							
val 105 intime			teri					N LA	DN							
and Condition			Ma					H	Tox Tox							
			ous					96	- 48]							
		Field	ardo		Time	G=Grab	# Of	E	atio							
Sample ID 1920 -1657	Sample Location	Matrix	Hazardous Material (Yes/No)	Date	(24hr)	C=Comp	Cont.	IV	NAI VAI	20C						
WL_BFWB_OUT_SP21_2020-06-29_N	WL_BFWB_OUT_SP21	WS		6/29/2020	9:00	G	6	2000000	X X	4.00	1					
										11.0	-					
			-										_		-	
						-				-						1.000
															1	
								5.5								
															2	
									1							
										-						
	and the first state of the second state of the					1				-						10.00
		+				lange -				-					1	
	and the second second second															
ADDITIONAL COMMENTS/SP				RELINQUIS			N		Date	Т	ime	Accept	ed By/Affiliatio	on E	ate	
Shipment includes 2 extra 20 L	bladders and 2 exti	alL		Т	ara Gentil	e		6/	29/2020							
plastic bottles.			<u> </u>													
															_	
SERVICE REQUEST (rush -													19 <u>1</u> 9 19 1			
Duitaria	Regular (2-3 business days) - 50%	(default) X	-	Sampler's Na	ame			Tara Ger	ntile		Mob	oile #				
	(2-3 business days) - 30% y (1 Business Day) - 100%		-				1	12-	-11	10	-					
				Sampler's Sign							Date			29-Jun-2		



END OF REPORT



Acute Toxicity Test Results

Sample collected July 13, 2020

Final Report

July 30, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Commis ID/	Dates							
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna test initiation				
WL_BFWB_OUT_SP 21_2020-07-13_N / 1920-1658	13-Jul-20 at 0900h	14-Jul-20 at 1300h	15-Jul-20 at 1240h	15-Jul-20 at 1517h				

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020- 07-13_N	11.8°C	1077	254

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Comple ID	Percent survival in	100% (v/v) sample	
Sample ID —	Rainbow trout	Daphnia magna	
VL_BFWB_OUT_SP21_2020-07-13_N	100	100	
Samala ID	Percent Immobi	lity in 100 (% v/v)	
Sample ID —		lity in 100 (% v/v) a magna	



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination		
WL_BFWB_OUT_SP21_2020-07-	Rainbow trout	None	None		
13_N	Daphnia magna	None	None		

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	2.9 (2.6-3.3) g/L KCl ¹	6.5 (6.0-6.9) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.4 (2.4-4.7) g/L KCl	6.0 (5.1-7.0) g/L NaCl
Reference toxicant CV	11.0%	5.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, July 3, 2020; ² Test Date July 6, 2020

LC = Lethal Concentration; CL = Confidence Limit



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Report By: Sara Thiessen, BSc Biologist

Reviewed By: Kayla Knol, BSc Biologist

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APPENDIX A – Summary of test conditions



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO4 (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

/ NALITILLIC

Trout Bench Sheet

est Log		t	TEC164	Reference	1920-1658		Chamber	_5
							Sample Infor	mation
Day	Date		Time	Initial	Chem. Cart	Daily Data		
0	2020/07/15		1240 *	CB / YY	Chem. Cart	Review	Initial pH:	1.4
1	2020/07/16		6740	FI FI			Initial EC (µS/o	
2	2020/07/17			ST	-	- PP	Initial DO (mg	<u>/L): 9,1</u>
3	2020/07/18		0832	ßS	-	TP	Initial Temp (°	C): (5
4	2020/07/19		0800	B	-	MF	Salinity (ppt):	2
-	2020/07/19		0766	AW/STIC	4	SS		0
ample Pre-A	oration		Note: * ; time v	when the test v	vas loaded with	fish		
		11.5					DO in mg/L (70% - 100%
eaeration tin	adjusted to 6.5 +/- 1 r	nL/min/L					saturation)**	
	inc.		0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg	/Lat 14°C
O(mg/L) of 1	00%		- 8.8				6.1 mg/L - 8.8 mg,	
							6.0 mg/L - 8.6 mg/	
	ry and Biology						**corrected for alt	
Conc.	CTL	100						
Day 0		1		pH (units) (r	ange: 5.5-8.5)			
Day 4	80	2.3						
Day 0		(15)		EC (u	IS/cm)			
Day 0 Day 4	672 1	JOU UZG						
,	900	151						
			DO (mg/	L) (70-100% s a	aturation at te	st temp.)		
Day 0	84 9	5.8						
Day 4	56	814						
			Та	manuture (°C				
Day 0	IS	15	Te	mperature (C,) (range: 14-16°	C)		
Day 4	15	5						
			Numbo	r Alive (In hard				
Day 0	10	10	Numbe	T Alive (In brac	kets number st	ressed)		
Day 1	10 1	0						
Day 2	10	10						
Day 3	10	10						
Day 4	io	1						
	Validity Criteria: mu	st be ≤ 1	0% mortality an	d/or stressed	hohavior in the	control		
	Unless otherwise note	ed, behavi	ior is considered	to be normal	benavior in the	control		
ntrol Organ	ism Data					-		
Control		eight				Test Organisn	n Information	
Fish		(g)				Batch	20200521TR	
1 [214	<u>~</u>],		(1)	0.2			
2	34 J.		_oading Density must be ≤0.5 g/L)	(g/L):	0.9	Source	Troutlodge	
3	A 44	_	must be 20.5 g/L)			-		
4		.y	loop Loop the		3.3	Tank #	2	
5	31 0		Mean Length (cr	n):				
6		.5			0	Days Held at 1	5±2°C	76 25
	35 0.0		ength Range (c	m):	3.0-3.6	(must be ≥14 day	s) –	the f
7	32 0.							
8	30 0.		vlean Weight (g):	6.4	Percent stock n	nortality	0
9	30 0		Must be ≥0.3g)	-		(7 days prior to tes		
10	30 0	Ň.Ý						
		V	Veight Range: (g	g):	0.2-0.5	Test Volume (L)	_	18
nments :	0.01							
nments :	96hr: N	oppt	-					
nments :	96hr: N	oppt	-					



Daphnia Bench Sheet

Method	DAS 20		Client	TEC164		Reference	1920	-1658	_
Test Log							Sample In	formatior	i
Day	Date	Time		Chem. Cart		ta Review	Initial pH:		J.Y
0	2020/07/15	ISIT	CBINU	3	V	AL	Initial EC (1723
2	2020/07/16 2020/07/17	0815	LE-	2	51		Initial DO		9.1
2	2020/07/17	0835	MF	5	M	W	Initial Tem Salinity (p		10
Lab Code	CTLA CTLB	CTLC	100A	100B	100C	1	Samily (p)	J().	L
						, '			
day 0	12181		pH (un	its) (range: 6.	.0-8.5)	T	r	1	
2	ar Sh	Sil	01	0.8	Oil				
2	The pH of th	le sample was r	not adjusted prior	to test setting	unless noted	in the comme	ents helow		
	ind prior d	ie sumple must	for adjusted prior	EC (uS/cm)	unicis noted	in the comme	ints below		
0	452 458	467	1545	1724	1737				
2	471 474	471	1412	MOB	1719				
				40 1000/			`		
0	20120	150	DO (mg/L) (40-100% sat	T C	t test temp	.)	1	
2	710 44	1.2	1-1-7	1.4	4.7				
			1-1-	~					
			Temperatu	re (°C) (range	e: 18-22 °C)			
0	20 20	20	20	20	20				
2	10 10	20	20	20	20				
				Numbe	r Alive				
				(I, immo					
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1	10 10	10	10	10	01				
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			be ≤ 10% mor nnid can't swir						
			d, behaviour i				move		
Culture	2.								
Young jar		Jar(s) mort	ality 7 days p	rior to test (n	nust be ≤2	5%)	0%		
OA (province	us month)					c			
QA (previou	us montn) t brood (≤12 days)	7				Control Va			51
	mber of young produce	ed (>15 your		32		Mean % m (must be ≤		to nours -	01.
	reatments randomized			0		(1100100 2	1070)		
		,							
Sample									
1	mple prior to aeration:	130)	Is aeration r	equired (<	40% or >10	0%)? (Yes or No	
Duration of	aeration (37.5 +/- 12.5	mL/min/L) :	20mins	Filtered with	110um sc	reen prior t	o testing	Yes or No	
	mg CaCO ₃ /L) of 100% :	ion		Is hardness	adjustment	t required (<25 mg Ca	CO ₃ /L)?	Yes or No
Hardness o	f sample after adjustme	nt (must be	between 25 -	30 mg CaC	0 ₃ /L)	-			\checkmark
Alkalinity of	f 100% sample (mg CaC	O ₃ /L):	254						
Dilution W				DO Levels (- corrected	for altitud	e -
	preparation date	2:07/07	_	3.3 to 8.2 m			3.1 to 7.7 r	0	
Hardness o	f dilution water (mg/L)	170	_	3.2 to 8.1 m			3.0 to 7.6 r	ng/L at 22	°C
Comments	/Observations:			3.2 to 7.9 m	y/L at 20 (-			
	Ohr: NO OF	+							
	48hr: 00 0	2+							
			-		anals	1/20			
ŀ	Reviewed By: 10		_ Date	e Reviewed:	WNOU	7/20			



APPENDIX C – Chain-of-custody form

Teck			Page 1	- 1						
	сос ір: 2020-07-13	3 Toxicity SP21	TURNAROUND TIME:	D TIME: Regular (default)	default)		RUSH: OTHERINFO			
T-dia Ne	PROJECT/CLIENT INFO		Lab Name	Lab Name Nautilus Environmental	le	Report Fo	Renort Format / Distribution	Excel P	PDF EI	EDD
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rroject ivianager breut iviasou	anager Dictu Masou Emeri hrett mecon@teck.com		Email	Email tamara@nautilusenvironmental.ca	onmental.ca	Email 2:	Thomas.Davidson@teck.com	n X	X	X
EIIIAI			Address	Address #4. 6125 - 12 Street SE	Ē	Email 3:	TeckCoal@equisonline.com			×
Address	C+ I MII IIIONI IIIN CI S					Email 4:	Tricia.Hill@teck.com	X	X	×
City	City Sparwood	Province BC	City	City Calgary P	Province AB	Email 5:	Marty.Hafke@teck.com	x	X	×
Postal Code V0B 2G0	V0B 2G0	Country Canada	Postal Code T2H 2K1		Country Canada	Email 6:				
							-	Loocar	37000	
Phone Number	Phone Number (250) 603 - 9417		Phone Number	r 403 253 7121			PO number	C9/ /0/ 0004A	C0//0	
	SAMPLE DETAILS					ANALYSIS REQUESTEI	REQUESTED			
Munitaulin Sx20L arbonis, 3x IL battles Noc/NGZ freed and fion wu.BFWB_OUT_SP21_2020-07-13_N wu.BFWB_OUT_SP Mu_BFWB_OUT_SP21_2020-07-13_N wu.BFWB_OUT_SP	Sample Location Matrix WL_BFWB_OUT_SP21 WS WL_BFWB_OUT_SP21 WS	RELINQUISHED BYAFTILIATION Part G=Grab	Time G=Grab # Of (24hr) C=Comp Cont. 9:00 G 6 6 9:00 H 6	ANALYSIS ANALYSIS ANALYSIS ANALT-Selfe_Cont ANALT-Selfe_Cont ANALT-Selfe_Cont ANALT-Selfe_Cont ANALT-Selfe_Cont ANALYSIS 200	11.000 C	Accepte	Accepted By/Affiliation	Date	Tin the second sec	Internet
Shipment includes 2 extra 20 L bladders and 2 extra 1 plastic bottles.	bladders and 2 extra 1 L	Tara Gentule	centure	111/11/11						
SERVICE REOURST (rash - subject to availability)	- subject to availability)									
Driver	Regular (default) X Driverty / 2 Austinate days) - 50% surchards	Sampler's Name	~	Nicholas Lagarde	Mo	Mobile #				
Emergen	Emergency (1 Business Day) - 100% surcharge	Sampler's Signature	1/2	all had	Date	Date/Time	13-Jul-20	ıl-20		



END OF REPORT



Acute Toxicity Test Results

Sample collected July 27, 2020

Final Report

August 18, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

		D	ates	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia</i> <i>magna</i> test initiation
WL_BFWB_OUT_SP21_2020-07-27_N / 1920-1770	27-Jul-20 at 0900h	28-Jul-20 at 1153h	29-Jul-20 at 1130h	29-Jul-20 at 1220h

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-07-27_N	11.1°C	813	256

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Percent survival in	100% (v/v) sample
Rainbow trout	Daphnia magna
100	100
Percent Immobi	lity in 100% (v/v)
	lity in 100% (v/v) a magna
	Rainbow trout

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
	Rainbow trout	None	None
WL_BFWB_OUT_SP21_2020-07-27_N	Daphnia magna	Surficial precipitate observed	None



QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	2.9 (2.6-3.3) g/L KCl ¹	6.1 (5.8-6.4) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.4 (2.4-4.7) g/L KCl	6.0 (52-7.1) g/L NaCl
Reference toxicant CV	11.0%	5.1%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, July 3, 2020; ² Test date July 20, 2020

LC = Lethal Concentration; CL = Confidence Limit



Report By: Linda Fan, BSc Biologist

asta lairek

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

Trout Bench Sheet

Test Log Day 0 1 2 3 4 Cample Pre-A	Date 2020/07/29 2020/07/30 2020/07/31	Time				Sample Infor		
0 1 2 3 4 5ample Pre- <i>A</i>	2020/07/29 2020/07/30	Time				Sample Infor	nation	
	2020/07/31 2020/08/01 2020/08/02	005 005 005 005 005	Initial	Chem. Cart - - - -	TF -	Initial pH: Initial EC (µS/c Initial DO (mg, Initial Temp (°C Salinity (ppt):	7.2 m): 1748 (L): 119	
Preaeration tir DO(mg/L) of 1	adjusted to 6.5 +/- 1 mL/min/L me	6		1.5 hours	2 hours	DO in mg/L (1 saturation)** 6.2 mg/L - 8.9 mg, 6.1 mg/L - 8.8 mg, 6.0 mg/L - 8.6 mg, **corrected for alt	'L at 14°C 'L at 15°C 'L at 16°C	
			pH (units) (ra	ange: 5.5-8.5)				
Day 0 Day 4	7.3 7.6 7.7 7.8		-					
			EC (u	uS/cm)				
Day 0 Day 4	42.3 1688							
	·	DO (ma/	(1) (70-100% s	aturation at te	st temn)			
Day 0 Day 4	8.4 8.8 E.g B.9							
		Te	emperature (°C) (range: 14-16 °	C)			
Day 0 Day 4	IS IS							
		Numbe	or Alive (In brow	ckets number st				
Day 0	10 10				(esseu)			
Day 1	10 10							
Day 2 Day 3	10 10							
Day 4	12 12							
	Validity Criteria: must be ≤ Unless otherwise noted, beha	10% mortality and vior is considere	nd/or stressed d to be norma	behavior in the	control			
ontrol Orga	inism Data				Test Organis	m Information		
Control Fish	Length Weight (cm) (g)				Batch	20200521TR		
1 2	3.6 0.6	Loading Density (must be ≤0.5 g/L)		0.3	Source	Troutlodge		
3 4	3. 4 0.5 3. 4 0. 4	Mean Length (c	cm).	3.5	Tank #	4		
5	3.0 0.3				Days Held at	15± 2°C	40	
6 7	3. 7 J. 7 3. 8 J. 7	Length Range ((cm):	3.0-3.8	(must be ≥14 da	ays)		
8	3.5 0.5	Mean Weight (g):	0.5	Percent stock	mortality	0	
9	3. 5 0.4	(Must be ≥0.3g)				est, must be ≤2%)		
10	7.5 0.5	Weight Range:	(a):	0.3-0.7	Test Volume (1)	18	
			(J).		i cot volume (-/	10	
omments :	o hr: Noppr							Ma.
C	abhe, Noppt						-	
	Reviewed By	BS			Date Reviewed	: 2020/	pplat	



Daphnia Bench Sheet

Method	DAS20	_		Client	TEC164		Reference	1920	-1770	-
Test Log					-				formation	1
Day	D	ate	Time	Technician	Chem. Cart	/ /	ta Review	Initial pH:		7.2
0	2020/	/07/29	1220	MF/AW	3	3	J.	Initial EC (µS/cm):	1748
1	2020/	/07/30	0855	VV-	-	TP		Initial DO	(ma/L):	nu
2		/07/31	CRIF	DAE	2		(Initial Tem		20
		01/01	COB	INF				Salinity (p		
Lab Code	Ain A	MAN	MAR	1000	10001		1	Samily (p)	1	2
Lab coue	GTA	TULD	ua	AGO)	(20)	(000	1		1	
al au s				11.6		0.0.5)				
day		0.0	0.0	рн (un	its) (range: 6	.0-8.5)	,	,		
0	0.2	18.6	8.4	1.6	1.0	7.10				
2	8.1	8.1	8.1	8.3	8.3	8.3				
		The pH of th	e sample was no	ot adjusted prio	r to test setting,	unless noted	I in the comm	ents below		
					EC (uS/cm)					
0	432	435	435	1203	1928	1820			1	
2	400	115	4110	1050	100	11 PU				
2	100	1912	ne	1000	Juno	100-1	1			
					40 100%					
0	1-10	120	1-1-0	DO (mg/L) (40-100% sa	turation a	t test temp)		
0	1.9	19	1.9	8.6	8.6	0.6				
2	7.9	1.9	7.9	7.9	7.9	7.9				
				Temperatu	re (°C) (range	e: 18-22 °C	.)			
0	20	20	20	18	18	18				
2	20	20	20	20	20	20				
						20	1	1		
					Numbe	r Alivo				
0	10	10	10		(I, immo		1	1		
0	10	10	10	10	10	10				
1	10	0	0	()	(O)	01				
2	10	10	10	10	10	()				
		Validity Cr	iteria: must b	e ≤ 10% mor	tality and/or	abnormal I	behavior in	the control		
		Notes: Imr	nobile; daph	nid can't swi	m after 60 se	ec. even if a	intenna still	move		
				d, behaviour i						
Culture				,						
Young jar	P5		lar(c) morta	ality 7 days p	rior to tost (r	nuct bo <2	E0/1	5		
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	ous month)		0					alidity Crite		-
	st brood (≤12		4	_	22			nortality at 4	48 hours -	O
Average n	umber of you	ng produce	d (≥15 youn	g)	33		(must be ≤	≤10%)		
	treatments ra			(Yes)/ N	0					
			,	<u> </u>						
Sample										
									6	
DO % of sa	ample prior to	o aeration:	1	4	Is aeration r	equired (<	40% or >10	00%)?	Yes or No	
Duration	of aeration (37	5 + /- 125	ml/min/l)	2000in	- Filtered with	110um sc	reen prior	to testing	Yes or No	
				amin				9		
Hardness ((mg CaCO ₃ /L)	of 100% :	83	-	Is hardness	adjustmen	t required (<25 mg Ca	$CO_3/L)?$	Yes or No
Hardness of	of sample afte	er adjustme	nt (must be	between 25	- 30 mg CaC	O ₃ /L)				
		-		254		5. 1				
Arkannity C	of 100% samp	ine (ing cac	03/L).	C04	-					
Dilution V			no zna	0	DO Levels (40-100%	saturation)	- corrected	d for altitud	e -
Pail label /	preparation	date (2:0/120	0	3.3 to 8.2 m	g/L at 18°C	-	3.1 to 7.7 r	ng/L at 21°	'C
Hardness of	of dilution wa	ter (mg/L)	30	-	3.2 to 8.1 m	g/L at 19°C	2	3.0 to 7.6 r	ng/L at 22°	°C
				-	3.2 to 7.9 m	0			5,	
Comment	s/Observatio	ins:				31 - 01 - 0 (_			
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				Gaini						
L	48 hr:	Sugn	I SURI	7001	PPT					
	Reviewed By:	Bs		Dat	e Reviewed:	2-2-2-	138/02	5		
				-		~10	10000	3		



APPENDIX C – Chain-of-custody form

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	Emergenc	y (1 Business Day) - 100% surch	arge	Company							F	anta/Timo			0011		



END OF REPORT



Acute Toxicity Test Results

Sample collected August 10, 2020

Final Report

August 31, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

	_	Da	ates	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation
WL_BFWB_OUT_SP21_2020-08-10_N/ 1920-1872	10-Aug-20 at 1400h	11-Aug-20 at 0950h	12-Aug-20 at 1440h	11-Aug-20 at 1615h

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-08-10_N	11.5°C	1007	267

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Sample ID -	Percent survival in 100% (v/v) sample					
Sample ID —	Rainbow trout					
WL_BFWB_OUT_SP21_2020-08-10_N	100	100				

Sample ID	Percent Immobility in 100 (% v/v)
Sample ID	Daphnia magna 20°C
WL_BFWB_OUT_SP21_2020-08-10_N	0

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination		
WIL REWR OUT SP21 2020 08 10 N	Rainbow trout	None	None		
WL_BFWB_OUT_SP21_2020-08-10_N	Daphnia magna	None	None		



QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	4.0 (3.7 - 4.4) g/L KCl ¹	6.2 (5.7 - 6.5) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.4 (2.4 - 4.7) g/L KCl	6.0 (5.1 - 7.0) g/L NaCl
Reference toxicant CV	10.8%	5.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, August 3, 2020; ² Test Date August 3, 2020

LC = Lethal Concentration; CL = Confidence Limit



Lindbay Clothin

Report By: Lindsay Clothier, MSc Environmental Scientist

acham

Reviewed By: Jacklyn Poole, BSc Laboratory Supervisor

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

✓ NAIITIIIIC

Trout Bench Sheet

Test Log Sample information Day 2020/07/2 Date Use (DTM) Date <	Method	TRS CI	ient	TEC164	Reference	1920-1872		_Chamber	5	
Day Date u-u010mp Initial Chem. Cart Daily Date Date <thdate< th=""> <thdate< th=""> <thdate< th=""></thdate<></thdate<></thdate<>	Test Log							Sample Inform	nation	
Day Date Leftine Initial Cem. Carl Regiver Initial EC (LS/CR): Table 2000/8713 1 20200/8713 CH C - V Initial EC (LS/CR):		1				r.	Daily Data			_
1 2020/08/13 0 5C - Initial Demptil: 9.4 3 2020/08/15 0 0 1 - When the test was loaded with 5th Sample Pre-Aeration Aeration rate adjusted to 6.5 +/- 1 mL/min/L 0 0 1 0 5 6	Day	Date		Motime	Initial	Chem, Cart		Initial pH:	7.4	
1 2020/08/13 0 5C - Initial Demptil: 9.4 3 2020/08/15 0 0 1 - When the test was loaded with 5th Sample Pre-Aeration Aeration rate adjusted to 6.5 +/- 1 mL/min/L 0 0 1 0 5 6		2020/08/12		500.5	18/ME	1			n): 182	7
2 22020/09/14 Oracian from the proper section of the section of t	1						the second se			-
3 2020/08/15 0 (0) 0 (1) My E Salinity (ppt): Sample Pre-Aeration Aeration rate adjusted to 65 +/- 1 mL/miv(L presention time DOI(mg/L) of 100% Node: *: time when tife test was loaded with fish Aeration rate adjusted to 65 +/- 1 mL/miv(L presention time DOI(mg/L) of 100% DO In mg/L (70% - 100% Sample As mg/L at NC E and A Samgli at NC E and	2					2	< P	Initial Temp (C	1: 20	
4 2020/08/16 100 SS AUX ST 4 Sample Pre-Aeration Aux St Loc 100 Import St Sample Pre-Aeration Areation rate adjusted to 6.5 +/- 1 mL/min/L (yes/no 2 hours 1 hour 15 hours 2 hours Sample Pre-Aeration Op(mg/L) of 100% Import St Import St Import St Sample Pre-Aeration Sample Pre-Aeration Conc. CTL 100 Import St Sample Pre-Aeration Sample Pre-Aeration Day 0 Import St Import St Sample Pre-Aeration Sample Pre-Aeration Sample Pre-Aeration Day 0 Import St Import St Import St Sample Pre-Aeration Sample Pre-Aeration Day 0 Import St Import St Import St Sample Pre-Aeration Sample Pre-Aeration Day 0 Import St Import St Import St Import St Sample Pre-Aeration Day 0 Import St Import St Import St Import St Import St Import St Day 0 Import St					R	-	MAE		1	_
Sample Pre-Aeration Note * : time when tife test was loaded with fish Do In mg/L (70% - 100% Sample Pre-Aeration Aeration rate adjusted to 6.5 +/- 1 mL/min/L Of In mg/L (70% - 100% In Information Of In mg/L (70% - 100% Of In mg/L (70% - 100% Of In mg/L (70% - 100% Of In mg/L (70% - 100% <th< td=""><td></td><td></td><td></td><td>1.77</td><td>NULST</td><td>1</td><td>TE</td><td>- Saurity (ppt).</td><td></td><td></td></th<>				1.77	NULST	1	TE	- Saurity (ppt).		
Aeration rate adjusted to 6.5 +/- 1 mL/min/L (yes/ho Struct 10, 9% Struct 30, 9% Struct 30, 9% Prevariation inter 0.5 hours 1 hour 1.5 hours 2 hours 52 mg/s. 4 9 mg/s. 18 °C Conc. CTL 100 100 100 100 100 100 Day 0 0.3 0.3 0.3 0.3 100 100 100 Day 0 0.3 0.3 0.3 0.3 100					when the test w	as loaded with		DO in ma/l /7	0% - 100%	_
Presention time DO(mg/L) of 100% Construction Solution			1 ml (min/l	$\langle \rangle$						<i>8</i> 0
DO(mg/L) of 100% Imple - 68 mg/L + 19°C Test Chemistry and Biology Imple - 68 mg/L + 19°C Conc. CTL 100 py 0 pH (units) (range: 5.5-6.5) Day 0 Imple - 68 mg/L + 19°C Day 10 Imple - 68 mg/L + 19°C Day 2 Imple -		-			1 hour	1. C. Income	2 hours	COMPONENT CLOSER		
Text Chemistry and Biology Image: 66 mg/l, at 19°C Conc. CTL 100 Day 0 pH (units) (range: 5.5-8.5) Day 0 EC (uS/cm) Day 4 EC (uS/cm) Day 1 EC (uS/cm) Day 2 EC (uS/cm) Day 3 EC (uS/cm) Day 4 Image: Start tart				U.S hours		1.5 hours	2 nours	-		
Test Chemistry and Biology "corrected for altitude Conc. CTL 100 "corrected for altitude Day 0 pH (units) (range: 5.5-8.5) Day 0 CluS/cm) Cu(S/cm) Day 0 Cu(S/cm) Day 0 Cu(S/cm) Day 0 Cu(S/cm) Day 0 Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2"	DO(mg/L) of	100%		48	40	T B		the state of the second s		
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $					pH (units) (r	ange: 5.5-8.5)				
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Day 4	7.9	8.0							
Day 4 Up Do (mg/L) (70-100% saturation at test temp.) Day 0 Day 4 Image: 14-16°C) Day 0 Image: 14-16°C) Image: 14-16°C) Day 1 Image: 14-16°C) Image: 14-16°C) Day 1 Image: 14-16°C) Image: 14-16°C) Day 1 Image: 14-16°C) Image: 14-16°C) Day 2 Image: 14-16°C) Image: 14-16°C) Day 3 Image: 14-16°C) Image: 14-16°C) Day 4 Image: 14-16°C) Image: 14-16°C) Day 3 Image: 14-16°C) Image: 14-16°C) Day 4 Image: 14-16°C) Image: 14-16°C) <td></td> <td></td> <td></td> <td></td> <td>EC (I</td> <td>ıS/cm)</td> <td></td> <td></td> <td></td> <td></td>					EC (I	ıS/cm)				
Day 0 Day 0 Day 4 Day 0 Day 4 Day 0 Day 1 Day 2 Day 2 Day 3 Day 4 Validity Criteria: must be s 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Control Organism Data Control Control Length Weight Fish (cm) (g) 1 2 3 3 4 3 0 0 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1		398	10.34			1				
Day 0 Day 4 Temperature (°) (range: 14-16°C) Day 0 Day 4 Image: 14-16°C) Day 0 Image: 14-16°C) Image: 14-16°C) Day 0 Image: 14-16°C) Image: 14-16°C) Day 0 Image: 14-16°C) Image: 14-16°C) Day 0 Image: 10 Image: 14-16°C) Day 0 Image: 10 Image: 14-16°C) Day 1 Image: 10 Image: 14-16°C) Day 2 Image: 10 Image: 10 Day 3 Image: 10 Image: 10 Day 4 Image: 10 Image: 10 Day 3 Image: 10 Image: 10 Day 4 Image: 10 Image: 10 Validity Criteria: must be s 10% mortality and/or stressed behavior in the control Image: 10 Unless otherwise noted, behavior is considered to be normal Batch 20200521TR Source Troutlodge Image: 10 Image: 10 Image: 10 1 Image: 10 Image: 10 Image: 10 Image: 10 2 Image: 10 Image: 10 Image: 10 Image: 10 Image: 10 1 Image: 10 Image	Day 4	410	1607							
Day 4 Temperature (°C) (range: 14-16°C) Day 0 Temperature (°C) (range: 14-16°C) Day 0 Number Alive (In brackets number stressed) Day 0 Number Alive (In brackets number stressed) Day 1 O Day 2 To (O) Day 2 To (O) Day 3 To (O) Day 3 To (O) Day 3 To (O) Day 4 Validity Criteria: must be \$10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Test Organism Information Batch 20200521TR Control Length Range (cm): 3.6 O, 7 1 3.6 O, 7 2 Control Length Range (cm): 2 O, 7 Day 5Held at 15± 2°C 3 O, 7 Day 5Held at 15± 2°C 3 O, 7 <			8.9	DO (mg/	/L) (70-100% s	aturation at te	st temp.)			
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Day 0 III Number Alive (In brackets number stressed) Day 0 10 10 10 Day 1 10 10 10 Day 2 10 10 10 Day 3 10 10 10 Day 4 10 10 10 Day 2 10 10 10 Day 3 10 10 10 Validity Criteria: must be \$10% mortality and/or stressed behavior in the control 10 Unless otherwise noted, behavior is considered to be normal 10 Control Length Weight Fish (cm) (g) 1 11 12 2 2 14 0.5 3 0.17 Mean Length (cm): 13 3 0.17 Mean Length (cm): 13 3 0.17 Mean Length (cm): 14 3 0.17 Mean Weight (g): 0 +0 10 10 17 10 10 3 0.17 Mean Weight (g): 0 +0 10 10<	Day 4	0.5	1	2						
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Control Organism DataControlLengthWeightFish(cm)(g)1 $3,7$ $0,6$ 2 $3,7$ $0,6$ 3 $3,6$ $0,7$ 4 $3,6$ $0,7$ 5 $3,3$ $0,7$ 6 $3,7$ $0,7$ 7 $3,8$ $0,7$ 8 $3,7$ $0,7$ 9 $3,7$ $0,7$ 10 $3,8$ $0,7$ Weight Range: g : $0,6$ $7,7$ $3,8$ $0,7$ 8 $3,7$ $0,7$ 9 $3,7$ $0,7$ 10 $3,8$ $0,7$ 9 $3,7$ $0,7$ 9 $0,7$ 10 $3,8$ </td <td>Day 4</td> <td>Validity Criteria:</td> <td>: must be ≤</td> <td></td> <td></td> <td></td> <td>control</td> <td>,.l</td> <td></td> <td></td>	Day 4	Validity Criteria:	: must be ≤				control	,.l		
ControlLengthWeight (cm)Batch20200521TR1 3.7 0.6 Loading Density (g/L): (must be $$0.5 g/L$) 0.73 SourceTroutlodge2 3.6 0.72 Mean Length (cm): 3.6 3.6 7.6 Days Held at $15\pm 2^{\circ}C$ (must be $$214 days$)5 3.7 0.7 Length Range (cm): (Must be $$20.3g$) 0.6 Percent stock mortality (7 days prior to test, must be $\le 2\%$)9 3.9 0.7 Mean Weight (g): (Must be $$20.3g$) $0.4-0.7$ Test Volume (L)Comments :		Unless otherwise	noted, beha	vior is considere	ed to be norma					
Fish(cm)(g)Batch20200521TR1 3.7 0.6 Loading Density (g/L): 0.3 SourceTroutlodge2 3.8 0.7 Mean Length (cm): 3.6 $7ack #$ 3 4 3.6 0.7 Mean Length (cm): 3.6 Days Held at $15\pm 2^{\circ}C$ $9ack = 214 days$ 5 3.7 0.7 Mean Weight (g): 0.6 Percent stock mortality 0 7 3.8 0.7 Mean Weight (g): 0.4 $7days prior to test, must be \leq 2\%093.90.7Mean Weight (g):0.40.47days prior to test, must be \leq 2\%090.70.7Mean Weight (g):0.40.40.40.490.70.7Mean Weight (g):0.40.40.490.70.70.70.40.40.490.70.70.70.40.40.490.70.70.40.40.490.70.70.40.40.490.70.70.40.40.490.70.70.40.40.490.70.70.70.40.490.70.70.70.40.490.70.70.70.40.490.70.70.70.7$	Construction of the Construction of the State						Test Organis	m Information		
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Fish	(cm)	(g)				Batch	20200521TR		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1	3,7	6,6	Loading Densit	ty (q/L):	0.3	Source	Troutlodge		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		3,4					. 45 8 2 5 1		•:	
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5 3.3 0.4 6 3.4 0.7 7 3.8 0.7 8 3.3 0.4 9 3.7 0.1 10 3.8 0.7 Weight Range: (g): 0.4 0.4 0.7 10 0.7		36		Mean Length (cm):	3.6				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		22		1		200 - 200042	Davs Held at	15± 2°C		
7 8 9 10 3,3 0,4 0,4 0,1 0		22	NI	Length Range	(cm):	32-39				_
8 9 10 339 0.710318 $0.7Weight Range: (g):0.4-0.7Test Volume (L)0.4-0.7100.4-0.7100.4-0.7101$		20	11	1 I I I I I I I I I I I I I I I I I I I	(4/11	1000 00 214 0			
9 10 3.9 0.7 (Must be $\ge 0.3g$) Weight Range: (g): Comments: 9 9 10 0.4-0.7 Test Volume (L) 0.4-0.7		39	a u	Mean Wolcht	(a) [.]	0.6	Percent star	mortality	0	
10 3.8 0.7 Weight Range: (g): 0.4-0.7 Test Volume (L)		38		-	(9).	0.0			0	_
Comments : 96 Wr'. No AA		21	UIT	(Must be ≥0.3g)			M days prior to	test, must de ≤2%)		
Comments: 96 WT! No APT	10	5.8	0.7	J Weight Range:	: (g):	0.4-0.7	Test Volume	(L)		ŝ
abhr: Noppt										_
	Comments :	- L - S								
		96 hr:	NODOF	0						
				TP			Date Reviewe	t 2000	0.10	

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Daphnia Bench Sheet

Method	DAS20	Client	TEC164	Reference	e 1920-1872	<u>-</u> ~
Test Log					Sample Informatio	
	Date	Timo Tochnic	ian Chem. Cart	Daily Data Poviow	Sample Information	
Day		Time Technic		The second second second second second second second	Initial pH:	7.4
0	2020/08/11	1615 AW/		luc	Initial EC (µS/cm):	1827
1	2020/08/12	1055 M		Qr	Initial DO (mg/L):	9.8
2	2020/08/13	0930 SC	3	Alal	Initial Temp (°C):	20
					Salinity (ppt):	
Lab Code	CTLA CTLB	CTLC 100 /	A 100 B	100 C		
day		рН	(units) (range: 6	0-8 5)		
0	03 193	83 136			1	r
2	10100		1 00	62		
2		6-01 8.	5 6.5	O-SI		
	The pH of the	sample was not adjusted	C	unless noted in the comm	ients below	
0		110 Date	EC (uS/cm)		rr	
0	453 451	752 665	1687	6400		
2	455 452	450 161	3 1658	1671		
		DO (ma	//) (40-100% sa	turation at test tem	n)	
0	19 16	14 0	10.2	8.3		1 1
2	1. 50	1.1 0.0	50	28		
2	47 177	+41 +2	177	171		
		Tempe	rature (°C) (rang	e: 18-22 °C)		
0	00	20 20	22	200		
2	70 70	20 20	20	20		
-			a			
			Numbe	ar Alivo		
0			(l, immo		1	
0	10 10	10 10	10	10		
1	$\left \begin{array}{c} 0 \\ 1 \end{array} \right $	10 15	10	10		
2	10 0	10 10	010	0		
	Validity Cri	teria: must be ≤ 10%	mortality and/or	abnormal behavior in	the control	
	Notes: Imm	nobile; daphnid can't	swim after 60 se	ec. even if antenna sti	ll move	
		erwise noted, behavio				
Culture	1				1	
Young jar	C5/05	Jar(s) mortality 7 day	/s prior to test (i	must he <25%)	01	
·····						
QA (previo	uc month)			Control	/alidity Criteria	
		9				6
	st brood (≤12 days)	1	- 31		nortality at 48 hours -	-
	umber of young produced			(must be	≤10%)	
Were test	treatments randomized o	n test tray? (Yes)/	No			
		\smile				
Sample		11				
DO % of c	mpla prior to paration:	IKA'L	Is paration	required LeADS or >1	00%)? Yes or N	-
1	ample prior to aeration:			required (<40% or >1		
Duration o	f aeration (37:5 +/- 12.5 r	mL/min/L) : 🕥 min	Filtered wit	h 110um screen prior	to testing Yes or N	0
Hardness (mg CaCO ₃ /L) of 100% :	1007	Is hardness	adjustment required	(<25 mg CaCO_//)	Yes or No
1				25 Ni	(
Hardness of	of sample after adjustmer	it (must be between	25 - 30 mg CaC	U ₃ /L)		
Alkalinity c	of 100% sample (mg CaCC	D ₃ /L): <u>267</u>				
Dilution W		Qually	DO Levels	(40-100% saturation	 corrected for altitu 	de -
Pail label /	preparation date	3400/04	3.3 to 8.2 m	ng/L at 18°C	3.1 to 7.7 mg/L at 21	1°C
Hardness o	of dilution water (mg/L)	183	3.2 to 8.1 m	ng/L at 19°C	3.0 to 7.6 mg/L at 22	2°C
				ig/L at 20°C		
Comment	s/Observations:	nr: Noppt	len te treat			
	110	brian	1_			
L	40	hrinopp				
	Reviewed By:		Date Reviewed:	2020 08 18		



APPENDIX C – Chain-of-custody form

Teck						Page	1	of	1									
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Project Manager						Lab					vironmental.		nail 2:	-		12 10 W	X	1. 1.
	brett.mason@teck.com							-						-	.Davidson@teck.com	Å	X	
Address	15 Km North HWY 43						Address	#4,	6125 - 1	2 Street	SE		nail 3:		al@equisonline.com			
	1						<i>a</i> '	0.1					nail 4:		fill@teck.com	X	X	
	Sparwood			Province BC			City	-			Province AE		nail 5:	Marty.H	lafke@teck.com	X	X	1
Postal Code	V0B 2G0			Country Cana	ada	Post	tal Code	121	1 2K I		Country Ca	nada Ei	nail 6:			100		
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Phone Number	(250) 603 - 9417					Phone	Number	403	253 712	21					O number	VPO0	0707765	
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1.60 tentin									onc	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @ 20C								
Vanirovinn			No)						Co	a C								
201 arboys, 3x11, bo SINGE cod Condition	(1)		Yes/					SIS	ngle	Ingl				1.1				
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ood Voral MUN			nop						L_9(L_48		1.1						
11.5°C		Field	Hazardous Material (Yes/No)		Time	G=Grab	# Of Cont.		NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	AU [*]			1					1
20 - 1872Sample ID	Sample Location WL BFWB OUT_SP21	Matrix WS	I	Date 8/10/2020	(24hr) 14:00	C=Comp G	6		X	X			-					1
BFWB_OUT_SP21_2020-08-10_N	WL_DFWB_001_3F21	113		0/10/2020	14.00	0			A					-		-		+
			-		1								-					+
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	DECLAL INCEDUCTIONS			RELINQUIS	HED BV/A	FEILIATIO	N		Dat	e	Time		Accente	d By/Affilia	tion	Date	т	ime
ADDITIONAL COMMENTS/S hipment includes 2 extra 20 L		a 1 I			ara Genti				8/10/2		. mite					and the state		
	blauders and 2 extra	uIL																
astic bottles.								-										
SERVICE REQUEST (rush	- subject to availability)						18 M.	1	1999 - S.						CARA SA			244
	Regular	(default) X		Sampler's N	ame			Blair	Peebles	5		Mobile #						
	y (2-3 business days) - 50% s		-	Juniper of t				1										
	cy (1 Business Day) - 100% s	urcharge	1	Sampler's Sig			n 1		BL	201		Date/Time			10-Aug-	20		



END OF REPORT



Acute Toxicity Test Results

Sample collected August 24, 2020

Final Report

September 8, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Dates							
Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 20°C test initiation				
24-Aug-20 at 0900h	25-Aug-20 at 1030h	25-Aug-20 at 1510h	25-Aug-20 at 1415h				
	24-Aug-20 at	CollectedReceived24-Aug-20 at25-Aug-20 at	CollectedReceivedRainbow trout test initiation24-Aug-20 at25-Aug-20 at25-Aug-20 at				

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-08-24_N	13.3°C	954	273

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID —	Percent survival in 100% (v/v) sample	
	Rainbow trout	Daphnia magna 20°C
WL_BFWB_OUT_SP21_2020-08-24_N	100	100
Comula ID	Percent Immob	ility in 100 (% v/v)
Sample ID —		ility in 100 (% v/v) magna 20°C



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-08-24_N	Rainbow trout	Precipitate observed on test vessel	None
	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	4.0 (3.7-4.4) g/L KCl ¹	5.8 (5.3-6.4) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.4 (2.4-4.7) g/L KCl	6.0 (5.1-7.0) g/L NaCl
Reference toxicant CV	10.8%	5.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, August 3, 2020; ² Test Date August 17, 2020

LC = Lethal Concentration; CL = Confidence Limit



no thiesen

Report By: Sara Thiessen, BSc Biologist

acham force

Reviewed By: Jacklyn Poole, BSc Laboratory Supervisor

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

Trout Bench Sheet



Method	TRS Client	TEC164	Reference	1920-2022		Chamber	5
Test Log						Committee Info	
		1	1	1	Daily Data	Sample Info	mation
Day	Date	Time	Initial	Chem. Cart	Review	Initial pH:	72
0	2020/08/25	1510 .	VX Aw	1/2-	55	Initial EC (µS/	cm): Li coco
1	2020/08/26	AUG	Ver		SP	Initial DO (mg	
2	2020/08/27	0850	Ma		TP	Initial Temp (0.
3	2020/08/28	0917	RS		Sip	Salinity (ppt):	10
4	2020/08/29	1005	MWIMF	1	CB		-2-
Preaeration DO(mg/L) of	e adjusted to 6.5 +/- 1 mL/min/ time	6	1 hour	vas loaded with 1.5 hours	2 hours	DO in mg/L (saturation)** 62 mg/L - 89 mg 6.1 mg/L - 88 mg 6.0 mg/L - 86 mg	g/L at 14°C g/L at 15°C g/L at 16°C
Conc.	CTL 100	1	(*corrected for a	ltitude
conc.				I			
			pH (units) (ra	0000 5 5 9 E)			
Day 0	77 710	r	pri (units) (ra	nige: 3.3-6.3)	T	T	ii
Day 4	50 80	·					
			EC (ut	S/cm)			
Day 0	409 1558				1	1	
Day 4	400 55						
					1		
	n	DO (mg/	L) (70-100% sa	turation at te	st temp.)		
Day 0	0.8 9.60	1			<u>}</u>	1	
Day 4	89 8-8			/			
						•	· · · · · · · · · · · · · · · · · · ·
		Te	emperature (°C)	(range: 14-16	'C)		
Day 0	15 15						
Day 4	<u> </u>						
	1.					- Li	
		Numbe	er Alive (In brack	kets number st	(ressed)		
Day 0	10 10						
Day 1					l		
Day 2	10 10						
Day 3	10 10					. (
Day 4	0 0 0						
	Validity Criteria: must be ≤	10% mortality a	nd/or stressed	behavior in th	e control		
	Unless otherwise noted, beha	vior is considere	ed to be normal	1			
Control Orga	Direction Direct						
Control					Test Organism	n Information	
Fish	Length Weight						
FISH	(cm) (g)				Batch	20200521TR	
1	40100	Londing Densit		0.4	-		
2	28 88	Loading Densit (must be ≤0.5 g/L)		0.1	Source	Troutlodge	
3	3856	(must be so s g/L)			Table H	2	
4	3844	Mean Length (c	·	38	Tank #	2	
5	29 51	wean cengin (c		50	Development	E . 2%C	67
6	36 26	Length Range ((m): 2	6-40	Days Held at 1 (m⊔st be ≥14 da		67
7	20 84	Length Kange ($\mathcal{O}_{\mathbb{C}}$	0 90	timust be 214 da	γs)	
8	20 17	Mean Weight (d	-)-	07	Percent stock	مم مرسا ما تام .	0
9	40 08	(Must be ≥0.3q)		0.1	17 days prior to te	· · · · · · · · · · · · · · · · · · ·	0
10	37 56	(man be 20.5g)		-	le days prior to te	st, must be ≤2‰)	
		Weight Range:	(a):	10-08	Test Volume (L)	10
		. signt hunge.		in the circ	Lear volume (L	-/	18
Comments :	Ohr. In D. MAL						
	ohr: no ppt						
	MOW! Stoket 0	dt coat	ing Lall	1			
			9	(4
	Reviewed By:			ſ	Date Reviewed	7120/08	[3]
					and meridired.	0.000100	1.2.1



Daphnia Bench Sheet

Method	DAS20	Client	TEC164	Referenc	e 1920-2022	
Test Log					Sample Information	
Day	Date	Time Technician	Chem. Cart	Daily Data Review	Initial pH:	73
0	2020/08/25		3/1	V	Initial EC (µS/cm):	1659
			Jid	00	Initial DO (mg/L):	
1	2020/08/26	OB30 AW	5	SUP		10.0
2	2020/08/27	1030 MF	3	T	Initial Temp (°C):	18
					Salinity (ppt):	2
Lab Code	CTLA CTLB	CTLC 100A	100B	100C		
day		1.3 pH (uni	ts) (range: 6	.0-8,5) 7.3		
0	8.3 8.5	0.3 8 7.9	19 1.5	69		
2	B.L B.S	8.5 83	84	8.4		
	The pH of the	sample was not adjusted prior		unless noted in the comr	nents below	
0		till Contract	EC (uS/cm)	1000	- T	
0	406 400	411 XIAS	120	1729		
2	400 398	400 1400	1020	Held		
		DO (mg/L) (40-100% sa	turation at test tem	ip.)	
0	79 29	29 01	P.I	PI		
2	10 10	79 79	7.9	7.9		
						;
		Temperatu	re (°C) (rang	e: 18-22 °C)		
0	30 30	20 19	19	19		
2	10 20	20 20	20	20		
			Numbe			
			(l, immo	obile)		
0	10 10	10 10	10	10		
1	0 10	10 10	10	10		
2	10 10	10 10	10	10		
	Validity Crit	eria: must be ≤ 10% mor	tality and/or	abnormal behavior i	n the control	
		obile; daphnid can't swir			ill move	
	Unless othe	rwise noted, behaviour i	s considered	to be normal		
Culture	Du				61	
Young jar		Jar(s) mortality 7 days pr	rior to test (r	nust be ≤25%)		
QA (previo	us month)	2		Control	Validity Criteria	
	t brood (≤12 days)	R			mortality at 48 hours -	0.1.
	imber of young produced	(>15,00000)	36	(must be		0.0
				(Indat be	51070)	
were test t	reatments randomized or	rest tray!	0			
Sample						
DO % of sa	mple prior to aeration:	711	Is aeration	required (<40% or >	100%)? Yes or No	
		al (min/l):		h 110um screen prio		
	faeration (37.5 +/- 12.5 m					- m
U	mg CaCO $_3$ /L) of 100% :			adjustment required	i (<25 mg CaCO ₃ /L)/~	Tes or NO
Hardness d	f sample after adjustment		- 30 mg CaC	O ₃ /L)	-	
Alkalinity o	f 100% sample (mg CaCO	93/L): <u>273</u>	•:			
	- • - ·		DOINT	(40.1000/	A second for all the	
Dilution W		21 20/11			 n) - corrected for altitud 	
	preparation date	2:0e/16		ig/L at 18°C	3.1 to 7.7 mg/L at 21	
Hardness c	f dilution water (mg/L)	160		ng/L at 19°C	3.0 to 7.6 mg/L at 22	τ I
Comment	Observation		3.2 to 7.9 m	ng/L at 20°C		
Commente	o hr: No ppr					
	48 hr: 00 ppt					
L						(
	Reviewed By: 10	Date	e Reviewed:	2020108/31		



APPENDIX C – Chain-of-custody form

Teck						Pag		6												
IECK	COC ID: PROJECT/CLIENT INFO	2020-08	8-24 T	oxicity SP2	21	Pag	NAROUN		TIME:		ur (defau	lt)				RUSH				
Facility Name						I	ab Name	N	LABORA	TORY	antal			and the series			ER INFO			
	Thomas Davidson						b Contact	-			cittai					Distributio		Excel	PDF	ED
	thomas.davidson@teck.com		-					-		nautiluse				ail 1:		LC-Lab@tex		X	X	10
	15 Km North HWY 43					-		-		12 Stree		ental.ca		ail 2:		s.Davidson	~	X	X	2
					-		Address	174	, 0125 -	12 Stree	I SE			ail 3:		oal@equison		1.00		
City	Sparwood			Province BC			City	C	1		Te d			ail 4:		Hill@teck.co		X	X	1
Postal Code		_		Country Can		-		-	lgary	L	Provin			ail 5:	Marty.F	Hafke@teck	.com	X	X	
Tostal Code				Country Can		Po	stal Code	12	H 2K1		Count	ry Canada	Ema	ail 6:						
Phone Number	(250) 603 - 9417					Phone	e Number	10	2 252 71	121										
		ILS			in the second	THOIR	ivuinder	40.	5 2 5 5 7 1	121		100000000000000000000000000000000000000	ANIAT	I VCIC I	REOUEST	O number	1	VPO00	0692115	-
020/08/25																				
0:30									-			Please indi	cate belo	ow Filter	ed, Perserv	ed or both (F, P, F/P)		1	-
<i>Canitoculin</i>									36	=	-					-				
020/08/25 5:30 Nanitoulin 10 9:20L carboys, 3x 11. bo 165/NGB 165/NGB			No)						NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @ 20C										
201 crobenic 3x 11. bo	tles		Hazardous Material (Yes/No)					SIS	igle	est										
LSING			al (ANALYSIS	NAUT_96Hr_RT_Singl entration_Toxicity Test	ty T										
0/1100 1-1			ateri					NA	RT	DM										
add Longhtion			s M					A	Hr Tox	Hr_To										
			nop						-00 0	48 tion										
Sample ID 1920-2022		Field	azar		Time	G=Grab	# Of		UT	UT										
	Sample Location WL_BFWB_OUT_SP21	Matrix WS	H	Date	(24hr)	C=Comp				NA cer 200		0								1.
ALUE!	wL_BrwB_001_SP21	ws		24/08/20	9:00	G	6		X	X	13.3	S.								
And the second state of the second state of																				
			_																	1
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ADDITIONAL COMMENTS/SF	ECIAL INSTRUCTIONS	Contraction of the second		RELINQUISH	ED BY/AF	FILIATION			Date		1. T	ime						-		
hipment includes 2 extra 20 L		11.			ra Gentil	and the state of the		150-61	8/24/20	11.7.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	n	inte	Ac	ccepted I	By/Affiliati	on	Dat	te	Ti	ime
lastic bottles.													in the state	-			-		-	
astie ootties.				the first second		-					_									
SERVICE REQUEST (rush -	subject to availability			THE REAL PROPERTY				1.172												_
SERVICE REQUEST (FUSH-		default) X	2.2.49						en a ser br>Ser a ser a	a a a contra de la										
Priority	(2-3 business days) - 50% su			Sampler's Na	me		G	ilroy	y James			Mobile	#							
	(1 Business Day) - 100% su	~							-				-			-				
For Emergency <1 Day, A	SAP or Weekend - Contact M	Vautilus	Si	ampler's Signa	ature							Date/Ti	me			24	4-Aug-20			



END OF REPORT



Acute Toxicity Test Results

Sample collected September 7, 2020

Final Report

September 28, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

	Dates						
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation			
WL_BFWB_OUT_SP21_2020-09-07_N /	7-Sep-20 at	8-Sep-20 at	8-Sep-20 at	8-Sep-20 at			
2021-0055	0900h	0850h	1600h	1555h			

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-09-07_N	6.0°C	957	249

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID —	Percent survival in 100% (v/v) sample					
	Rainbow trout	Daphnia magna 20°C				
WL_BFWB_OUT_SP21_2020-09-07_N	100	100				

¹According to information provided by Nautilus Environmental (Burnaby, BC)

Sample ID	Percent Immobility in 100% (v/v)
	Daphnia magna 20°C
WL_BFWB_OUT_SP21_2020-09-07_N	3



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
	Rainbow trout	None	None
WL_BFWB_OUT_SP21_2020-09- 07_N	Daphnia magna	Surficial precipitate observed	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.6 (3.2-3.9) g/L KCl ¹	6.5 (6.0-7.0) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.4 (2.6-4.6) g/L KCl	6.0 (5.1-7.0) g/L NaCl
Reference toxicant CV	9.7%	5.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, August 24, 2020; ² Test Date August 31, 2020

LC = Lethal Concentration; CL = Confidence Limit



un thiessen

Report By: Sara Thiessen, BSc Senior Biologist

Desta larek

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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APPENDIX A – Summary of test conditions



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data



Trout Bench Sheet

	TRSC	lient	TEC164	Reference	2021-1055	2021-0095	Chamber	
est Log							Sample Inform	ation
Davi	Date		Time	i - tata r	Cham Cart	Daily Data	1	7.3
Day 0	2020/09/08		Time	Initial	Chem. Cart 1	Review	Initial pH: Initial EC (µS/cm	
1	2020/09/09		6930	KK/MN KIL	-	OP	Initial DO (mg/L	
2	2020/09/10		0820	ME		CH2	Initial Temp (C)	
3	2020/09/11		0835	BS .	2	SP	Salinity (ppt):	-1-
4	2020/09/12		0978	MAX	1	St	Summy (ppt).	K
ample Pre- eration rate eaeration t O(mg/L) of	adjusted to 6.5 +/ ime	- 1 mL/min/	Note: * ; time w	1 hour	1.5 hours		DO in mg/L (70 saturation)** 6 2 mg/L - 8.9 mg/L 6,1 mg/L - 8.8 mg/L	at 14°C at 15°C
	and the local						6.0 mgA - 8.6 mgA	
Conc.	try and Biology	100					**corrected for altit	ude
Conc	CTL	100						
				pH (units) (ra	nge: 5.5-8.5)			
Day 0	8.1	74		Address Mand Cold Table (MCA)				
Day 4	8.1	8.3)	
	10 A							
				EC (u	S/cm)			
Day 0	YTY	14+						_
Day 4	HDY	1484						
			50			. The second		
David		0.0	DO (mg/l) (70-100% sa	turation at tes	t temp.)		_
Day 0	Ort	Bal						
Day 4	8.7	8.1	· · · · · · · · · · · · · · · · · · ·					
			To	monthing (°C)	(range: 14-16°	0		
Day 0		111	10	niperature (C)	(range, 14-10	C)	r r	
Day 4	HM H	12-						
Day 4		D					II	
			Numbe	r Alive (In brac	kets number st	ressed)		
Day 0	10	10					P	
Day 1	0	(0)						
Day 2	10	10						
Day 3	10	10						
Day 4	10	10						
-	Validity Criteria:	must be ≤	10% mortality a	nd/or stressed	behavior in the	control		
	Unless otherwise	noted, beha	vior is considere	d to be norma	Ú			
						Tect Oceanics	n Information	
ntrol Oroz	nism Data						in innormation	
ntrol Orga Control		Weight				rest organis		
_	I nism Data Length (cm)	Weight (g)				Batch	20200731TR	
Control Fish	Length	(g)			- 2	Batch		
Control Fish	Length	(g)	Loading Density	/ (g/L):	- 2	100	20200731TR Sam Livingston	
Control Fish 1 2	Length	(g)	Loading Density (must be ≤0.5 g/L)	γ (g/L):	- 2	Batch Source	Sam Livingston	
Control Fish 1 2 3	Length	(g) 0.5 0.5	(must be ≤0.5 g/L)		0.3	Batch		
Control Fish 1 2 3 4	Length	(g) 0.5 0.5 0.5		nı):	0.3 3.4	Batch Source Tank #	Sam Livingston	20
Control Fish 1 2 3 4 5	Length	(g) 0.5 0.5 0.5 0.5 0.5	(must be ≤0,5 g/L) Mean Length (c	nı):	0.3 3.4	Batch Source Tank # Days Held at 1	Sam Livingston 5 5± 2°C	39
Control Fish 1 2 3 4 5 6	Length	(g) 0.5 0.5 0.5 0.5 0.5 0.5	(must be ≤0.5 g/L)	nı):	0.3 3.4	Batch Source Tank #	Sam Livingston 5 5± 2°C	39
Control Fish 1 2 3 4 5 6 7	Length (cm) 3.4 5.6 7.6 7.6 7.6 7.6 7.5 7.5 7.5 7.5	(g) 0,5 0,5 0,5 0,5 0,5 0,5 0,5 0,5	(must be ≤0,5 g/L) Mean Length (c Length Range (c	nı): .m): 3	0.3 3.4 0- 3.6	Batch Source Tank # Days Held at 1 (must be ≥14 da	Sam Livingston 5 5± 2°C _{ys)}	
Control Fish 1 2 3 4 5 6 7 8	Length (cm)	() 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	(must be ≤0,5 g/L) Mean Length (c Length Range (c Mean Weight (g	nı): .m): 3	0.3 3.4 0- 3.6 0.5	Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock	Sam Livingston 5 5± 2°C _{ys)}	39 0
Fish 1 2 3 4 5 6 7 8 9	Length (cm)	() 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	(must be ≤0,5 g/L) Mean Length (c Length Range (c	n1): cm): 3_ 1):	0.3 3.4 0- 3.6 0.5	Batch Source Tank # Days Held at 1 (must be ≥14 da	Sam Livingston 5 5± 2°C _{ys)}	
Control Fish 1 2 3 4 5 6 7 8	Length (cm)	() 0.5 0.5 0.5 5 0.5 5 5 5 5 5 5 5 5 5 5 5	(must be ≤0,5 g/L) Mean Length (c Length Range (c Mean Weight (g (Must be ≥0.3g)	n1): ;in): 3_] ;):	0.3 3.4 0- 3.6 0.5	Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te	Sam Livingston 5 5± 2°C ys) mortality st. must be ≤2%)	0
Control Fish 1 2 3 4 5 6 7 8 9	Length (cm)	() 0.5 0.5 0.5 5 0.5 5 5 5 5 5 5 5 5 5 5 5	(must be ≤0,5 g/L) Mean Length (c Length Range (c Mean Weight (g	n1): ;in): 3_] ;):	0.3 3.4 0- 3.6 0.5	Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock	Sam Livingston 5 5± 2°C ys) mortality st. must be ≤2%)	
Control Fish 1 2 3 4 5 6 7 8 9	Length (cm) 3.4 3.4 3.4 7.6 7.6 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7	(g) 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	(must be ≤0.5 g/L) Mean Length (c Length Range (c Mean Weight (g (Must be ≥0.3g) Weight Range: (n1): ;in): 3_] ;):	0.3 3.4 0- 3.6 0.5	Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te	Sam Livingston 5 5± 2°C ys) mortality st. must be ≤2%)	0
Control Fish 1 2 3 4 5 6 7 8 9 10	Length (cm) 3.4 3.4 3.4 7.6 7.6 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7	(g) 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	(must be ≤0.5 g/L) Mean Length (c Length Range (c Mean Weight (g (Must be ≥0.3g) Weight Range: (n1): ;in): 3_] ;):	0.3 3.4 0- 3.6 0.5	Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te	Sam Livingston 5 5± 2°C ys) mortality st. must be ≤2%)	0
Control Fish 1 2 3 4 5 6 7 8 9 10	Length (cm) 3.4 3.4 3.4 7.6 7.6 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7	(g) 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	(must be ≤0.5 g/L) Mean Length (c Length Range (c Mean Weight (g (Must be ≥0.3g) Weight Range: (n1): ;in): 3_] ;):	0.3 3.4 0- 3.6 0.5	Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te	Sam Livingston 5 5± 2°C ys) mortality st. must be ≤2%)	0
Control Fish 1 2 3 4 5 6 7 8 9 10	Length (cm)	(g) 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	(must be ≤0.5 g/L) Mean Length (c Length Range (c Mean Weight (g (Must be ≥0.3g) Weight Range: (n1): ;in): 3_] ;):	0.3 3.4 0-3.6 0.5 4-0.6	Batch Source Tank # Days Held at 1 (must be ≥14 da Percent stock (7 days prior to te Test Volume (1	Sam Livingston 5 5± 2°C ys) mortality st. must be ≤2%)	0 18



Daphnia Bench Sheet

Test Log								Sample I	nformatio	n
Day		Date	Time	Technician	Chem. Cart	Daily Da	ta Review	Initial pH		7.3
0	202010	80/08	1555	SS/LC	3	Ku		Initial EC		1655
1	102010	9104	020	KE	1.00	T	9	Initial DO		11.2
2	200004	110	19202	CB	3		•	Initial Ter		14
Lab Code	CTIA	CTLB	CTI C	ICOA	1008	100C	1	Salinity (p	pt):	2
L	LUCT -	0.00		Ticon	1000	TOOL	1			
day					its) (range: 6					
0 2	8.4	83	83,	7.9	7.9	8.0				
-	<u>0</u> , Y			t adjusted prio	to test setting,	unless noted	in the comme	ents below		I
		Malvoe		COMPOSITION P	EC (uS/cm)	anness moteu	ar the commu	into below		
0 2	419	472	422	1635	1679	1681				
2	433	1431	4.33	1883	1600	1657				
			2	DO(ma/l)(40-100% sat	uration at	tost tomo	v		
0	7.9	79	7.9	7 9	Q	1.9	lest temp	.)	1	1
2	7.9	7.4	7.9	79	7.9	7.9				
				-	10.00		2			
0	20	20	20		re (°C) (range)			r
2	20	20	2.0	20	10	20				
						P.V.				
					Number	12.25				
0				1.0	(I, immo	bile)				
1	10	10	10	10	-10	18				
2	-1 <u>2</u>	10	10	-10-	10	DUI				
	<u> </u>	Validity Crit	eria: must be	e ≤ 10% mort	ality and/or	abnormal h	ehavior in t	he control		
		Notes: Imm	obile; daphr	id can't swin	n after 60 sec	. even if a	ntenna still	move		
Culture		Unless othe	rwise noted,	behaviour is	s considered	to be norn	nal			<u> </u>
Young jar	D2		lar(c) mortal	ity 7 days ad	and a second day		-044	201	č.	
roung jui		e	ar(s) mortal	ity 7 days pr	ior to test (m	ust be ≤ 25	576)	01.	-	
QA (previo							Control Va	lidity Crit	eria	
Days to firs	t brood (≤12	days)	9		14	1.	Mean % m	ortality at 4	48 hours -	0
Average nu	mber of your	ng produced	(≥15 young) 🦰 -	37.4	07	(must be ≤	10%)		~
Were test ti	reatments rar	ndomized or	n test tray?	Yes / No	37.4"					
Sample										
	mple prior to	aeration [.]	162		ls aeration re	ouired (24	10% or >10	0% \2	ve or No	
									-	
Hardness (n	aeration (37. ng CaCO ₃ /L) d	of 100% ·	957	20 min	ls hardness a	diuctment	een prior to	25 mg Ca	Yes or No	Yes or No
	sample after						required (>	ico nig ca	CO3/L):	res oning
	100% sample			40	su mg caco	3/L)				
Internet of	100% sampi		3/L).	<u> </u>						8
Dilution Wa	ater			1	DO Levels (4	0-100% sa	aturation)	correcter	for altitud	le -
Pail label / p	preparation da	ate 🛛 💈	: 08/28		3.3 to 8.2 mg				ng/L at 21	
Hardness of	dilution wate	er (mg/L) 📜	189		3.2 to 8.1 mg			3.0 to 7.6 r	ng/L at 22°	°C
		, . .			3.2 to 7.9 mg	/L at 20°C				
e										
Comments/	Observation	is: Oh:	no ppt							



APPENDIX C – Chain-of-custody form

International condition Condition </th <th>Teck</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Page</th> <th></th> <th>1 of 1</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	Teck						Page		1 of 1									
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oli Torvine [BC County (candia) Provine [BC County (candia) Torvine [BC Provine [BC Prov				ſ									Email 4:	Tricia.Hill@teck	k.com	X	x	X
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B: - 417 Plane Number Plane Number Plane Number Plane Number Plane Number Sixtering Instring Sixtering Instring Number Plane Number Plane Number Plane Number Sixtering Instring Number Number Number Plane Number Plane Number Plane Number Sixtering Instring Number Number Number Number Plane Number Plane Number Sixtering Instring Number Number Number Number Number Number Sixtering Number Number Number Number Number Number Sixtering Number Number Number Number Number Number Sixtering Number Number Number Number Number Sixtering Number Number Number Sixtering <td>Postal Code</td> <td>V0B 2G0</td> <td></td> <td>_</td> <td>Country Can</td> <td>Ida</td> <td>Pos</td> <td>tal Code</td> <td>e T2H 2</td> <td>IKI</td> <td>Country (</td> <td>anada</td> <td>Email 6:</td> <td></td> <td></td> <td></td> <td>19 100</td> <td></td>	Postal Code	V0B 2G0		_	Country Can	Ida	Pos	tal Code	e T2H 2	IKI	Country (anada	Email 6:				19 100	
33: 5417 SWEETE BERXINS Place Knimer do 23:53 71:1 Place Knimer do 23:53 71:1 Nonmber V000076 SWEETE BERXINS SWEETE BERXINS Anti-NSS BERLER MALENS BERLER MALEND SERVERATION NAMARE BERLER MALEND MALENS BERLER MALEND MA																		
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The constant for the constant of	30/00/05	SAMPLE DET											ANALYSIS	REQUESTED				
Image 1000000000000000000000000000000000000	60 Michthat											lease indic	ate below Filte	red, Perserved or bot	th (F, P, F/P)			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Shet where she bett	Q		(v/s9Y) (sterial (Yes/Vo)						Toxicity Test	miest fusive							
$ \begin{array}{ $	sample 10 2021 - 0055	Sample Location	Field Matrix	Hazardou	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.		noitertion <u>.</u> NAUT_48	200							
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	FWB_OUT_SP21_2020-09-07_N		SM		9/7/2020	9:00	9	9	1									
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lefault) X lefault) X charge Sampler's Name Tafi Mugadza Mobile # Colarge Sampler's Signature Date/Time	ADDITIONAL COMMENTS/SP	PECIAL INSTRUCTIONS			RELINQUISH	ED BY/AF	FILIATIO	7		Date 9/8/2020	Tim		Accepte	d By/Affiliation	Da	te	Tin	me
Regular (default) X Sampler's Name Tafi Mugadza Mobile # -50% surcharge Sampler's Signature Date/Time Date/Time	prineiri includes 2 exita 20 L	Diauueis ailu z exil										ht						
Regular (default) X Sampler's Name Tafi Mugadza Mobile # -50% surcharge Sampler's Signature Date/Time Date/Time	SERVICE REQUEST (rush -	- subject to availability)																
Sampler's Signature Date/Time	Priority	Regular 7.0-3 husiness dave) - 50% s		S.	ampler's Na	me			Tafi Mu	gadza		Mobile	#					
	Emergency	y (1 Business Day) - 100% s	urcharge	Sat	mpler's Sign	ture						Date/Ti	me		7-Sen-20	1		



END OF REPORT



Acute Toxicity Test Results

Sample collected September 22, 2020

Final Report

October 13, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC



SAMPLE INFORMATION

		Da	ates	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation
WL_BFWB_OUT_SP21_2020-09-22_N /	22-Sep-20 at 0900h	23-Sep-20 at 1050h	24-Sep-20 at 1400h	23-Sep-20 at 1455h
2021-0184	050011	105011	140011	145511

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-09-22_N	8.7°C	888	259

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID —	Percent survival i	n 100% (v/v) sample
Sample ID	Rainbow trout	Daphnia magna 20°C
WL_BFWB_OUT_SP21_2020-09-22_N	100	100

Sample ID	Percent Immobility in 100% (v/v)
	Daphnia magna 20°C
WL_BFWB_OUT_SP21_2020-09-22_N	0

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-09-	Rainbow trout	None	None
22_N	Daphnia magna	None	None



QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.5 (3.1-4.0) g/L KCl ¹	5.8 (5.5-6.0) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.6-4.6) g/L KCl	6.0 (5.1-7.0) g/L NaCl
Reference toxicant CV	9.6%	5.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, September 14, 2020; ² Test Date September 28, 2020

LC = Lethal Concentration; CL = Confidence Limit



Michael Ulrubleshi

Report By: Michael Wrubleski, BSc Biologist

Destalant

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

✓ MAIITIIIIC

Trout Bench Sheet

lethod	TRS Client	TEC164	Reference	2021-0184		Chamber	
est Log						Sample Infor	mation
					Daily Data		223
Day	Date	Time	Initial	Chem, Cart	Review	Initial pH:	7.8
0	2020/09/24	IYDD -	(BIBS	1	ST	Initial EC (µS/	m): (<73
1	2020/09/25	0900	LC		TP	Initial DO (mg	/L): "Q, [
2	2020/09/26	0920	AF	×	X	Initial Temp (*	C): 19
3	2020/09/27	OR35	MF	19	Cl	Salinity (ppt):	1
4	2020/09/28	0945	LCIAN		KL	1	
		Note: * ; time v	when the test w	as loaded with	fish '		
mple Pre-		17				DO in mg/L (70% - 100%
	adjusted to 6.5 +/- 1 mL/m					saturation)**	
eaeration ti		0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg	g∕Lat 14°C
O(mg/L) of	100%	8.8		1		6.1 mg/L - 8.8 mg	g/L at 15°C
122 8						6.0 mg/L - 8.6 mg	1/L at 16°C
	try and Biology					**corrected for a	titude
Conc.	CTL 100		0				
			pH (units) (ra	nge: 5.5-8.5)		l	
Day 0	19 8.1)		l			
Day 4	8. 8.1						
							10
			EC (u	S/cm)			
Day 0	306 152						
Day 4	409 155	4					
			100.00 (200.000)	-			
		DO (mg/l	L) (70-100% sa	turation at tes	t temp.)		
Day 0	2.0 8.0			l			
Day 4	8.1 8.	4					
				e			
		Te	mperature (°C)	(range: 14-16°	C)		
Day 0	12 15						
Day 4	615			11			
			A.P. 2000 J				
Day 0	10		r Alive (In brac	kets number str	ressed)	r	
Day 0 Day 1		10					
2							
Day 2	10 10]				
Day 3	PD K	_					
Day 4		4001					
	Validity Criteria: must be Unless otherwise noted, b				control		
	Uniess otherwise noted, b	enavior is considere	d to be norma				
ntrol Orga	nism Data				Test Oreasia		
Control	Length Weight				rest organisi	n Information	
Fish	(cm) (g)				Batch	20200826TR	
	(c) (9)				batteri	2020002011	421
1	31 0.3	Loading Density	(a/l):	02	Source	Sam Livingsto	0
2	30 0.2		(g) -/·	1.40	Jource	Jam Livingsto	H €2
3	32 0.4				Tank #	7.0	/
4	34 0.4		m).	23			B
5	33 02			2	Days Held at 1	5+ 2°C	2
6	33 04	Length Range (-m).		(must be ≥14 da		
7	32 0.7				/	1-1	
8	3.6 0.4	Mean Weight (d	ı).	0.4	Percent stock	mortality	0
9	32 0.3	(Must be ≥0.3g)				est, must be ≤2%)	
10	3.5 0.4						
			(a):	5.3-0.4	Test Volume (I		1
					. csc + olume (I	-/	
nments :							
	96hr: IN DOL						
	96hr: No ppt	ву: 65					/ /



Daphnia Bench Sheet

Method	DAS	Client	TEC164	Reference	e 2021-0184	
Test						
Test Log	Data	These I Tradestate		DID	Sample Informat	ion
Day 0	Date		n Chem. Cart	Daily Data Review	Initial pH:	7.8
1	2020/09/23 2020/09/24	1455 MFINK		5	Initial EC (µS/cm):	1573
		0740 ST	-	Qr	Initial DO (mg/L):	-91
2	2020/09/25	1040 CB	2	- 52	Initial Temp (°C):	19
D 1 C 1					Salinity (ppt):	SS DI
Lab Code	CTLA CTLB	CTLC 100 A	100 B	100 C		
day		pH (ui	nits) (range: 6.	0-8.5)		
0	8.4 8.9	847.9	110	791		
2	BU BU	84 55	85	81		
	The pH of the	sample was not adjusted pri-	or to test setting,	unless noted in the comm	ents below	
			EC (uS/cm)	110443 677		
0	415 400	400 1593	1011	102		
2	Yas zas	MOS ISIO	1583	1572		
			1000		· · · · · · · · · · · · · · · · · · ·	
0	7970		(40-100% sat	turation at test temp)	
2 2	21 27	17 97	0.4	0.4		
- 1		- <u>'</u>	10	12	I	I.
		Temperati	ure (°C) (range	e: 18-22 °C)		
0	20 20	20 18	18	18		
2	20 20	20 20	20	2)		
			10			
			Numbe			
			(l, immo	bile)	14	
0	10 10	10 10	10	10		
1	10 10	10 10	10	10		
2			10	0		
		eria: must be ≤ 10% mo				
		obile; daphnid can't sw rwise noted, behaviour			i move	
Culture	official offic	Twise Hoted, behaviour	is considered	to be normal		
Young jar	DI	Jar(s) mortality 7 days p	prior to test (n	1ust he <25%)	0	
l'eangjan				lust be 32370)		
QA (previou	is month)	~		Control V	alidity Criteria	
	brood (≤12 days)	- (~ '		nortality at 48 hours	
Average nu	mber of young produced	(≥15 young)	3	(must be s		·
	eatments randomized or		No	,	,	0
		\sim				
Sample		1000 2220			5	
DO % of sar	nple prior to aeration:	109	Is aeration re	equired (<40% or >1	00%)? (Yes)or	No
Duration of	aeration (37.5 +/- 12.5 n	L/min/L): 20mic	- Filtered with	110um screen prior		
	ng CaCO ₃ /L) of 100% :			adjustment required (
	sample after adjustment			•	(-25 mg cuco3/2).	
			50 mg cacc		÷	
Aikainity Of	100% sample (mg CaCO	₃ /L): <u>259</u>	_			
Dilution Wa	ator		DO Lovels (40-100% saturation)	Corrected for alti	
1	preparation date	1.09/19				COLUMN THE
	dilution water (mg/L)	1012	3.3 to 8.2 mg		3.1 to 7.7 mg/L at	
	and ton water (mg/t)	(4)	3.2 to 8.1 mg 3.2 to 7.9 mg		3.0 to 7.6 mg/L at	
Comments	Observations: 👩 🛌	E	D.2 10 7.3 mg	y/ = al 20 C		
	Uh	r: no ppt				1
	48	1: AN not				
	1.6	pr		1 1		
R	eviewed By: BS	Da	te Reviewed:	2020/09/29		



APPENDIX C – Chain-of-custody form

Teck						Page		1 of 1									
	COC ID: PROJECT/CLIENT INFO	2020-09-22		Toxicity SP21		TURN	AROUN	TURNAROUND TIME:		Regular (default)			RL	RUSH:			
Facility Name WLC AWTF						L	ab Name	Nautilus	Lab Name Nautilus Environmental	tental		4	0	OTHER INFO			
Project Manager Brett Mason	Brett Mason					Lab	Contact	Lab Contact Tamara Pomerov	Pomerov		T	Email 1.	Keport Format / Distribution	ution	_		EDD
Email	Email brett.mason@teck.com						Email	tamara@	Dnautiluse	tamara@nautilusenvironmental.ca	al ca	Email 7.	DL-WLC-Lab(g)teck.com	(a)teck.com	× :	X	X
Address	Address 15 Km North HWY 43						Address	#4, 6125	Address #4, 6125 - 12 Street SE	at SE		Email 3:	TeckCoal@emisconlanceck.com	TreckCoal@equisconline.com	×	×	×
			ſ									Email 4:	Tricia Hill@teck.com	ck.com	X	X	< ×
City	City Sparwood		<u>e</u>	Province BC			City	City Calgary		ProvinceAB	AB	Email 5:	Marty Hafke@teck.com	teck com	: ×	< ×	< >
Postal Code V0B 2G0	V0B 2G0		<u> </u>	Country Canada	da	Pos	Postal Code	T2H 2K1		Country Canada	Canada	Email 6:			4	<	10 20
Phone Number	Phone Number (250) 603 - 9417					Phone	Phone Number	403 253 7121	7121				PO minimore	hor	2000DdV	3766	
	SAMPLE DETAI	AILS										ANAL VCIC BEATINGTE	Inn O'	IDEL	VPO00707765	1765	
Moniteulin Bood Condition Sample ID 2021-0184 Sample Lo Sample ID 2021-0184 Sample Lo WL. BFWB_OUT SP21_2020-09-22_N WL. BFWB_O	Sample Location WL_BFWB_OUT_SP21	Field Matrix ws	Hazardous Material (Yes/No)	Date 9/22/2020	71me 9:00	G=Grab C=Comp	# Of cont. 6	ANALYSIS ANT_96Hr_RT_Single_Conc	× centration_T48Hr_DM_Single_Con × centration_Toxicity Test @ 20C								
ADDITIONAL COMMENTS(SECIAL INCTUINTS)	SCIAL INSTBILCTIONS		-												++		
Shipment includes 2 extra 20 L bladders and 2 extra plastic bottles.	oladders and 2 extra	alL	×	KELINQUISHED BY/AFFILIATION Julia Johnson	Julia Johnson	LIATION		Date 9/22/2020	te 2020	Time		Accepted By/Affiliation	/Affiliation	Date		Time	
SERVICE REOUEST (rash - subject to availability)	subject to availability)										-						
Priority (Priority (2-3 business days) - 50% surcharge	(default) X Ircharge	Sai	Sampler's Name	0		Juli	Julia Johnson			Mobile #				-		
Energency (1 Business Day) - 100% surcharge For Emeronery <1 Day ASAP or Weekend - Contrast Nonstine	Emergency (1 Business Day) - 100% surcharge	ircharge	Com							t							



END OF REPORT



Acute Toxicity Test Results

Samples collected December 7, 2020

Final Report

December 23, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC



SAMPLE INFORMATION

			Da	ites		
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> 10°C test initiation	<i>Daphnia magna</i> 20°C test initiation	Daphnia magna antiscalant test initiation
F2_BPO_WG_2020- 12-07_N-SRF /	7-Dec-20 at 0855h	8-Dec-20 at 1020h	8-Dec-20 at 1600h	8-Dec-20 at 1510h	8-Dec-20 at 1510h	-
2021-0701-01	000011	102011	100011	131011	151011	
F2_BPO_WG_2020- 12-07_N-SRF-AS /	7-Dec-20 at 0856h	8-Dec-20 at 1020h	-	-	-	8-Dec-20 at 1505h
2021-0701-02	00200	10200				15050

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
F2_BPO_WG_2020-12-07_N-SRF	1.6°C	1285	483
F2_BPO_WG_2020-12-07_N-SRF-AS	2.6°C	1285	483

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test
- Daphnia magna 48-h single concentration screening test (conducted at 10°C)
- *Daphnia magna* 48-h single concentration screening test (conducted with 20 mg/L antiscalant)



RESULTS

Toxicity test results

	Per	rcent survival ir	n 100% (v/v) samp	le
Sample ID	Rainbow trout	Daphnia magna 10°C	Daphnia magna 20°C	Daphnia magna antiscalant
F2_BPO_WG_2020-12-07_N-SRF	90	100	100	-
F2_BPO_WG_2020-12-07_N-SRF-AS	-	-	-	100

	Perce	ent Immobility in 100%	(v/v)
Sample ID	Daphnia magna 10°C	Daphnia magna 20°C	<i>Daphnia magna</i> antiscalant
F2_BPO_WG_2020-12-07_N-SRF	0	0	-
F2_BPO_WG_2020-12-07_N-SRF-AS	-	-	0

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
F2 BPO WG 2020-12-07 N-SRF	Rainbow trout	None	None
	Daphnia magna	None	None
F2_BPO_WG_2020-12-07_N-SRF-AS	Daphnia magna	None	None



QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	4.3 (3.8-4.7) g/L KCl ¹	6.9 (6.6-7.2) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.6 (2.8-4.6) g/L KCl	6.2 (5.4-7.1) g/L NaCl
Reference toxicant CV	8.6%	4.5%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, November 25, 2020; ² Test Date December 7, 2020

LC = Lethal Concentration; CL = Confidence Limit



that Cell.

Report By: Shae Cole, BSc Biologist

Destataret

Reviewed By: Leila Oosterbroek, BSc Environmental Scientist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μ g/L) and Na ₂ SeO ₄ (2 μ g Se/L)
Control/dilution water for antiscalant test	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 µg/L), Na ₂ SeO ₄ (2 µg Se/L) and 20 mg/L antiscalant
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



-	
Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μg/L) and Na ₂ SeO ₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	10 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 3.Summary of test conditions: 48-h Daphnia magna survival test at 10°C.



APPENDIX B – Toxicity test data



Trout Bench Sheet

Day Date Time Initial Chem. Carl Date Time Date Date <th< th=""><th>/lethod</th><th>TRS</th><th>Client</th><th>TEC 164</th><th>Reference</th><th>2021-0701-01</th><th></th><th>Chamber</th><th>5</th></th<>	/lethod	TRS	Client	TEC 164	Reference	2021-0701-01		Chamber	5	
Day Date Time Initial Chem. Cat Deliy Obai Initial P1: 7.7 1 12/4/2020 Lb.oo MWY 57 1 MME	est Log							Sample Info	rmation	
0 128/2020 1 bp 0 NWV 57 1 Initial DC (no)(10, 57) 2 127/02020 5 1 Note: *; time when the test was loaded with fish Initial DC (no)(10, 57) 3 127/12020 0.5 15 1 Initial DC (no)(10, 57) 4 127/12020 0.5 15 1 Initial DC (no)(10, 57) attraction 127/12020 0.5 15 1 Initial DC (no)(10, 57) maple Pre-Acration reservation and aloded with fish DO in mg/L (70%, -10%, ration)** Stanuard in the test was loaded with fish DO in mg/L (70%, -10%, ration)** 00(mg/L) of 100% 1 1 Note: *; time when the test was loaded with fish DO in mg/L (70%, -10%, ration)** Conc. CTL 100 1 Note: *; time when the test was loaded with fish DO in mg/L (70%, -10%, ration)** Day 0 10 10 1 1 1 1 1 Conc. CTL 100 1 1 1 1 1 Day 0 2.5 2.0 1 1 1 1 1 1 Day 0 3.	_						Daily Data			
1 12/9/2020 5 00 ML - Initial Temp (2): (5 3 12/11/2020 08/15 N. - Initial Temp (2): (5 mple Pre-Acration Salinity (ppt): Salinity (ppt): Salinity (ppt): Salinity (ppt): mple Pre-Acration France Salinity (ppt): Salinity (ppt): Salinity (ppt): marking acration time Sign (2): Salinity (ppt): Salinity (ppt): Salinity (ppt): Conc CTL 100 Intel Temp (2): Salinity (ppt): Salinity (ppt): Conc CTL 100 PH (units) (range: 55-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 55-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 15-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 15-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 15-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 15-8.5) Salinity (ppt): Salinity (ppt):				Time			Review	Initial pH:		
1 12/9/2020 5 00 ML - Initial Temp (2): (5 3 12/11/2020 08/15 N. - Initial Temp (2): (5 mple Pre-Acration Salinity (ppt): Salinity (ppt): Salinity (ppt): Salinity (ppt): mple Pre-Acration France Salinity (ppt): Salinity (ppt): Salinity (ppt): marking acration time Sign (2): Salinity (ppt): Salinity (ppt): Salinity (ppt): Conc CTL 100 Intel Temp (2): Salinity (ppt): Salinity (ppt): Conc CTL 100 PH (units) (range: 55-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 55-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 15-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 15-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 15-8.5) Salinity (ppt): Salinity (ppt): Day 0 Image: 10: 100 PH (units) (range: 15-8.5) Salinity (ppt): Salinity (ppt):					MW/ ST	1		Initial EC (µS/	(cm): 2237	
3 12/11/2020 12/15 12/12 12/12/2020 12/12/					MW	2	TP	Initial DO (m	g/L): 0, 9	
4 12/12/2020 12/12/2020 12/12/2020 12/12/2020 12/12/2020 12/12/2020 10/17/2010				0815	an	24	TP	Initial Temp (C): (3	
Note: *: time when the test was loaded with fish Dimer Acria market on tab adjusted to 6.5 +/- 1 mi/min/L: fier ino 05 hours 1 hour 1.5 hours 2 hours <td></td> <td></td> <td></td> <td>0845</td> <td>AN</td> <td>÷.</td> <td>(IP)</td> <td>Salinity (ppt):</td> <td>3</td>				0845	AN	÷.	(IP)	Salinity (ppt):	3	
Imple Pre-Aeration DD (mg/L) of 10% DD (mg/L) of 10% DD (mg/L) of 10% carcinot itime 0////0.5 0/////0.5 0/////0.5 0/////0.5 startation itime 0/////0.5 0/////0.5 0/////0.5 0/////0.5 conc CTL 100 0/////0.5 0/////0.5 0/////0.5 conc CTL 100 0/////0.5 0/////0.5 0/////0.5 Day 0 0////0.5 0/////0.5 0/////0.5 0/////0.5 0/////0.5 Day 0 0/////0.5 0/////0.5 0/////0.5 0/////0.5 0/////0.5 Day 0 0//////0.5 0//////0.5 0/////0.5 0/////0.5 0/////0.5 Day 0 10 10 0//////0.5 0/////0.5 0//	4	12/12/202	20		RN	1	LC		State 1	
ration rate adjusted to 6.5 +/- 1 mL/min/L. (e) no Shours 1 hour 15 hours 2 hours Shours 1 hour 1 hour 10 hours 10 hours 10 hours 10 hours 10 hours 10 hour 10 hour <td>ample Pre-</td> <td>Aeration</td> <td></td> <td>Note: • ; time v</td> <td>when the test v</td> <td>was loaded with</td> <td>fish 🦷</td> <td>DO in mg/L</td> <td>(70% - 100%</td>	ample Pre-	Aeration		Note: • ; time v	when the test v	was loaded with	fish 🦷	DO in mg/L	(70% - 100%	
aearation time Of Shours 1 hour 1.5 hours 2 hours et ang. + 8 mg/L at 14/c comp(1) of 100% Image: 4.5 0.4 <td>eration rate</td> <td>adjusted to 6.</td> <td>5 +/- 1 mL/min/</td> <td>L:ves/no</td> <td></td> <td></td> <td></td> <td>Committee and the second second second</td> <td>generative exercises</td>	eration rate	adjusted to 6.	5 +/- 1 mL/min/	L:ves/no				Committee and the second second second	generative exercises	
Ormp(1) of 100% Q.Q.Q.Q.A.S Q.L.Q.St St mg/L at 15°C St Chemistry and Biology Conc. CTL 100 Conc. CTL 100 Day 0 D.S.Z.Z.Z.Z.Z.Z.Z.Z.Z.Z.Z.Z.Z.Z.Z.Z.Z.Z.					1 hour	1.5 hours	2 hours			
Is Chemistry and Biology Is Simple, 11:10C "corrected for altitude Conc. CIL 100 Day 0 Conc. CIL 100 Day 0 Conc. CIL CIL <th< td=""><td>O(mg/L) of</td><td>100%</td><td></td><td>aa</td><td>9.7</td><td></td><td></td><td></td><td></td></th<>	O(mg/L) of	100%		aa	9.7					
** Consister and Biology Conc. Temperature (C) (range: 14-16°C) Day 0 Do (mg/L) (70-100% saturation at test temp.) Day 0 Do (mg/L) (70-100% saturation at test temp.) Day 0 Do (mg/L) (70-100% saturation at test temp.) Day 0 Do (mg/L) (70-100% saturation at test temp.) Day 0 Do 10 Day 0 Day 0							-11	_	-	
Conc. CTL 100 pH (units) (range; 5.5-8.5) Day 0 Day 0 Day 0 Day 4 S 3 2 3 DO (mg/L) (70-100% saturation at test temp.) Do (mg/L) (70-100% saturation at test temp.) Do (mg/L) (70-100% saturation at test temp.) Day 0 Do (mg/L) (70-100% saturation at test temp.) Day 0 Day 4 S 4 DO (mg/L) (70-100% saturation at test temp.) Day 0 Do (mg/L) (70-100% saturation at test temp.) Day 1 Day 4 Day 0 Number Alive (In brackets number stressed) Day 2 Day 1 Day 1 Day 1 Day 2 Day 1 Day 2 Day 1 Day 2 Day 1 Day 2 Day 1 Day 2 Day 1 Day 2 Day 2 Day 1 Day 4 Satch 20201109TR Source Smoky Trout Farm Tak # 8 Days Held at 15± 2°C (must be 204 day) Percent stock mortality (Must be 203 g) Weight Range: (g): O (Must be 203 g) O (Must be 200 g) O (Must be 200 g) O (Must be 200 g) O (Must b	est Chemis	try and Biolog	V					and the second se		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $										
$\begin{array}{c c c c c c c c c c c c c c c c c c c $								/		
Day 4 Image: Second secon	Day 0	75	77		pH (units) (r	ange: 5.5-8.5)				
Day 0 US5 2 0 DO (mg/L) (70-100% saturation at test temp.) Day 0 S:8 G. Y DO (mg/L) (70-100% saturation at test temp.) Day 0 S:8 G. Y Image: 14-16°C) Day 1 Image: 14-16°C) Image: 14-16°C) Image: 14-16°C) Day 1 Image: 10 Image: 10 Image: 10 Image: 10 Day 2 Image: 10 Image: 10 Image: 10 Image: 10 Day 3 Image: 10 Image: 10 Image: 10 Image: 10 Image: 10 Day 4 Image: 10 Image: 10 Image: 10 Image: 10 Image: 10 Image: 10 Day 4 Image: 10 Image: 10 Image: 10 Image: 10 Image: 10 <thimage: 10<="" th=""> Image: 10 <thimage< td=""><td>•</td><td>8.3</td><td>8.3</td><td></td><td></td><td></td><td></td><td>1</td><td></td></thimage<></thimage:>	•	8.3	8.3					1		
Day 0 US5 2 0 DO (mg/L) (70-100% saturation at test temp.) Day 0 S:8 G. Y DO (mg/L) (70-100% saturation at test temp.) Day 0 S:8 G. Y Image: 14-16°C) Day 1 Image: 14-16°C) Image: 14-16°C) Image: 14-16°C) Day 1 Image: 10 Image: 10 Image: 10 Image: 10 Day 2 Image: 10 Image: 10 Image: 10 Image: 10 Day 3 Image: 10 Image: 10 Image: 10 Image: 10 Image: 10 Day 4 Image: 10 Image: 10 Image: 10 Image: 10 Image: 10 Image: 10 Day 4 Image: 10 Image: 10 Image: 10 Image: 10 Image: 10 <thimage: 10<="" th=""> Image: 10 <thimage< td=""><td></td><td></td><td></td><td></td><td>F.C.V</td><td></td><td></td><td></td><td></td></thimage<></thimage:>					F.C.V					
Day 4 DO (mg/L) (70-100% saturation at test temp.) Day 0 S.S Q.Y Day 4 Temperature (°C) (range: 14-16°C) Day 0 Number Alive (In brackets number stressed) Day 0 Number Alive (In brackets number stressed) Day 1 Image: Imag	Day 0	UTT	2.00		·EC (I	15/cm)		r	1	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		570	1897							
Day 0 S.8 A. Y Temperature (C) (range: 14-16°C) Day 0 Image: Comparison of the second	,	Leit	11010					1		
Temperature (°C) (range: 14-16°C) Temperature (°C) (range: 14-16°C) Day 0 10 14 1 Day 0 10 10 10 10 Day 1 10 10 10 10 10 Day 2 10 10 10 10 10 10 Day 2 10 10 10 10 10 10 10 10 Day 2 10	Day 0	8.8	TAY	DO (mg/	L) (70-100% s	aturation at tes	t temp.)		17	
Temperature (C) (range: 14-16°C) Day 0 Temperature (C) (range: 14-16°C) Number Alive (In brackets number stressed) Day 0 Day 0 Day 0 Day 0 Day 1 Day 2 Day 2 Day 3 Validity Criteria: must be ≤ 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Test Organism Information Batch 20201109TR Source Smoky Trout Farm Tank # 8 Day 3 Day 4 Source Smoky Trout Farm Tank # 8 Day 4 Day 5 Test Organism Information Batch 20201109TR Source Smoky Trout Farm Tank # 8 Day 5 Day 6 3.2 O.4 Mean Length (cm):		5 1	EC							
Day 0 Number Alive (In brackets number stressed) Number Alive (In brackets number stressed) Day 0 Day 0 Day 1 Day 1 Day 1 Day 1 Day 2 Day 3 Day 4 Validity Criteria: must be \$ 10% mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Trol Organism Data Control Length Weight (g/L): Time of Organism Data Control Length Weight (g/L): Tak # 8 3.2 O.4 Loading Density (g/L): O.3 Source Smoky Trout Farm Tak # 8 3.2 O.4 Length Range (cm): 3.3 Day 4 Source <th colspa<="" td=""><td>Duy 4</td><td>L 0.4</td><td>10.7</td><td></td><td></td><td></td><td>· · · · · · · · · · · · · · · · · · ·</td><td></td><td>k</td></th>	<td>Duy 4</td> <td>L 0.4</td> <td>10.7</td> <td></td> <td></td> <td></td> <td>· · · · · · · · · · · · · · · · · · ·</td> <td></td> <td>k</td>	Duy 4	L 0.4	10.7				· · · · · · · · · · · · · · · · · · ·		k
Number Alive (In brackets number stressed) Number Alive (In brackets number stressed) Day 0 10 10 10 Day 1 10 10 10 10 Day 2 10 10 10 10 10 Day 3 10 10 10 10 10 10 Day 3 10 <th< td=""><td></td><td></td><td></td><td>Те</td><td>mperature ("C</td><td>) (range: 14-16"</td><td>C)</td><td></td><td></td></th<>				Те	mperature ("C) (range: 14-16"	C)			
Number Alive (In brackets number stressed) Number Alive (In brackets number stressed) Day 0 Day 1 Do Do Do Do Do Do Day 2 Colspan="2">Colspan="2">Number Alive (In brackets number stressed) Day 2 Colspan="2">Colspan="2">Colspan="2">Number Alive (In brackets number stressed) Day 2 Colspan="2">Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2">Colspan="2"Cols		15	14							
Day 0 10 10 10 10 Day 1 10 16 16 16 16 Day 2 0 (6 16 16 16 16 Day 2 0 (6 16 16 16 16 16 Day 3 10 16 16 16 16 16 16 16 Day 3 10 10 16 17 16 17 16 17 16 16 16 16 16 16 16 16 16 16 16 17 16 17 16 16 16 16 16 16 16 16 16	Day 4	LIS	IS							
Day 0 10 10 10 10 Day 1 10 16 16 16 16 Day 2 0 (6 16 16 16 16 Day 2 0 (6 16 16 16 16 16 Day 3 10 16 16 16 16 16 16 16 Day 3 10 10 16 17 16 17 16 17 16 16 16 16 16 16 16 16 16 16 16 17 16 17 16 16 16 16 16 16 16 16 16				Numbe	er Alive (In brad	- kets number sti	reccerl			
Day 2 Day 3 Day 4 Test Organism Liferation (Cm) Test Organism Information (Cm) 1 3.3 0.4 1 3.2 0.4 3 2 0.4 4 2 0.5 5 3.2 0.4 6 3.2 0.4 7 3.5 0.5 8 3.2 0.4 9 3.5 0.5 10 Weight (g): 0.5 7 3.5 0.5 8 3.2 0.4 9 3.5 0.5 10 3.5 0.5 Mean Length (cm): 3.3 10 3.2 0.4 Weight Range (cm): 0.5 10 3.5 0.5 10 3.5 0.5 10 3.5 0.5 10 3.5 0.5 10 10 10 10 10 10 10 10 10 10 10 10 10 1	Day 0	10	10	Τ	in the phi ora				ľ	
Day 2 Day 3 Co Co <thco< th=""> <thco< th=""> Co</thco<></thco<>	Day 1	10	16							
Day 3 Day 4 Image: Control state of the state of	Day 2	0								
Day 4 Image: Control Unless otherwise noted, behavior is considered to be normal Test Organism Information ntrol Organism Data Control Length Weight Fish (cm) (g) Test Organism Information 1 3.3 0.4 2 0.4 3 2 3 2 4 3.2 5 3.2 6 3.2 7 3.5 8 3.2 10 3.2 8 3.2 9 3.3 10 3.5 8 3.2 9 3.3 10 3.4 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	Day 3							-	· · · · · · · · · · · · · · · · · · ·	
Validity Criteria: must be $\le 10\%$ mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normalTest Organism Data Control Ength Weight Fish (cm) (g)13.30.4Loading Density (g/L): (must be ≤ 0.5 g/L)0.3Source SourceSmoky Trout Farm23.20.4Mean Length (cm):3.3Days Held at $15\pm 2^{\circ}C$ (must be ≤ 14 days)2433.20.4Length Range (cm):3.2Days Held at $15\pm 2^{\circ}C$ (must be ≥ 14 days)2463.20.4Mean Weight (g): (Must be ≥ 0.3)Percent stock mortality (7 days prior to test, must be $\le 2\%$)18103.20.5Mean ge: (g):0.4-6Test Volume (L)18	Day 4	10								
Test Organism DataControlLengthWeightFish(cm)(g)Data1 3.3 0.4 Loading Density (g/L): 0.3 2 3.2 0.4 Imust be ≤ 0.5 g/L) 0.3 3 2.2 0.4 Imust be ≤ 0.5 g/L) 3.3 4 3.2 0.4 Mean Length (cm): 3.3 5 3.2 0.4 Imust be ≤ 0.5 g/L) 3.3 6 3.2 0.4 Mean Length (cm): 3.2 7 3.5 0.5 Mean Weight (g): 0.5 8 3.2 0.4 Mean Weight (g): 0.5 9 3.2 0.5 Mean Weight (g): $0.4 - 6.5$ 10 3.2 0.5 Mean Weight (g): $0.4 - 6.5$ Weight Range: (g): $0.4 - 6.5$ Test Volume (L)1810 $0.4 - 6.5$ $0.4 - 6.5$ 1.8	,	Validity Crite	eria: must be ≤	10% mortality a	nd/or stressed	behavior in the	e control		1	
Control FishLength (cm)Weight (g)Batch $20201109TR$ 13.30.9Loading Density (g/L): (must be ≤ 0.5 g/L)0.3SourceSmoky Trout Farm23.20.9(must be ≤ 0.5 g/L)Tank #843.20.9Mean Length (cm): Length Range (cm):3.3Days Held at $15\pm 2^{\circ}C$ (must be ≥ 14 days)73.50.5Mean Weight (g): (Must be $\geq 0.3g)$ 0.9Percent stock mortality (7 days prior to test, must be ≤ 236)93.20.9Mean Weight (g): (Must be $\geq 0.3g)$ 0.90.9103.60.90.918		Unless otherv	vise noted, beha	vior is considere	d to be norma	al				
Fish (cm) (g) $Batch$ $20201109TR$ 13.20.4Loading Density (g/L) : (must be $\pm 0.5 g/L)$ 0.3SourceSmoky Trout Farm23.20.4(must be $\pm 0.5 g/L)$ Tank #843.20.4Mean Length (cm): Length Range (cm):3.3Days Held at $15 \pm 2^{\circ}C$ (must be $\pm 14 days)$ 73.50.5Mean Weight (g): (Must be $\pm 0.3g)$ 0.4 - 6993.20.4Mean Weight (g): (Must be $\pm 0.3g)$ 0.4 - 69103.60.50.4 - 618Test Volume (L)18		anism Data					Test Organis	m Information	r	
$\begin{array}{c} 1\\ 1\\ 2\\ 3\\ 3\\ 2\\ 4\\ 3\\ 3\\ 2\\ 3\\ 2\\ 6\\ 3\\ 2\\ 2\\ 0\\ 4\\ 4\\ 3\\ 3\\ 2\\ 0\\ 4\\ 4\\ 3\\ 3\\ 2\\ 0\\ 4\\ 4\\ 3\\ 3\\ 2\\ 0\\ 4\\ 4\\ 3\\ 3\\ 2\\ 0\\ 4\\ 4\\ 3\\ 3\\ 2\\ 0\\ 4\\ 4\\ 3\\ 3\\ 2\\ 0\\ 4\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 6\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 6\\ 6\\ 3\\ 2\\ 0\\ 4\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\ 6\\$		2	Weight							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Fish	(cm)	(g)				Batch	20201109TR	-0	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1	3.2	0.0	l oading Density	v (a/L):	0.3	Source	Smoley Trout	Farm	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				(must be <0.5 a/l)	, (9/ -/.		Jource	Smoky Hout		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		3.2					Tank #	9		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		12		Mean Length (c).	22		0		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				incon Lengui (C		0.0	Dave Hold at	15+ 2°C	70	
7 3.5 0.5 8 3.2 0.4 Mean Weight (g): 0.5 Percent stock mortality 0 9 3.3 0.5 0.5 Must be $\ge 0.3g$ $0.4 - 6.5$ Percent stock mortality 0 10 3.6 0.5 Mean Weight (g): $0.4 - 6.5$ Percent stock mortality 0 10 3.6 0.5 Must be $\ge 0.3g$ $0.4 - 6.5$ Percent stock mortality 18 Imments: 0 Hrs: $N0$ Phrs 0 phr 18 18			1 1 1	Length Pange ((m);	32-21			60	
8 9 10 $3 \cdot 2 \cdot 0 \cdot 4$ 9 10 $3 \cdot 2 \cdot 0 \cdot 4$ $(Must be \ge 0.3g)$ Weight Range: (g): $0 \cdot 4 - 6 \cdot 6$ $0 \cdot 4 - 6 \cdot 6$ Test Volume (L) 18 18		20		rength Kange (citi).	2.(-)./0	(must de ≥14 d	ays)		
9 10 $3 c$ 0.5 (Must be $\pm 0.3g$) Weight Range: (g): 0.4 - 6.5 Test Volume (L) 18 18 18 18 18 18 18 18 18 18		3.3		Moon Mainhe /	-).	65			IC	
10 3 6 6 6 6 100		50			J J.				-	
Weight Range: (g): $0.4 - 0.6$ Test Volume (L) 18 mments: 0 Hrs: No RAT 96 Hrs: No RAT		25		(Must be ≥0.3g)			(7 days prior to t	est, must be ≤2%)		
ments: 0 Hrs: No PAt 96 Hrs: No ppt	10	56	0.4		(-)	0.4-6 6	T			
96 Hrs: No ppt				weight Range:	(g):	UNI U V	Test Volume ((L)	18	
	mments :	0 Hrs: NO	8 pt							
		96 Hrs:	(ALA)							
Reviewed By: Date Reviewed: 1000112		NUS.	opt							
Reviewed By: Date Reviewed: NOULL			Mar 11	1.2				anni	1.1.1	
			Reviewed By:	N			ate Reviewed		14/14	



Daphnia Bench Sheet

Method	DAS20		Client	TEC164		Reference	2021-0	701-01	
Test Log							Sample In	formation	
Day	Date	Time	Technician	Chem. Cart	Daily Dat	a Review	Initial pH:		77
0	2020/12/08	1510	XKISC.	3	51		Initial EC (2230
1	2020/12/ 09	0805	LE	1.00	TP		Initial DO (9.9
2	2020/12/ (0	10400	11	3	P	L	Initial Tem		15
Lab Code	CTLA CTLB	CTLC	100A	1000	1000		Salinity (pp	ot):	-3
Lub couc			100A	100B	100C				
day			pH (uni	its) (range: 6.	0-8.5)				
0	0.3 83	8.2	8.1	8.1	6.1				
2	83 83	187	RM	9.4	8.4				
	The pH of t	he sample was no	ot adjusted prior		unless noted	in the comme	ents below		
0	124 443	NUM	760	EC (uS/cm)	200				
2	YEL UU	902	5190	212	400	_			
	1001971	119-		450	uov				
_			DO (mg/L) (40-100% sat	turation at	test temp	.)		
0	19 79	7-9	8.1	8.1	8.1				
2	79779	1-24	77	29	79		· · · · · · · · · · · · · · · · · · ·		
			Temperatu	re (°C) (range	18.22 0	N N			
0	20 20	170		19	19-22 0	Í			
2	20 20	10	70	20	70				
				Numbe					C**
0	10 I 10	10	10	(I, immo					
1		10	10	10					
2	10 10		10		TO				
	Validity C	riteria: must b	e ≤ 10% mor	tality and/or	abnormal I	pehavior in	the control		
	Notes: Im	ımobile; daph	nid can't swir	m after 60 se	c. even if a	ntenna still	move		
Culture	Unless ot	herwise notec	, behaviour i	s considered	to be nor	mal			
Young jar	DI	lar(s) morta	lity 7 days p	rior to tost (n	aurtho <2	E9/1	61		
l oung jar			ility 7 days pi	nor to test (n	lust be ≤2	5%)			
QA (previo	us month)					Control V	alidity Crite	ria	100
	st brood (≤12 days)	Q					ortality at 4		0'
Average nu	umber of young produc	ed (≥15 youn		27		(must be ≤	10%)		~
Were test t	reatments randomized	on test tray?	(Yes) N	0					
Sample								2.	
	mplo prior to porstion			le constico a	a a utima al (u	100/ 1/			-
	mple prior to aeration	\Y		Is aeration r				Yes or No.	
	f aeration (37.5 +/- 12.5	mL/min/L) :	ZOMin					Yes or No	20
1	mg CaCO₃/L) of 100% :			Is hardness		t required (<25 mg Ca	_O ₃ /L)?	Yes or No
	of sample after adjustme			- 30 mg CaCO) ₃ /L)				
Alkalinity o	f 100% sample (mg Ca0	.O₃/L):	483						
Dilution W	lator		1	DO Lough	40 1009/			6	
	preparation date	211210	() (DO Levels (3.3 to 8.2 m			3.1 to 7.7 r		
	of dilution water (mg/L)	190	⁴¹ .	3.2 to 8.1 m			3.0 to 7.6 r		
				2 2 to 7 0 m				J	
Comments	Observations:	Oh: no pr	or						
		48h: 504	xial pp	7					
			• r						
1	Reviewed By: 🚺		Date	e Reviewed:	7001	2/11			



Daphnia 10°C Bench Sheet

Method	DAS10	Client	TEC164	Referen	ce 2021-0701-01	
Test Las					in the second	
Test Log	Data	The I The Lot		0.1.0.0	Sample Information	
Day	Date	Time Technician	Chem. Cart	Daily Data Review		++
0	2020/12/08	1510 KKISC	3	T	Initial EC (µS/cm):	2250
1	2020/12/05	0815 UF	147	J.	Initial DO (mg/L):	99
2	2020/12/ (0	0910 50	1	YVI	Initial Temp (°C):	(5
	11.0	ener ee		- the	Salinity (ppt):	7
Lab Code	CTLA CTLB	CTLC 100A	100B	100C	Sumity (ppt).	
			1000	1000		
day		pH (uni	its) (range: 6.	0-8.5)		
0	8.3 8.3	8.2 BI	8.1	8.1		· · · · · ·
2	81 87	87 84	0 11	87		· · · · · · · · · · · · · · · · · · ·
	The pH of the	sample was not adjusted prior	to test setting	unless noted in the corr	ments below	·
	the priver the	sample nas nocesjastes prier	EC (uS/cm)	amess noted in the con		
0	UN9 423	400 7180	290	2100		
2	ULE UED	01-100	540	120		
-	4014541	731100	2190	630		
		DO (mg/L) (4	40-100% sat	uration at test ter	np.)	
0	9.0 9.0	9.10 9.6	9.6	9.6		
2	9.4 9.4	9.9 94	94	9.4		
				1 1		
0		Temperatu	ire (°C) (rang	e: 8-12 °C)	- r r r	
0			11			
2	22	12 12	12	12		
			1 25			
			Numbe			
-	· · · · · · · · · · · · · · · · · · ·		(I, immo	bile)		
0	10 10	10 10	10	10		
1	10 ID	10 10	10	10		
2	10 10	10 10	IP	10		
	Validity Crit	eria: must be ≤ 10% mor	tality and/or	abnormal behavior	in the control	
	Notes: Imm	obile; daphnid can't swi	m after 60 se	ec. even if antenna :	still move	
	Unless othe	rwise noted, behaviour	is considered	l to be normal		
Culture					mia	
Young jar	_ CZ	Jar(s) mortality 7 days p	rior to test (r	nust be ≤25%)		
	0.14723					
	ous month)	ID			l Validity Criteria	0.1
Days to fire	st brood (≤12 days)	Ð		Mean %	6 mortality at 48 hours -	\mathcal{O}
Average n	umber of young produced	(≥15 young)	30	(must b	e ≤10%)	
	treatments randomized or		0	(
60505 5550						
Sample					0	
DO % of sa	ample prior to aeration:	112	Is aeration r	equired (<40% or >	> 100%)? (Yes or No	
1	-			•		-
	f aeration (37.5 +/- 12.5 n					-
Hardness (mg CaCO ₃ /L) of 100% :	1285	Is hardness	adjustment require	d (<25 mg CaCO ₃ /L)?	Yes or No
Hardness o	of sample after adjustmen	t (must be between 25	- 30 mg CaC	O3/L)		
CONTRACTOR AND ADDRESS	of 100% sample (mg CaCC	1		1897 - 18		
in anning c			-			
Dilution V	Vater		DO Levels (40-100% saturatio	on) - corrected for altitud	P -
1	preparation date	2112101	4.1 to 10.3 n		3.8 to 9.6 mg/L at 11°	
		c. rejor				
	of dilution water (mg/L)	190	4.0 to 10.0 n		3.7 to 9.4 mg/L at 12°	د
Comment	s/Observations: 🕐 സ	na pot	3.9 to 9.8 m	g/L at 10°C		
Comment						
	Yoh	rino ppt		See Day		
	Reviewed By: 1k	Date	e Reviewed:	200/2/1	И	

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Daphnia Antiscalant Bench Sheet

Method	DAS AS	Client	TEC164	R	Reference	2021-0	0701-02	
Test Log						Sample In	formation	
Day	Date	Time Techniciar	Chem. Cart	Daily Data	Review	Initial pH:		77
0	2020/12/08	INTE KERSE	3	ST	0	Initial EC (uS/cm): 🦳	2230
1	2020/12/09	OSOS LF		ar		Initial DO (gg
			1		111	Initial Tem		12
2	2020/12/ 6	0400 X	<u> </u>		1L	1127.5 AVE 113	10 C C C C C C C C C C C C C C C C C C C	21
						Salinity (pp	эц).	5
Lab Code	CTLA CTLB	CTLC 100A	100B	100C				
day		pH (u	nits) (range:	5.0-8.5)				
0	83 83	8.3 P.1	18.1	8.1		()		
2	Q. 97	RA RY	RU	RU				
	The pH of the	sample was not adjusted p	prior to test sett	ing, unless noted	d in the com	ments below	··	
	the pir of the		EC (uS/cm)	g, chiefe jiere	C0			
•	1120 1100	2160	LC (us/cin)	0.00		r	r T	1
0	457 459	440 atto	pula	10				
2	446 440	457 716	127.00	1100				
		110 0.00						
		DO (mg/L	.) (40-100% :	saturation a	t test ten	ıp.)		1
0	7979	79 81	1.3	8-1				
2	79 75	10 79	29	29				
		- pp col	P (L. D.				
		Temperati	ure (°C) (rang	e: 18-22 °C)				
0	20 20	201 10	10	TICI				
2	40 60	100 17	1	70				
2	6 0	10 10	10	10		(· · · · · · · · · · · · · · · · · · ·	
				er Alive				
		· · · · · · · · · · · · · · · · · · ·	(I, imn	nobile)				
0	10 10	10 10	10	10				
1	10 (0	10 10	10	10				
2			10	10				
<u> </u>	Validity Cr	iteria: must be ≤ 10% π	ortality and	or abnormal	behavior i	n the contro		
	Validity Ch	nobile; daphnid can't	initiancy and/	cos over if	antonna (till move		
	Notes: Infr	nobile, dapriniu carre	swift after of	J Sec. even II	antenna : 	sun move		
	Unless oth	erwise noted, behavio	our is conside	red to be no	mai			
Culture	1921					2	1	
Young jar	0	Jar(s) mortality 7 day	s prior to tes	it (must be ≤	25%)	0		
								2577 11
QA (previo	ous month)	-		(Control V	alidity Cri	teria	6.1
	rst brood (≤12 days)	0			Mean % n	nortality at	48 hours -	0.
	umber of young produce	d(>15 voung)	30		(must be	≤10%) [°]	23	
	treatments randomized		No	-	`	,		
were test	treatments fandomized		NO					
Sample							0	0
DO % of s	ample prior to aeration:	112	Is aeration	required (<4	40% or >1	00%)? (Yes or No	
							Voc or No	N
	of aeration (37.5 +/- 12.5		Mentered wi	un ribum scr	een phor	to testing	Tes of No)
Hardness	(mg CaCO ₃ /L) of 100% :	1205	Is hardnes	s adjustment	required	(<25 mg C	aCO ₃ /L)?	Yes or No
Hardnore	of sample after adjustme	ant (must be between	25 - 30 mg i		<u> </u>			
						-		
Alkalinity	of 100% sample (mg CaO	10 ₃ /L): 48	2					
Dilution V	Water		Antiscala	nt				
Pail label	/ preparation date	2-12101	Final Conc	entration in S	Sample:	20	Male	144
	of dilution water (mg/L)	enerol	Volume of			Volume c	of antiscalant:	15BUL
rialuness	of unution water (mg/L)	FIU	Volume of	sumple.	um			- augu
				(10 1000/ -) correct	ad for altitude	
-			- 1 2 C 17 C 1 C 1				ed for altitude	
Comment	ts/Observations: 🗥 🦄	noddt		mg/L at 18°C			mg/L at 21°C	
				mg/L at 19°C		3.0 to 7.6	mg/L at 22°C	-
	YON	TNOPPT	3.2 to 7.9	mg/L at 20°C	-			
	~			0	hold	1		
	Reviewed By:	נח	ate Reviewed	: TADD	lulu	1		
					and the second second			



APPENDIX C – Chain-of-custody form

For Emergency <1 Day, A5	Priority (2-3	SERVICE REQUEST (rush - subject to availability)		BC1: degrees C	ADDITIONAL COMMENTS/SPECIAL					NSN NSN	F2_BPO_WS_2020-12-07_N-SRF-AS - 02	NO	12_BPO_WS_2020-12-07_N-SRF -OI		Sample ID 2021-01-	I milior man	and constin	Nos Mat and a second	Sx101 inchase. Ex 12 both	Monitovilin		2020/12/08	T IOTO CALLER TO A CONTRACT OF	Phone Number	2							City		Address	Email	Project Manager	Facility Name / Joh# F7 SRF		leck
Emergency (1 Business Day) - 100% surcharge For Emergency <1 Day, ASAP or Weekend - Contact ALS	Regular (default) X Priority (2-3 business days) - 50% surcharge	ject to availability)	s C	S C	IAL INSTRUCTIONS						F2_BPO		F2_BPO	(ap)					Her				SAMPLE DETAIL	050 405 6170	1000000							Sparwood		RRI	and the set of the set	Project Manager Group 1: BRETT MASON	# F7 SRF	CUCID:))))) ()
ALS	ault) X large										WS		WS	×		rdo	us M	ater	ial (Y	es/N	0)	100	2															P2 Week	
Sampler's Signature	Sampler's Name			cle !	MELINQUIS						2020/12/07		2020/12/07	+						03/14		-		Country								Province					S 10, 11 515	Weekly 1 0X 07 2020	
nature	Vame	IT SI STU		Ulicko	HED BY/AFF						7 8:56		8:55		Time		-							Canada								BC						2020	
				21-15	BY/AFFILIATION				_	-	ଦ		G J	p Co		G=Grab							Phone Number	Postal (Ad	Email Email	I ah Co	I ah	TURNAR	
				12	DA	ns)	2						12 2	Cont. 48 Co	hr Da	phn	NALA: ia Ma	gna S	Single		aw) (141	11.2	nber 403-253-7121	Postal Code T2H 2K1			_					City Calgary	11000 h - 0	Address #4 6125 12		ntact	Inne Marti	TURNAROUND TIME:	
					DATE/TIME								2	20 48)	C hr Dag incent	phn	ia Ma	gna S				AN		1										#4.6125.12 Street SE	(a)mintilmeanui	ah Contact	LABORATORY	-	
					ACC						-			Co		ratio			Single 'oxicity			ANALYSIS REQUESTED		Country								Province		ronmentat.ca	ronmontal co	аі - вс	Y DO		
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me	#				ACCEPTED BY/AEFILIATION					2200	1020		2007						Single y 15C				PO number		Email 13:	Email 12:	Email 11.	Email 9:	Email 8:	Email 7:	Email 6:	Email 5:	Email 4:	Email 2:	Email I:	Report Fo			
																						Villered - W.F			teckcoal@equisonline.com				Kennedy Allen@teck.com	Marty.Hafke@teck.com	teckcoal@equisonline.com	Samintha Usher Pteck.com	Jocelyn. Traverse@teck.com	Annie Larrivee @teck.com	H20.lab.results@teck.com	Report Format / Distribution	OTHER INFO	RUSH:	
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END OF REPORT



Acute Toxicity Test Results

Samples collected December 14, 2020

Final Report

December 26, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC



SAMPLE INFORMATION

				Dates		
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation ¹	<i>Daphnia magna</i> 10°C test initiation	Daphnia magna 20°C test initiation	Daphnia magna antiscalant test initiation
F2_BPO_WG_2020- 12-14_N-SRF/	14-Dec-20 at 0905h	15-Dec-20 at 0930h	17-Dec-20 at 1555h	16-Dec-20 at 1330h	16-Dec-20 at 1350h	-
2021-0756-01						
F2_BPO_WG_2020- 12-14_N-SRF-AS/	14-Dec-20	15-Dec-20	_	-	_	16-Dec-20 at
2021-0756-02	at 0906h	at 0930h				1405h

¹According to information provided by Nautilus Environmental (Burnaby, BC)

Sample chemistry

Sample ID	Receipt temperature	Hardness (mg/L CaCO3)	Alkalinity (mg/L CaCO3)
F2_BPO_WG_2020- 12-14_N-SRF	2.7°C	1468	481
F2_BPO_WG_2020- 12-14_N-SRF-AS	4.6°C	1468	481

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test
- Daphnia magna 48-h single concentration screening test (conducted at 10°C)
- *Daphnia magna* 48-h single concentration screening test (conducted with 20 mg/L antiscalant)



RESULTS

Toxicity test results

	Per	cent survival ir	n 100% (v/v) samp	le
Sample ID	Rainbow trout ¹	Daphnia magna 10°C	Daphnia magna 20°C	Daphnia magna antiscalant
F2_BPO_WG_2020-12-14_N-SRF	100	100	100	-
F2_BPO_WG_2020-12-14_N-SRF-AS	-	-	-	100

¹According to information provided by Nautilus Environmental (Burnaby, BC)

	Percent Immobility in 100 (% v/v)								
Sample ID	Daphnia magna 10°C	Daphnia magna 20°C	Daphnia magna antiscalant						
F2_BPO_WG_2020-12-14_N-SRF	0	0	-						
F2_BPO_WG_2020-12-14_N-SRF-AS	-	-	0						

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
F2_BPO_WG_2020-12-14_N-SRF	Rainbow trout ¹	Precipitate observed on the bottom of test vessel	None
12_br0_w0_2020-12-14_14-51(1	Daphnia magna	Precipitate observed on the surface of 20 degree test	None
F2_BPO_WG_2020-12-14_N-SRF-AS	Daphnia magna	None	None

¹According to information provided by Nautilus Environmental (Burnaby, BC)



QA/QC

QA/QC summary	Rainbow trout ³	Daphnia magna
Reference toxicant LC50 (95% CL)	98.4 (71.9-141.6) μg/L Zn¹	6.9 (6.6-7.2) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	79.9 (29.5-211.0) μg/L Zn	6.2 (5.4-7.1) g/L NaCl
Reference toxicant CV	52%	4.5%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date December 17, 2020; ² Test Date December 7, 2020; ³According to information provided by Nautilus Environmental (Burnaby, BC)

LC = Lethal Concentration; CL = Confidence Limit



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Report By: Courtney Bogstie, BSc Senior Biologist

Reviewed By: Kayla Knol, BSc Senior Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	20-L glass aquarium
Test volume	10 to 20 L (depending on size of fish)
Test solution depth	≥15 cm
Test concentrations	100% (undiluted) sample, 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℃
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; salinity measured in the undiluted sample at test initiation; conductivity measured at test initiation and termination; survival checked daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Test endpoint	Survival
Test acceptability criterion for controls	Survival ≥90%
Reference toxicant	Zinc (added as ZnSO4)

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

¹According to information provided by Nautilus Environmental (Burnaby, BC)



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Control/dilution water for antiscalant test	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 μg/L), Na ₂ SeO ₄ (2 μg Se/L) and 20 mg/L antiscalant
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



-	
Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 µg/L) and Na₂SeO₄ (2 µg Se/L)
Test solution renewal	None
Test temperature	10 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 3.Summary of test conditions: 48-h Daphnia magna survival test at 10°C.



APPENDIX B – Toxicity test data

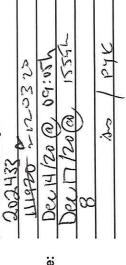
	Rainbow Trout S	summary Sheet
		_
Client:	Neudilus Environmental Cal	gonyStart Date/Time: Devit120@ 15:55h
Work Order No .:	202433	Test Species: <u>Oncorhynchus mykiss</u>
Sample Informatio	n:	Test Validity Criteria: ≥ 90% control survival
Sample ID: Sample Date: Date Received: Sample Volume: Other:	2021-0756-0[December 14 2020 December 16, 2020 IXZOL	WQ Ranges: T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5
Dilution Water:		
Type: Hardness (mg/L Ca Alkalinity (mg/L Ca0		p Water
Test Organism Info	ormation:	9 10
Batch No.: Source: No. Fish/Volume (L Loading Density (g/ Mean Length ± SD Mean Weight ± SD	L): 0.26 (mm): 34 ± 2	
Zinc Reference To	xicant Results:	
Reference Toxicant Stock Solution ID: Date Initiated: 96-h LC50 (95% Cl	202003 December 17, 2020	5 1.6) Lg/L Zn
Reference Toxican Reference Toxican	t Mean and Historical Range:	79.9 (29.5 - 211.0) Mg/L ZN
Test Results:	0% Martality at 9	6h in the 100% (VIV) undiluted sample.
Reviewed by:	<u>UU</u>	Date reviewed: Dec 21, 2020
Version 1.4; Issued May 29, 2	2015.	Nautilus Environmental Company Inc.

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96-Hour Rainbow Trout Toxicity Test Data Sheet

Date Collected/Time: Sample Setup By: Date Setup/Time: Client/Project#: RBT Batch #: Sample I.D. W.O.# CER #:



ζ (Cond./Salinity meter/probe: _ 2 D.O. meter/probe: 2 pH meter/probe: 1/1 Thermometer: (212)

2

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Calgary			,	
		120:00	15251	DYC
whiles Environmented		56	1200) est
Hilus F	202432	- 025 HIV	100	
New	202	٦ď	ð	7

Total Pre-aeration Time (mins): Number Fish/Volume: 7-d % Mortality: Ae



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mL/min/L? (Y/N)
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	Undiluted 3	Jndiluted Sample WQ	
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	Jul	0	いそう
D.O. (mg/L)	トス		914
Hd	22	/	713
Cond. (µS/cm)	2320	/	2
Salinity (ppt)	1.2		$l_i \mathcal{L}$

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Concentration			#	# Survivors	ors			Ē	Temperature (°C)	rature	()°) e		Disso	Dissolved Oxygen (mg/L)	Dxyge	n (mg	(T)		0	Hd		Cond (µS	Conductivity (µS/cm)
 10 16 10 14, 145 15.0 150 15, 0 15, 0 12, 0 1, 12, 12, 12, 12, 12, 12, 12, 12, 12,	(// %)	-	2	4	24	48	72	96	•	-	48	72	96	-						-		\square		96
10 10 10 115 145 15.0 150 914 9.9 9.8 9.6 0 6 73 9.4 8.2 6.1 2350 10 10 10 115 145 15.0 150 914 9.9 9.8 9.6 12 2350 10 10 10 10 115 145 15.0 150 974 9.7 9.7 176 146 20 125 10 10 10 10 10 10 10 10 10 10 10 10 10 1	レンナ				0	0	10		0141	16%	14.5	0.2	Clei	10:01	2.8	9.79	5 5	4		6 7	1 7.	ور		24
And HEC a 22 martine HEC a Por HEC a	00				Q	01	0		N'E	12/	14.5	5.0	13.0	346	7.9 6	2.8 9	5 3	6	138	5	8 4	5 21	2350	2200
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ations: presignable, observed a dr and bothon of fait	Description	n at 9	19 H		¥	the	Į	6 al	Serd	080	-	(, lut	1	1	age.	N	Num	ber o	f Stre	ssed	-ish a	t 96 h		a
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	ewed by:					-11	- \			2		2				ä	ate R	eview	ed:		Dee	12.	NERC	

Version 2.5; Issued July 19, 2017

Nautilus Environmental Company Inc.

Client: <u>North</u> Sample ID: <u>2021</u> W.O. #: <u>202</u>	-0756 -01	Balance ID: <u>Bal - 2</u> Date Measured <u>AHHAD</u> Dec 21/20 Batch #: HHAD 120320
	Length (mm)	Weight (g)
	1 32	6.31
	2 37	0.34
	3 36	0.32
	4 33	0.30
	5 34	6.30
	6 35	0.34
	7 33	0.26
	8 <u>3</u> '4	6.31
	9 <u>38</u>	0.38
	10 33	0-22
	Total <u>345</u>	3.08
	Mean <u>34</u>	0.31
	Std. Dev	0.04
	Low 32	0.22_
	High <u>38</u>	0.38
	Loading Density (g/L)	26
	Initials	2
Reviewed by:	Date R	Reviewed: Dec-21, 2020

Rainbow trout (Oncorhynchus mykiss) Length and Weight Sheet

Version 1.3 Issued March 11, 2020

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Daphnia Bench Sheet

Method	DAS-20			Client	TEC 164	0	Reference	2021-0	756-01	
Test Log								Sample In	formation	
Day	D:	ate	Time	Technician	Chem. Cart	Daily Dat	a Review	Initial pH:		.73
0	2020/		1350	LEIMW	3	Duly Du	In neview	Initial EC (IS/cm)·	2260
1				LEIMAN	5		0	Initial DO (2000
	2020/		0840	111			r			13
2	2020/	12/18	Dars	NW	3	Ah	/	Initial Tem		
						1		Salinity (pp	ot):	4
Lab Code	CTL A	CTL B	CTL C	100 A	100 B	100 C				
day				pH (uni	ts) (range: 6	.0-8.5)				
0	8.4	8.4	8.3	7.5	7.5	1.5				
2	8.3	8.7	8.2	8.4	8.4	8.4				
		The pH of the	sample was no	ot adjusted prior	to test setting, EC (uS/cm)	unless noted	in the comme	ents below		
0	120		121	2700	all the state of the later of the later of the	2200	T			
0	439	441	436	2290	2180	2200				
2	449	445	450	2100	2210	2100	I		ļ I	
				DO (mg/L) (4	40-100% sa	turation at	t test temp	.)		
0	8.1	8.1	8.1	8.1	80	8.1	1	ľ –		
2		7.7	22	7.8	21	0.1				·
2	1.1	1.1		1.0	1.1	1.1				
				Temperatu	re (°C) (rang	a 18-22 °C	7			
0		19					í –		1 1	- 1
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2	10	20	20	20	ro	20				
					Nivenin					
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-					(l, immo					
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1	<u> </u>	, 10	10	10	10	10		10		
2	10	6	10	0	D	10		Q		
				e ≤ 10% mor						
				nid can't swir				move		
		Unless oth	erwise noted	d, behaviour i	s considered	l to be nor	ma			
Culture								1		
Young jar	c2		Jar(s) morta	ality 7 days pi	rior to test (r	must be ≤2	:5%)	5/		
							C		!-	
QA (previo			8					alidity Crit		-
	st brood (≤12				20			nortality at 4	48 nours - _a	0
	umber of you				35	S	(must be ⊴	≦10%)		
Were test t	reatments ra	ndomized o	n test tray?	(Yes) N	0					
c				\smile						
Sample			10	1	. 1/2	20 - 402	71/240	000() 0		
DO % of sa	ample prior to	aeration:		00/	Is aeration				Yes or No	
Duration o	f aeration (37	.5 +/- 12.5	mL/min/L)	-	Filtered wit	h 110um so	reen prior	to testing	Yes or No	$) \sim$
	mg CaCO₃/L)		1468		ls hardness					Yes or No
	-			- h - turn			Cardinate C		- 15	\bigcirc
110-111 AV	of sample afte	-			- su mg cac	U ₃ /L)		-0		
Alkalinity o	of 100% samp	le (mg CaC(⊃₃/L):	481						
					6 					
Dilution W	/ater				DO Levels	(40-100%	saturation	- corrected	d for altitud	le -
Pail label /	preparation of	date	2:12/00	1	3.3 to 8.2 m	ng/L at 18°	С	3.1 to 7.7	mg/L at 21°	°C
	of dilution wat		576	-	3.2 to 8.1 m	ng/L at 19°	С	3.0 to 7.6	mg/L at 22	°C
		·		-	3.2 to 7.9 m				÷	
Commente	s/Observatio	ns:								
	0 Hre	noppt								
	/R Lires	or she	ht Surf	Enclas AA	4					
L	40 1115.	0.000	in Jun	terrot bb				1 - 1		
	Reviewed By:		R	Dat	e Reviewed:	20	20/17	2		
	neviewed by.		ヤー	-	e nerieweu.			<u> </u>		



Daphnia 10°C Bench Sheet

Method	DAS-10	Clie	ent	TEC 164	8	Reference	2021-0756	5-01	
Test Log							Sample In	formation	
Day	Date	Time Te	chnician	Chem. Cart	Daily Dat	a Poviow	Initial pH:	Tormation	
0	2020/12/16				Daily Dat	a Review		(C (ana))	(.)
1			FIMM	3	51		Initial EC (2260
-	2020/12/17		1F	-	TP	_	Initial DO		8.5
2	2020/12/18	1016 1	M	5	AL	1	Initial Tem		13
		1			· · ·	•	Salinity (pp	ot):	4
Lab Code	CTLA CTLB	CTL C	100 A	100 B	100 C		i i		
day			nH (uni	ts) (range: 6.	0-8.5)				
0	83 931	82					1		
2	22 02	01	1.4	7.4	7.4				
2	8.3 8.5	8.5	8.4	8.5	8.5				
	The pH of the	sample was not adj	justed prior	-	unless noted	in the comme	nts below		
				EC (uS/cm)					i
0	443 436	439 2	280	2140	2260				
2	476 472	45 2	180	2200	2170				
0	9.6 9.6	9 ()	(mg/L) (4	10-100% sat	turation at	test temp	.)		
2	9.5 97	95	ar	al	9.6				
		10		4.6	11.6				
		Te	mneratu	re (°C) (rang	e: 8-12 °C)				
0		NI I	11						
2			1						
2			11	1					
				Numbe (I, immo					
0	10 10	10	10	10					
1	21				10		·		
2		10	0	10	10				
2		10	10	10	0				
		eria: must be ≤							
		obile; daphnid					l move		
la constante	Unless othe	rwise noted, be	ehaviour i	s considered	d to be nori	mal			
Culture							- 1		
Young jar	<u>DI</u>	lar(s) mortality	7 days pr	rior to test (r	must be ≤2	5%)	0/.		
QA (previo	us month)	_				Control V a	alidity Crite	eria	-
Days to firs	t brood (≤12 days)	8					ortality at 4		$\left(\right)$
Average nu	Imber of young produced	(≥15 young)		79		(must be ≤			
Were test t	reatments randomized or	test tray?	Yes N			(11001001	10,0)		
		(Cottruy)		0					
Sample									
	mple prior to aeration:	100		ls poration r	oquirod / </td <td>10% or > 10</td> <td>10% 12</td> <td>Yes or No</td> <td>3</td>	10% or > 10	10% 12	Yes or No	3
	-			Is aeration r	-			X	d
Duration of	aeration (37.5 +/- 12.5 m	1L/min/L) :		Filtered with	n 110um sci	reen prior t	o testing	Yes or No	
Hardness (r	ng CaCO ₃ /L) of 100% :	1468		Is hardness	adjustment	required (<25 mg Ca	CO ₃ /L)?	Yes or No
	f sample after adjustment						J	• 150	
1.2				- 30 mg Cac	.U ₃ /L)				
Alkalinity of	f 100% sample (mg CaCO	₃/L):	181						
Dilution W				DO Levels (
Pail label /	preparation date	2.12/09		4.1 to 10.3 г	ng/L at 8°C		3.8 to 9.6 r	ng/L at 11'	°C
Hardness o	f dilution water (mg/L) 🦷	226		4.0 to 10.0 r	ng/L at 9°C		3.7 to 9.4 r	ng/L at 12°	°C
				3.9 to 9.8 m				J	
Comments	/Observations:		1	2.5 to 5.6 m	3/ = 01 10 C				
	O Hrs: NO PPt								
(P	48 Hrs: No p()	2.4	D-+-	Denviewert	-	aluala			
10 10	Reviewed By:		Date	Reviewed:	200	-011212	1		



Daphnia Antiscalant Bench Sheet

Method	DAS-AS			Client	TEC 164	5	Reference	2021-	0756-02	
Tost Log								Sample In	formation	
Test Log	[Data		70	IT a stratistic	Cham Cast		n n a da		ormation	
Day	Date		Time		Chem, Cart	Daily Dat	ta Review	Initial pH:	<i></i>	7.3
0	2020/12/		1405	LEIML	3	4	T	Initial EC (2260
1	2020/12/	'17	0835	LE		TP .		Initial DO	(mg/L):	2.8
2	2020/12/	'18	0955	Ma	3	Alal		Initial Tem	ip (°C):	13
			2.62			100		Salinity (p		4
Lab Code	CTLA	CTLB	CTLC	100A	100B	100C				
day				ioH (ur	nits) (range: 6	5.0-8.5)				
-	021	01	0 4	pir (ui		5.0-0.5)	r	<u></u>		
0	8.0	8.4	0.4	1.8	1.6	1.0		·		
2	8.5	8.2	0.3	1 8.4	8.4	8.5				
	The	e pH of the	sample was r	not adjusted p	rior to test setti	ng, unless no	ted in the con	nments below		
0	140	120	651	TATEN	EC (uS/cm)			1	r	
0	442	438	436	2180	2250	2250				
2	447 1	143	447	2260	2060	2180	·			
				DO (mg/L)	(40-100% s		at test ten	ו . קר		
0	8.1	8.1	8-1	8.2	8.2	8.2				
2	7.8 7	.8	7.8	7.8	78	7.8				
				Temperatu	re (°C) (rang	e: 18-22 °C)			
0	19	19	19	18	18	18				
2	20	to	20	20	40	20	<u> </u>			
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					Numbe	n Alivo				
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0	10	10	10	10	10	10				
1	01	10	10	10	10	10				
2	6	10	10	10	10	10				
	Va	lidity Crit	eria: must b	be ≤ 10% mo	ortality and/o	or abnormal	l behavior in	n the contro	4	
	No	otes: Imm	iobile; dapł	nnid can't sv	wim after 60	sec. even i	if antenna s	till move		
	Ur	iless othe	erwise note	d, behaviou	ur is consider	red to be n	ormal			
Culture	Lange 1							-1		
Young jar	C3		Jar(s) mort	ality 7 days	prior to test	: (must be :	≤25%)	0/-		
									÷2	
QA (previo	us month)	_		1			Control V	alidity Crit	eria	1
Days to firs	t brood (≤12 da	IVS) 8	s-ot	- LF				nortality at		
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					No		(must be s	210707		
were test t	reatments rando	omized of	n test tray?	(reg /	NO					
Samala										
Sample									0	
DO % of sa	imple prior to ae	eration:	10	0	Is aeration i	required (<	40% or >1	00%)?	Yes or No	í l
Duration of	f aeration (37.5 -	+/- 12 5 r			Filtered with	h 110um co	reen prior	to testing	Yes or No	
			10							N 0
	mg CaCO₃/L) of		1468	- 2	Is hardness		t required	<25 mg Ca	1CO3/L)?	Yes or No
Hardness o	of sample after a	djustmen	it (must be	e between 2	25 - 30 ma C	aCO ₃ /L)	-			
	, f 100% sample (485	5 -	J. 1	-			
		ing cace	J3/L).	401						
Dilution W	/ater				Antiscalan	t				
	preparation date	0	11010	1.0	Final Conce		Samplet	28	mg/L	
			2.1410							Ibaul
l aroness o	of dilution water	(mg/L)	ma	2	Volume of s	sample:	500m	volume o	f antiscalant:	DEML
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	s/Observations:	0			3.3 to 8.2 m	<u> </u>			mg/L at 21°C	
0 Hrs ho	St				3.2 to 8.1 m			3.0 to 7.6	mg/L at 22°C	:
48 Hrs:	NO ROT				3.2 to 7.9 m	ng/L at 20°0	C			
4			0				1.41.	5		
F	Reviewed By:		CB	Date	e Reviewed:	202	0/12/2	1		



APPENDIX C – Chain-of-custody form

PROJECT/C	PROJECT/CLIENT INFO	T. T. W.CONIY		0707		LAB	LABORATORY	TORY			OTHE	OTHER INFO	
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Page



END OF REPORT



Acute Toxicity Test Results

Sample collected October 7, 2020

Final Report

October 26, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

	Dates				
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> test initiation	
WL_BFWB_OUT_SP21_2020-10-07_N/ 2021-0278	7-Oct-20 at 0900h	8-Oct-20 at 0930h	9-Oct-20 at 1620h	8-Oct-20 at 1520h	

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-10-07_N	10.3°C	987	272

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID —	Percent survival in	100% (v/v) sample
	Rainbow trout	Daphnia magna
WL_BFWB_OUT_SP21_2020-10-07_N	100	100

Sample ID ——	Percent Immobility in 100 (% v/v)
Sample 18	Daphnia magna
WL_BFWB_OUT_SP21_2020-10-07_N	0



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-10-07_N	Rainbow trout	Precipitate observed on the bottom of test vessel	None
	Daphnia magna	Surficial precipitate observed	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.2 (3.0-3.5) g/L KCl ¹	6.7 (6.4-6.9) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.6-4.6) g/L KCl	6.0 (5.1-7.0) g/L NaCl
Reference toxicant CV	9.6%	5.4%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, October 5, 2020; ² Test Date October 12, 2020

LC = Lethal Concentration; CL = Confidence Limit



that Cell.

Report By: Shae Cole, BSc Biologist

Reviewed By: Kayla Knol, BSc Senior Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data



Trout Bench Sheet

Test Log Sample Information Day Date Time Initial Chem. Cat Daily Date 1 2020/10/09 Law Sample for Amation Initial D (mg/L): Alternation 2 2020/10/11 Ches. Am Initial D (mg/L): Alternation Initial D (mg/L): Alternation 3 2020/10/11 Ches. Am Initial D (mg/L): Alternation Initial D (mg/L): Alternation Sample for Amation Note: *; lime when the test was loaded with faith Initial D (mg/L): Alternation Initial D (mg/L): Alternation Sample for Amation OS hours: 1 hour: 15 hours: 1 hour: 15 hours: Initial D (mg/L): Alternation Sample for Amation OS hours: 1 hour: 15 hours: Initial D (mg/L): Alternation Initial D (mg/L): Alternation Sample for Amation OS hours: 1 hour: 15 hours: Initial D (mg/L): Alternation Sample for Amation OS hours: 1 hour: 15 hours: Initial D (mg/L): Alternation Sample for Amation OS hours: 1 hour: 15 hours: Initial E (mg/C): Initial E (mg/C): Day 0	Method	TRSClient	TEC164	Reference	2021-0278		Chamber	5
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0 22020/10/0 04/2 C/L 1 C/L Initial EC (strigging) [2-17] 2 2020/10/13 C/L A/E	Day	Date	Time	Initial	Chem. Cart	· ·	Initial pH	72
1 2020/10/10 03/4/5 MMP - Avr Initial Tem p (C): 10/5 3 2020/10/12 05/10/5 MV - MAP - Avr 4 2020/10/12 05/10/5 MV - MAP - MAP 5ample Pre-Aeration Aeration rate adjusted to 65 + /- 1 mL/min/L: (Exhoo 2 hours 1 hour 15 hours 2 hours 5 mg/L: 670% - 510% Presention time 00/13 0.13 1 hour 15 hours 2 hours 5 mg/L: 680 mg/L: 690 mg/L: 70% - 700% Sample Pre-Aeration Conc CTL 100 1 hour 15 hours 2 hours 5 mg/L: 68 mg/L: 81 mg/L: 82 mg/L: 81 mg/L: 81 mg/L: 81 mg/L: 82 mg/L: 81 mg/L						(B		
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Day 4 Validity Criteria: must be $\leq 10\%$ mortality and/or stressed behavior in the control Unless otherwise noted, behavior is considered to be normal Control Organism Data Control Length Weight Fish (cm) (g) Loading Density (g/L): 0.2 Source Troutlodge Tank # 8 Mean Length (cm): 3.3 4 3.4 4 5 6 7 8 9 10 10 10 10 10 10 10 10 10 10	Day 3	10 10						
Unless otherwise noted, behavior is considered to be normal Control Organism Data Control Length Weight Fish (cm) (g) 1 2 3 4 5 6 7 8 9 10 Control Length Weight (cm) (g) Loading Density (g/L): (must be s0.5 g/L) Mean Length (cm): Control Control Length Range (cm): Control Control Length Weight (must be s0.5 g/L) Mean Length (cm): Control Control Length Range (cm): Control Control Length Range (cm): Control Control Length Range (cm): Control Control Length Range (cm): Control Control Length (g): Control Length Range: (g): Control Length Range: (g): Control Control Length (cm): Control Control	Day 4					1		
Unless otherwise noted, behavior is considered to be normal Control Organism Data Control Length Weight Fish (cm) (g) 1 2 3 4 5 6 7 8 9 10 Control Length Weight (cm) (g) Loading Density (g/L): (must be s0.5 g/L) Mean Length (cm): Control Control Length Range (cm): Control Control Length Weight (must be s0.5 g/L) Mean Length (cm): Control Control Length Range (cm): Control Control Length Range (cm): Control Control Length Range (cm): Control Control Length Range (cm): Control Control Length (g): Control Length Range: (g): Control Length Range: (g): Control Control Length (cm): Control Control		Validity Criteria: must be :	10% mortality a	nd/or stressed	behavior in th	e control		
Control Length Weight Fish (cm) (g) 1 2 3 4 5 6 7 7 8 9 10 Control Length Weight (cm) (g) Loading Density (g/L): (must be $s0.5$ g/L) Mean Length (cm): Control Control Con		Unless otherwise noted, beh	navior is considere	ed to be norma	1			
Control Length Weight Fish (cm) (g) 1 2 3 4 5 6 7 7 8 9 10 Control Length Weight (cm) (g) Loading Density (g/L): (must be $s0.5$ g/L) Mean Length (cm): Control Control Con								
Fish (cm) (g) 1 (g)						Test Organis	n Information	
$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}$								
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Fish	(cm) (g)				Batch	20200820TR	-
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					$\Delta $			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		3.5 0.4			Urd	Source	Troutlodge	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		34 0.4						~
5 6 7 8 9 10 5 6 7 8 9 10 5 6 7 8 9 10 5 10 5 10 5 10 5 10 10 10 10 10 10 10 10 10 10		3.0 0.3			27	Tank #		3
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		3.7 0.6	Mean Length («	cm):	2.5			Geo.
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	5	32 0.3		2	2.0	Days Held at '	15± 2°C	27 2
7 3.9 9 9 3.9 0.9 10 3.9 0.9 Weight Range: (g): 0.3 Weight Range: (g): 0.3 Test Volume (L) 18 Somments : 9 9 9 9 9 9 0.9 9 0.9 9 0.9 9 0.9 10 18 9 10 9 10 9 10 9 10 9 10 9 10 10 10 10 10 10 10 10 10 10 10 10 10 10 18 10 18 10 10 10 10 10 10 10 10 10 10 10 10 10 10	6	3.4 0.3	Length Range ((cm): 5.	0-57	(must be ≥14 da	iys)	
$\frac{9}{10} \qquad \frac{3.5}{3.5} \qquad \frac{9}{0.4} \qquad (Must be 20.3g) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \\ (8 days prior to test, must be \\ (9 days prior$	7	3.4 0.4			1 Jack	1		
$\frac{9}{10} \qquad \frac{3.5}{3.5} \qquad \frac{9}{0.4} \qquad (Must be 20.3g) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (7 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \le 2\%) \qquad (8 days prior to test, must be \\ (8 days prior to test, must be \\ (9 days prior$	8	3.3 0.4	Mean Weight (g):	0.4	Percent stock	mortality	0
10 3.5 0.9 Weight Range: (g): 0.3-0.6 Test Volume (L) 18 Somments: 91ehr: ppt coating bottom of tank	9	3.4.0.4	(Must be ≥0.3g)			1		
omments: 9/enr: ppt coating bottom of tank	10	35 0.4			(, ,	
omments: 9/enr: ppt coating bottom of tank			Weight Range:	(g): 🔨 🍊	-0.6	Test Volume (L)	18
96hr: ppt coating bottom of tank			J	U 📑		(-,	
	comments :							
		Olabor -						
		Munr: pptc	caring	bottom	of ta	ink		
Reviewed By: Date Reviewed:							222	into
		Reviewed By			[Date Reviewed	2020	010



Daphnia Bench Sheet

Method	DAS		Client	TEC164		Reference	2021	-0278	-1
Test Log								£	
Day	Date	Time	Tachaisian	Chara Cart	Della Del	D	Sample In	formation	22
0	202010108	Time		Chem. Cart		a Review	Initial pH: Initial EC (J	S (cm)	til
1	20201010				m	/	Initial DO (dif.
2	7070/1010	0 0800	12	2	QF.		Initial Tem	Transfer 1	114
	000101	0 0000	21	6	JC		Salinity (pp		10
Lab Code	CTLA CTL	B CTLC	100A	100B	100C		Sannity (p)	sty.)	
day			pH (uni	ts) (range: 6	.0-8.5)				
0	8.1 813	8.3	7.6	7.6	Fil				
2	8.3 8.3	5.8	8,4	814	8.4				
	The pH c	f the sample was r	not adjusted prior	to test setting, EC (uS/cm)		in the comme	ents below		
0	433 43	1425	117.7	1771	1230				· · · · · · · · · · · · · · · · · · ·
2	1120 1170	1127	1712		1/00				
-	430 46	1 4 38	1640	1690	1699				
0			DO (mg/L) (40-100% sa	turation at	test temp	.)		
0	ALL XIT	RIZ	8.1	2.1	81				
2	47 49	1 47	178	4.8	7.8				
			Temperatu	re (°C) (range	e: 18-22 °C)			
0	18 18	18	1 19	19	14		· · · · · · · · · · · · · · · · · · ·		
2	20 2	0 20	70	20	70				
			-						
				Numbe	r Alive				
				(l, immo	bile)				
0	10 10	10	10	10	10				
1	10 10	10	10	10	10				
2	10 10	10	10	10	10				
	Validity	Criteria: must	be ≤ 10% mor	tality and/or	abnormal b	ehavior in	the control		
	Notes: I	mmobile; dapl	nnid can't swir	n after 60 se	c. even if a	ntenna still	move		
Culture		otherwise note	d, behaviour i	s considered	to be norr	nal			
Young jar	QI	lox(c) month	- lite - 7 - el	:		50()	DI		
roung jar	· · · · · · · · · · · · · · · · · · ·	Jar(s) mort	ality 7 days pr	ior to test (r	nust be ≤2:	5%)	\underline{O}_{1}		
QA (previo	us month)	_				Control V	alidity Crite	ria	- 1
	st brood (≤12 days)	7		-			ortality at 4		- 27 - 1
	imber of young produ			55		(must be ≤		o nours	
	reatments randomize					(10/0)		
			العت	-					
Sample			m l						
	mple prior to aeration	n 17:	7%	ls aeration r	equired (~	10% or > 10%	10% 17	Tes or No	
		The state of the state	70.						
	f aeration (37.5 +/- 12	.5 mL/min/L) :						Yes or No	
	mg CaCO₃/L) of 100%			Is hardness		required (<25 mg Ca	CO ₃ /L)?	Yes or No
Hardness o	f sample after adjustr	nent (must be	between 25 -	30 mg CaC	O₃/L)	-			
Alkalinity o	f 100% sample (mg Ca	aCO ₃ /L):	172				•		
Dilution W		1 AGO		DO Levels (
	preparation date	1:0912	-	3.3 to 8.2 m			3.1 to 7.7 r		
Hardness o	f dilution water (mg/L	190		3.2 to 8.1 m			3.0 to 7.6 r	ng/L at 22'	°C
Comment	(Obcomunt: /	h: Nopf	st l	3.2 to 7.9 m	g/L at 20°C				
comments					and has				
	4	8h: Viliz	shi surt	scial p	Pt				
	Reviewed By:		Data	Reviewed:	2020	liala			
r			- Date	- reviewed:	2010	1010			

(6)



APPENDIX C – Chain-of-custody form

leck					Page	1 0	1 of 1				and the second			
	COC ID: 2020-	2020-10-07 T	Toxicity SP21	1	TURNA	ROUND	TURNAROUND TIME: Reg	Regular (default)	fault)		RUSH: OTHE	USH: OTHER INFO		
Facility Name	Facility Name WLC AWTF				Lab	Name N	Lab Name Nautilus Environmental	ironmental		Report I	Report Format / Distribution		Excel PDF	F EDD
Project Manager Brett Mason	Brett Mason				Lab (Lab Contact T	Tamara Pomeroy	croy		Email 1:	DL-WLC-Lab@teck.com	k.com	X	X
Email	Email brett.mason@teck.com					Email t	Email tamara@nautilusenvironmental.ca	tilusenviro	nmental.ca	Email 2:	Thomas.Davidson@teck.com	teck.com	x	X
Address	Address 15 Km North HWY 43				A	ddress #	Address #4, 6125 - 12 Street SE	Street SE		Email 3:	TeckCoal@equisonline.com	line.com		
										Email 4:	Tricia.Hill@teck.com	m	X	X
City	City Sparwood		Province BC			City C	Calgary	Pro	Province AB	Email 5:	Marty. Hafke@teck.com	com	X	X
Postal Code V0B 2G0	V0B 2G0		Country Canada	ada	Posta	Postal Code 1	T2H 2K1	Cc	Country Canada	Email 6:				-
Phone Number					Phone N	umber 4	Phone Number 403 253 7121				PO number		VPO00723080	080
	SAMPLE DETAILS							-		ANALYSIS	ANALYSIS REQUESTED			-
2020/10/06 09:36 Manitarlin		(0)							Please in	dicate below Filt	Please indicate below Filtered, Perserved or both (F. P. F/P)	(F, P, F/P)		
25:20Learbests, 3x il bottles Nos/Not Boe of Condition 10.3°C same	offics Field Samuel ocation	ج. ه Hazardous Material (Yes/N	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	ANALYSIS NAUT_96Hr_RT_Single_ entration_Toxicity Test	AUT_48Hr_DM_Single centration_Toxicity Test 20C						
WL BFWB OUT SP21 2020-10-07 N	WL BFWB OUT SP21	-	10/7/2020	00:6	9	9	×	X						
			VOLLATION PACKAGE	TED DV/AE	NULTATION	4 1 1	Date		Time	Accents	Accented Bv/Affiliation	Date		Time
Shipment includes 2 extra 20 L bladders and 2 extra 1 L	bladders and 2 extra 1 L		nf	Julia Johnson	u		10/7/2020	20						
plastic bottles.														
SERVICE REQUEST (rush - subject to availability)	a a la a					1			-	-				
Priority	Priority (2-3 business days) - 50% surcharge	<	Sampler's Name	ame		н	Bella Chen		Me	Mobile #				
Emergency (1 Business Day) - 100% surcharge Exercised of a convolution of the convolution	Emergency (1 Business Day) - 100% surcharge		Comparts Cignotura											



END OF REPORT



Acute Toxicity Test Results

Sample collected October 19, 2020

Final Report

November 4, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

		Da	ates	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> test initiation
WL_BFWB_OUT_SP21_2020-10-19_N / 2021-0345	19-Oct-20 at 0900h	20-Oct-20 at 0930h	20-Oct-20 at 1600h	20-Oct-20 at 1510h

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-10-19_N	7.8°C	1440	197

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID	Percent survival in	100% (v/v) sample
Sample ID —	Rainbow trout	Daphnia magna
WL_BFWB_OUT_SP21_2020-10-19_N	100	100

Sample ID ——	Percent Immobility in 100 (% v/v)
Sample 18	Daphnia magna
WL_BFWB_OUT_SP21_2020-10-19_N	0



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-10-19_N	Rainbow trout	None	None
WL_DFWD_001_3P21_2020-10-19_10	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.2 (3.0-3.5) g/L KCl ¹	6.7 (6.4-6.9) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.6-4.6) g/L KCl	6.0 (5.1-7.0) g/L NaCl
Reference toxicant CV	9.6%	5.4%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, October 5, 2020; ² Test Date October 12, 2020

LC = Lethal Concentration; CL = Confidence Limit



thiesen

Reviewed By: Sara Thiessen, BSc Senior Biologist

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.

Report By: Adam Wilson, BSc Biologist

AAA



APPENDIX A – Summary of test conditions



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data



Trout Bench Sheet

1ethod	TRS	Client	TECI64	Reference	2021-0	345	Chamber	_5
est Log							Sample Infor	mation
Davi			Time	Initial	Cham Cart	Daily Data	latisfal al h	7.3
Day	20200	ate	Time	LCIF	Chem, Cart	Review	Initial pH: Initial EC (µS/	
1	2001	0121	0820	LUT		OP .	Initial DO (mc	
2	2020/	10177	0830	AR	-	ne.	Initial Temp (
3	7876711	1723	0885	SIE		ST	Salinity (ppt):	
4	2020110	124	1125	IF	- 1	A	1	8
			Note: * ; time w	when the test	was loaded with	fish	-	
ample Pre-A			A				DO in mg/L (
		+/- 1 mL/min/L	0.5 hours	1	2 15 h	21	saturation)**	
reaeration tir O(mg/L) of 1			CO.S hours	nour 5	1.5 hours	2 hours	6.2 mg/L - 8.9 mg	
O(mg/t) 01 1	00%		1.4	39	(D		6.1 mg/L - 8.8 mg 6.0 mg/L - 8.6 mg	
est Chemist	y and Biology			8.1			**corrected for a	
Conc.	CTL	100	[]		1			
					.1			
	CR 7			pH (units) (i	ange: 5.5-8.5)			
Day 0	24	7,63						
Day 4	8.1	1 8.2						
				FC (uS/cm)			
Day 0	421	UnDia					1	
Day 4	44-21	1572						
	1.1.5	the second						
			DO (mg/	L) (70-100% s	aturation at te	st temp.)		
Day 0	8.8	8.4						
Day 4	8.7	8,8						
			T		44.40			
Day 0	100	I IA	10	inperature ((2) (range: 14-16°	C)	1	1
Day 4	12	17			-			
,								
			Numbe	er Alive (In bra	ckets number st	ressed)		
Day 0	10	10						
Day 1	10	10						
Day 2	10	10						
Day 3 Day 4	-18	10						
Day 4		ria: must be <	10% mortality a	nd/or stresse	d behavior in th	control	J	
			vior is considere			control		
ontrol Organ						Test Organis	m Information	
Control	Length	Weight					000000	PATO
Fish	(cm)	(g)				Batch	202009	SOIN
1	20	0.6	Loading Densit	(αl)	0.2	Source	Travior	0.0
2	20	0.6	(must be ≤0.5 g/L)			Source	Troutlod	ge
3	32	0.2				Tank #	4	
4	27	02	Mean Length (cm):	3.2	- Carlie -		-
5	3.6	0.5	1			Days Held at	15± 2°C	.39
~	3.0	0.3	Length Range ((cm):	2.7.38	(must be ≥14 d		
6	2.8	0.2						
7	3.0	0.3	Mean Weight (g):	0.4	Percent stock		0.1
7 8		0.2	(Mu≤t be ≥0.3g)			(7 days prior to t	est, must be ≤2%)	
7 8 9	27				0.2-0.6			0
7 8	27	ac	MI 1 1 1 1			Test Volume (11.1	
7 8 9	3.7	dv	Weight Range:	(g):	0.20.0	rest volume ((⊏/	
7 8 9 10	2.7			(g):	0.20.0	Test Volume ((L)	
7 8 9 10	27 3.7 96h	i no pp		(g): 	0.20.4			
7 8 9 10	27 3.7 96n			(g):	0.20.0			
7 8 9	27 3.7 96n	ino pp		(g):			1: 2020	11



Daphnia Bench Sheet

Method	DAS	_		Client	TEC164	a	Reference	2021-	-0345	
Test Log									formation	
Day		ate	Time	Technician	Chem. Cart	Daily Dat		Initial pH:		7.3
0		/10/20	1510	AW/KK	3	LF		Initial EC (1695
1	2020/		1145	ST	-	đ		Initial DO (12.1
2	2020/	10/22	1010	ST	3	1	<u> </u>	Initial Tem		15
Lab Code	CTL A	CTL B	CTLC	100 4	100 P	100.0		Salinity (pp	эт). Г	
Lab coue	I CILA	I CILB	CTL C	100 A	100 B	100 C				
day	-			pH (uni	ts) (range: 6	.0-8.5)				
0	8.3	6-3	0.5	7.9	7.9	7.9				
2	7.9	8.0	8.0	8.3	83	8.3				
		The pH of the	sample was no	ot adjusted prior	EC (uS/cm)	unless noted	in the comme	ents below		
0	YPI	4122	480	1793		1827			r – 1	
2	495	493	495	1797	1800	1819				
					1000					
0				DO (mg/L) (40-100% sa		test temp	.)		
0	7.9	7.9	7.9	7.9	7.9	7.9				
2	14	1 29	39	79	7.7	7,9				
				Temperatu	re (°C) (range	- 18-22 ℃)			
0	30	20	20	a	20	30	Í			
2	76	10	20	70	70	70				
					Numbe					
0		10	10	1.0	(I, immo					
0	10	10	10	10	10	10				
1 2	-18-	10	10	10	10	IO(II)				
2				e ≤ 10% mor	() tality and/or	abnormal b	havior in	the control		
				nid can't swir						
				l, behaviour i						
Culture	Det									
Young jar	04	-	Jar(s) morta	ility 7 days pi	rior to test (r	nust be ≤2	5%)	_0		
QA (previo	ur month)							aliditas Caita		
	t brood (≤12	dave)	R				Mean % m	alidity Crite nortality at 4	18 hours -	0
	imber of you		1 (>15 youn	a)	31		(must be ≤	(10%)	to nours -	
	reatments rai			Yes / N	0	10	(
			,							
Sample									2	
DO % of sa	mple prior to	aeration:	10	\mathbf{O}	Is aeration i	required (<	40% or >1(00%)? (Yes or No	
Duration of	aeration (37	.5 +/- 12.5 i	mL/min/L) :<	mm	Filtered with	n 110um sc	reen prior t	to testing	Yes or No	
	ng CaCO ₃ /L)		1440	ACCULE)	ls hardness		•	_		Yes or No
L.	f sample afte			between 25 -		-	· · · ·	2	- /	\smile
300 KM - 163	f 100% samp	•		197	5.20	UT 17		-		
10540095			5 F. 8							
Dilution W					DO Levels			- corrected	d for altitud	e -
	preparation o		1:10/10		3.3 to 8.2 m				mg/L at 21°	
Hardness o	f dilution wat	ter (mg/L)	186		3.2 to 8.1 m			3.0 to 7.6 i	mg/L at 22°	C
Commente	/Observatio	ns:			3.2 to 7.9 m	ig/L at 20°C				
Somments	, 55561 Valio	OHr: No. PP	T .							
		1.1.0	ppt		8					
12		0-	11			5. 1	11			
I	Reviewed By:			Dat	e Reviewed:	2020	10/26			



APPENDIX C – Chain-of-custody form

Teck						Page	1	of	1									
	COC ID: PROJECT/CLIENT INFO	2020-10	-19_7	oxicity_SP2	21	TURN	AROUN			Regula	r (defaul	t)			RUSH:			-
Facility Name					A States	I	ah Nama	-	ABORA	TORY nvironme	ntal				OTHER INF			
Project Manager							Contact	-			intai		Report Email 1:		at / Distribution	Exce		ED
	brett.mason@teck.com					Lat		-		autilusen	vironme	intal ca	Email 1: Email 2:	-	L-WLC-Lab@teck.com	X		1 11 A 11
	15 Km North HWY 43		0.000					+		12 Street		intal.ca	Email 2: Email 3:				X	104 C
									0120	12 00000	JL.		Email 4:		eckCoal@equisonline.com	X	X	
City	Sparwood			Province BC			City	Cal	lgary		Provinc	AB	Email 5:		arty Hafke@teck.com	X		
Postal Code	V0B 2G0			Country Can	ada	Pos	tal Code	-			-	y Canada	Email 6:		20.lab.results@teck.com	X	11 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1
				1 1							[Country]	Jeunudu	Ennin o.		control a control a factoria	-		the state
Phone Number	(250) 603 - 9417					Phone	Number	403	3 253 71	21					PO number	VDC	00072308	0
		AILS				1 none	rumber	40.	5 2 3 3 7 1	21			ANALYSIS	S REOL		VIC	0072308	.0
2020/10/20 09:30 Manitoulin DC 3x20L carboys, 3x1L bo Nos/Nob Good <i>Candition</i>						1						Sec. Start			87.5 (FE) (FE) (FE)	25 M		
09:30												Please ind	cate below Fill	tered, Pe	erserved or both (F, P, F	P)		
Manitoulin			-						onc	uo								
30			Hazardous Material (Yes/No)					10	NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @ 20C								
3x201 corbors 3x11 bo	Tes		(Yes					NSI	ingl	Tes								
NA NOT	11100		rial					AL	r_S ity 1	M_S city								
y oon tob it.			Aate					AN	-R'	Dixio								
bobal landition			us N						6Hr _To	8Hr n_T								
			urdoi						T_9 tion	T_4								
Sample ID 2021 - 03415	Sample Location	Field Matrix	Haza	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.		IAU ⁷ ntra	IAU oC								
WL_BFWB_OUT_SP21_2020-10-19_N	WL_BFWB_OUT_SP21	WS		10/19/2020	9:00	G	6		X	X	2.5	2				<u> </u>		-
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ADDITIONAL COMMENTS/SPI	ECIAL INSTRUCTIONS	-	-	RELINQUISH	IED BY/A	FILIATION			Dat	e	т	ime	Accent	ed By/A	filiation	Date	E	Time
Shipment includes 2 extra 20 L b	ladders and 2 extra	a 1 L			ra Genti	and the second se			10/19/2				incept	July		June		Thite
plastic bottles.	•																	
																	_	
SERVICE REQUEST (rush -	subject to availability)							-										
		(default) X		Sampler's Na	me		G	ilro	y James			Mobi	0.#		and the second se			
	(2-3 business days) - 50% st (1 Business Day) - 100% st		-	- inpret of the					y sames			WIODI	C#					
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END OF REPORT



Acute Toxicity Test Results

Sample collected November 2, 2020

Final Report

November 18, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

	Dates					
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> test initiation		
WL_BFWB_OUT_SP21_2020-11-02_N /	2-Nov-20 at 0900h	3-Nov-20 at 1000h	4-Nov-20 at 1545h	4-Nov-20 at 1430h		
2021-0437	090011	100011	104011	145011		

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-11-02_N	7.0°C	933	223

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID	Percent survival in 100% (v/v) sample					
Sample ID —	Rainbow trout	Daphnia magna				
WL_BFWB_OUT_SP21_2020-11-02_N	100	100				

Sample ID	Percent Immobility in 100 (% v/v)
Sample ID ——	Daphnia magna
WL_BFWB_OUT_SP21_2020-11-02_N	0



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-11-02_N	Rainbow trout	None	None
WL_DFWD_OU1_3F21_2020-11-02_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.3 (2.8-3.8) g/L KCl ¹	6.1 (5.8-6.4) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.7-4.5) g/L KCl	6.0 (5.0-7.2) g/L NaCl
Reference toxicant CV	8.4%	6.0%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, November 5, 2020; ² Test Date November 9, 2020

LC = Lethal Concentration; CL = Confidence Limit



Michael Ulrubleshi

Report By: Michael Wrubleski, BSc Biologist

thiesen

Reviewed By: Sara Thiessen, BSc Senior Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

MAIITHIC

P

Trout Bench Sheet

/lethod	TRSClient	TEC164	Reference	2021-0437		Chamber	5		
est Log						Sample Infor	mation		
		_			Daily Data	1			
Day	Date	Time	Initial	Chem. Cart	Review	Initial pH:	72		
0	2020-11-04	45 1450	SC / LF	1	Vac	Initial EC (µS/o			
1	2020-11-05	0435	LC		R	Initial DO (mg			
3	2020-11-06 2020-11-07	0910	St		(T	Initial Temp (*	0: 19		
4	2020-11-07	00	MW		X	Salinity (ppt):	_ 2		
	2020-11-00	Nota: * : time >	when the test w	as loaded with	CB				
ample Pre-A	Aeration	A time v	when the test w	as loaded with	nsn	DO in mg/L (70% - 100%		
eration rate	adjusted to 6.5 +/- 1 mL/mi	in/L ves no				saturation)**	10070		
reaeration ti		0.5 hours	1 hour	1.5 hours	2 hours	6.2 mg/L - 8.9 mg	/l at 14°C		
O(mg/L) of	100%	12.1	10.4	91	8.8	6.1 mg/L - 8.8 mg/L at 15°C			
					0.0	6.0 mg/L - 8.6 mg/L at 16°C			
est Chemist	ry and Biology					**corrected for al			
Conc	CTL 100			//			1		
						1			
Day 0	701	2	pH (units) (ra	nge: 5.5-8.5)			ŕ		
Day 0 Day 4	6.8 6.7	2							
Duy	0010.3				·	L			
			EC TO	S/cm)					
Day 0	43 100	1	LC (u	37 cm		r	r		
Day 4	UN IN	1							
-	Card to the loss	4							
		DO (mg/	'L) (70-100% sa	turation at tes	t temp.)				
Day 0	8.8 8.5	8				ľ.	[
Day 4	63 8-	7					·		
D0		Te	emperature (°C)	(range: 14-16°	C)				
Day 0 Day 4	15 15								
Day 4						· · · · · · · · · · · · · · · · · · ·			
		Numbe	er Alive (In brac	kets number st	reccod)				
Day 0	10	10		ices number st	(3360)		l"		
Day 1	10 10								
Day 2	10 10								
Day 3	10 10								
Day 4	ON OI					· · · · · · · · · · · · · · · · · · ·			
	Validity Criteria: must be	≤ 10% mortality a	nd/or stressed	behavior in the	control				
	Unless otherwise noted, be	havior is considere	ed to be norma						
ontrol Organ	niem Data								
Control	Length Weight				Test Organism	n Information			
Fish	(cm) (g)				Batch	20200820TR			
	(0) (9)				batch	202006201K	ai -		
1	3.5 0.0	Loading Densit	v (a/L):	0.5	Source	Troutlodge			
2	2.1 0.4	(must be ≤0.5 g/L)			and the second				
3	3.0 0.3				Tank #				
4	3-8 0.0	Mean Length (o	:m):	34	5		2		
5	26 0.2		13		Days Held at 1	5± 2°C	54		
6	4.5 1.1	Length Range (cm):		(must be ≥14 da				
7	40 0.8								
0	3.0 0.3	Mean Weight (g	g):		Percent stock i		0		
8	310 0.0				(7 days prior to te	st, must be ≤2%)			
9					-				
	300.2		101:	1-1-2-6	Test Volume (L	.)	18L		
9	<u> </u>	Weight Range:	(g).						
9 10	Obr no opt	Weight Range:	(9).						
9 10	Obr no opt	Weight Range:	(g).						
9 10		Weight Range:							

120



Daphnia Bench Sheet

Method	DAS 20		Client	TEC164		Reference	2021-	0437	
Test Log							Sample In	formation	
Day	Date	Time		Chem, Cart		all substantiation of the second	Initial pH:		7.2
0	2020/11/04	1430	MFILG	M 3	Se		Initial EC (µ		1478
1	2020/11/05	0120	VIL		(M)		Initial DO (10.8
	2020/11/00	1155	ME	5	CK		Initial Tem Salinity (pp		19
Lab Code	CTLA CTLB		100A	100B	100C		Samity (pr	л <i>у</i> .	2
dav				t-1 (0.0.5	I			
day 0	QZ B3	QZ		ts) (range: 6.	0-8.5)		(
2	BI BZ	B.Z	83	83	às				
	The pH of the	e sample was no	t adjusted prior	÷	unless noted	in the comme	ents below		
0	marun		1502	EC (uS/cm)	15-00				
2	44 41	415	1320	1210	EUN				
	LIE LIVE	10	1200	13 10	12-14		×		
0	12 000	0	DO (mg/L) (40-100% sat	turation at	test temp	.)		
0 2	98 98	52	5.8	2.8	9.8				
-	1.0110			1.0	1.0		-	· · · · · · · · · · · · · · · · · · ·	
			Temperatu	re (°C) (range	e: 18-22 °C)			
0	19 19	19	19	19	19				
2	10 70	20	20	20	20				
				Numbe	r Alive				
				(I, immo					
0	10 10	10	10	10	10				
1 2	0 0	10	-10	(0)	10				
2	Validity Cri	teria: must be	e < 10% mor	tality and/or	abnormal	ebavior in	the control		
		nobile; daphr							
	Unless oth	erwise noted	, behaviour i	s considered	l to be norr	nal			
Culture	03		··			50()	m.1		
Young jar		Jar(s) morta	lity 7 days pi	nor to test (r	nust be ≤2	5%)	07.	•	
QA (previo		0				Control Va	alidity Crite	eria	1
	st brood (≤12 days)	<u> </u>					iortality at 4	18 hours -	6
	umber of young produce			34		(must be ≤	10%)		
vvere test t	treatments randomized o	on test tray?	(Yes)/ N	0					
Sample									
DO % of sa	ample prior to aeration:	12	Q.	Is aeration r	equired (<	40% or >10)0%)? (Yes or No	
Duration o	f aeration (37.5 +/- 12.5	mL/min/L) :	zomin	Filtered with	n 110um sc	reen prior t	o testing	Yes or No	
Hardness (mg CaCO₃/L) of 100% :	933	and the second s	Is hardness	adjustmen	t required (<25 mg Ca		Yes or No
Hardness c	of sample after adjustme	nt (must be l	oetween 25 ·	- 30 mg CaC	O₃/L)	at <u>.</u> (2	-		\sim
1	f 100% sample (mg CaC		223	-	Ş				
Dilution W	later			DO Levels	40-100%	aturation	- corrector	for altitud	A -
	preparation date	2:10120	1	3.3 to 8.2 m				mg/L at 21°	
	of dilution water (mg/L)	189		3.2 to 8.1 m				mg/L at 22'	
				3.2 to 7.9 m				-	
Comment	s/Observations:	no pot							
		no ppt							
		1.1	D-+	o Doviewe J	1001	1116			
	Reviewed By:		Dat	e Reviewed:	-WW	nup	÷;		



APPENDIX C – Chain-of-custody form

PROJ Facility Name WLC Project Manager Brett Email brett. Address 15 K City Spar Postal Code VOB Phone Number 250- 250- 2020/11/03 0:00 Monitodin SC 3x20L carboy/S, 3x1L both NoS/NGS Social Condition Sample ID 2021-0437	DJECT/CLIENT INFO C AWTF ett Mason tt.mason@teck.com Km North HWY 43 arwood B 2G0 D-425-4837 SAMPLE DETA			Province BC Country Can		Lab Lab Pos	Contact Email	LA Nau Tam tam #4, (Calg T2H	BORATO tilus Environmente ara @nau 5125 - 12 gary 1 2K1 253 712	vironmen eroy utilusenvi 2 Street S	tal ironmen SE Province Country	AB Canada	Email 1 Email 2 Email 2 Email 3 Email 4	2: H20.la 3: TeckC 4: Tricia 5: Marty 6: SIS REQUES	LC-Lab@teck ib.results@teck ioal@equisonli Hill@teck.cor .Hafke@teck.c	k.com k.com ine.com com	X X X X	PDF X X X X 723080	EDD X X X X X X
Facility Name WLC Project Manager Brett Email brett. Address 15 K City Spar Postal Code VOB Phone Number 250- 2020/11/03 0:00 Wanitoonlin 35C Sample ID 2021 - 01-82	DJECT/CLIENT INFO C AWTF ett Mason tt.mason@teck.com Km North HWY 43 arwood B 2G0 D-425-4837 SAMPLE DETA	AILS		Province BC		Lab	Contact Email Address City tal Code	Nau Tam tam #4, 0 Calg T2H	tilus Env ara Pom ara@nau 5125 - 12 gary I 2K1 253 712	vironmen eroy utilusenvi 2 Street S	ironmen SE Province Country	AB Canada	Email 1 Email 2 Email 2 Email 3 Email 4	1: DL-W 2: H20.lz 3: TeckC 4: Tricia 5: Marty 6:	Distribution LC-Lab@teck bb results@tecl oal@equisonli Hill@teck.cor Hafke@teck.co PO number STED	k.com k.com ine.com com	X X X X	X X X X	X X X X
Project Manager Brett Email brett. Address 15 K City Spar Postal Code VOB Phone Number 250- 2020/11/03 0:00 Wanitanlin SC 3x20L canboy/s, 3x1L both VoS/NGS Good Condition Sample ID 2021-0182	ett Mason tt.mason@teck.com Km North HWY 43 arwood B 2G0 0-425-4837 SAMPLE DETA				ada	Lab	Contact Email Address City tal Code	Tam tam #4, 0 Calg T2H	ara Pom ara@nau 5125 - 12 gary I 2K1 253 712	eroy utilusenvi 2 Street S	ironmen SE Province Country	AB Canada	Email 1 Email 2 Email 2 Email 3 Email 4	1: DL-W 2: H20.lz 3: TeckC 4: Tricia 5: Marty 6:	LC-Lab@teck ib.results@teck ioal@equisonli Hill@teck.cor Hafke@teck.co PO number TED	k.com k.com n com	X X X X	X X X X	X X X X
Email brett. Address 15 K City Spar Postal Code VOB Phone Number 250- 250- 2020/11/03 0:00 Manitodin SC 3x20L canboys, 3x1L both VOS/NGS Good Condition Sample ID 2021-0482	tt.mason@teck.com Km North HWY 43 arwood B 2G0)-425-4837 SAMPLE DETA				ada	Pos	Email Address City al Code	tam #4, (Calg T2H	ara@nau 5125 - 12 gary 1 2K1 253 712	2 Street S	BE Province Country	AB Canada	Email 2 Email 2 Email 2 Email 2 Email 0	2: H20.la 3: TeckC 4: Tricia 5: Marty 6: SIS REQUES	b.results@tecl oal@equisonli Hill@teck.cor Hafke@teck.c PO number STED	k.com ine.com n com	X X X	x x x	x x x
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Phone Number 250- 020/11/03 0:00 Vanitarin SC Sx20L carbonys, 3x1L both VOS/NGS Good Condition Sample ID 2021-0432	0-425-4837 SAMPLE DETA								253 712	L Con			ANALY	SIS REQUES	STED	F, P, F/P)	VPO00	723080	
020/11/03 0:00 Vonitoalin SC Sx20L carbozys, 3x1L both VOS/NGS Good Condition Sample ID 2021-0432	sample deta		lous Material (Yes/No)			Phone	Number	403 SISATEN	Zonc	Con		Please inc	KER LA A	SIS REQUES	STED	F, P, F/P)	VPOOD	723080	
020/11/03 0:00 Nonitonlin SC Sx20L carbonys, 3x1L both 105/NGS food Condition Sample ID 2021-0432	sample deta		lous Material (Yes/No)			Phone	Number	403 SISXTEN	Zonc	Con		Please inc	KER LA A	SIS REQUES	STED	F, P, F/P)	VPOOD	723080	
020/11/03 0:00 Vonitoalin SC Sx20L carbozys, 3x1L both VOS/NGS Good Condition Sample ID 2021-0432	sample deta		lous Material (Yes/No)			Phone	Number	403 SISATEN	Zonc	Con		Please inc	KER LA A	SIS REQUES	STED	F, P, F/P)			
Sample ID 2021-0432	Hes		lous Material (Yes/No)					NALYSIS	Single_Conc Test	ingle_Con Test @		Please inc	KER LA A	· · · · · · · · · · · · · · · · · · ·	「「「「「「「「」」」	F, P, F/P)			
Sample ID 2021-0432		Field	lous Material (Yes/No)					NALYSIS	Single_Conc Test	ingle_Con Test @		Please inc	dicate below	Filtered, Perse	rved or both (F	F, P, F/P)			a france
Sample ID 2021-0432		Field	lous Material (Yes/No)					NALYSIS	single_Conc Test	ingle_Con Test @			and the state of the						and the second
Sample ID 2021-0432		Field	lous Material (Yes/No)					NALYSIS	Single_Conc Test	ingle_Con Test @								ų	
Sample ID 2021-0432		Field	lous Material (Yes/No)					NALYSIS	Single_C Test	ingle_C Test @									1
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Sample ID 2021-0432		Field	lous Material ()					NALY	17 E									1	
Sample ID 2021-0432		Field	lous Materia					NA	12	1 S ity								6	
Sample ID 2021-0432		Field	lous Ma						RT	DIN								1	
Sample ID 2021-0432		Field	lous					1	Hr To	T.								1	
Sample ID 2021-0432		Field							96 00	48 tion								1	
			arc		Time	G=Grab	# Of		UT	UT									
	2 Sample Location	Matrix	Haz	Date	(24hr)	C=Comp	Cont.		NA ent	NA cen 200									
	WL_BFWB_OUT_SP21	WS		11/2/2020	9:00	G	6		Х	X	2,0	20							
		-				-													
		1							-						-				
						1	-											-	1
						-	-									-		-	+
				in the second			-							-					-
and the second												1							-
																			4
								1											
		-																	
					-			-				-			-				1
			-					-	Dat	1	T	ime	Acc	cepted By/Aff	ilistion	1	ate	1	Time
ADDITIONAL COMMENTS/SPECIA			-	RELINQUIS			N	-	11/2/2	A CONTRACTOR OF A CONT	1	une	Au	epicu byini	mation		inc	-	
hipment includes 2 extra 20 L blac	adders and 2 extr	ra 1 L	-	J	ulia Johns	on	-	+	11/2/2	.020		-		-					
lastic bottles.			-				-	-			1								
								1											
SERVICE REQUEST (rush - subje	piect to availability)							-											
construction only		r (default) X		6		1		Taf	Mugadz	3		Mo	bile #						
Priority (2-3			1 .	Sampler's N	ame	1		1 411	wingauz			1410	one n					_	
() Emergency (1 E	3 business days) - 50% s					a second second				in the second second	-	-					20		



END OF REPORT



Acute Toxicity Test Results

Sample collected November 16, 2020

Final Report

December 2, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC



SAMPLE INFORMATION

		Da	ates	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> test initiation
WL_BFWB_OUT_SP21_2020-11-16_N /	16-Nov-20 at	17-Nov-20 at	17-Nov-20 at	17-Nov-20 at
2021-0528	0900h	1115h	1510h	1405h

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-11-16_N	7.0°C	901	224

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID —	Percent survival in	100% (v/v) sample
	Rainbow trout	Daphnia magna
WL_BFWB_OUT_SP21_2020-11-16_N	100	100

Sample ID —	Percent Immobility in 100 (% v/v)
	Daphnia magna
WL_BFWB_OUT_SP21_2020-11-16_N	0



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-11-	Rainbow trout	None	None
16_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.3 (2.8-3.8) g/L KCl ¹	6.1 (5.8-6.4) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.7-4.5) g/L KCl	6.0 (5.0-7.2) g/L NaCl
Reference toxicant CV	8.4%	6.0%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, November 5, 2020; ² Test Date November 9, 2020

LC = Lethal Concentration; CL = Confidence Limit



un thiesen

Report By: Sara Thiessen, BSc Senior Biologist

Reviewed By: Kayla Knol, BSc Senior Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data



Trout Bench Sheet

Day 0 1 2 3 4 Sample Pre-A	11/17/2020 11/18/2020		Time	Initial	Γ	Daily Data	Sample Inform	1.25
0 1 2 3 4	11/17/2020 11/18/2020			Initial		· ·	530 MF - 65 - 665	1.252
1 2 3 4	11/18/2020				Chem. Cart	Review	Initial pH:	73
2 3 4	11/18/2020			MWINE	1	YAL	Initial EC (µS/cr	
3 4			0000	Au		TP	Initial DO (mg/	
4	11/19/2020		0080	A J	1	The	Initial Temp (C	
4	11/20/2020		0900	ME	-		Salinity (ppt):	
	11/21/2020		0905	The second		-15-		2
anania Dura	11/21/2020			when the test u	vas loaded with	fich		
annnio Pro. (Veration		Note: , time y	when the test w	vas loaded with	nsn	DO in mg/L (7	0% 100%
	adjusted to 6.5	1 / 1 ml /min /	Estas				12800-048-010-148-001-8001-	070 - 10076
reaeration tir		•/ ••••••/••••	0.5 hours	1 hour	156	2	saturation)**	
O(mg/L) of 1					1.5 hours	2 hours	6.2 mg/L - 8.9 mg/	
	100%		12.9	12.7	12.4	12.2	6.1 mg/L - 8.8 mg/	
	an in the second						6.0 mg/L - 8.6 mg/	
	ry and Biology	100			r		**corrected for alti	itude
Conc.	CTL	100					·	
				pH (units) (r	ange: 5.5-8.5)			
Day 0	ð.\	7.4						
Day 4	8.1	8.1						
							N	
				EC (L	iS/cm)			
Day 0	424	1426					1	
Day 4	431'	1399		· · · · · · · · · · · · · · · · · · ·	· · · · · ·		1	
							1	
			DO (ma/	() (70-100% s	aturation at te	st temn.)		
Day 0	8.0	22	u u u u u u		1		1 1	
Day 4	09	29						
	2.9	9.0					<u></u>	
			To	mooratura (°C	(manage 14 16			
Day 0	<u><u></u></u>	111		inperature (C) (range: 14-16	0		
Day 4	- 19	_19_						
53,4	6			0				
			Ni, um hia			11.12.13 N		
Day 0	10	10	Numbe	Alive (in Diac	kets number st	ressed)	7 7	
Day 0 Day 1								
	0	i0						
Day 2	10	10						
Day 3	10	10			· ·	· · · · · · · · · · · · · · · · · · ·		
Day 4	10	10						
	Validity Criter	ia: must be ≤	0% mortality a	nd/or stressed	behavior in th	e control		
	Unless otherwis	se noted, beha	vior is considere	ed to be norma	al			
ntrol Organ	nism Data					Test Organis	m Information	
Control	Length	Weight						
Fish	(cm)	(g)				Batch	20200820TR	
					0			
1 [3.5	6.5	Loading Densit	y (g/L):	0.5	Source	Troutlodge	
2	3.5	0.5	(must be ≤0.5 g/L)					
3	77	Duff			2.1	Tank #	2	
4	3.0	0.1	Mean Length (o	.m).	3.4	, MIIX #	·	
5	21	0.7	wear cengui (c	.m y. – – – – – – – – – – – – – – – – – – –		Days Held at 1	15+ 2°C	67
6	7.6	- tr	Length Range ((m); 7	0-36	(must be ≥14 da		67
	3.5	0.9	Length Kange (un). 🦂	0-1.6	(must be 214 da	iys)	
7	24	01	Advanta Advanta I a. A		01			
7 8			Mean Weight (g):	05	Percent stock		0.0
8	23	0.1	(Must be ≥0,3g)			(7 days prior to te	st, must be ≤2%)	
8 9	37	0.4		0	207			
8	3-3		Maight Dara		1.3-0.7	Test Volume (L)	18
8 9	3-3		Weight Range:	(g). 💟				
8 9 10	3-3		weight Kange:	(g).				
8 9 10 mments :	0 Hrs: 10	PPt	weight Kange:	(g).				
8 9 10 mments :	0 Hrs: 100 96 Hrs: 100	PP+ 202	vveignt Kange:	(g).				
8 9 10 mments :	(• V	ppt ppt	weight Kange:	(g).				
8 9 10 mments :	(• V	PPT PPT Reviewed By:		(g).			1000/11	Var



Daphnia Bench Sheet

Method	DAS 20	Client		TEC164	•:	Reference	2021	-0528	
Test Log							Sample In	formation	i
Day	Date			Chem. Cart		ta Review	Initial pH:		7.3
0	2020/11/17	1405 MF1		3	-	6	Initial EC (1584
2	2020/11/18 2020/11/19	0825 14				1	Initial DO		4.9
<u> </u>	2020/11/19	0425 M	1F	3		8	Initial Tem		11
Lab Code	CTLA CTLB	CTLC 10	D A C	100 B	100 C		Salinity (pp	bt).	3
day			LI (uni	a lanara (0.05				
0	RI RO	18217		ts) (range: 6.	0-8.5)				
2	B.1 B.2	BZB.	2	B2	8.2			_	
	The pH of th	e sample was not adjust	ed prior		unless noted	in the comme	nts below		
0	LASS LAZA	4210 156	5	EC (uS/cm)	TORI	r			
2	450 444	443 5	35	1576	12710				
	19				10.14				
0	BIBI		19/L) (4	40-100% sat	turation at	t test temp.)		
2	79 79	9:4 4	. 7	7.7	7.4		_		
0	na ra		eratur	e (°C) (range	18-22 °C)			
2	20 20	20 20	5	20	50				
		600 100			20			I	
				Numbe					
0	10 10	10 10	n I	(I, immo 10	10				
1	10 10	10 10	_	10	10				
2	0 10	10 10		(2)	10				
	Validity Cr	iteria: must be ≤ 109 nobile; daphnid can	6 mort	ality and/or	abnormal t	ehavior in t	he control		
	Unless oth	erwise noted, behav	viour is	considered	to be norr	ntenna still i nal	move		
Culture	(2	inductors and a					- 1		
Young jar		Jar(s) mortality 7 d	ays pri	or to test (n	nust be ≤2	5%)	5%		
QA (previo	us month)	~				Control Va	lidity Crite	ria	
Days to firs	t brood (≤12 days)	&				Mean % mo			0
Average nu	imber of young produce	d (≥15 young)	· · · · -	34		(must be ≤1	10%)		
were test t	reatments randomized o	on test tray? (Yes)/ No)					
Sample									
DO % of sa	mple prior to aeration:	124		ls aeration re	equired (<-	40% or >10	0%)?	Yes or No	
Duration of	aeration (37.5 +/- 12.5			Filtered with			10 10 10 10 10 10 10 10 10 10 10 10 10 1	Yes or No	
	mg CaCO ₃ /L) of 100% :	901	and the second se	ls hardness a		and the second	and the second		Yes or No
Hardness o	f sample after adjustme	nt (must be betwee	n 25 -	30 mg CaCC)₃/L)				4
Alkalinity o	f 100% sample (mg CaC	O₃/L):	4						
Dilution W	ater		п	DO Levels (4	10-100% c	aturation)	corrected	for altitude	
	preparation date	2:11/10		3.3 to 8.2 mg			3.1 to 7.7 n		
Hardness o	f dilution water (mg/L)	23		3.2 to 8.1 mg	g/L at 19°C		3.0 to 7.6 n		
Commente	/Observations:	Obr on ant		3.2 to 7.9 mg	g/L at 20°C				
connents		0 hr: 00 ppt 48hr: 00 ppt							
		NPPT							
					0.001	102			
ŀ	Reviewed By: <u> </u>		Date	Reviewed:	IVAN	Ult			



APPENDIX C – Chain-of-custody form

leck						Page		1 of 1									
		2020-11-16		Toxicity_SP2		TURN/	ROUN	TURNAROUND TIME:		Regular (default)			RUSH:	:H:			
Facility Name WLC AWTF	PROJECT/CLIENT INFO WLC AWTF					La	b Name	LABO Nautilus	Lab Name Nautilus Environmental	nental		2	TO	OTHER INFO	Evoal I	PDF	EDD
Project Manager Brett Mason	Brett Mason					Lab	Contact	Tamara	Lab Contact Tamara Pomeroy			Email 1:	mail 1: DL-WLC-Lab@teck.com	tion 2)teck.com	394.7	500	X
Email	Email brett.mason@teck.com						Email	tamara(Dnautiluse	Email tamara@nautilusenvironmental.ca	al.ca	Email 2:	H20.lab.results@teck.com	@teck.com	X	×	X
Address	Address 15 Km North HWY 43						Address	#4, 612:	Address #4, 6125 - 12 Street SE	et SE		Email 3:	TeckCoal@equisonline.com	isonline.com	100		×
												Email 4:	Tricia Hill@teck.com	k.com	X	X	×
City	City Sparwood		PI	Province BC			City	City Calgary		Province AB	NB	Email 5:	Marty.Hafke@teck.com	eck.com	X	X	X
Postal Code V0B 2G0	V0B 2G0		Ŭ	Country Canada	la	Post	al Code	Postal Code T2H 2K1	1	Country Canada	Canada	Email 6:					-
Phone Number 250-425-4837						Phone]	Number	Phone Number 403 253 7121	7121				PO number	ber	VPO00723080	23080	
	SAMPLE DETAILS	S									- Law - L	ANALYSIS REQUESTED	EQUESTED				
F11 112											Please indic	ate below Filter	Plcase indicate below Filtered, Perserved or both (F, P, F/P)	oth (F, P, F/P)			
Sulpus 3x Zou Corbey/3x IL Bottle			(0 _N					di seconda	900 9000								5
Nostination Great wind then Fue			faterial (Yes/						olgni2_MQ_								
Sample ID 202] - 052 & Sample Location	Sample Location	Field Matrix	M suobrazaH	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	H96_TUAN	koT_noitertin 1H84_TUAN koT_noitertin								
WL_BFWB_OUT_SP21_2020-11-16_N	WL_BFWB_OUT_SP21	WS		11/16/2020		G	9										
			+						+								
											+						
												-					
			÷					1000									
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	ECIAL INSTRUCTIONS		-	RELINOUISHED BY/AFFILIATION	CD BV/AFF	TLIATION			Date	Time		Accented	Accented By/Affiliation	Date	te	Time	2
Shipment includes 2 extra 20 L bladders and 2 plastic bottles.	bladders and 2 extra 1 L	11		Juli	Julia Johnson			11/1	11/16/2020								
SERVICE REQUEST (rush - subject to availability)	subject to availability)											-		-			
Priority	Priority (2-3 business days) - 50% surcharge	tault) X harge	S	Sampler's Name	ne		0	Gilroy James	nes		Mobile #	#					1 :
Emergency (1 Business Day) - 100% surcharge	/1 D - D 1 1000/ 1	-															ŀ



END OF REPORT



Acute Toxicity Test Results

Sample collected November 30, 2020

Final Report

December 16, 2020

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

		Da	ates	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> test initiation
WL_BFWB_OUT_SP21_2020-11-30_N /	30-Nov-20 at	01-Dec-20 at	01-Dec-20 at	01-Dec-20 at
2021-0651	0900h	1015h	1600h	1410h

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020-11-30_N	5.3°C	939	211

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID	Percent survival in	100% (v/v) sample
Sample ID —	Rainbow trout	Daphnia magna
WL_BFWB_OUT_SP21_2020-11-30_N	100	100

Sample ID —	Percent Immobility in 100 (% v/v)
	Daphnia magna
WL_BFWB_OUT_SP21_2020-11-30_N	0



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-11-	Rainbow trout	None	None
30_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.3 (2.8-3.8) g/L KCl ¹	6.9 (6.6-7.2) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.5 (2.7-4.5) g/L KCl	6.2 (5.4-7.1) g/L NaCl
Reference toxicant CV	8.4%	4.5%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, November 5, 2020; ² Test Date December 7, 2020

LC = Lethal Concentration; CL = Confidence Limit



ASTO

Report By: Adam Wilson, BSc Biologist

Reviewed By: Kayla Knol, BSc Senior Biologist

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APPENDIX A – Summary of test conditions



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data



Trout Bench Sheet

Method	TRS	Client	TEC164	Reference	2021	-0651	Chamber	5
Test Log							Sample Infor	mation
Day	Dat	A	Time	Initial	Chem, Cart	Daily Data	1	~ 2
0	2020-1		11000+	ST / MF	1	Review	Initial pH: Initial EC (µS/d	-1-2
1	2020-1		0000	517101		of	Initial EC (µS/0	minen
2	2020-1	and the second se		UT .			Initial DO (mg	
			GANO	- OF		TO	Initial Temp (*	
3	2020-1		6900	IN	<u> </u>	TP	Salinity (ppt):	3
4	2020-1	2-05	0151	bull		2.2		
Preaeration t DO(mg/L) of	e adjusted to 6.5 +, ime	/- 1 mL/min/	Note: * ; time v	1 hour	1,5 hours	2 hours	DO in mg/L (saturation)** 6.2 mg/L - 8.9 mg 6.1 mg/L - 8.8 mg 6.0 mg/L - 8.6 mg **corrected for al	ı/Lat 14℃ ı/Lat 15℃ /Lat 16℃
		100					1	
				pH (units) (ra	ange: 5.5-8.5)			
Day 0	7.81	7.0		,, (J		T	1
Day 4	2.2	83						
		012			L			
				EC 76	iS/cm)			
Day 0	402	1011	1	20 (0			T	· · · · · · · · · · · · · · · · · · ·
Day 4	2011	15 di						
Day 4	448	1041					1	
			DO (mg/	L) (70-100% s i	aturation at te	st temp.)		
Day 0	8.9	10.2						
Day 4	8.6	18.7						
					·			
			Te	emperature (°C) (range: 14-16	C)		
Day 0	14	19						1
Day 4	15	15						
-								
			Numbe	er Alive (In brad	kets number st	ressed)		
Day 0	10	10				,,	1	1
Day 1	10	10						
Day 2	ID	ID						
Day 3	15	CO						· · · · · · · · · · · · · · · · · · ·
Day 4	10	10						
54) 1			10% mortality a	nd (or stressed	he have a to the	e restructure I		
	Unless otherwise	noted beh	avior is considere	nu/or stressed	Denavior in th	e control		
	offiess officialise	e noteu, ben	avior is considere	eu to be norma	1			
Control Orga	nicm Data					T 10	CONTRACTOR CONTRACTOR	
Control	Length	Weight				lest Organisi	m Information	
Fish	(cm)					B	202000000	j.
1 1311	(CIII)	(g)			_	Batch	20200820TR	
1	5.3	(C 11)		<i>, , ,</i> ,	03	-		
1	3.3	6.4	Loading Densit		0	Source	Troutlodge	
2	3.2	0.4	(must be ≤0.5 g/L)					
3	3.8	6.7			01	Tank #	5	
4	2.9	0.3	Mean Length (d	:m):	3.4			D
5	3.2	0.4			10.0	Days Held at 1	15± 2°C	\$ 28
6	3.7	0.6	Length Range (cm):	2.9.30	(must be ≥14 da	ays)	
7	2.5	0.5			1			
8	3.5	0.6	Mean Weight (g):	0.5	Percent stock	mortality	0
9	3.0	2.0	(Must be ≥0.3g)				est, must be ≤2%)	
10	3.5	0.6			1200			
			Weight Range:	(g):	0.3-0.1	Test Volume (L)	18
							·	
Comments :								
	96h - r	in ni						
	1411 1	in the						
•		Reviewed By	10		-	Nete D 1 1	000	2102-
	1	veriewed By	-00-	;	e L	vate Reviewed:	20101	LIUT
							100	



Daphnia Bench Sheet

Method	DAS 20	-8		Client	TEC164		Reference	2021	-0651	
Test Log								Sample In	nformation	
Day	Di	ate	Time	Technician	Chem. Cart		ta Review	Initial pH:		7.3
0	2020/	12/01	MID	SIMU	3	V	e l	Initial EC (μS/cm):	1671
1	2020/	12/02	6855	8		0	Y	Initial DO		11.0
2	2020/		0355	ST	2	6.4	E	Initial Tem		17
2		-2,00	0000			P		Salinity (p		h
Lab Code	CTL A	CTL B	CTL C	100 A	100 B	100 C				1
		5								
day 0	127	27	67	pH (uni	ts) (range: 6.	0-8.5)	1		·	
2	25	93	OIL	11	-55	ST				
F-	012	The pH of the	sample was n	ot adjusted prior	to test setting		in the comme	ents below		
				• •	EC (uS/cm)	unicis noted				
0	956	457	450	611	16201	1623				
2	431	452	461	1605	1609	1606				
									· _ /	
0	-0	01	12 1	DO (mg/L) (4			t test temp	.)	·	1
0 2	94	- Cal	D.L	Del	G.L	8.2	2			
2	4.9	tu	47	YI	29	79				
				Temperatur	re (°C) (range	∝18-22 °C	.)			
0	19	(9)	19	ISI	R	(9)	1			
2	70	20	70	120	70	70				
						Lu			J Į	
					Numbe	r Alive				
					(l, immo	bile)				
0	10	10	10	10	10	10				
1	0	0	0	10	10	61				
2	10	10	10	10	10	10				
				e ≤ 10% mort						
				nid can't swin				move		
Culture		Unless othe	erwise noted	d, behaviour is	s considered	to be nor	mal			
Culture	52			1. . .				()	1.	
Young jar	<u>es</u>		Jar(s) morta	ality 7 days pr	ior to test (n	nust be ≤2	.5%)	0	∧.: •.	
QA (previor	us month)		0				Control Va	alidity Crite	eria	~1
	t brood (≤12	days)	Y		-1-			ortality at 4		0"
	mber of your		1 (> 5000		18		(must be ≤		io nours	<u> </u>
	reatments rar			Yes / No			(11030.00.3	1070)		
			, cost tray.		5.					
Sample				10000				1		
DO % of sa	mple prior to	aeration [.]	15	5	ls aeration r	equired (<	40% or > 10	10% 17	Yes or No	
1	aeration (37.		al Amin /I \ .	-		,			11	
			A Co		Filtered with				Yes or No	
	ng CaCO ₃ /L)		171		Is hardness	-	t required (<25 mg Ca	(O_3/L)	Yes or No
		-		between 25 -	30 mg CaC	⊃₃/L)	-			-
Alkalinity of	100% sampl	e (mg CaCC) ₃ /L):	24						
Dilution W		1	1115	-	DO Levels (- corrected	d for altitud	e -
	preparation d		1111		3.3 to 8.2 m			3.1 to 7.7 ı	mg/L at 21°	c
Hardness of	f dilution wat	er (mg/L)	19 8		3.2 to 8.1 m			3.0 to 7.6 r	mg/L at 22°	c
-	(A)		110		3.2 to 7.9 m	g/L at 20°0				
Comments	/Observatio	ns:	100	00+						
		U.S.V	: no	not						
		4011	100	PP'						
F	eviewed By:	10		Date	Reviewed:	20201	12/07			



APPENDIX C – Chain-of-custody form

International and the state of th	Teck						Page	-	1 of 1							- 1	
montext Lab Name Lab Name Lab Name Report Format/1 Repor			2020-11-	30 To>	vicity_SP2		TURNA	ROUNI	D TIME:		r (default)	-		RUSH:	0 INEO		
$ \begin{array}{ $	Facility Name	TINT					Lat) Name	Nautilus J	Environm	sntal		Report F	ormat / Distribution			
Indexton Email Email Email Email Email Email Motion state No	Project Manager 1	Brett Mason					Lab	Contact	Tamara P	omeroy			Email 1:	DL-WLC-Lab@tech	k.com		X
HIVV 43 Matters 44, 6124-13 Earal 3 Tack of all position and all 3 Tack of all all	Email	brett.mason@teck.com						Email	tamara@	nautiluser	wironmenta	.ca	Email 2:	H20.lab.results@tec	ck.com	X	X
Fund Fund <th< td=""><td>Address</td><td>15 Km North HWY 43</td><td></td><td></td><td></td><td></td><td>4</td><td>Vddress</td><td>#4, 6125</td><td>- 12 Stree</td><td>t SE</td><td></td><td>Email 3:</td><td>TeckCoal@equisonl</td><td>line.com</td><td></td><td></td></th<>	Address	15 Km North HWY 43					4	Vddress	#4, 6125	- 12 Stree	t SE		Email 3:	TeckCoal@equisonl	line.com		
Provincijalić Totoli (subi) Totoli (Email 4:	Tricia.Hill@teck.con	E Start	X	X
County	City 2	Sparwood		A	rovince BC			City	Calgary		Province A.	~	Email 5:	Marty.Hafke@teck.c	com		X
7 Place Number 101 7 Place Number 10333 121 AMMER BETAILS Place Number 10333 121 AMMER BETAILS Place Number 103133 121 10011 1211 Number NALLYSIS 11000200 0 0 0 10011 1211 NALLYSIS NALLYSIS 11000200 0 0 0 10011 1211 NALL NALLYSIS Place Material (Forder) 10011 1211 NALL NALLYSIS Place Material (Forder) 10011 1211 NALL NALLYSIS Place Material (Forder) 10011 121 NALL NALL NALLYSIS 11000200 0 0 NALL NALL 10011 121 NALL NALL NALL 11000200 0 0 NALL NALL 10011 121 NALL NALL NALL 10012 121 NALL NALL NALL 1012 121 Time NALL NALL </td <td>Postal Code</td> <td>V0B 2G0</td> <td></td> <td>0</td> <td>Country Cana</td> <td>da</td> <td>Post.</td> <td>al Code</td> <td>T2H 2K1</td> <td></td> <td>Country C</td> <td>mada</td> <td>Email 6:</td> <td></td> <td></td> <td></td> <td></td>	Postal Code	V0B 2G0		0	Country Cana	da	Post.	al Code	T2H 2K1		Country C	mada	Email 6:				
7 Place Numble Flace Numble Place Numble PO numble VO007306 NMMY BET/LIS Among Network Field Among Network												+					
Available Available Available Available Available Available Available Available Field Field Field Field Field Time G-Grab Field Field Field Plazardous Field Time G-Grab Field Field Field Plazardous Field Distribution Field	Phone Number	250-425-4837					Phone 1	Number	403 253	7121		+		PO number		PO00723	080
Place induction Field Precention Precention Precention		MPL	ILS										ANALYSIS	REQUESTED			
Image: Second	720/12/01									1		case indica	le below Filter	ed, Perserved or both ()	F, P, F/P)		
Field Time Composition Field Time B_001_Strip Winty Hazardous Material (Yes/No) No No B_001_Strip NS 1100000 Stable C Comp No B_001_Strip NS 1100000 Stable C Comp No B_001_Strip NS NUUT_state NUUT_state NUUT_state B_001_Strip NUUT_state NUUT_state NUUT_state NUUT_state B_001_Strip NUUT_state NUUT_state NUUT_state NUUT	anitour in								əəuq				-				
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	visor controje, 3xil bot osmez och Condition	Hes	a.	oV/ssY) (vaterial (Yes/Vo)					O_algni2_TA_H6	D_algni2_MQ_1H8							
$ \begin{array}{ $	Sample ID 2021 -065	Sample Location	Field Matrix	Hazardou	Date	Time (24hr)	G=Grab C=Comp	# Of Cont.	6_TUAN	₽_TUAN							
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	BFWB_OUT_SP21_2020-11-30_N	WL_BFWB_OUT	MS		11/30/2020	9:00	e	9	×			~					
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$										-							
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$																	
Image: state strain										-							
RELINQUISHED BY/AFFILATION Date Time Accepted By/Affiliation Date Tara Gentile 11/30/2020 Time Accepted By/Affiliation Date Image: Tara Gentile 11/30/2020 Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile 11/30/2020 Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile 11/30/2020 Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile Image: Tara Gentile<																	
Tara Gentile 11/30/2020 Non-2020	ADDITIONAL COMMENTS/CDE	SCIAL INSTRUCTIONS			ASITON 138	ED RV/AF	VULATION		_	Jate	Time		Accented	I Bv/Affiliation	Date		Tim
Regular (default) X Mobile # 50% surcharge Sampler's Name Tafi Mugadza 000% surcharge Sampler's Signature 30-Nov-20	ipment includes 2 extra 20 L t istic bottles.	pladders and 2 extr	alL		Ĩ	ara Gentile			11/3	0/2020				•			
Regular (default) X Sampler's Name Tafi Mugadza Mobile # 30-Nov-20 50% surcharge Sampler's Signature Sampler's Signature 30-Nov-20 30-Nov-20	- the transmission of transmission of the transmission of transmission of the transmission of transmis	And the second										-				-	
- 20% surcharge		Regular		1	Sampler's Na	me		T	Tafi Muga		0	Mobile	#		19.8		
	Emergency	(2-) DUSINESS DAYS) - 2076 (1 Business Day) - 100% s	urcharge	Sa	moler's Sign	ature				4		Date/Ti	me		30-Nov-20		



END OF REPORT



Acute Toxicity Test Results

Sample collected December 20, 2020

Final Report

January 1, 2021

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

Comple ID/		Da	ites	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation
WL_BFWB_OUT_SP 21_2020-12-20_N /	20-Dec-20 at 0900h	23-Dec-20 at 1100h	24-Dec-20 at 1305h	23-Dec-20 at 1415h
2021-0796				

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020- 12-20_N	6.1°C	851	183

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Sample ID ——	Percent survival in 100% (v/v) sample			
	Rainbow trout	Daphnia magna 20°C		
WL_BFWB_OUT_SP21_2020-12- 20_N	100	100		

Sample ID	Percent Immobility in 100 (% v/v) Daphnia magna 20°C			
WL_BFWB_OUT_SP21_2020-12- 20_N	0			

Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-12- 20_N	Rainbow trout	None	None
WL_BFWB_OUT_SP21_2020-12- 20_N	Daphnia magna	None	None



QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.9 (3.6 – 4.3) g/L KCl ¹	6.2 (5.9 – 6.5) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.6 (2.8 – 4.6) g/L KCl	6.2 (5.4 – 7.1) g/L NaCl
Reference toxicant CV	8.2%	4.5%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, December 21, 2020; ² Test Date December 21, 2020

LC = Lethal Concentration; CL = Confidence Limit



Dan h

Report By: Dana Wong, BSc Biologist

thiessen

Reviewed By: Sara Thiessen, BSc Senior Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival \geq 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

/ MALITILIC

Trout Bench Sheet

lethod	TRSClient	TEC164	Reference	2021-0796-01	6	Chamber	
est Log						Sample Inform	nation
		_			Daily Data		20
Day	Date	Time	Initial	Chem. Cart	Review	Initial pH:	1.5
0	2020/12/24	1305 *	AW / DW	1		Initial EC (µS/cr	1111
1	2020/12/25	0845	MF	12 E	jar	Initial DO (mg/	
2	2020/12/26	0418	(AL)	-	XX	Initial Temp (°C	
3	2020/12/27	0815	ST		10	Salinity (ppt):	3
4	2020/12/28	0925	Mu		J.C.		
la Dea	A anadian	Note: * ; time w	then the test v	vas loaded with	tish	DO in mg/L (7	0% 100%
ample Pre-/	adjusted to 6.5 +/- 1 mL/m						076 - 10076
reaeration ti		0.5 hours	1 hour	1.5 hours	2 6	saturation)**	
O(mg/L) of		and the second se	10.2	9,8	2 hours	6 2 mg/L - 8 9 mg/	
O(IIIg/L/ OI	10078	10.0	10.0	1.6	4.2	6.1 mg/L - 8.8 mg/	
est Chemici	try and Biology					6.0 mg/L - 8.6 mg/ **corrected for alti	
Conc.	CTL 100			1	r	conected for all	llude
conc.							
			pH (units) (r	ange: 5.5-8.5)			
Day 0	3.8 75						
Day 4	8. 82			l			
			FC (i	JS/cm)			
Day 0	438 1444					1	
Day 4	465 1489						
		D0 //			1-20-000-00		
Day 0	20108	DO (mg/l	L) (70- 100% s	aturation at te	st temp.)		
Day 4	83 83						
Duy 4	0.0 0.0			L			
	D~	Te	mperature (°C) (range: 14-16'	(C)		
Day 0	14 14	T				1	
Day 4	15 15						
			A DE LORINO D			- 17. · · · · · ·	
Day 0	10	10 Numbe	r Alive (In bra	ckets number st T	ressed)	1	
Day 1	10 10		-	-	è		
Day 2	ID IN	_		1			
Day 3	in th						
Day 4	10 10						
,	Validity Criteria: must be	≤ 10% mortality a	nd/or stressed	l behavior in th	e control		
	Unless otherwise noted, be						
ntrol Orga	nism Data				Tost Organia	m Information	
Control	Length Weight				l'est organis		
Fish	(cm) (g)				Batch	20201114TR	
				20.0			-
1	3.0 03	Loading Density	y (g/L):	D.2	Source	Troutlodge	
2	3.0 0.3	(must be ≤0.5 g/L)			1		
	3.0 0.3			3.0	Tank #	7	-
3		Mean Length (c	:m):				
4	2.7 0.3				Days Held at		
4 5	2.7 0.3		7	~ ~ ~			
4 5 6	0.0	Length Range (cm): 2	7-3.2	(must be ≥14 d	ays)	
4 5 6 7	3.2 0.3	1		100 mm			
4 5 6 7 8	3.2 0.4 3.0 0.7 7.0 0.7 7.0 0.7	Mean Weight (0.3	Percent stock	mortality	0
4 5 6 7 8 9	x 2 0.4 x 3 0 0.7 x 9 0.7 x 9 0.7 x 9 0.7	1		100 mm	Percent stock		0
4 5 6 7 8	3.2 0.4 3.0 0.7 7.0 0.7 7.0 0.7	Mean Weight (g (Must be ≥0.3g)	g):	0.3	Percent stock	x mortality test, must be ≤2%)	
4 5 6 7 8 9	x 2 0.4 x 3 0 0.7 x 9 0.7 x 9 0.7 x 9 0.7	Mean Weight (g):	100 mm	Percent stock	x mortality test, must be ≤2%)	
4 5 6 7 8 9	3.2 0.4 3.0 0.3 3.0 0.4 2.9 0.2 3.2 0.4 1.4 0.3	Mean Weight (g (Must be ≥0.3g) Weight Range:	g):	0.3	Percent stock	x mortality test, must be ≤2%)	0
4 5 7 8 9 10	x 2 0.4 x 3 0 0.7 x 9 0.7 x 9 0.7 x 9 0.7	Mean Weight (g (Must be ≥0.3g) Weight Range:	g):	0.3	Percent stock	x mortality test, must be ≤2%)	
4 5 7 8 9 10	3.2 0.4 3.0 0.3 3.0 0.4 2.9 0.2 3.2 0.4 1.4 0.3	Mean Weight (g (Must be ≥0.3g) Weight Range:	g):	0.3	Percent stock	x mortality test, must be ≤2%)	



Daphnia Bench Sheet

Method	DAS20	Client	TEC164	Reference	e 2021-0796	—
T						
Test Log	Data	Time Technisian	Change Cart	Daily Data Daviau	Sample Informatio	
Day 0	Date	Time Technician		Daily Data Review	Initial pH:	1.5
0	2020-12-23 1415	KK/MW	13		Initial EC (µS/cm):	1564
<u> </u>	2020-12-24	0000 51		0	Initial DO (mg/L):	10.9
2	2020-12-25	2426 LC	3	ME	Initial Temp (°C):	-13
1		- <u></u>			Salinity (ppt):	2
Lab Code	CTLA CTLB	CTLC 100A	100B	100C		
day		pH (un	its) (range: 6.	0-8.5)		
0	0.2 87	67- 79	179	19		
2	8.4 6.4	84 84	84	9.4		
	The pH of the s	ample was not adjusted prio		unless noted in the comm	nents below	- <u>h</u>
0		HIQT HOZG	EC (uS/cm)	1.001	T T	1 1
2	yes year	907 1050	iais	low		
2	40 705	76711003	1020	16:10		
0		DO (mg/L)	(40-100% sat	uration at test tem	p.)	
0	7.9 7.9	79 04	62	82		
2	8.0 8.0	8.0. 8.0	8.0	0.0	<u> </u>	
		Temperatu	ire (°C) (range	: 18-22 °C)		
0	20 20	70 10	101	(8)		
2	9 (9	19 19	(9	19		
	2 <u>-</u>	S (*	Nu verbari	n Album		
			Numbe (I, immo			
0	010/	$ 0\rangle 10\rangle$			T T	
1	(0 (0	18 10	10	10		
2	10 10	10 10	TA	18		
		ria: must be ≤ 10% mo				
		bile; daphnid can't swi wise noted, behaviour			ll move	
Culture	Uniess Uther	wise noted, benaviour	is considered	to be normal		1
Young jar	JC Ja	ar(s) mortality 7 days p	rior to test (n	nust be ≤25%)	5	
QA (previo		0			/alidity Criteria	0
	t brood (≤12 days)	0	32		mortality at 48 hours	
	Imber of young produced			(must be	≤10%)	
Were test t	reatments randomized on	test tray? Yes N	10			
Sample						
DO % of sa	mple prior to aeration:	113	Is aeration r	equired (<40% or >	100%)? Yes or M	lo
Duration of	f aeration (37.5 +/- 12.5 m	/min/L): 200000	-	110um screen prior		
	mg CaCO ₃ /L) of 100% :	851			(<25 mg CaCO ₃ /L)?	Yes or No
Hardness o	of sample after adjustment	(must be between 25		•		
Alkalinity o	f 100% sample (mg CaCO ₃	/L): 183	2		-13	
			-			
Dilution W					 corrected for altit 	
	preparation date 🛛 🧕 🧕	12/10	3.3 to 8.2 m	U .	3.1 to 7.7 mg/L at 2	
Hardness o	of dilution water (mg/L)	707	3.2 to 8.1 m		3.0 to 7.6 mg/L at 2	22°C
Comments	observations:	no ppt	3.2 to 7.9 m	g/Lat 20 C		
		noppt				
	78 M	nupp.				
	Reviewed By:	Da Da	te Reviewed:	2020/12/	28	



APPENDIX C – Chain-of-custody form

	COC ID:	2020-12-2	20 T	oxicity SP2	1	TURN	AROUN	DT	IME	Regular	r (default)				RUSH:				
	PROJECT/CLIENT INFO	2020-12-2	20_1	Oxicity_512	. 1	T	AROUN		ABORAT		i (uciauli)				OTHER I	FO			
Facility Name	WLC AWTF					L	ab Name	-		vironme	ental		Repo	rt For	mat / Dis	stribution	Exc	el P	DF	EDD
Project Manager						Lat	Contact	Tar	nara Por	meroy			Email			-Lab a teck.co		X	X	X
	brett.mason@teck.com						Email	tam	nara@na	autilusen	vironmer	ntal.ca	Email			esults a teck c		x	X	X
	15 Km North HWY 43			10				-		12 Street			Email 3			a equisonline.		-	~	X
							- radie ob	,	0120	12 Street	UL		Email 4	_		lateck.com		x	v	X
City	Sparwood			Province BC			City	Cal	gary		D :	4.0							X	
Postal Code					1		-	-			Provinc		Email :		Marty.Ha	fke@teck.con		x	X	X
Postal Code	V0B 2G0			Country Cana	ida	Pos	tal Code	121	H 2KI		Country	Canada	Email	5:						6
								-												
Phone Number						Phone	Number	403	253 712	21						number	VP	PO0072	13080	
	SAMPLE DETAI	LS		T							1	1	ANALYS	SIS RE	QUESTE	D				
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													-							
			()			1			NAUT_96Hr_RT_Single_Conc entration_Toxicity Test	NAUT_48Hr_DM_Single_Con centration_Toxicity Test @ 20C										
			Hazardous Material (Yes/No)					S	e C	t @										
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-0796 Sample ID	C L L ···	Field	aza		Time	G=Grab	# Of		AU	AU"										
	Sample Location WL BFWB OUT SP21	Matrix WS	H	Date	(24hr)	C=Comp					l									
VL_BFWB_OUT_SP21_2020-12-20_N	WL_BFWB_OUT_SP21	***		12/20/2020	9:00	G	6		X	X							_	_		
2-10112122																				
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ADDITIONAL COMMENTS/SPE				RELINQUISH			N		Date		Ti	ime	Acce	oted B	y/Affiliatio	on	Date		Tin	me
Shipment includes 2 extra 20 L b	ladders and 2_extra	1L		Vaness	a li	arns			12/20/2		-	_						_		
plastic bottles.								- '	44	1/20	20				11.11					
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(v) SERVICE REQUEST (rush - s	ubject to availability)					12	Plantes,				1	1200000		1						
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R	Regular (default) X		Sampler's Na	-	1	\$7.	mag	sa Turne			Mobi	1 //							



END OF REPORT



Acute Toxicity Test Results

Sample collected December 28, 2020

Final Report

January 6, 2021

Submitted to: **Teck Coal Ltd.** Sparwood, BC

#4, 6125 12 Street SE, Calgary, AB T2H 2K1



SAMPLE INFORMATION

		Da	ates	
Sample ID/ Internal ID	Collected	Received	Rainbow trout test initiation	Daphnia magna 20°C test initiation
WL_BFWB_OUT_SP21_2020 -12-28_N /	28-Dec-20 at 0900h	29-Dec-20 at 0830h	30-Dec-20 at	29-Dec-20 at
2021-0804	09000	08301	1555h	1405h

Sample chemistry

Sample ID	Receipt	Hardness	Alkalinity
	temperature	(mg/L CaCO3)	(mg/L CaCO3)
WL_BFWB_OUT_SP21_2020- 12-28_N	4.6°C	952	211

TEST TYPES

- Rainbow trout 96-h single concentration screening test
- Daphnia magna 48-h single concentration screening test

RESULTS

Toxicity test results

Samula ID	Percent survival i	n 100% (v/v) sample
Sample ID	Rainbow trout	Daphnia magna 20°C
/L_BFWB_OUT_SP21_2020- 12-28_N	100	100
Samula ID	Percent Immob	ility in 100 (% v/v)
Sample ID		ility in 100 (% v/v) magna 20°C



Precipitate observations

Sample ID	Species	Precipitate in test vessel at test termination	Precipitate on test organism at test termination
WL_BFWB_OUT_SP21_2020-12-	Rainbow trout	None	None
28_N	Daphnia magna	None	None

QA/QC

QA/QC summary	Rainbow trout	Daphnia magna
Reference toxicant LC50 (95% CL)	3.9 (3.6-4.3) g/L KCl ¹	6.2 (5.9-6.5) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.6 (2.8-4.6) g/L KCl	6.2 (5.4-7.1) g/L NaCl
Reference toxicant CV	8.2%	4.5%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, December 21, 2020; ² Test Date December 21, 2020

LC = Lethal Concentration; CL = Confidence Limit



M. Frit

Report By: Michelle Fritz. BSc Biologist

Reviewed By: Kayla Knol, BSc Senior Biologist

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



Test species	Oncorhynchus mykiss
Organism source	Fish Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 – 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
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	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

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



Test species	Daphnia magna
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	375 mL glass vessels
Test volume	150 mL
Test concentrations	100% (undiluted) sample plus laboratory control
Test replicates	3 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended wit 4 mg/L KCl and with B12 (2 μg/L) and Na₂SeO₄ (2 μg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	Mean Percent survival
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

Table 2.Summary of test conditions: 48-h Daphnia magna survival test.



APPENDIX B – Toxicity test data

O NATITILIC

Trout Bench Sheet

H.

Method	TRSClient	TEC164	Reference	2021-0804		Chamber	5
Test Log						Sample Inform	ation
					Daily Data	Jampie mom	
Day	Date	Time	Initial	Chem. Cart	Review	Initial pH:	7.1
0	2020-12-30	iSS5 *	DW/AW	1		Initial EC (µS/cr	
1	2020-12-31	0745	MF	100	AP	Initial DO (mg/	
2	2021-01-01	0900	AN	-	- Ar	Initial Temp (°C): 17
3	2021-01-02	0830	AC		1B	Salinity (ppt):	1
4	2021-01-03	0930	when the test w	as loaded with	/VPW		
Preaeration t DO(mg/L) of	adjusted to 6.5 +/- 1 mL/min/ ime	0	1 hour	1.5 hours	2 hours	DO in mg/L (7 saturation)** 6.2 mg/L - 8.9 mg/ 6.1 mg/L - 8.8 mg/ 6.0 mg/L - 8.6 mg/ **corrected for alti	Lat 14°C Lat 15°C Lat 16'C
Conc.	CTL 100			i i i i i i i i i i i i i i i i i i i			
							1
_			pH (units) (ra	ange: 5.5-8.5)			
Day 0	+.+ 7.3						
Day 4	2.0 3.1	2					
			EC A.	S/cm)			
Day 0	1435 IIUUK	1		S/City		т т	
Day 4	45h Wer						
	- sorras						
		DO (mg/	L) (70-100% sa	turation at te	st temp.)		
Day 0	8.9 9.5						
Day 4	88 8.8						
		725-	W (1588)	90. ma			
5		Te	mperature ("C)	(range: 14-16	C)		
Day 0	14 19						
Day 4	LIS 15						
		Numbe	r Alive (In brac	kets number st	ressed)		
Day 0	01 01			keta namber st	reasedy	1	
Day 1	0 0						
Day 2	10 10						
Day 3	10 10						
Day 4	0101						
	Validity Criteria: must be ≤				e control		
	Unless otherwise noted, beha	avior is considere	d to be norma	I			
Control Orga	niam Data						
Control	Length Weight				rest Organis	m Information	
Fish	(cm) (g)			(Batch	20201114TR	
	``			1.0			
1	3.4 0.5	Loading Densit	y (g/L):	6.2	Source	Trout Lodge	
2	36 0.5	(must be ≤0.5 g/L)	1				
3	32 0.3			3.3	Tank #	7	
4	35 0.4	Mean Length (c	:m):				
5	3.2 0.3			3.0-3.6	Days Held at		23
6 7	3-5 0.4	Length Range (cm):	1.0-7.6	(must be ≥14 da	ays)	
8	35 05	Mean Weight (D-4	Percent stock	mortality	
9	36 03	(Must be ≥0.3g)	<i>a</i> /·		Percent stock	mortality est, must be ≤2%)	0
10	30 62		72				
		Weight Range:	(g): 🜔	1.3-6.5	Test Volume (L)	18
			<u> </u>		Wabbac. Province (-	.0
Comments :	01						
	96h-noppt	-					
	D 1 1	TP				2021/21	105
	Reviewed By:				Jate Reviewed	2021/01	20



Daphnia Bench Sheet

Method	DAS 20	<		Client	TEC164		Reference	2021-	-0804	
Test Log								Sample In	formation	
Day	D	ate	Time	Technician	Chem. Cart	Daily Dat	- Roviow	Initial pH:		
									(class)	7.1
0	2020/		1405	MUX	3			Initial EC (1540
1	2020/		0830	B		5	P	Initial DO (10.9
2	2020/	12/29	11m	AN	3	N	Ŧ	Initial Tem	p (°C):	17
				1.2				Salinity (pp	ot):	1
Lab Code	CTLA	CTLB	CTLC	100A	100B	100C	I			
day				pH (uni	ts) (range: 6.	.0-8.5)				
Ó	8.2	0 2	8.2	7.4	7.4	7.4	·			r i
2	0.2	0.4	2.5			1.0				
2	0.3	0.5	0.0	0.5	0.3	8.3				0
	0	The pH of the	sample was no	t adjusted prior	to test setting, EC (uS/cm)	unless noted	in the comme	ents below		
0	1412	1117	412	1620		11.14	r			1
	710	412			1619	1219				· · · · · · · · · · · · · · · · · · ·
2	403	402	395	1572	1585	1599				
					40-100% sa	turation at	tost tomp	Ň		
0	10.1	81				9,9	l test temp		r	r1
0	81	0.1	8.	9.1	9.9					
2	0.9	8.2	6.9	8.1	B-1	<i>e</i> .1				
				Temperatu	re (°C) (range	a: 18-22 °C)			
0	16	10					, T			r
		19		19		19				
2	18	10	16	19	9	9			1	
					Numbe	Section .				
					(l, îmmo	bile)				
0	10	10	10	10	10	10				
1	10	10	10	10	10	10	1			
2					1.				e	
2		10	10	10	10	10				
			teria: must be							
		Notes: Imm	nobile; daphr	nid can't swir	m after 60 se	ec. even if a	intenna still	move		
		Unless othe	erwise noted,	, behaviour i	s considered	l to be nori	mal			
Culture	1							1		
	C'5		lou(a) no outo				C 0/)	D1		
Young jar		5.	Jar(s) mortal	lity / days pi	rior to test (r	nust be ≤2	.5%)	-01	-	
							-			-
QA (previor			0				Control Va	alidity Crit	eria	1
Days to firs	t brood (≤12	days)	X				Mean % m	ortality at 4	48 hours -	O(1)
	Imber of your		1 (>15 young		25		(must be ≤			
	reatments rar				2		(1100100-	10,0)		
were test t	reatments rai	idomized o	n test tray?	Yes / N	0					
				\smile						
Sample									0	
DO % of sa	imple prior to	aeration	17	5 %	Is aeration i	required (<	40% or >10	00%)?	Ves or No	
	• •				-			-	1-	
10 III III III III III III III III III I	f aeration (37.	-	mL/min/L) :	20 Min	Filtered wit				Yes or No	
Hardness (r	mg CaCO₃/L)	of 100% :	952		Is hardness	adjustmen	t required (<25 mg Ca	CO ₃ /L)?	Yes or No
	-					-	`	. <u> </u>	3 . F (1)	
Inaruness 0	of sample afte	aujustmen	it (must be b	between 25 -	- su mg cac	U3/L)		-		
Alkalinity of	f 100% sampl	e (mg CaCC	D₃/L):	211						
Dil			23			10 1000		e ange generation	d Bula state	
Dilution W			as letter		DO Levels					
Pail label /	preparation d	ate	2 110		3.3 to 8.2 m	19/L at 18°	C	3.1 to 7.7	mg/L at 21	°C
Hardness o	f dilution wat	er (ma/L)	20		3.2 to 8.1 m			3.0 to 7.6	mg/L at 22	°C
1		, , , , , , , , , , , , , , , , , , , ,			3.2 to 7.9 m					-
Commente	/Observatio		0 . 1		5.2 (07.51	9/1-01 20 0				
		DIAS	°, no ppt							
		40h	r. Nopp	4						
I	Reviewed By:	JP		Dat	e Reviewed:	2021	101105			



APPENDIX C – Chain-of-custody form

Teck					Page	1 of								
	COC ID: 2020	-12-28	2020-12-28 Toxicity S	SP21	TURNA	TURNAROUND TIME:	A T	Regular (default)	lefault)		RUSH: OTHE	RUSH: OTHER INFO		
Facility Name WLC AWTF	WLC AWTF				Lal	Name N	Lab Name Nautilus Environmental	vironment	1	Rep	Report Format / Distribution		Excel	PDF
Project Manager Brett Mason	Brett Mason				Lab (Contact T	Lab Contact Tamara Pomeroy	leroy		Email 1:	1: DL-WLC-Lab@teck.com	@teck.com	x	×
Email	Email brett.mason@teck.com					Email ta	amara@na	utilusenvii	Email tamara@nautilusenvironmental.ca	Email 2:	2: H20.lab.results@teck.com	@teck.com	×	×
Address	Address 15 Km North HWY 43				1	Address #	Address #4, 6125 - 12 Street SE	2 Street S		Email 3:	3: TeckCoal@equisonline.com	iisonline.com		
										Email 4:		ck.com	X	x
City	City Sparwood		Province BC	ç		City C	City Calgary	F	Province AB	Email 5:	5: Marty.Hafke@teck.com	teck.com	X	X
Postal Code V0B 2G0	V0B 2G0		Country Canada	anada	Posti	Postal Code T	T2H 2K1		Country Canada	la Email 6:	6:		1904 1904	
						T						-		
Phone Number 250-425-4837	250-425-4837				Phone 1	Vumber 4	Phone Number 403 253 7121				PO number	ıber	VPO00723080	23080
	SAMPLE DETAILS			-						ANALY	ANALYSIS REQUESTED			
							and the		Please	e indicate below	Please indicate below Filtered, Perserved or both (F, P, F/P)	oth (F, P, F/P)		A COLOR
							and the second s	And the second	ricas	indicate below	ritered, reiserved or b	om (r, r, r/r)		1
								u						
		(0]	1					@ C01						
		N/20				Sh	st Ble_) isa			-			
		9A)				SA	gni2 29T	oT y						
		[Rin91					icity	M						
		teM :					Tox	To						
	1	snop.n :		ł		000	_noite 90_T1	84_TI noi187						
Sample ID	Sample Location Ma	Matrix H	Date	1 ime (24hr)	C=Comp	F OI Cont.	entr	20C 102 1VN						
WL_BFWB_OUT_SP21_2020-12-28_N	21	WS	12/28/2020	-		9	х		4.6°C					
2021-0804														
2670/17/79														
0830														
TICO OFF														
				-										
176 10000		-												
		t		+					1					
				Ļ					-					
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	CIAL INSTRUCTIONS		RELINOI	ISHED BV/	RELINOUISHED BV/AFFILIATION		Date		Time	Acc	Accepted Bv/Affiliation	Di	Date	Time
Shinment includes 2 extra 201. hladders and 2 extra 1	ladders and 2 extra 11.				i rài		12/28/2020	020		*				
nlastic hottles				<i>a</i> .		-				200				
	· · · · · · · · · · · · · · · · · · ·					1						-		
SERVICE REOLIEST (ruch - subject for availability)	stron: subject to availability)				-									
	Regular (default)	(t) X	Complete	Compley's Name white		- Int	Iulia Iohneon			Mahila #				
Priority	Priority (2-3 business days) - 50% surcharge	ge	oampici s	- value						TUDIT T				1
Emergency (1 Business Day) - 100% surcharge	Emergency (1 Business Day) - 100% surcharge	ge	Sampler's Signature ^{4,411}	ionaturé" ^{+ 4}	117				â	Date/Time		28-Dec-20	0	



END OF REPORT