



2430 Jingle Pot Rd
Nanaimo, British Columbia
Canada V9R 6W2
Tel: 250.585.0800
www.waterlineresources.com

September 13, 2018
2768-18-001

Cowichan Valley Regional District
175 Ingram Street
Duncan, BC
V9L 1N8

Attention: David Parker, Engineering Technologist III

RE: Saltair Groundwater Exploration – TW18-1 Drilling and Testing

1.0 INTRODUCTION AND BACKGROUND

The Cowichan Valley Regional District (CVRD) is exploring the potential of developing a fresh groundwater supply to service the community of Saltair. The CVRD anticipates a water demand of approximately 1,090 to 1,635 m³/day (200 to 300 USPGM).

To support this objective, Waterline Resources Inc. (Waterline) completed a Phase 1 groundwater potential study in 2017 to compile and review available geologic and hydrogeologic information related to the study area and provide drilling targets¹. Based on this preliminary work, an alluvial fan at the confluence of North and West Banon Creeks was chosen as the preferred target for groundwater exploration. The alluvial fan had previously been mapped and identified as a potential aquifer target in a 1965 report by the provincial government during a field reconnaissance program by J.C. Foweraker². The potential aquifer target is located approximately 3.5 km southwest of Saltair (the site; Figure 1). The mapped extent of the alluvial fan is presented on Figure 2 (shown as yellow).

A seismic geophysical survey was conducted as part of the 2017 Phase 1 study to define the thickness of potential permeable zones within the accessible portion of the alluvial fan and help select the best possible location for drilling³. The geophysical seismic lines are presented on Figure 2 (red points). The preliminary drilling target was chosen because the seismic results indicated the overburden was the thickest in this area and because of its proximity to an access road. The target is located on forested crown land, approximately 100 m east of Bannan Creek.

Based on the results of the Phase 1 study, the CVRD retained Waterline to complete a Phase 2 drilling and testing program after a crown land tenure was attained by the CVRD.

¹ Waterline Resources Inc., 2017. Preliminary Hydrogeological Site Characterization for Saltair Groundwater Source, Including Cost Estimate (CVRD No. ES-031-16). 2768-17-001.

² BC Government, 1965. Water Resources Groundwater Development.

³ Frontier Geosciences Inc. 2017. Seismic Refraction Survey Report. Saltair Groundwater Project. Saltair, BC. Submitted to the Cowichan Valley Regional District.

For the readers convenience, Section 6.0 provides definitions for the acronyms used throughout the report.

1.1 Objectives and Scope of Work

The primary objective of the groundwater exploration program was to drill and test a potential aquifer target to determine if sufficient groundwater supply exists to support future development opportunities at the site. To address CVRD's objectives, Waterline completed the following scope of work:

- Provided hydrogeological support during the drilling, construction, and testing of one water supply test well (TW18-1), shown on Figure 2;
- Processed and interpreted the aquifer test data and estimated the long-term sustainable yield of the well;
- Collected groundwater samples for water quality analysis;
- Presented the results to the CVRD; and
- Provided a short technical memorandum to summarize the results of the program and provide recommendations regarding long-term groundwater supply options at the site.

2.0 RESULTS

2.1 Drilling and Well Construction

The drilling program was completed between April 9-17, 2018 by Drillwell Enterprises Ltd. (Drillwell) using a Foremost DR12 dual-rotary rig. Surface casing was installed by cementing a 12-inch steel casing from surface to 5 mbgl. The subsurface geology encountered at TW18-1 can be summarized as follows:

- 0 to 21.3 mbgl: fine to coarse grained sand and gravel;
 - Water-bearing from 10.7 mbgl; and
 - Air-lifting estimate 163 to 360 m³/d (30 to 66 USgpm).
- 21.3 to 22.9 mbgl: Fine-grained silty sand;
 - Less water production after this unit.
- 22.9 to 38.1 mbgl: Fine-grained sand, some silt;
 - Water-bearing, however lower water production.
- 38.1 to 47.5 mbgl: Shale bedrock, competent, no water-bearing fracture zones encountered.

The results indicated there were two potential aquifer zones: The upper sand and gravel from 10.7 to 21.3 mbgl, and the lower sand unit from 22.9 to 38.1 mbgl. The upper sand and gravel unit corresponds to Layer 2 on the geophysics results (shown in green on Figure 3), while the lower sand unit corresponds to Layer 3 (shown in yellow on Figure 3).

Air-lift testing indicated the upper sand and gravel aquifer from 10.7 to 22 m was the most prolific zone encountered during drilling; however, the total available drawdown (TAD) of the well would be limited for this aquifer. In addition, the Hazard Screening outlined in the BC Guidance Document

for Determining Ground Water at Risk of Containing Pathogens (GAPR)⁴ indicates that wells within 150 m of a water body with an intake depth of less than 15 m are at higher risk of being GARP.

Waterline retained McElhanney Consulting Services Ltd.(McElhanney) to complete grain size analyses on 16 sediment samples collected from 15.2 to 36.6 m depth to help determine a screen interval and select an appropriate slot size. The grain size distribution curves are provided for reference as Appendix C. The analyses indicated that although the lower sand unit contained a higher percentage of silt than the upper sand and gravel; an adequate yield may have been produced from the lower sand unit with a long enough well screen. Completing the lower sand unit would maximize the total available drawdown and decrease the risk of GARP.

TW18-1 was first completed with 15 ft of 30 slot and 5 ft of 40 slot telescoping stainless steel wire-wrap screen across the lower sand from 29 to 35 mbgl. Air-lift testing was performed for 45 minutes to test the potential yield of the lower sand aquifer at a rate of 82 to 44 m³/d (15 to 8 USGPM). The results indicated that although the well was producing, it would not provide the rate required by the CVRD. The screen was pulled, and the borehole was backfilled with pea gravel to a depth of 21.3 mbgl.

TW18-1 was then completed with 15 ft of 30 slot screen installed across the sand and gravel interval from 16.3 to 21.3 m. The theoretical yield of a screen of this size is approximately 1,800 m³/d (330 USgpm). The screen was developed by air lifting techniques at a rate of 327 to 436 m³/d (60 to 80 USgpm) to remove fine sediment from around the well and create a natural filter pack. Well completion details and drilling observations are presented in the borehole log (Appendix B) and are summarized below in Table 1.

⁴ BC Government, 2015. Guidance Document for Determining Ground Water at Risk of Containing Pathogens (GARP), Version 2.

Table 1: Well Construction Details

Well Name	TW18-1
Well Type	Test Well
Completion Date (dd-mmm-yr)	17-Apr-2018
BC Well Identification Number	52145
BC Well Tag #	---
Easting ¹	0441282
Northing ¹	5420806
Ground Elevation (masl) ¹	213.3
Casing Stick-up (magl)	0.67
Drilling Contractor	Drillwell Enterprises Inc.
Drilling Method	Dual-Rotary
Borehole TD (mbgl)	47.5
Casing Diameter (mm)	203 (ID), 8-inch
Aquifer Formation	SAND and GRAVEL
Aquifer Top (mbgl)	Unconfined (NPWL: 3.35 mbgl)
Aquifer Bottom (mbgl)	22.2
NPWL (mbgl)	3.35
Available Drawdown (m) ²	12.6
Screen Interval and Slot Size	16.3-21.3 m (30-slot)
Screen Type	Stainless Steel Wire Wrap

Notes: 1. coordinates from drillers handheld GPS. 2. For unconfined aquifers, the available drawdown is defined as two-thirds of the saturated thickness of the aquifer. 'masl' means metres above sea level; 'magl' means metres above ground level; 'mbgl' means metres below ground level; 'NPWL' means non-pumping groundwater level; 'mbtoc' means metres below top of casing; 'N/A' means not available.

2.2 Aquifer Testing

A step-rate well performance test was completed at TW18-1 on April 24, 2018 by BC Aquifer Services (BC Aquifer). The step test consisted of four rate-steps of 30 minutes duration run at 163, 272, 359, and 436 m³/d to establish a sustainable pumping rate for the constant rate test and evaluate well losses. The water level response in TW18-1 during the step drawdown test is shown on Figure 4.

A 48-hr constant-rate aquifer test was completed at TW18-1 from April 24-26, 2018 at a rate of 350 m³/d (64 USGPM). The rate was increased by approximately 5.4 m³/d (1 USGPM) 1,200 minutes into the test when BC Aquifer installed their Microscopic Particulate Analysis (MPA) testing equipment. An increase of 5 m³/d is less than a 2% change in the overall rate and not considered to have affected the test in any significant way. Water was discharged approximately 200 m down-gradient (south) of the pumping well along the access road.

Figure 5 presents the pumping well water level hydrograph representing the testing period. The pumping rate was sustained for 48 hours, resulting in 7.9 m of drawdown representing approximately 63% of the total available drawdown. An observation well was not available for monitoring during the test. After the pump was shut down, water level recovery was monitored for four days using a pressure transducer and data logger.

During aquifer testing, surface water levels in Banon Creek were monitored. Surface water monitoring results indicate that pumping TW18-1 at a rate of 350 m³/d did not influence water levels

in the creek. Both groundwater and surface water levels were influenced by barometric pressure changes, which were filtered out of the data as best as possible, but still observed slightly in the recovery data.

The Nanaimo Airport climate station indicates 5.2 and 3.4 mm of precipitation fell on April 28 and 29 2018 during the recovery portion of the test (Figure 5). Precipitation did not appear to influence groundwater levels.

2.3 Aquifer Parameter Estimates

The water level data collected during the pumping and recovery intervals was used to assess the aquifer response to pumping, to determine aquifer hydraulic parameters, and to evaluate the presence of hydraulic boundaries in the aquifer.

Analysis of the pumping test data was completed using AQTESOLV, Version 4.50-Professional, Aquifer Test Design and Analysis Computer Software (1996-2007 HydroSOLVE Inc.). This aquifer test solver provides analytical solutions for evaluating hydraulic parameters in confined, unconfined, leaky, or fractured aquifer systems. In this analysis, aquifer test data was analyzed by visual curve matching to determine the “best fit”, and in turn, select the most appropriate interpretation to represent aquifer conditions within the upper sand and gravel. Several assumptions are implicit in the hydraulic parameter calculations, and there will invariably be some discrepancy between predicted (i.e., theoretical) and measured drawdown. For instance, the solutions applied assume the aquifer is unconfined, has infinite areal extent, and assume the aquifer is homogeneous, isotropic and of uniform thickness.

Table 2 presents a summary of the estimated aquifer parameter values obtained from the pumping and recovery data. The AQTESOLV plots are provided in Appendix D.

Table 2: Aquifer Parameter Estimates

Solution	Pumping or Recovery Cycle	Time Interval Analyzed	Transmissivity	Storativity (S)
			(m ² /d)	-
Moench	Pumping	All	143	-
Neuman	Pumping	All	143	-
Cooper-Jacob	Pumping	Mid	465	-
Cooper-Jacob Agar rec	Recovery	Mid to Late	464	-

Notes: Bold indicates value used for long-term predictive analysis. Storativity values can not be calculated without an observation well.

The transmissivity (T) parameter represents the aquifer’s ability to transmit water and can be calculated from the test data. Water level drawdown in TW18-1 occurred very quickly during the step and constant-rate tests (Figure 4 and Figure 5); however, after the initial drawdown water levels stabilized. Therefore, the T of the aquifer was estimated to be relatively high, between 142 to 464 m²/d. The wide range in values is attributed to the lack of an observation well which does not allow for differentiation between well inefficiencies and potential boundary conditions (i.e., recharge from Banon Creek) that could have resulted in a steep initial drawdown followed by stabilization. The T values and stabilization of the drawdown curve suggest that the aquifer may

have a large extent. and the aquifer may be receiving recharge from the creek upgradient of the well location. The data indicates more aggressive well development will likely improve the well efficiency.

No flow boundaries, which are often observed near bedrock valleys or outcrops and evidenced by an increase in drawdown, were not detected in the data set.

The aquifer's hydraulic conductivity (K) is equal to T divided by the saturated thickness (b) of the aquifer. Therefore, the estimated K value for the aquifer, using T (146 to 464 m²/d) and b (22.2 m), is 7 to 21 m/d (9×10^{-5} to 2×10^{-4} m/s), the former being representative of a silty to clean sand, with the later being more representative of clean sand with fine-grained gravel.

2.4 Sustainable Well Yield (Q₂₀) Calculation

The Modified Moell method (Q₂₀) developed by van der Kamp and Maathuis (2005) was applied to estimate the long-term sustainable yield of the aquifer. Table 3 summarizes the input parameters. The Q₂₀ calculation indicates that TW18-1 could sustain 312 to 367 m³/d (57 to 67 USGPM) of continuous pumping over a 20-year period (24 hours per day, 7 days per week, and 365 days per year). Well development may improve the observed drawdown in the well, which may increase the estimated long-term sustainable yield by improving well efficiency.

Table 3: Q₂₀ Calculation Input Parameters

Parameter	Unit	TW18-1	
Tested pumping rate (Q)	m ³ /d	350	
Available head (H _a)	m	12.6	
Measured drawdown after 100 minutes (S _{100mins})	m	7.69	
Theoretical drawdown after 100 minutes (S _{100 mins theor})	m	2.1	0.8
Theoretical drawdown after 20 years (S _{20yrs theor})	m	4.3	1.5
Transmissivity	m ² /d	143	460
Estimated Storativity (Specific Yield) ¹	-	0.2	0.2
Theoretical 20-year sustainable yield (Q ₂₀)	m ³ /d	312	367

Notes: 1. Estimated from published values for a sand and gravel aquifer

2.5 Groundwater Quality

Field water quality parameters were recorded from TW18-1 and Banon Creek over the course of the 48-hr constant-rate test (Table E1). Field parameters for both TW18-1 and Banon Creek were relatively stable throughout the pumping test, with the exception of turbidity, which improved from 14 NTU at the start of the test to 0.49 NTU at the end of the test. The specific conductance values measured in the field indicate the groundwater is fresh.

Water quality samples were collected from TW18-1 and Banon Creek near the end of the constant-rate test on April 26, 2018. The general, major ion and metal samples were submitted to CARO

Analytical Services in Richmond, BC, while the microbiology samples and MPA filter were sent to MB Laboratories Ltd in Sidney, BC. Analytical results were compared to the Canadian Drinking Water Quality Guidelines (2018) to identify potential water quality concerns. The comparison tables are provided as Appendix E (Table E2 to E5). No exceedances were observed, with the exception of pH, which was slightly below the aesthetic objective (AO) of 7.0, and total aluminum in Banon Creek (0.122 mg/L, CDWQG AO is 0.1 mg/L), which is believed to be a reflection of acid preservation of water samples where suspended aluminum silicate clay minerals are present. A piper plot (Figure 6) shows that the major ion concentrations from Banon Creek and TW18-1 plot similarly, indicating a hydraulic connection. Microbiology had no detection of bacteria (IRB, SRB, coliforms or E. coli).

MPA testing did not detect Giardia, Cryptosporidium, Coccidia, Diatoms, Algae, Protozoa, Insects, or Rotifers; however, plant debris was detected and rated to be extremely heavy (1666/100 Gallons). The overall risk rating of surface water contamination provided from the MPA testing was indicated to be of low risk. A copy of the results is included in Appendix E for reference.

2.6 Further Groundwater Exploration

Waterline understands that the predicted diversion volumes from TW18-1 do not meet the CVRD's objectives for the proposed project. However, it may be possible through water management and storage and the addition of more supply wells to meet the objective of the project. Additional drilling and testing would be required to map the extent of the aquifer and explore for additional groundwater.

It is Waterline's understanding that since the time of the Phase 1 study, additional historic reports and data sets have been acquired by the CVRD and new groundwater exploration areas located on CVRD land south of Stocking Lake reservoir have been identified. The new groundwater exploration areas are located north of the mapped Banon Creek alluvial fan but correspond to areas identified as having higher groundwater potential based on results of historical geological mapping and geophysics. Explorative drilling in these areas is currently underway and a summary of this exploration program will be reported under a separate cover.

The western section of the Banon Creek alluvial fan was previously not considered for drilling because of limited site access; however, this area now has access because of recent logging operations in the area. It is possible that the western section of the fan between the north and west Banon Creeks may represent the apex of the alluvial fan deposit. The apex of alluvial fans often contain coarser-grained materials and potentially could have a greater depth to groundwater which would decrease the risk of GARP. However, the nearest seismic lines indicate that the target aquifer may thin to the north and west of TW18-1.

While the seismic results provided an estimate of the lithological thicknesses underlying the site, additional geophysics, such as transient electromagnetic (TEM) or electrical resistivity tomography (ERT) surveys, would help to map and target the coarsest and most permeable water-producing units. Alternatively, a new technique known as Magnetic Resonance Sounding (MRS) or Nuclear Magnetic Resonance (NMR) has recently been used to directly study groundwater reservoirs. MRI/NMR is apparently able to measure the water content and estimate the permeability and depth

of water-bearing units. Although drilling and testing would be required to calibrate the geophysics, geophysics would help to map the extent of the aquifer and target the most prolific units. These methods could be used within the alluvial fan system, or at a new target aquifer location.

Prior to drilling along Banon Creek, an understanding of the environmental flow needs of the creek is required to ensure additional wells would not withdraw a significant portion of base flow rates.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the drilling and testing program, Waterline has reached the following conclusions:

- The aquifer appears to be of moderate transmissivity and no negative boundary conditions were observed at the time of testing.
- Improvement in well efficiency may be possible with a more aggressive screen development (surge block).
- If the CVRD would like to license TW18-1, the provincial government typically requires a pumping test conducted at the low flow period (August to September)⁵. Licensing also typically requires an observation well; the addition of an observation well would also improve certainty of the aquifer assessment and long-term well yield calculations.
- There is potential, through water management and storage and the addition of supplementary supply wells, to meet the objective of the project. Additional drilling and testing would be required to map the extent of the aquifer and explore for additional groundwater.

Based on the findings of the study, Waterline has the following recommendations:

- Redevelop the well using Drillwell's cable tool rig. Drillwell has indicated a half day of development will provide the information to determine whether further development is warranted (i.e., 1 hour per ft of screen).
- Once the well is redeveloped, a second test could be completed on the well during the low-flow period (late summer to early fall). Resampling of the well is recommended at that time to assess seasonal affects.
- In order to properly assess potential hydraulic connection between the well and the creek, Waterline recommends installing mini-piezometers in the alluvial deposits adjacent to the creek to confirm pressure changes directly in the adjacent aquifer. It may be possible to drive steel pipes (drive-point piezometers) directly into the material. The location and elevation of the tops of the piezometers and the well head should be surveyed to convert the groundwater depths into groundwater elevations.
- Obtain a work plan and cost estimate from a geophysicist to complete a resistivity survey to help map and target the coarser and more-permeable water producing units within the alluvial fan system prior to further exploratory drilling within the alluvial fan system.
- Additional groundwater supply wells may be feasible in the aquifer; however, the environmental flow needs of Banon Creek should be confirmed and compared to the CVRD's water demands.

⁵ BC Government, 2016. Guidance for Technical Assessment Requirements in Support of an Application for Groundwater Use in BC.

4.0 CERTIFICATION

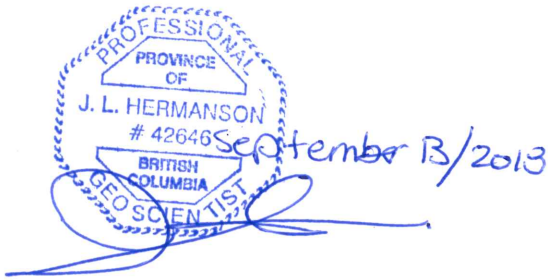
This document was prepared under the direction of a professional geoscientist registered in the Province of British Columbia.

Waterline Resources Inc. trusts that the information provided in this document is sufficient for your requirements. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

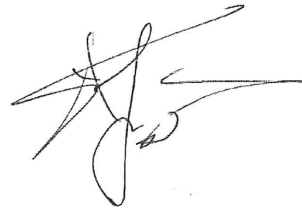
Respectfully submitted,

Waterline Resources Inc.

Reviewed by:

A blue ink stamp of a professional geoscientist. The stamp is circular with a scalloped border. Inside the border, the text reads: "PROFESSIONAL" at the top, "PROVINCE OF" below it, "J. L. HERMANSON" in the center, "# 42646" below that, "BRITISH COLUMBIA" below that, and "GEO SCIENTIST" at the bottom. To the right of the stamp, the date "September 13/2013" is handwritten in blue ink. A blue ink signature is written across the bottom of the stamp.

Jolene Hermanson, M.Sc., P.Geo.
Hydrogeologist

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke at the end.

Steve Foley, M.Sc., P.Geo.
Principal Hydrogeologist

A handwritten signature in black ink, written in a cursive style.

Gage Nordstrom, B.Sc., G.I.T.
Project Scientist

5.0 LIMITATIONS AND USE

The information presented in this document was compiled exclusively for the Cowichan Valley Regional District (the Client) by Waterline Resources Inc. (Waterline). This work was completed in accordance with the scope of work for this project that was agreed between Waterline and the Client. Waterline exercised reasonable skill, care and diligence to assess the information acquired during the preparation of this document, but makes no guarantees or warranties as to the accuracy or completeness of this information. The information contained in this document is based upon, and limited by, the circumstances and conditions acknowledged herein, and upon information available at the time of the preparation of this document. Any information provided by others is believed to be accurate but cannot be guaranteed. No other warranty, expressed or implied, is made as to the professional services provided to the Client.

Any use, reliance on, or decision made, by a third party based on this document is the sole responsibility of said third party. Waterline makes no representation or warranty to any third party with regard to this document and, or the work referred to in this document, and accepts no duty of care to any third party or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred as a result of the use of, reliance on, any decision made, or any action taken based on, this document or the work referred to in this document.

When Waterline submits instruments of professional service; including, reports, drawings and project-related deliverables, the Client agrees that only original signed and stamped paper versions shall be considered as original documents. The hard copy versions submitted by Waterline to the Client shall be considered as copies of the original documents, and in the event of a dispute or discrepancy, the signed and stamped original documents retained by Waterline shall govern over all copies, electronic or otherwise, provided to the Client.

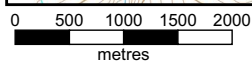
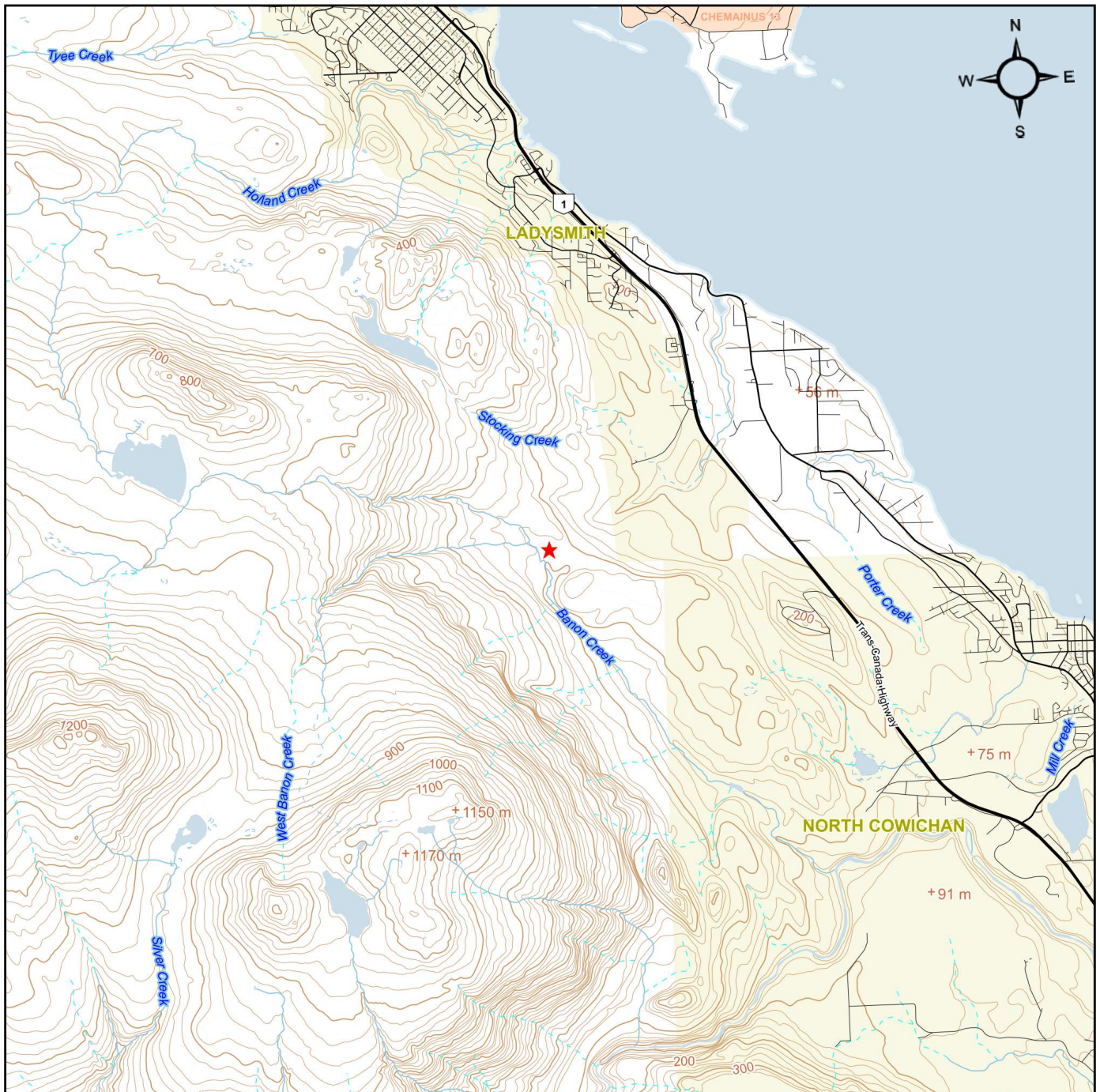
This document is intended to be used in its entirety, and no individual part of the document may be taken as representative of the findings of the document. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form, by any third party, without the expressed written permission of the Client or Waterline.

6.0 DEFINITIONS

AO	Aesthetic objective; the term applies to certain substances or characteristics of drinking water that can affect its acceptance by consumers (taste, odour, colour) or interfere with practices for supplying good water
b	Thickness of the aquifer
CDWQG	Canadian Drinking Water Quality Guidelines
CVRD	Cowichan Valley Regional District
GARP	Groundwater At Risk of Containing Pathogens
Ha	Available head
IRB	Iron related bacteria
K	Hydraulic conductivity; a property that describes the ease with which a fluid can move through pore spaces or fractures
m³/d	metres cubed per day
magl	metres above ground level
masl	metres above sea level
mbgl	metres below ground level
mbtoc	metres below top of casing
mg/L	milligrams per Litre
MPA	Microscopic Particulate Analysis
NPWL	non-pumping groundwater level
NTU	Nephelometric Turbidity Units; a unit measuring the lack of clarity of water
Q	Tested pumping rate
Q₂₀	Sustainable well yield calculation; used to estimate the long-term sustainable yield of the aquifer
S	Storativity; the volume of water released from storage per unit decline in hydraulic head in the aquifer, per unit area of the aquifer
S_{100 mins theor}	Theoretical drawdown after 100 minutes
S_{100mins}	Measured drawdown after 100 minutes
S_{20yrs theor}	Theoretical drawdown after 20 years
SRB	Sulphate Reducing Bacteria
T	Transmissivity; the aquifer's ability to transmit water
TAD	Total available drawdown
TW	Test well
USGPM	US Gallons per minute

FIGURES

Figure 1	Location Map
Figure 2	Site Plan
Figure 3	TW18-1 Projected on Line 1 Seismic Results
Figure 4	Step-Rate Test Hydrograph
Figure 5	Constant Rate Test Hydrograph
Figure 6	Piper Plot



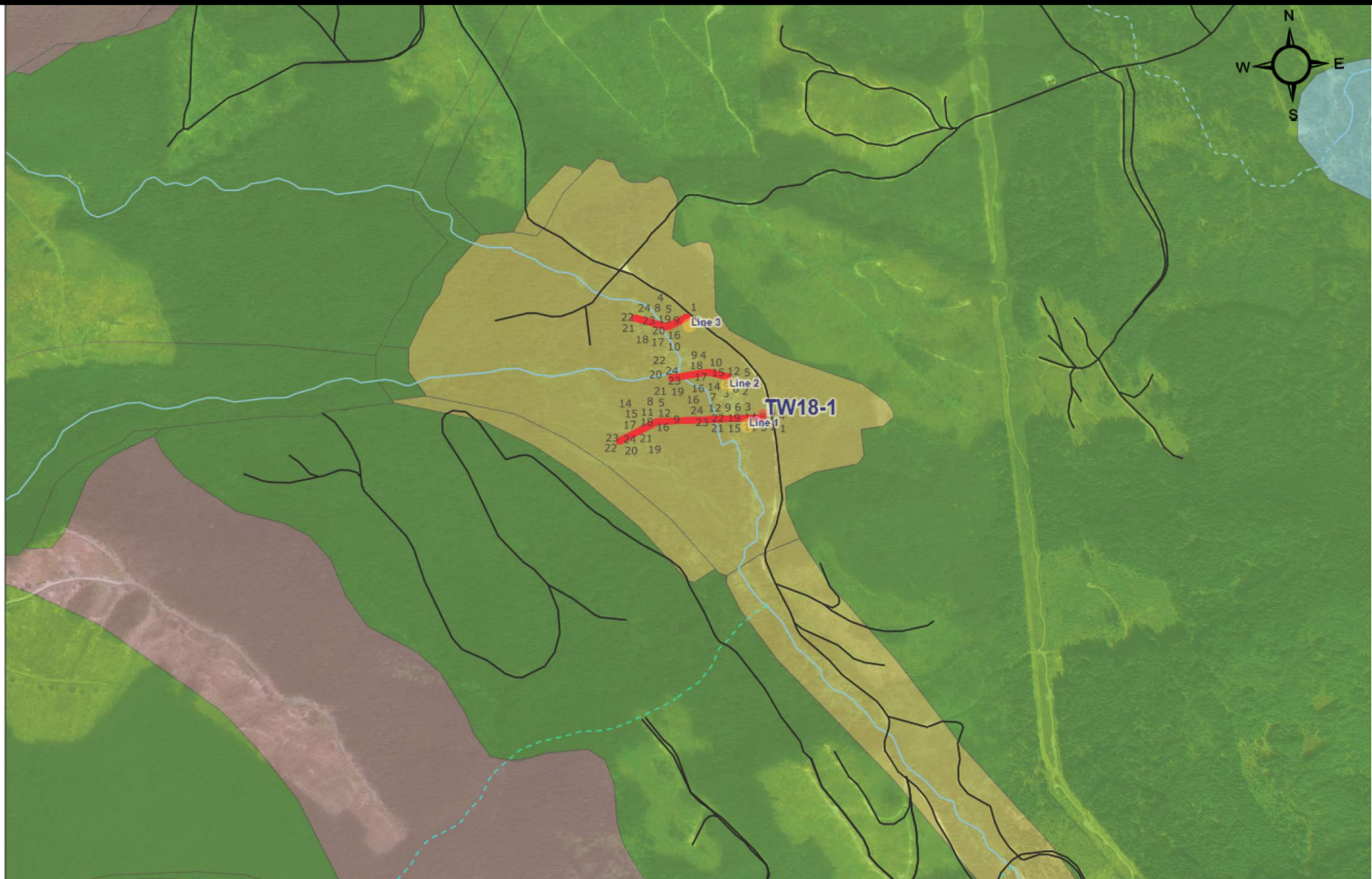
Coordinate System: NAD83 / BC Albers

LEGEND:

- ★ Approximate Site Location
- Stream - Definite
- - - Stream - Indefinite
- · - · - Stream - Intermittent
- Lake/Reservoir - Definite
- River
- Wetlands
- Contour
- Index Contour

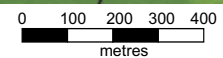



PROJECT	
Groundwater Supply Exploration - TW18-1 Drilling and Testing	
Saltair, BC	
Submitted to Cowichan Valley Regional District	
TITLE	
LOCATION PLAN	
	PREPARED BY: Waterline Resources Inc.
	PROJECT: 2768-18-001
	COMPILED BY: CGD
	DATE ISSUED: June 2018
REVISED: -	
FIGURE 1	

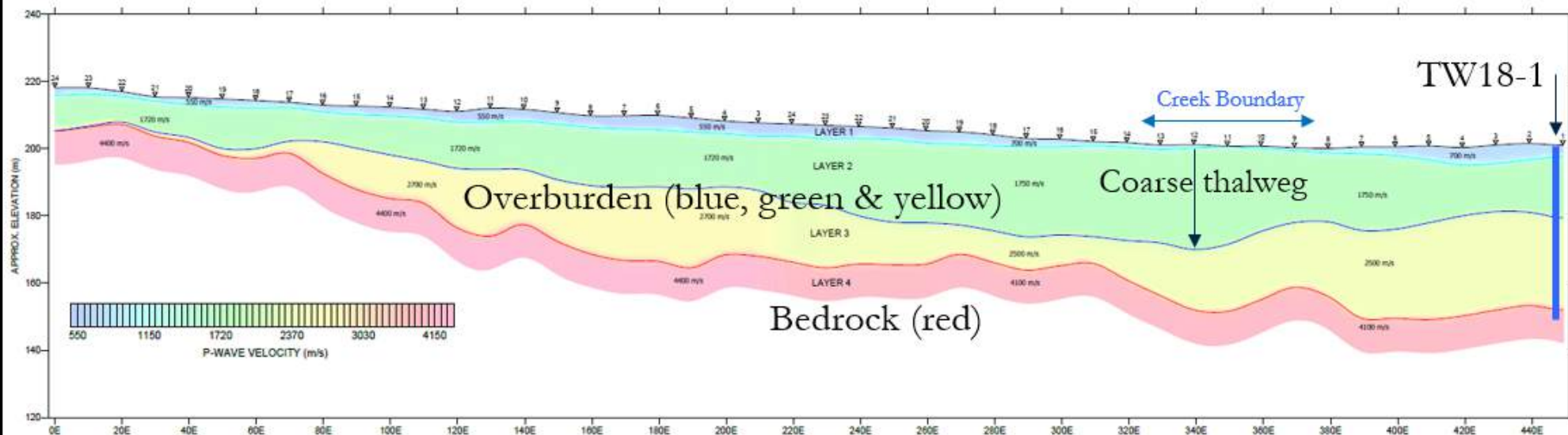


LEGEND:

- Colluvium
- Fluvial Material
- Marine Material
- Morainal Material (till)
- River/Stream - Definite
- - - River/Stream - Indefinite
- Forestry Road
- Saltair Seismic Pont



PROJECT		Groundwater Supply Exploration - TW18-1 Drilling and Testing Saltair, BC Submitted to Cowichan Valley Regional District	
TITLE		SITE PLAN	
		PREPARED BY: Waterline Resources Inc.	
		PROJECT: 2768-18-001	
		COMPILED BY: CGD	
		DATE ISSUED: June 2018	
		REVISED: --	
		FIGURE 2	



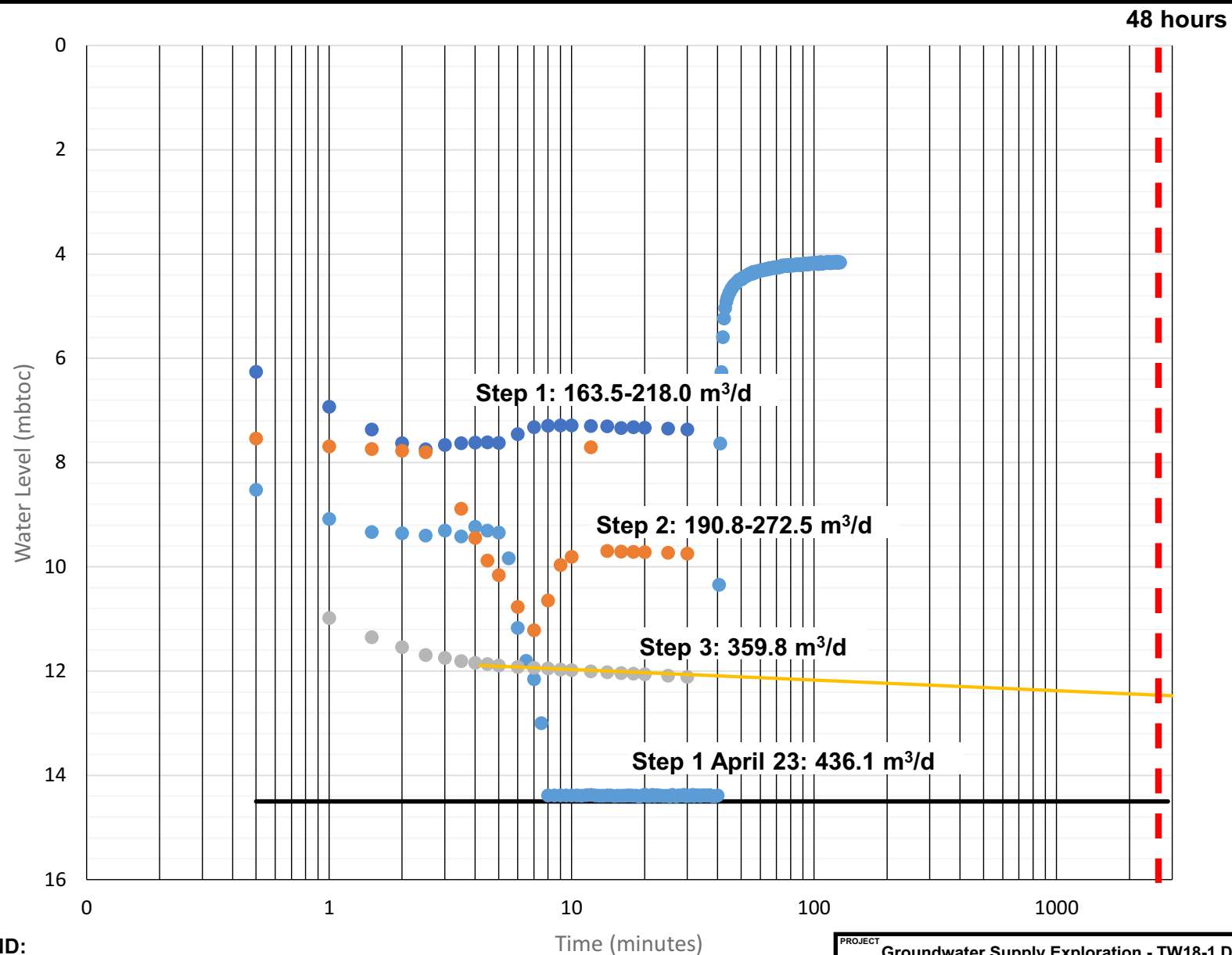
PROJECT
Groundwater Supply Exploration - TW18-1 Drilling and Testing
Saltair, BC
Submitted to Cowichan Valley Regional District

TITLE
**TW18-1 PROJECTED ON LINE 1
SEISMIC RESULTS**



PREPARED BY: Waterline Resources Inc.
PROJECT: 2768-18-001
COMPILED BY: CGD
DATE ISSUED: June 2018
REVISED: --

FIGURE 3




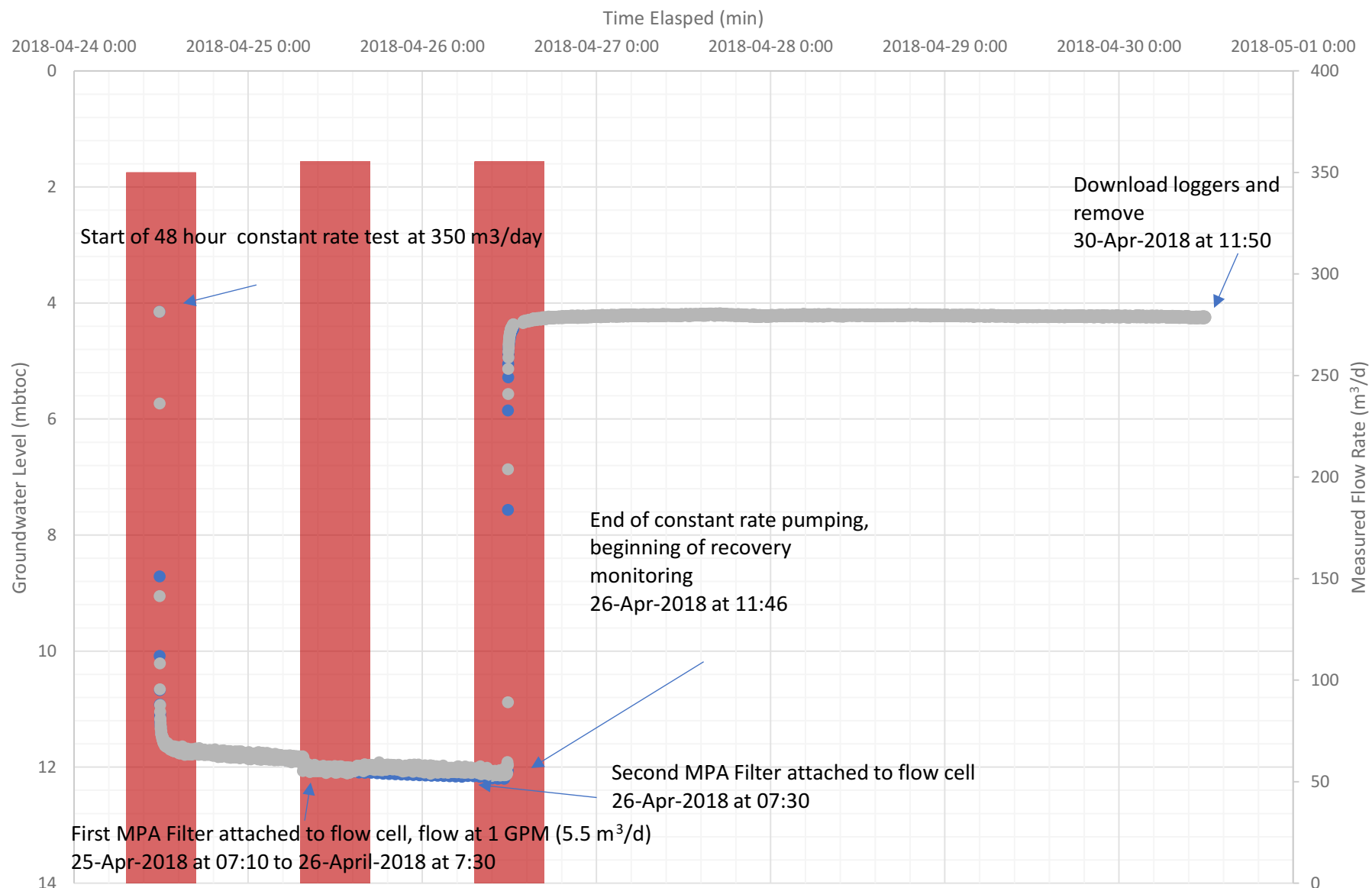
LEGEND:

- Step 1 - April 23 (436.1 m³/d)
- Step 1 (163.5 to 218.0 m³/d)
- Step 2 (30 to 50 gpm)
- Step 3 (359.8 m³/d)

— Top of Pump

Note: 5.5 m³/d = 1 US gallon per minute

PROJECT		Groundwater Supply Exploration - TW18-1 Drilling and Testing Saltair, BC Submitted to Cowichan Valley Regional District	
TITLE		STEP-RATE TEST HYDROGRAPH	
		PREPARED BY: Waterline Resources Inc.	
		PROJECT: 2768-18-001	
		COMPILED BY: CGD	
		DATE ISSUED: June 2018	
		REVISED: --	
		FIGURE 4	



LEGEND:

- Flow Rate Measurements
- Manual Groundwater Levels
- Pressure Transducer Groundwater Levels

PROJECT
Groundwater Supply Exploration - TW18-1 Drilling and Testing
Saltair, BC
Submitted to Cowichan Valley Regional District

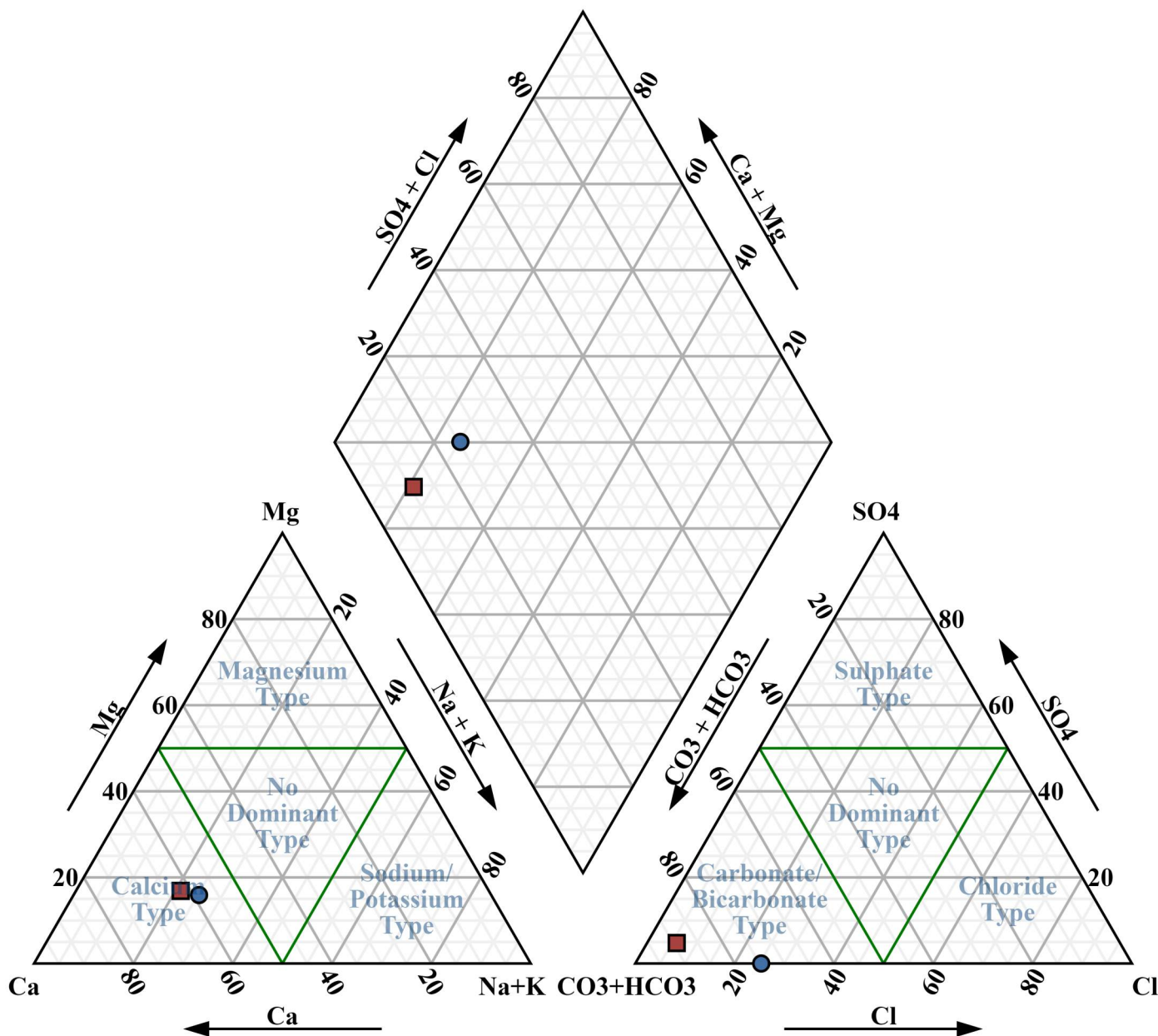
TITLE

CONSTANT RATE TEST HYDROGRAPH



PREPARED BY: Waterline Resources Inc.
PROJECT: 2768-18-001
COMPILED BY: CGD
DATE ISSUED: June 2018
REVISED: --

FIGURE 5



LEGEND:

- Banon Creek
- TW18-1

PROJECT
Groundwater Supply Exploration - TW18-1 Drilling and Testing
Saltair, BC
Submitted to Cowichan Valley Regional District

TITLE

PIPER PLOT

Waterline

PREPARED BY: Waterline Resources Inc.
PROJECT: 2768-18-001
COMPILED BY: CGD
DATE ISSUED: June 2018
REVISED: --

FIGURE 6

APPENDICES

Appendix A	Site Photos
Appendix B	TW18-1 Grain Size Analysis
Appendix C	TW18-1 Well Log and Drill Record
Appendix D	AQTESOLV Plots
Appendix E	Water Quality Comparison Tables and Certificates of Analysis

Appendix A: Site Photos



Photo A1: Site before drilling begins



Photo A2: Drillwell setup on site with D12 Dual Air-Rotary Rig



Photo A3: View of site from road

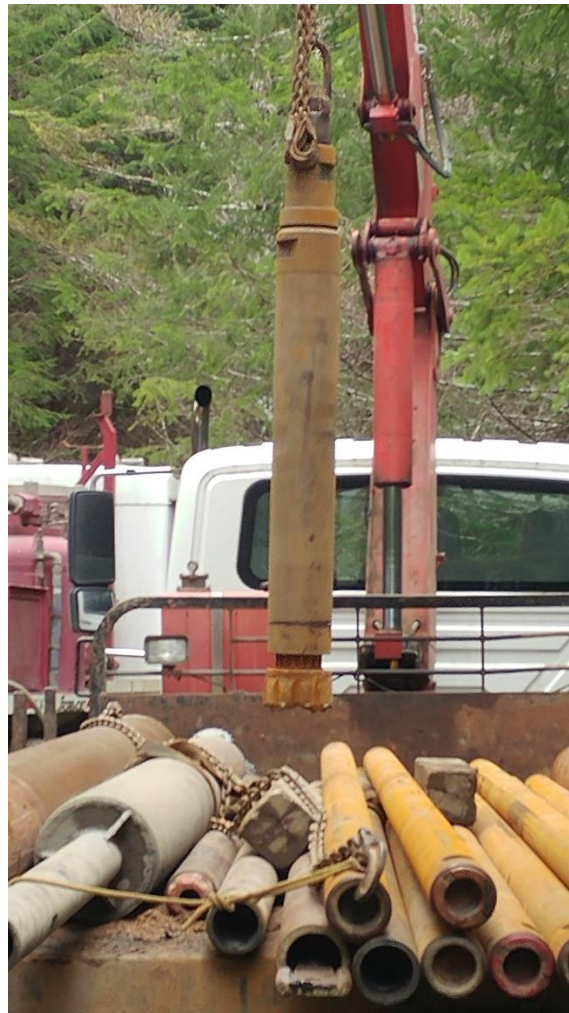


Photo A4: Drill bit for 8-inch casing



Photo A5: Installing 15' (4.57 m) of 30-slot stainless steel wire wrap screen



Photo A6: BC Aquifer's pump for step test and constant rate test



Photo A7: MPA filter during constant rate test; flow rate 355 m³/d (65.1 USgpm)



Photo A8: Discharge hose 200 m down road from site



Photo A9: Completed well and well cap; ID Plate Number 52145

Appendix B: TW-1 Grain Size Analysis

McElhanney Consulting Services Ltd.

495 Sixth Street
Courtenay, BC

**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

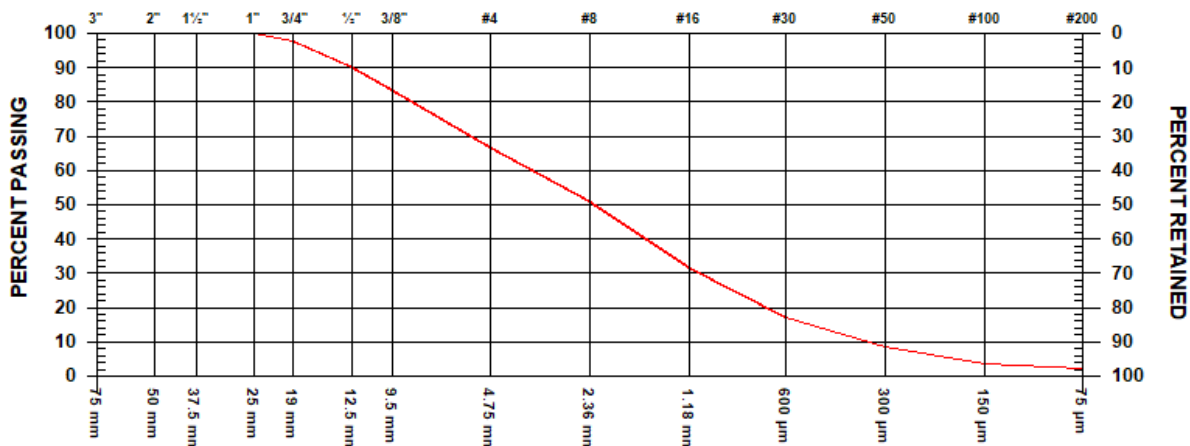
CLIENT Waterline Resources Inc.
C.C.

PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 1 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 50 ft
SPECIFICATION
MATERIAL TYPE Sand/Gravel

SAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED



GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm		
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm	100.0	
3/4"	19	mm	97.9	
1/2"	12.5	mm	90.3	
3/8"	9.5	mm	83.2	

SAND SIZES AND FINES			PERCENT PASSING	GRADATION LIMITS
No. 4	4.75	mm	66.9	
No. 8	2.36	mm	50.7	
No. 16	1.18	mm	31.6	
No. 30	600	µm	17.0	
No. 50	300	µm	8.4	
No. 100	150	µm	3.7	
No. 200	75	µm	2.1	

MOISTURE CONTENT 10.0%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.

495 Sixth Street
Courtenay, BC

**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

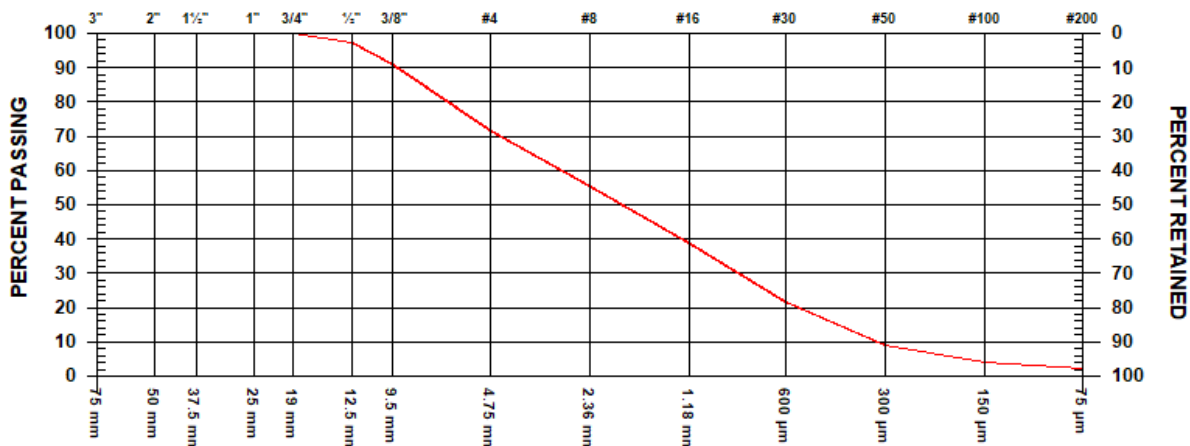
CLIENT Waterline Resources Inc.
C.C.

PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 2 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 55 ft
SPECIFICATION
MATERIAL TYPE Sand/Gravel

SAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED



GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75 mm			
2"	50 mm			
1 1/2"	37.5 mm			
1"	25 mm			
3/4"	19 mm		100.0	
1/2"	12.5 mm		97.4	
3/8"	9.5 mm		90.9	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	71.7	
No. 8	2.36 mm	55.5	
No. 16	1.18 mm	38.6	
No. 30	600 µm	21.6	
No. 50	300 µm	8.8	
No. 100	150 µm	3.9	
No. 200	75 µm	2.3	

MOISTURE CONTENT 13.5%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.

495 Sixth Street
Courtenay, BC

**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

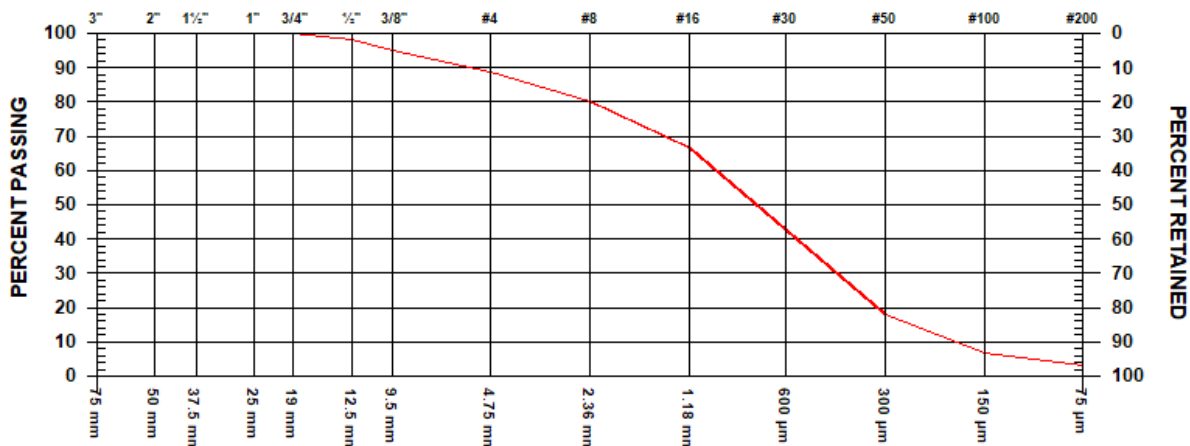
CLIENT Waterline Resources Inc.
C.C.

PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 3 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 60 ft
SPECIFICATION
MATERIAL TYPE Sand/Gravel

SAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED



GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75 mm			
2"	50 mm			
1 1/2"	37.5 mm			
1"	25 mm			
3/4"	19 mm		100.0	
1/2"	12.5 mm		98.4	
3/8"	9.5 mm		95.0	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	88.9	
No. 8	2.36 mm	80.4	
No. 16	1.18 mm	66.6	
No. 30	600 µm	42.6	
No. 50	300 µm	18.0	
No. 100	150 µm	6.8	
No. 200	75 µm	3.3	

MOISTURE CONTENT 14.9%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.

495 Sixth Street
Courtenay, BC

**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

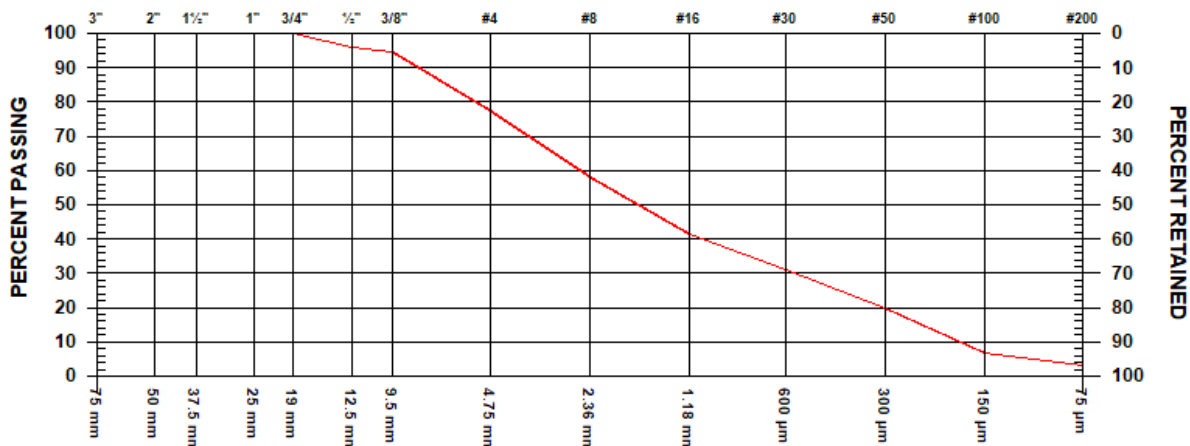
CLIENT Waterline Resources Inc.
C.C.

PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 4 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 65 ft
SPECIFICATION
MATERIAL TYPE Sand/Gravel

SAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED



GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75 mm			
2"	50 mm			
1 1/2"	37.5 mm			
1"	25 mm			
3/4"	19 mm	100.0		
1/2"	12.5 mm	95.9		
3/8"	9.5 mm	94.8		

SAND SIZES AND FINES			PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	77.5		
No. 8	2.36 mm	58.2		
No. 16	1.18 mm	41.4		
No. 30	600 µm	31.1		
No. 50	300 µm	19.6		
No. 100	150 µm	6.9		
No. 200	75 µm	3.0		

MOISTURE CONTENT 12.2%

COMMENTS

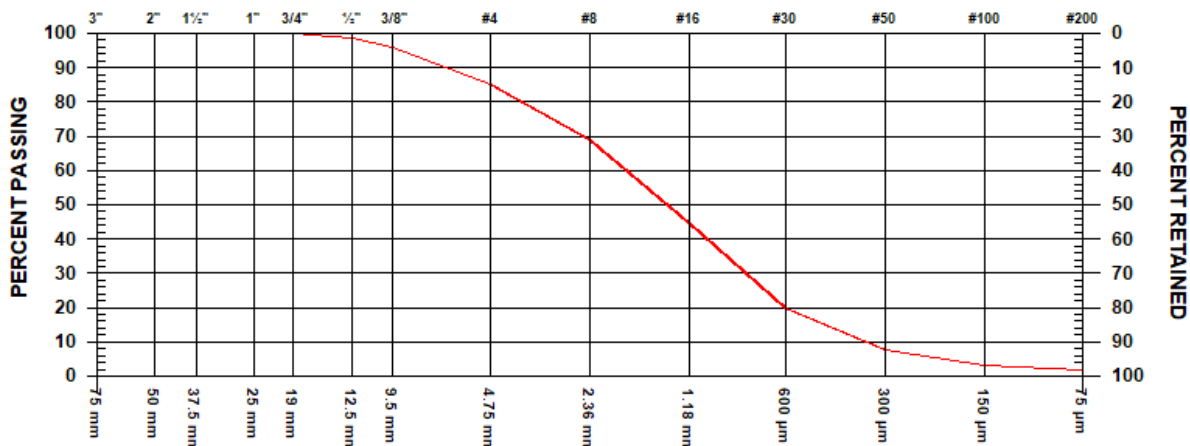
Waterline File: 2768-18001

McElhanney Consulting Services Ltd.495 Sixth Street
Courtenay, BC**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**TO
Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

CLIENT Waterline Resources Inc.
C.C.PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 5 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 70 ft
SPECIFICATION
MATERIAL TYPE Sand/GravelSAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED

GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm		
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm		
3/4"	19	mm	100.0	
1/2"	12.5	mm	98.7	
3/8"	9.5	mm	96.1	

SAND SIZES AND FINES			PERCENT PASSING	GRADATION LIMITS
No. 4	4.75	mm	85.3	
No. 8	2.36	mm	68.9	
No. 16	1.18	mm	44.5	
No. 30	600	µm	19.8	
No. 50	300	µm	7.5	
No. 100	150	µm	3.1	
No. 200	75	µm	1.8	

MOISTURE CONTENT 11.5%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.

495 Sixth Street
Courtenay, BC

**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

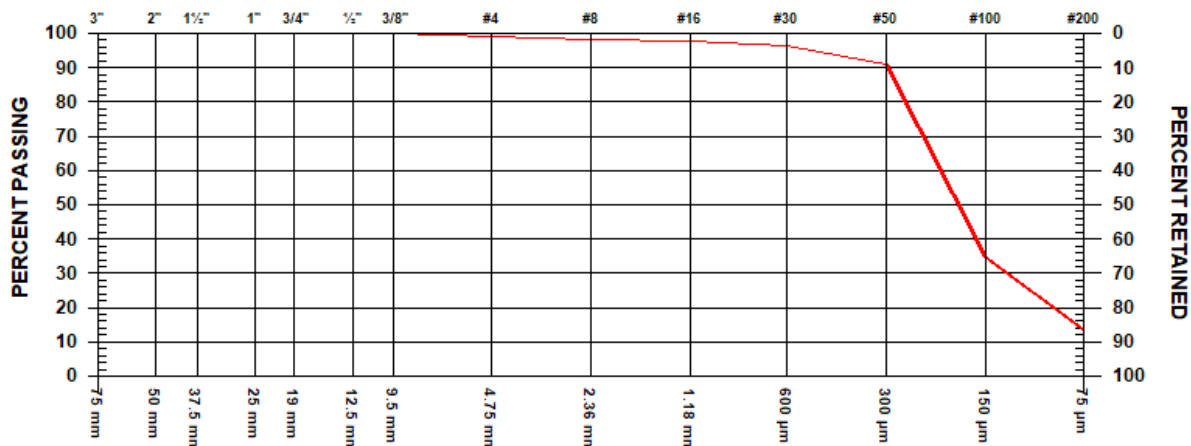
CLIENT Waterline Resources Inc.
C.C.

PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 6 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 73 ft
SPECIFICATION
MATERIAL TYPE Sand

SAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED



GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm	100.0	
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm		
3/4"	19	mm		
1/2"	12.5	mm		
3/8"	9.5	mm		

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	98.9	
No. 8	2.36 mm	98.3	
No. 16	1.18 mm	97.6	
No. 30	600 µm	96.4	
No. 50	300 µm	34.6	
No. 100	150 µm	13.4	
No. 200	75 µm	13.4	

MOISTURE CONTENT 21.0%

COMMENTS

Waterline File: 2768-18001

**495 Sixth Street
Courtenay, BC**

SIEVE ANALYSIS REPORT

8 16 30 50 SERIES

TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

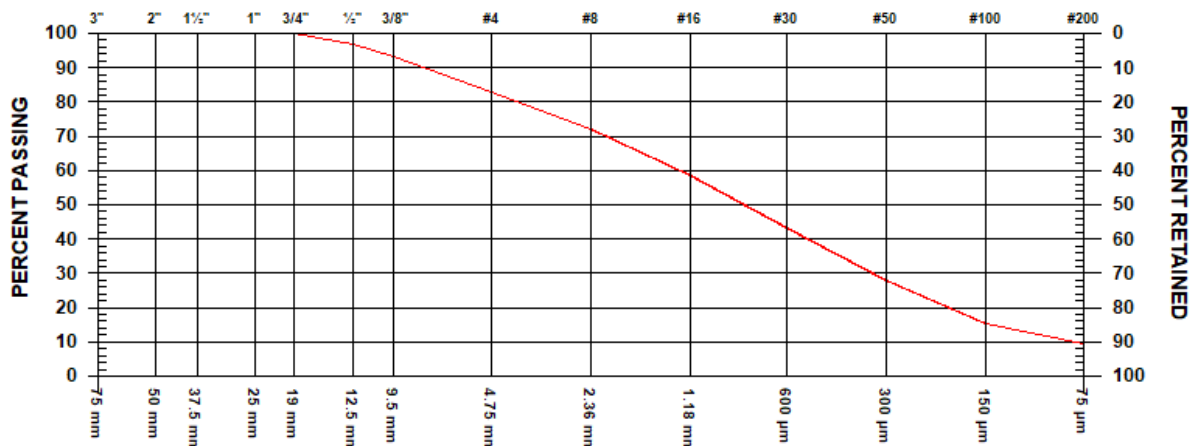
CLIENT Waterline Resources Inc.
C.C.

PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 7 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER	TW1
SOURCE	75 ft
SPECIFICATION	
MATERIAL TYPE	Sand/Gravel

SAMPLED BY	Client
TESTED BY	B.Hannah
TEST METHOD	WASHED



GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3 "	75	mm	100.0 96.8 93.1	
2 "	50	mm		
1 1/2 "	37.5	mm		
1 "	25	mm		
3/4 "	19	mm		
1/2 "	12.5	mm		
3/8 "	9.5	mm		

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	82.9	
No. 8	2.36 mm	72.3	
No. 16	1.18 mm	58.4	
No. 30	600 μ m	43.2	
No. 50	300 μ m	28.1	
No. 100	150 μ m	15.2	
No. 200	75 μ m	9.3	

MOISTURE CONTENT 11.4%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.495 Sixth Street
Courtenay, BC**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

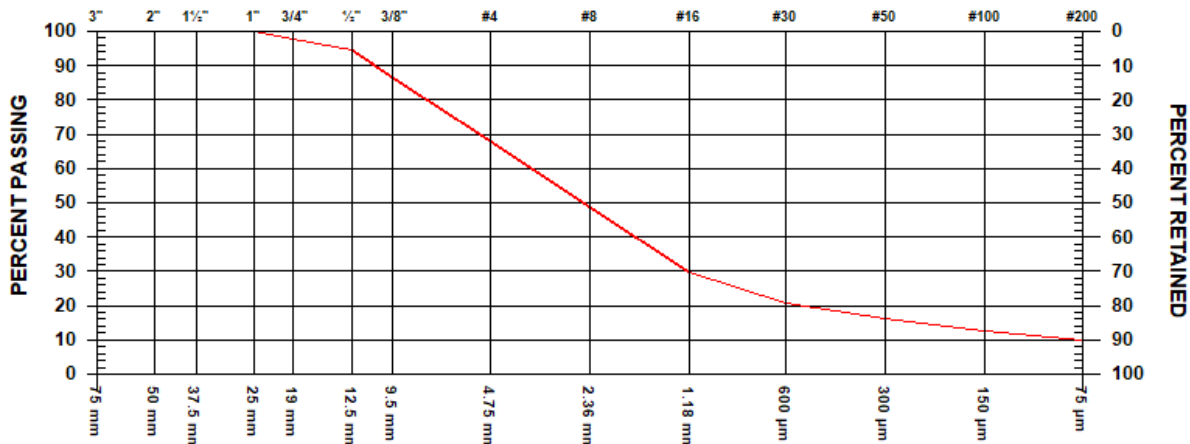
TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

CLIENT Waterline Resources Inc.
C.C.PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 8 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 80 ft
SPECIFICATION
MATERIAL TYPE Sand/GravelSAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED

GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm		
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm	100.0	
3/4"	19	mm	97.6	
1/2"	12.5	mm	94.6	
3/8"	9.5	mm	86.5	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	67.9	
No. 8	2.36 mm	48.6	
No. 16	1.18 mm	29.7	
No. 30	600 µm	20.6	
No. 50	300 µm	16.0	
No. 100	150 µm	12.5	
No. 200	75 µm	9.7	

MOISTURE CONTENT 8.0%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.

495 Sixth Street
Courtenay, BC

**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

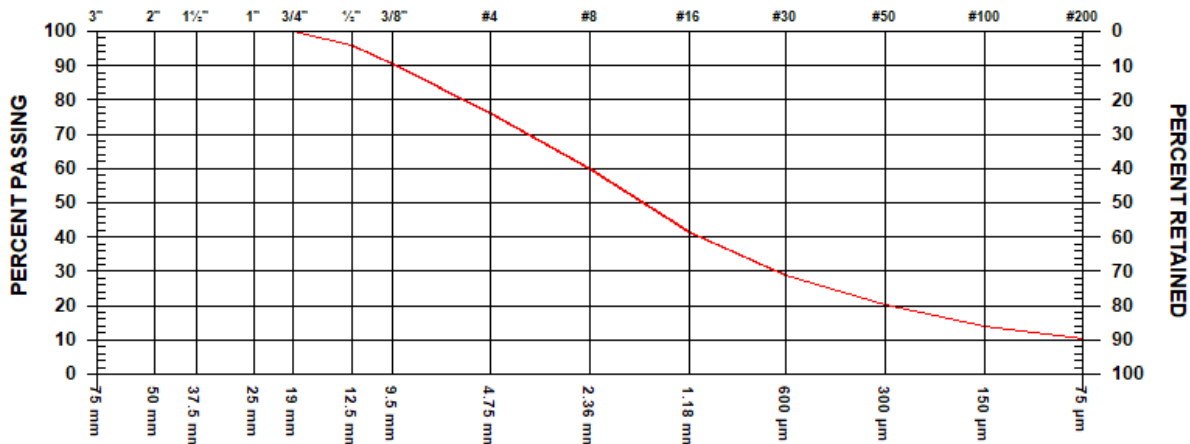
CLIENT Waterline Resources Inc.
C.C.

PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 9 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 85 ft
SPECIFICATION
MATERIAL TYPE Sand/Gravel

SAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED



GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm		
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm		
3/4"	19	mm	100.0	
1/2"	12.5	mm	96.1	
3/8"	9.5	mm	90.7	

SAND SIZES AND FINES			PERCENT PASSING	GRADATION LIMITS
No. 4	4.75	mm	76.0	
No. 8	2.36	mm	60.1	
No. 16	1.18	mm	41.4	
No. 30	600	µm	28.6	
No. 50	300	µm	20.2	
No. 100	150	µm	14.0	
No. 200	75	µm	10.3	

MOISTURE CONTENT 9.3%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.495 Sixth Street
Courtenay, BC**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

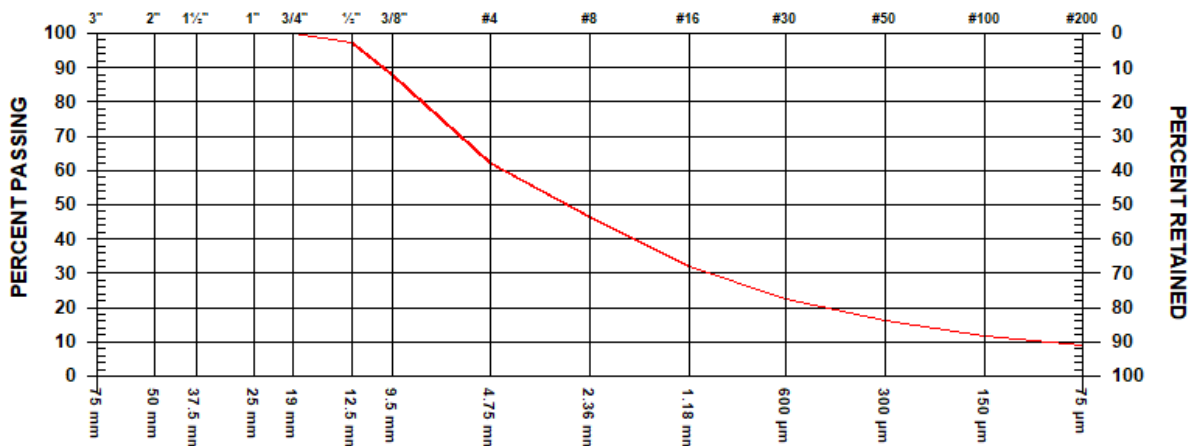
TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

CLIENT Waterline Resources Inc.
C.C.PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 10 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 90 ft
SPECIFICATION
MATERIAL TYPE Sand/GravelSAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED

GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75 mm			
2"	50 mm			
1 1/2"	37.5 mm			
1"	25 mm			
3/4"	19 mm	100.0		
1/2"	12.5 mm	97.1		
3/8"	9.5 mm	87.7		

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	62.3	
No. 8	2.36 mm	46.4	
No. 16	1.18 mm	31.8	
No. 30	600 µm	22.4	
No. 50	300 µm	16.3	
No. 100	150 µm	11.5	
No. 200	75 µm	8.8	

MOISTURE CONTENT 7.7%

COMMENTS

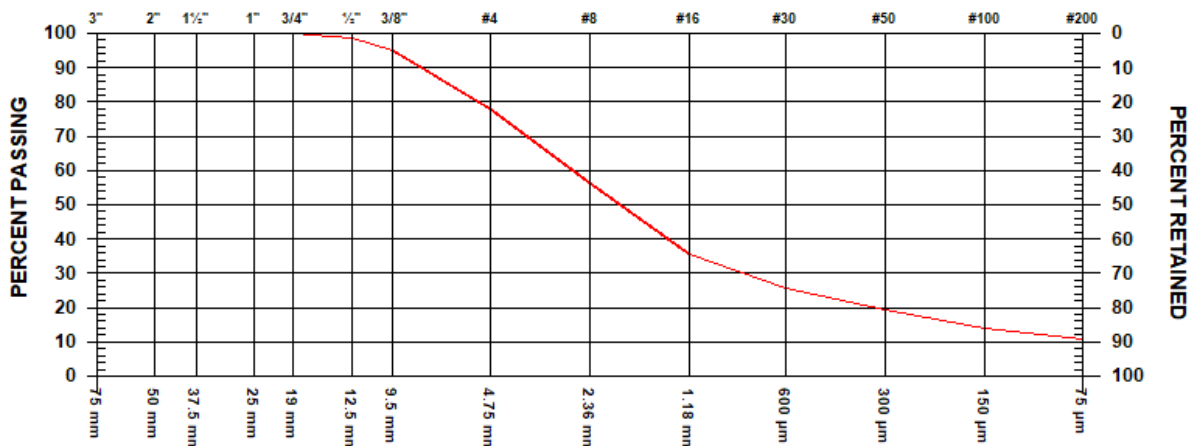
Waterline File: 2768-18001

McElhanney Consulting Services Ltd.495 Sixth Street
Courtenay, BC**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**TO
Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

CLIENT Waterline Resources Inc.
C.C.PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 11 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 95 ft
SPECIFICATION
MATERIAL TYPE Sand/GravelSAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED

GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm		
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm		
3/4"	19	mm	100.0	
1/2"	12.5	mm	98.6	
3/8"	9.5	mm	95.0	

SAND SIZES AND FINES			PERCENT PASSING	GRADATION LIMITS
No. 4	4.75	mm	78.1	
No. 8	2.36	mm	56.2	
No. 16	1.18	mm	35.8	
No. 30	600	µm	25.6	
No. 50	300	µm	19.4	
No. 100	150	µm	13.9	
No. 200	75	µm	10.7	

MOISTURE CONTENT 10.0%

COMMENTS

Waterline file: 2768-18001

McElhanney Consulting Services Ltd.495 Sixth Street
Courtenay, BC**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

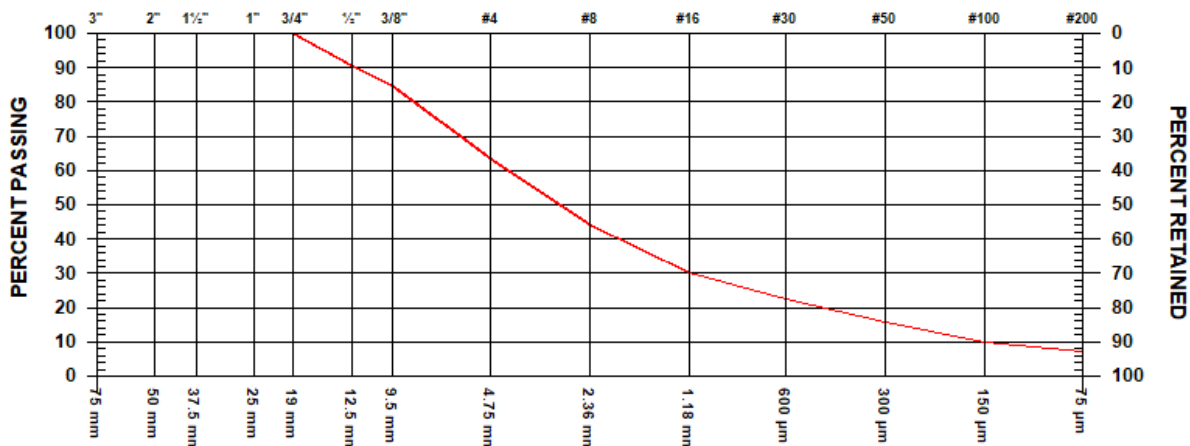
TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

CLIENT Waterline Resources Inc.
C.C.PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 12 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 100 ft
SPECIFICATION
MATERIAL TYPE Sand/GravelSAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED

GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75 mm			
2"	50 mm			
1 1/2"	37.5 mm			
1"	25 mm			
3/4"	19 mm		100.0	
1/2"	12.5 mm		90.5	
3/8"	9.5 mm		84.6	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	63.7	
No. 8	2.36 mm	44.0	
No. 16	1.18 mm	30.4	
No. 30	600 µm	22.3	
No. 50	300 µm	15.7	
No. 100	150 µm	10.0	
No. 200	75 µm	7.2	

MOISTURE CONTENT 8.7%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.

495 Sixth Street
Courtenay, BC

**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

PROJECT NO. 2231-81600-03

CLIENT Waterline Resources Inc.
C.C.

TO

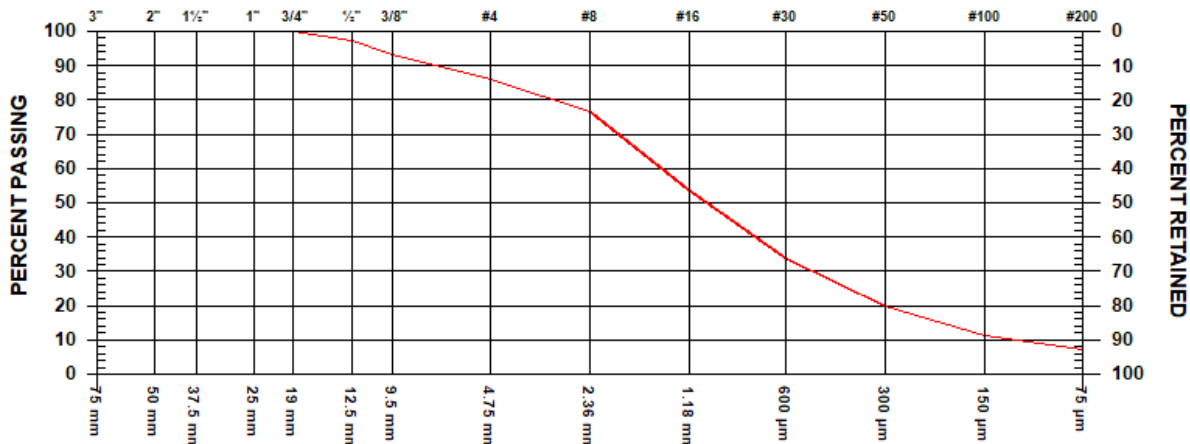
Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 13 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 105 ft
SPECIFICATION
MATERIAL TYPE Sand/Gravel

SAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED



GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm		
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm		
3/4"	19	mm	100.0	
1/2"	12.5	mm	97.2	
3/8"	9.5	mm	93.1	

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	86.2	
No. 8	2.36 mm	76.7	
No. 16	1.18 mm	53.8	
No. 30	600 µm	33.8	
No. 50	300 µm	19.7	
No. 100	150 µm	11.3	
No. 200	75 µm	7.3	

MOISTURE CONTENT 12.5%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.495 Sixth Street
Courtenay, BC**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

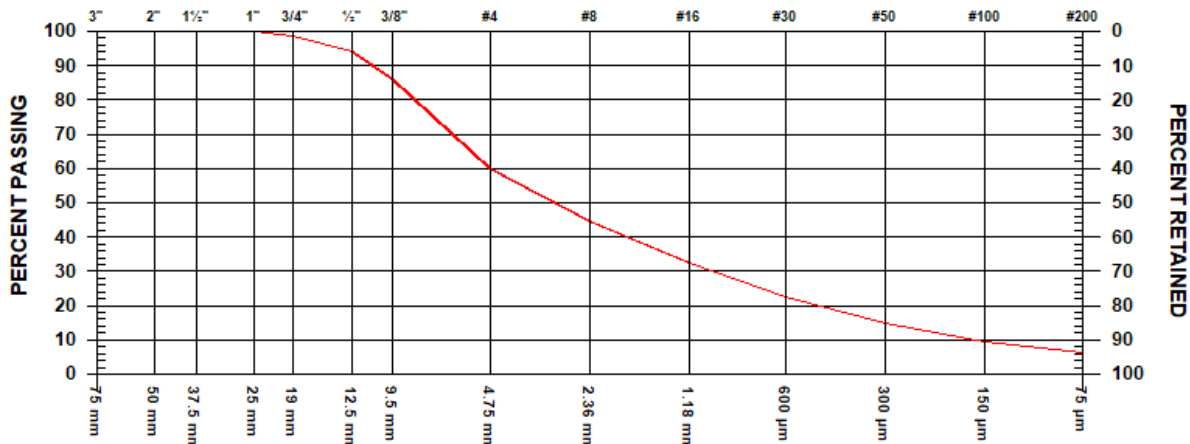
TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

CLIENT Waterline Resources Inc.
C.C.PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 14 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 110 ft
SPECIFICATION
MATERIAL TYPE Sand/GravelSAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED

GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75 mm			
2"	50 mm			
1 1/2"	37.5 mm			
1"	25 mm	100.0		
3/4"	19 mm	98.5		
1/2"	12.5 mm	94.1		
3/8"	9.5 mm	86.2		

SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	60.0	
No. 8	2.36 mm	44.4	
No. 16	1.18 mm	32.3	
No. 30	600 µm	22.5	
No. 50	300 µm	14.9	
No. 100	150 µm	9.4	
No. 200	75 µm	6.3	

MOISTURE CONTENT 8.7%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.495 Sixth Street
Courtenay, BC**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

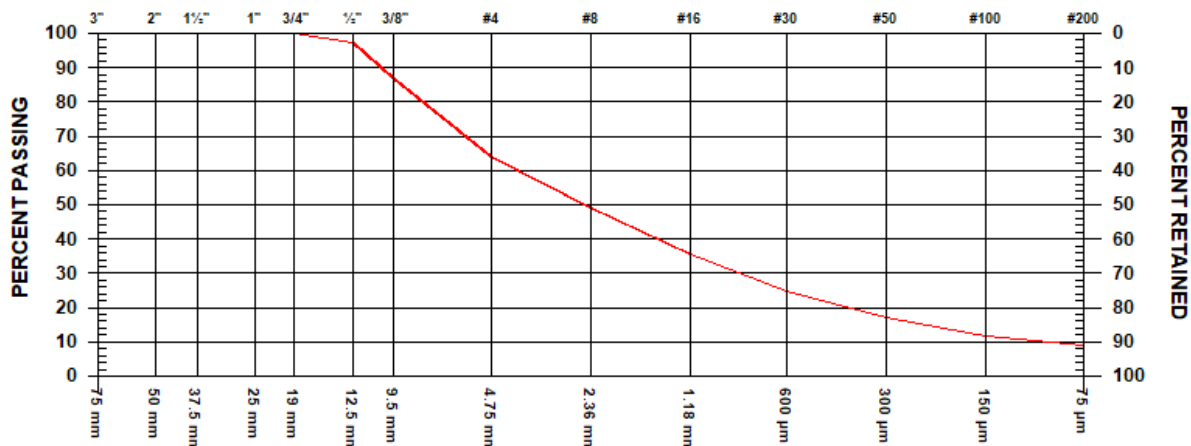
TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

CLIENT Waterline Resources Inc.
C.C.PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 15 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 115 FT
SPECIFICATION
MATERIAL TYPE Sand/GravelSAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED

GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm		
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm		
3/4"	19	mm	100.0	
1/2"	12.5	mm	97.2	
3/8"	9.5	mm	87.0	

SAND SIZES AND FINES			PERCENT PASSING	GRADATION LIMITS
No. 4	4.75	mm	63.8	
No. 8	2.36	mm	49.1	
No. 16	1.18	mm	35.5	
No. 30	600	µm	24.7	
No. 50	300	µm	17.2	
No. 100	150	µm	11.8	
No. 200	75	µm	9.0	

MOISTURE CONTENT 9.2%

COMMENTS

Waterline File: 2768-18001

McElhanney Consulting Services Ltd.495 Sixth Street
Courtenay, BC**SIEVE ANALYSIS REPORT
8 16 30 50 SERIES**

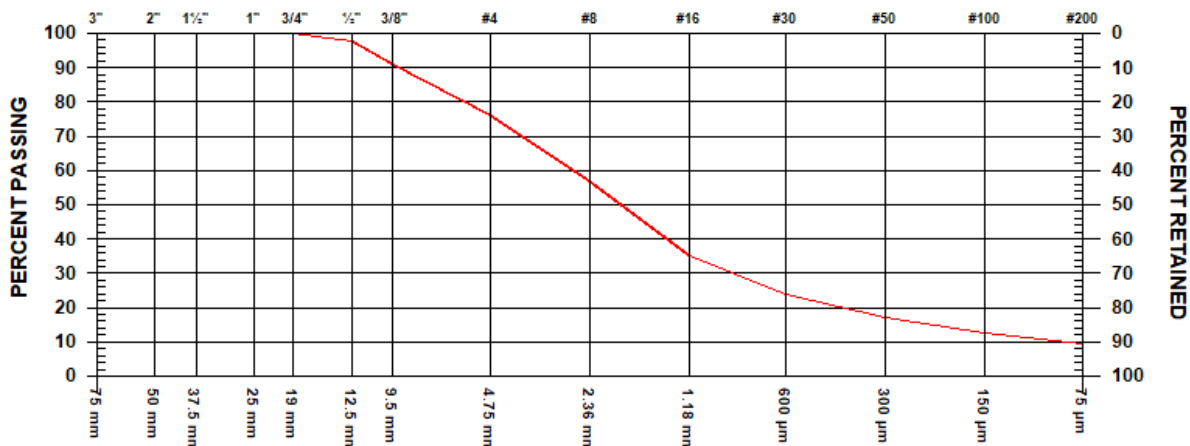
TO

Waterline Resources Inc.
2430 Jingle Pot Road
Nanaimo, BC
V9R 6W2

PROJECT NO. 2231-81600-03

CLIENT Waterline Resources Inc.
C.C.PROJECT CVRD Saltair
Groundwater Exploration
CONTRACTOR

SIEVE TEST NO. 16 DATE RECEIVED 11-Apr-2018 DATE TESTED 12-Apr-2018 DATE SAMPLED 10-Apr-2018

SUPPLIER TW1
SOURCE 120 ft
SPECIFICATION
MATERIAL TYPE Sand/GravelSAMPLED BY Client
TESTED BY B. Hannah
TEST METHOD WASHED

GRAVEL SIZES			PERCENT PASSING	GRADATION LIMITS
3"	75	mm		
2"	50	mm		
1 1/2"	37.5	mm		
1"	25	mm		
3/4"	19	mm	100.0	
1/2"	12.5	mm	97.6	
3/8"	9.5	mm	91.2	


SAND SIZES AND FINES		PERCENT PASSING	GRADATION LIMITS
No. 4	4.75 mm	76.0	
No. 8	2.36 mm	56.8	
No. 16	1.18 mm	35.2	
No. 30	600 µm	23.7	
No. 50	300 µm	17.1	
No. 100	150 µm	12.4	
No. 200	75 µm	9.4	


MOISTURE CONTENT 11.5%

COMMENTS

Waterline File: 2768-18001

Appendix C: TW-1 Well Log and Drill Record

		BOREHOLE: TW18-1	
INSTALLED BY: Drillwell Enterprises		ATS:	
DRILL TYPE: DR12 Dual Rotary		SITE: Saltair	
		EAST: 441282 NORTH: 5420806	
ELEVATION: 213.00 (masl)			
FILL TYPE: <input type="checkbox"/> Backfill <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Grout <input type="checkbox"/> Open Hole <input type="checkbox"/> Cement <input type="checkbox"/> Sand <input type="checkbox"/> Slough <input type="checkbox"/> Unknown			
SAMPLE TYPE: <input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> No Recovery <input type="checkbox"/> Split Spoon <input type="checkbox"/> Disturbed <input type="checkbox"/> Dynamic Cone <input type="checkbox"/> Core <input type="checkbox"/> Grab Sample			
Depth (m)	ELEV (masl)	SOIL DESCRIPTION	WELL INSTALLATION
212		GRAVEL with silt, brownish blue, sub angular to angular, hard, moist (0 to 6.1 m)	Stickup: 0.665 m
210		...sandy GRAVEL with silt, fine to medium grained, sub angular to sub rounded, hard, moist (3 m)	BC Well ID: 52145
208		...GRAVEL with sand, some silt, fine grained, sub angular to sub rounded, hard, moist (4.6 m)	8-inch Steel Casing to 16 m
206		SAND and GRAVEL trace silt, fine to coarse grained, brownish blue, sub angular to sub rounded, hard, moist (6.1 to 12.2 m)	SWL: 3.35 mbgl
204		...silty SAND and GRAVEL (9.1 m)	12-inch Bentonite Surface Seal (0 to 5 m)
202		...SAND and GRAVEL trace silt, Airlifting 30 gpm (10.7 m)	
200		SAND and GRAVEL, fine to coarse grained, greyish blue, sub angular to sub rounded, hard, moist, (12.2 to 18.3 m)	
198		...Airlifting 66 gpm, EC 30 uS/cm, pH 6 (15.2 m)	
196		gravelly SAND, fine to coarse grained, grey, sub angular to sub rounded, loose, moist (18.3 to 21.3 m)	15.2 m, d30/d40: 43/63
194		Sand and GRAVEL, fine to coarse grained, greyish blue, sub angular to sub rounded, loose, moist (21.3 to 22.2 m)	K-Packer and Riser (15.7 to 16.3 m)
192		SAND with silt, fine to medium grained, light brown, loose, wet, water decreasing here, (22.2 to 22.9 m)	Stainless Steel Wire Wrap Screens 30-slot (16.3 to 21.3m)
190		silty SAND and GRAVEL, fine to coarse grained, greyish blue, sub angular to sub rounded, hard, wet (22.9 to 38.1 m)	16.8 m, d30/d40: 33/49
			18.3 m, d30/d40: 17/22
			19.8 m, d30/d40: 22/42
			21.3 m, d30/d40: 31/41
			22.2 m, d30/d40: 5/6
			22.9 m, d30/d40: 13/20
			24.4 m, d30/d40: 47/68
		TYPE: Water Supply Well	COMPLETION DEPTH: 16.0 (m)
		LOGGED BY: GN	COMPLETION DATE: April 17/2018
		CHECKED BY: JH	Page 1 of 2 Date printed: 11-May-2018

		BOREHOLE: TW18-1	
INSTALLED BY: Drillwell Enterprises		ATS:	
DRILL TYPE: DR12 Dual Rotary		SITE: Saltair	
EAST: 441282		NORTH: 5420806	
ELEVATION: 213.00 (masl)			
FILL TYPE: <input type="checkbox"/> Backfill <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Grout <input type="checkbox"/> Open Hole <input type="checkbox"/> Cement <input type="checkbox"/> Sand <input type="checkbox"/> Slough <input type="checkbox"/> Unknown			
SAMPLE TYPE: <input checked="" type="checkbox"/> Shelby Tube <input type="checkbox"/> No Recovery <input type="checkbox"/> Split Spoon <input type="checkbox"/> Disturbed <input type="checkbox"/> Dynamic Cone <input type="checkbox"/> Core <input type="checkbox"/> Grab Sample			
Depth (m)	ELEV (masl)	SOIL DESCRIPTION	WELL INSTALLATION
26	188		25.9 m, d30/d40: 25/43
28	186		27.4 m, d30/d40: 41/69
30	184		29.0 m, d30/d40: 32/54
32	182	...Boulder, hard (30.8 to 32 m)	30.5 m, d30/d40: 45/76
34	180		32.0 m, d30/d40: 20/29
36	178		33.5 m, d30/d40: 40/72
38	176		35.1 m, d30/d40: 33/58
40	174	SHALE interbedded with some sandstone, hard (38.1 to 47.5 m)	36.6 m, d30/d40: 34/54
42	172		
44	170		
46	168		
48	166		
		END OF HOLE AT 47.5 m Water Level Date April 23/2018	
		TYPE: Water Supply Well LOGGED BY: GN CHECKED BY: JH	COMPLETION DEPTH: 16.0 (m) COMPLETION DATE: April 17/2018 Page 2 of 2 Date printed: 11-May-2018



Ministry of
Environment

☒ Well Construction Report

☐ Well Closure Report

☐ Well Alteration Report

DRILLWELL ENTERPRISES LTD.

4994 Polkey Road

Duncan, B.C. V9L 6W3

Phone: 250-746-5268

Ministry Well ID Plate Number: S2145

Ministry Well Tag Number: _____

☐ Confirmation/alternative specs. attached

☐ Original well construction report attached

Red lettering indicates minimum mandatory information.

See reverse for notes & definitions of abbreviations.

Owner name: CVRD
Mailing address: 175 Ingram street Town Duncan Prov. BC Postal Code V9L 1N8

Well Location: Address: Street no. _____ Street name _____ Town _____
(or) Legal description: Lot Parcel F Plan 691 D.L. _____ Block 142m Sec. _____ Twp. _____ Rg. _____ Land District Oyster

(or) PID: _____ (and) Description of well location (attach sketch, if nec.): Part of parcel F (DD137599I)
off of South Watts Rd, Saltair area

NAD 83: Zone: 10 (see note 2) UTM Easting: 0441282 m (or) Latitude (see note 3): _____
UTM Northing: 5420806 m (or) Longitude: _____

Method of drilling: ☒ air rotary ☐ cable tool ☐ mud rotary ☐ auger ☐ driving ☐ jetting ☐ excavating ☐ other (specify): Dual Rotary

Orientation of well: ☒ vertical ☐ horizontal Ground elevation: 700' ft (asl) Method (see note 4): _____

Class of well (see note 5): Water Supply Sub-class of well: Non-domestic

Water supply wells: indicate intended water use: ☐ private domestic ☐ water supply system ☐ irrigation ☐ commercial or industrial ☒ other (specify): test

Lithologic description (see notes 7-14) or closure description (see notes 15 and 16)

From ft (bgl)	To ft (bgl)	Relative Hardness	Colour	Material Description (Use recommended terms on reverse. List in order of decreasing amount, if applicable)	Water-bearing Estimated Flow (USgpm)	Observations (e.g., fractured, weathered, well sorted, silty wash), closure details
0	12'	Hard	Brown	Gravel, very coarse + cobbles		
12'	32'	Hard	Brown	Gravel, coarse, sandy + cobbles	WB	
32'	59'	mod Hard	Brown	Gravel, clean coarse	WB	
59'	72'	Loose	Brown	Sand very coarse, some gravel	WB	
72'	74'	Loose	Brown	Sand silty, fines trace of gravel	WB	
74'	101'	Hard	Grey	Gravel, very silty little water		
101'	105'	Hard	Grey	Granite Bolder		
105	122.5	Hard	Grey	Gravel, very silty Little to No water		
122.5	156'	Hard	Black grey	Shale Bedrock, some sandstone Inter bedded		

Casing details

From ft (bgl)	To ft (bgl)	Dia in	Casing Material / Open Hole	Wall Thickness in	Drive Shoe
0	16.5	12"	Steel/Pullout	-	-
0	123	8'	Steel	.322	DR

Screen details

From ft (bgl)	To ft (bgl)	Dia in	Type (see note 18)	Slot Size
51'6"	53'6"	7"	K-Packer + Riser	-
53'6"	59'	7"	SS. Screen	.030"
59'	64'6"	7"	SS. Screen	.030"
64'6"	70'	7"	SS. Screen	.030"

Surface seal: Type: Bentonite Depth: 16.5' ft

Method of installation: ☒ Poured ☐ Pumped Thickness: 2" in

Backfill: Type: _____ Depth: _____ ft

Liner: ☐ PVC ☐ Other (specify): _____

Diameter: _____ in Thickness: _____ in

From: _____ ft (bgl) To: _____ ft (bgl) Perforated: From: _____ ft (bgl) To: _____ ft (bgl)

Intake: ☒ Screen ☐ Open bottom ☐ Uncased hole

Screen type: ☒ Telescope ☐ Pipe size

Screen material: ☒ Stainless steel ☐ Plastic ☐ Other (specify): _____

Screen opening: ☒ Continuous slot ☐ Slotted ☐ Perforated pipe

Screen bottom: ☐ Bail ☒ Plug ☐ Plate ☐ Other (specify): _____

Filter pack: From: _____ ft To: _____ ft Thickness: _____ in

Type and size of material: _____

Developed by:

☒ Air lifting ☐ Surging ☐ Jetting ☐ Pumping ☐ Bailing

☐ Other (specify): _____ Total duration: 1.5 hrs

Notes: _____

Well yield estimated by:

☒ Pumping ☒ Air lifting ☐ Bailing ☐ Other (specify): _____

Rate: 60+ USgpm Duration: 1.5 hrs

SWL before test: _____ ft (btoc) Pumping water level: _____ ft (btoc)

Obvious water quality characteristics:

☒ Fresh ☐ Salty ☒ Clear ☐ Cloudy ☐ Sediment ☐ Gas

Colour/odour: _____ Water sample collected: ☐

Well driller (print clearly):

Name (first, last) (see note 19): Scott Burrows

Registration no. (see note 20): WD 04121407

Consultant (if applicable; name and company): _____

DECLARATION: Well construction, well alteration or well closure, as the case may be, has been done in accordance with the requirements in the Water Act and the Ground Water Protection Regulation.

Signature of Driller Responsible SBurrows

PLEASE NOTE: The information recorded in this well report describes the works and hydrogeologic conditions at the time of construction, alteration or closure, as the case may be. Well yield, well performance and water quality are not guaranteed as they are influenced by a number of factors, including natural variability, human activities and condition of the works, which may change over time.

white: Customer copy
canary: Driller copy
pink: Ministry copy

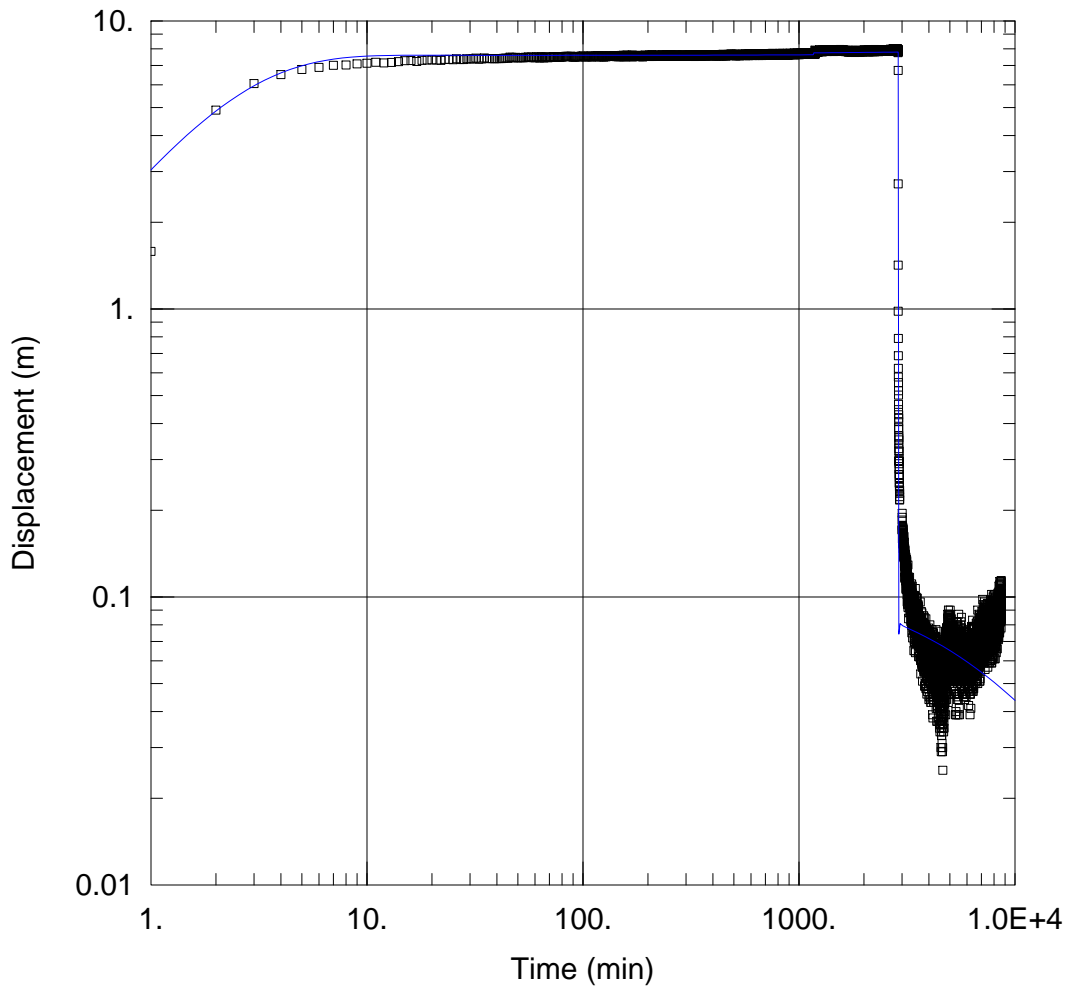
Sheet 1 of 1

Date of work (YYYY/MM/DD):

Started: 2018/04/09 Completed: 2018/04/17

Comments: _____

Appendix D: AQTESOLV Plots



WELL TEST ANALYSIS

Data Set: P:\...\Moench.aqt

Date: 06/18/18

Time: 11:35:35

PROJECT INFORMATION

Company: Waterline Resources

Client: CVRD

Project: 2768-18-001

Location: Saltair

Test Well: PW

Test Date: April 2018

AQUIFER DATA

Saturated Thickness: 18.6 m

Anisotropy Ratio (Kz/Kr): 0.07901

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW1	0	0

Observation Wells

Well Name	X (m)	Y (m)
□ TW1	0	0

SOLUTION

Aquifer Model: Unconfined

Solution Method: Moench

T = 142.6 m²/day

S = 1.156E-51

Sy = 0.2044

β = 1.85E-6

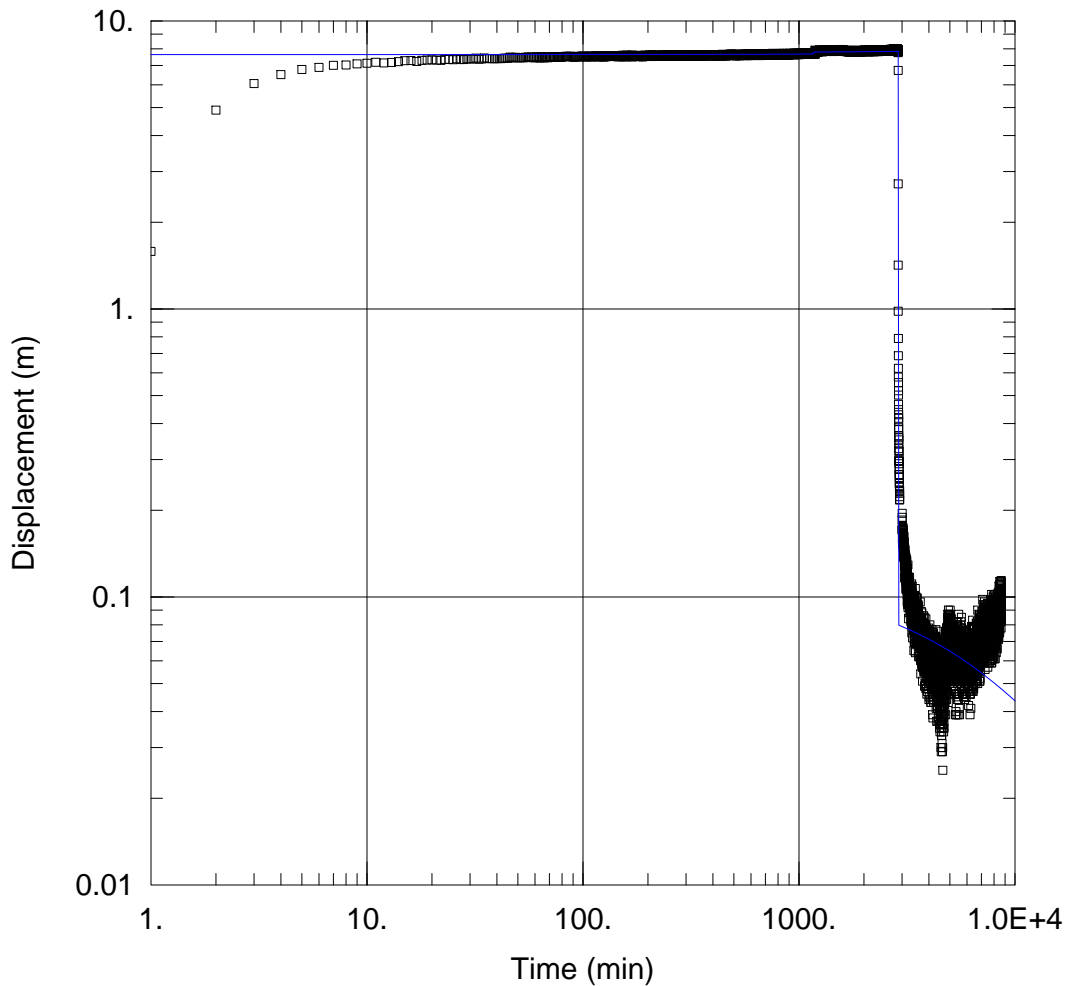
Sw = 0.

r(w) = 0.09 m

() = 0.1412

() = 1.2E-22

: -1



WELL TEST ANALYSIS

Data Set: P:\...\neuman.aqt

Date: 06/18/18

Time: 11:35:53

PROJECT INFORMATION

Company: Waterline Resources

Client: CVRD

Project: 2768-18-001

Location: Saltair

Test Well: PW

Test Date: April 2018

AQUIFER DATA

Saturated Thickness: 18.6 m

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW1	0	0

Observation Wells

Well Name	X (m)	Y (m)
□ TW1	0	0

SOLUTION

Aquifer Model: Unconfined

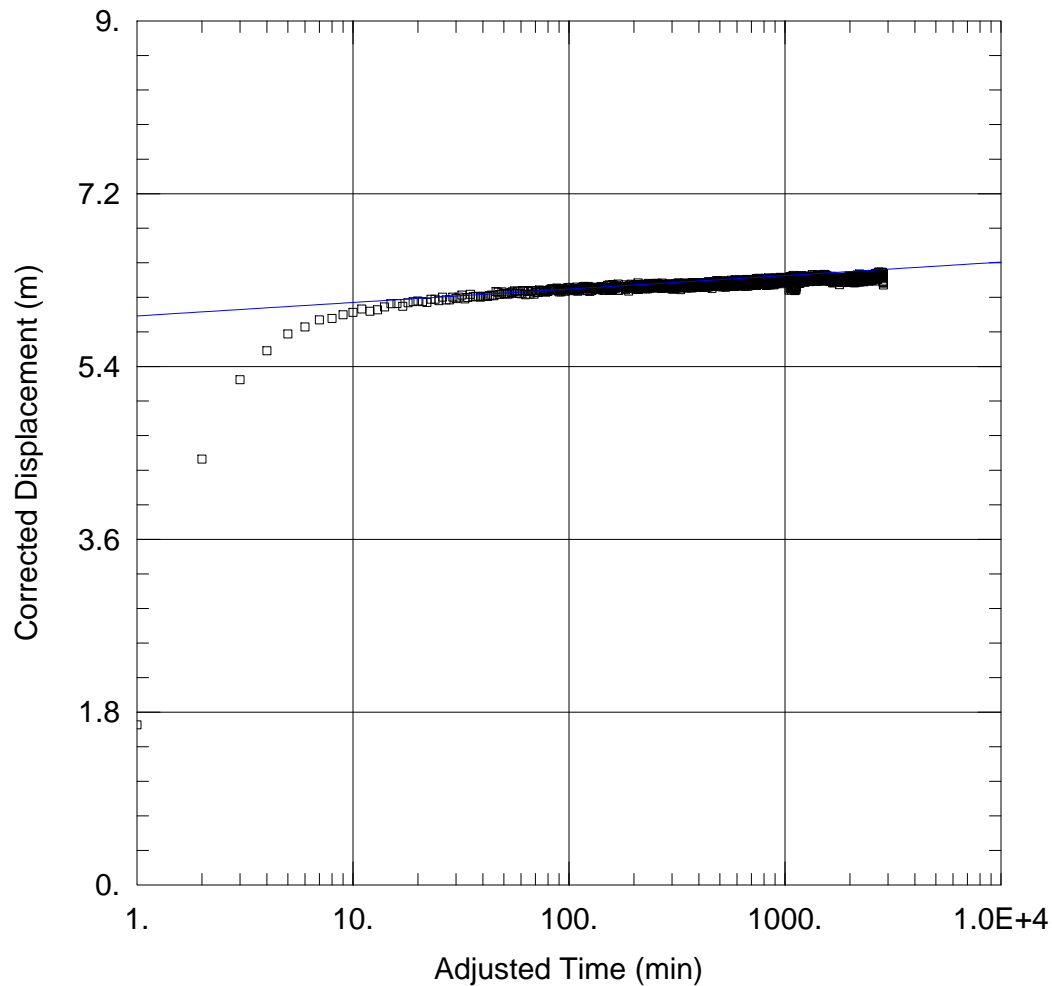
Solution Method: Neuman

$T = 142.6 \text{ m}^2/\text{day}$

$S = 1.156\text{E-}51$

$S_y = 0.2044$

$\beta = 1.85\text{E-}6$



WELL TEST ANALYSIS

Data Set: P:\...\Cooper-Jacob.aqt
Date: 06/18/18

Time: 11:38:48

PROJECT INFORMATION

Company: Waterline Resources
Client: CVRD
Project: 2768-18-001
Location: Saltair
Test Well: PW
Test Date: April 2018

AQUIFER DATA

Saturated Thickness: 18.9 m

Anisotropy Ratio (Kz/Kr): 0.5

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW1	0	0

Observation Wells

Well Name	X (m)	Y (m)
□ TW1	0	0

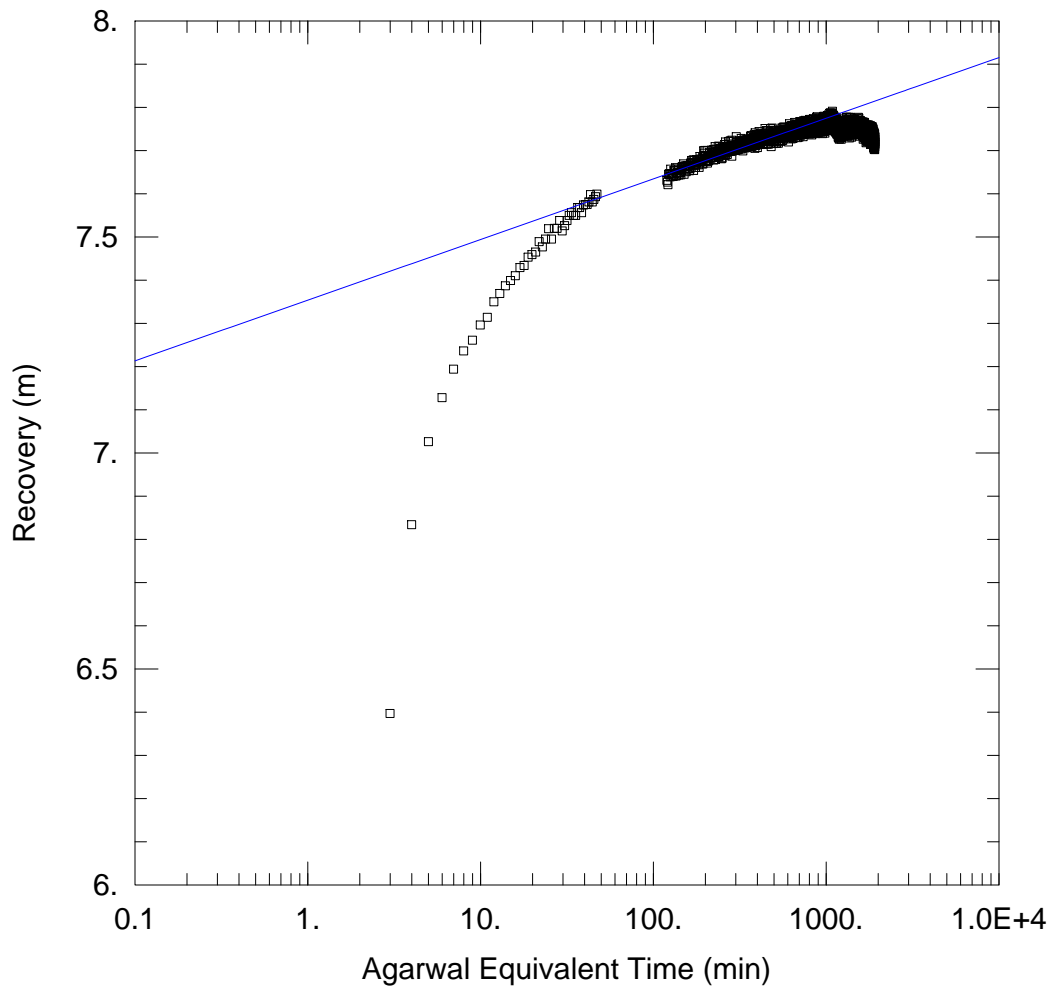
SOLUTION

Aquifer Model: Unconfined

Solution Method: Cooper-Jacob

T = 464.9 m²/day

S = 4.395E-41



WELL TEST ANALYSIS

Data Set: P:\...\Cooper-Jacob (Agar Rec).aqt

Date: 06/18/18

Time: 11:36:29

PROJECT INFORMATION

Company: Waterline Resources

Client: CVRD

Project: 2768-18-001

Location: Saltair

Test Well: PW

Test Date: April 2018

AQUIFER DATA

Saturated Thickness: 18.6 m

Anisotropy Ratio (Kz/Kr): 1.

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW1	0	0

Observation Wells

Well Name	X (m)	Y (m)
□ TW1	0	0

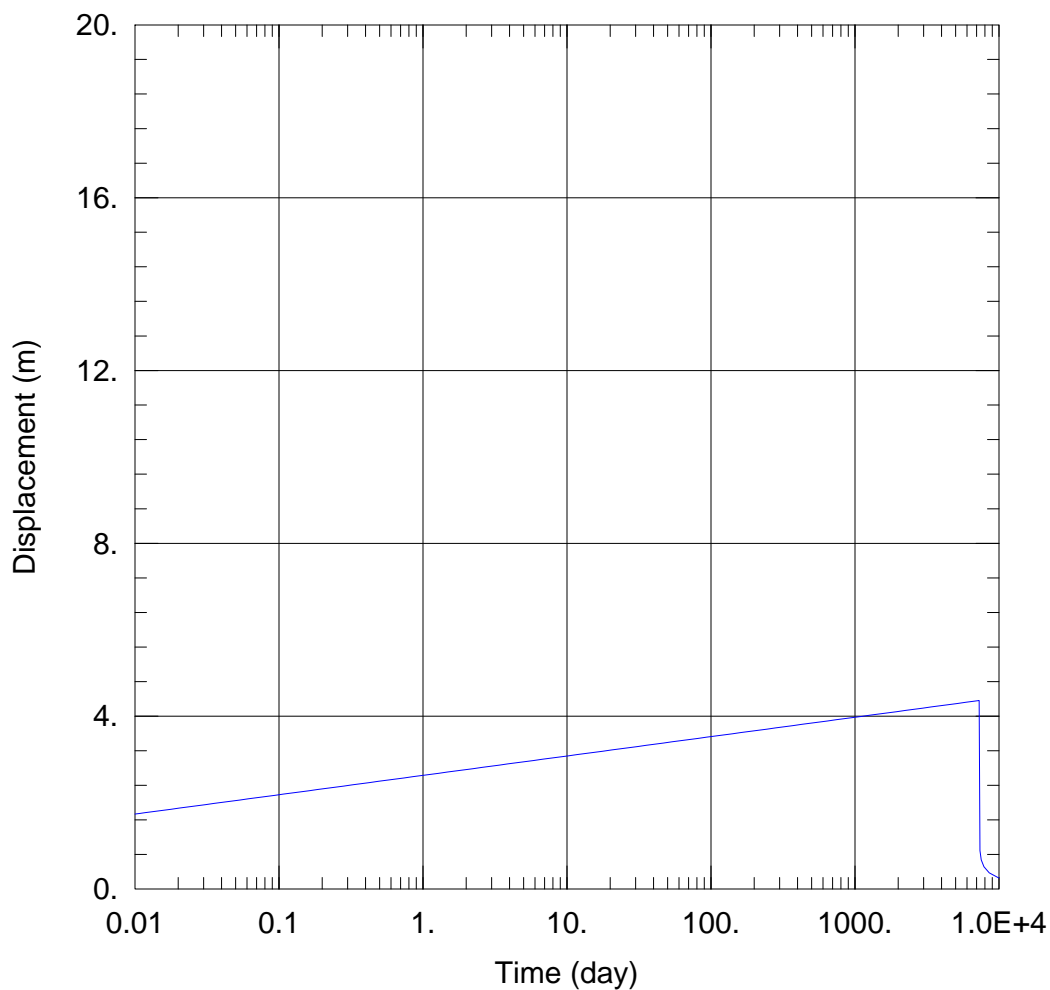
SOLUTION

Aquifer Model: Unconfined

Solution Method: Cooper-Jacob

T = 463.9 m²/day

S = 3.762E-51



WELL TEST ANALYSIS

Data Set: P:\...\forward solution 143m2pd.aqt

Date: 06/18/18

Time: 11:40:13

PROJECT INFORMATION

Company: Waterline Resources

Client: CVRD

Project: 2768-18-001

Location: Saltair

Test Well: PW

Test Date: April 2018

AQUIFER DATA

Saturated Thickness: 18.6 m

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW1	0	0

Observation Wells

Well Name	X (m)	Y (m)
□ TW1	0	0

SOLUTION

Aquifer Model: Unconfined

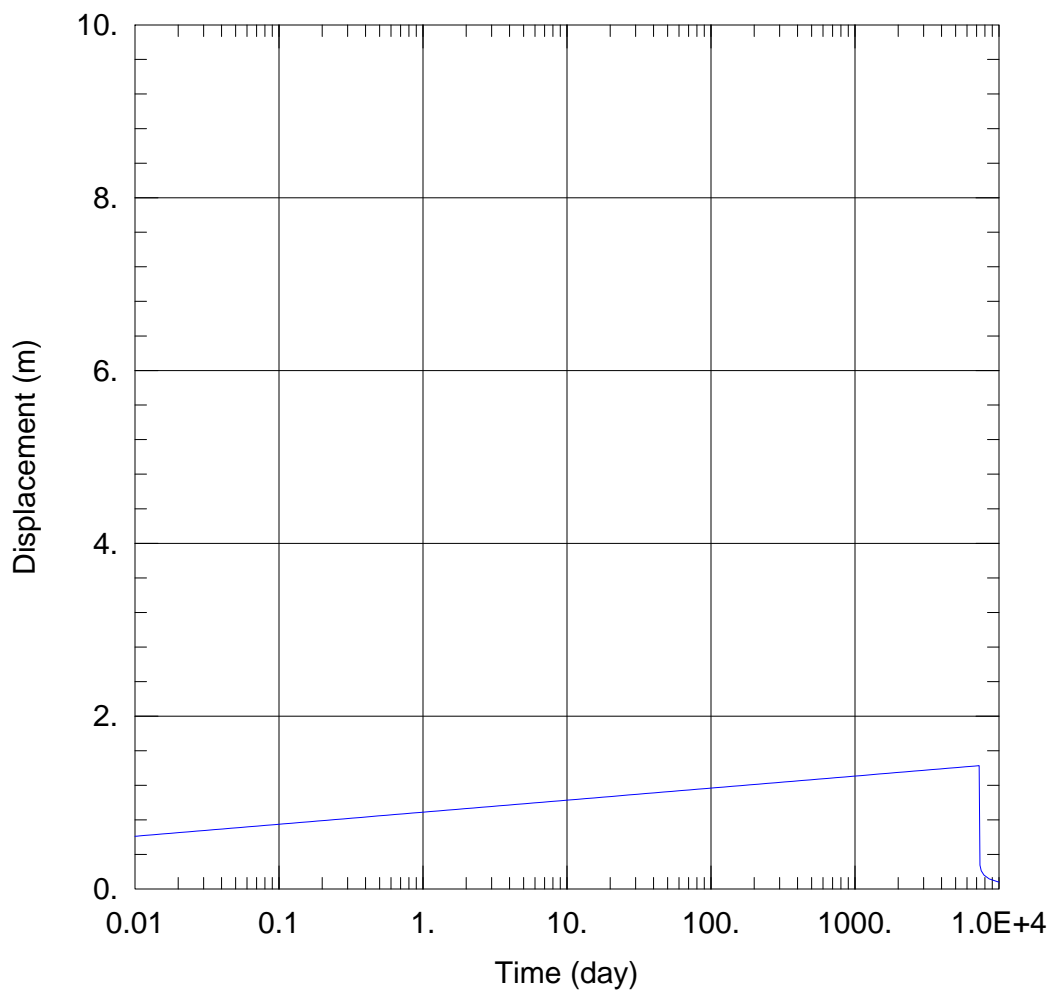
Solution Method: Neuman

T = 143. m²/day

S = 0.0001

Sy = 0.2

β = 0.1



WELL TEST ANALYSIS

Data Set: P:\...\forward solution 460m2pd.aqt

Date: 06/18/18

Time: 11:40:33

PROJECT INFORMATION

Company: Waterline Resources

Client: CVRD

Project: 2768-18-001

Location: Saltair

Test Well: PW

Test Date: April 2018

AQUIFER DATA

Saturated Thickness: 18.6 m

WELL DATA

Pumping Wells

Well Name	X (m)	Y (m)
TW1	0	0

Observation Wells

Well Name	X (m)	Y (m)
□ TW1	0	0

SOLUTION

Aquifer Model: Unconfined

Solution Method: Neuman

T = 460. m²/day

S = 0.0001

Sy = 0.2

β = 0.1

Appendix E: Water Quality Comparison Tables and Certificates of Analysis

Table E1. Field Measured Parameters

Table E2. General Chemistry and Major Ions

Table E3. Total Metals

Table E4. Dissolved Metals

Table E5. Microbiology Analysis

MB Labs Certificate of Analysis

CARO Analytical Certificate of Analysis

Table E1. Field Measured Parameters

				Field				
Sample Location	Sample Date	Field Sample ID	Lab ID	Field Conductivity (EC)	Field pH	Field Temperature	Field Total Dissolved Solids	Field Turbidity
			Units	µS/cm	-	°C	ppm	NTU
Guidelines		GCDWQ AO Exceedance	-	7-10.5	-	≤500	1	
		GCDWQ MAC Exceedance	-	-	-	-	-	
Banon Creek	2018-04-23 09:00	-	-	9	6	4.2	4	-
Banon Creek	2018-04-26 10:45	Surface Water	8042387-02	11	6.7	6.1	5	0.89
TW18-1	2018-04-24 12:00	-	-	45	6.3	9	24	1.28
TW18-1	2018-04-26 11:00	TW18-1	8042387-01	46	6.45	8.8	23	0.49

Notes:

Guidelines - Health Canada, February 2017, Guidelines for Canadian Drinking Water Quality (GCDWQ), Summary Table.

Violet highlight - Value exceeds the Aesthetic Objectives (AO).

Yellow highlight - Value exceeds the Maximum Acceptable Concentration (MAC).

Table E2. General Chemistry & Major Ions

				General Chemistry										Major Ions																							
Sample Location	Sample Date	Field Sample ID	Lab ID	Colour	Alkalinity, Bicarbonate (as CaCO ₃)	Alkalinity, Carbonate (as CaCO ₃)	Alkalinity, Hydroxide (as CaCO ₃)	Alkalinity, Total (as CaCO ₃)	Conductivity (EC)	pH	Total Dissolved Solids-Calculated	Total Hardness (CaCO ₃)	Total Organic Carbon (TOC)	Turbidity	Ammonia-Total (as N)	Bicarbonate (HCO ₃)	Calcium (Ca)-Dissolved	Carbonate (CO ₃)	Cation - Anion Balance	Chloride (Cl)	Fluoride (F)	Hydroxide (OH)	Ion Balance	Iron (Fe)-Dissolved	Magnesium (Mg)-Dissolved	Manganese (Mn)-Dissolved	Nitrate-N	Nitrite-N	Organic Nitrogen-Total (as N)	Phenolphthalein	Potassium (K)-Dissolved	Sodium (Na)-Dissolved	Sulphate (SO ₄)	Sulphide	Total Kjeldahl Nitrogen		
			Units	TCU	mg/L	mg/L	mg/L	mg/L	µS/cm	-	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Guidelines		GCDWQ AO Exceedance		15	-	-	-	-	-	7-10.5	500	-	-	1	-	-	-	-	-	-	250	-	-	-	0.3	-	0.05	-	-	-	-	-	-	200	500	0.05	-
		GCDWQ MAC Exceedance		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	-	-	-	-	-	10	1	-	-	-	-	-	-	-	
Banon Creek	2018-04-26 10:45	Surface Water	8042387-02	-	-	-	-	3.2	12.8	6.6	4.21	4.33	-	-	-	3.9	1.36	<2.0	5.4	0.77	<0.10	<2.0	181	0.012	0.223	<0.00020	0.014	<0.010	-	-	<0.10	0.67	<1.0	-	-		
TW18-1	2018-04-26 11:00	TW18-1	8042387-01	<5.0	23.4	<1.0	<1.0	23.4	49.7	6.98	25	17.2	<0.50	0.17	0.059	28.6	5.4	<0.600	-	1.11	0.11	<0.340	-	0.02	0.89	0.00388	0.083	<0.010	0.067	<1.0	0.28	1.94	1.2	<0.020	0.126		

Notes:

Guidelines - Health Canada, February 2017, Guidelines for Canadian Drinking Water Quality (GCDWQ), Summary Table.

Violet highlight - Value exceeds the Aesthetic Objectives (AO).

Yellow highlight - Value exceeds the Maximum Acceptable Concentration (MAC).

Table E3. Total Metals

Sample Location	Sample Date	Field Sample ID	Lab ID	Metals																																							
				Aluminum (Al)-Total	Antimony (Sb)-Total	Arsenic (As)-Total	Barium (Ba)-Total	Beryllium (Be)-Total	Bismuth (Bi)-Total	Boron (B)-Total	Cadmium (Cd)-Total	Calcium (Ca)-Total	Chromium (Cr)-Total	Cobalt (Co)-Total	Copper (Cu)-Total	Iron (Fe)-Total	Lead (Pb)-Total	Lithium (Li)-Total	Magnesium (Mg)-Total	Manganese (Mn)-Total	Mercury (Hg)-Total	Molybdenum (Mo)-Total	Nickel (Ni)-Total	Phosphorus (P)-Total	Potassium (K)-Total	Selenium (Se)-Total	Silicon (Si)-Total	Silver (Ag)-Total	Sodium (Na)-Total	Strontium (Sr)-Total	Sulphur (S)-Total	Tellurium (Te)-Total	Thallium (Tl)-Total	Thorium (Th)-Total	Tin (Sn)-Total	Titanium (Ti)-Total	Tungsten (W)-Total	Uranium (U)-Total	Vanadium (V)-Total	Zinc (Zn)-Total	Zirconium (Zr)-Total		
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Guidelines		GCDWQ AO Exceedance	0.1	-	-	-	-	-	-	-	-	-	-	-	1	0.3	-	-	-	0.05	-	-	-	-	-	-	-	200	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
		GCDWQ MAC Exceedance	-	0.006	0.01	1	-	-	5	0.005	-	0.05	-	-	-	-	0.01	-	-	-	0.001	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-	-
Banon Creek	2018-04-26 10:45	Surface Water	8042387-02	0.122	<0.00020	<0.00050	<0.0050	<0.00010	<0.00010	0.007	<0.000010	1.52	<0.00050	<0.00010	0.00069	0.028	<0.00020	<0.00010	0.261	0.00063	-	<0.00010	<0.00040	<0.050	<0.10	<0.00050	1.5	<0.000050	0.71	0.0063	<3.0	<0.00050	<0.000020	<0.00010	0.00029	<0.0050	<0.0010	<0.000020	<0.0010	<0.000020	<0.0010	<0.0040	<0.00010
TW18-1	2018-04-26 11:00	TW18-1	8042387-01	0.0054	<0.00020	<0.00050	0.0058	<0.00010	<0.00010	0.014	<0.000010	5.68	<0.00050	<0.00010	0.00044	0.031	<0.00020	<0.00010	1.01	0.00433	<0.000040	0.00013	<0.00040	<0.050	0.27	<0.00050	5.4	<0.000050	2.08	0.0205	<3.0	<0.00050	<0.000020	<0.00010	<0.00020	<0.0050	<0.0010	<0.000020	0.0011	0.0118	<0.00010		

Notes:
Guidelines - Health Canada, February 2017, Guidelines for Canadian Drinking Water Quality (GCDWQ), Summary Table.
Violet highlight - Value exceeds the Aesthetic Objectives (AO).
Yellow highlight - Value exceeds the Maximum Acceptable Concentration (MAC).



Table E4. Dissolved Metals

				Metals																																
Sample Location	Sample Date	Field Sample ID	Lab ID	Aluminum (Al)-Dissolved	Antimony (Sb)-Dissolved	Arsenic (As)-Dissolved	Barium (Ba)-Dissolved	Beryllium (Be)-Dissolved	Bismuth (Bi)-Dissolved	Boron (B)-Dissolved	Cadmium (Cd)-Dissolved	Chromium (Cr)-Dissolved	Cobalt (Co)-Dissolved	Copper (Cu)-Dissolved	Lead (Pb)-Dissolved	Lithium (Li)-Dissolved	Molybdenum (Mo)-Dissolved	Nickel (Ni)-Dissolved	Phosphorus (P)-Dissolved	Selenium (Se)-Dissolved	Silicon (Si)-Dissolved	Silver (Ag)-Dissolved	Strontium (Sr)-Dissolved	Sulphur (S)-Dissolved	Tellurium (Te)-Dissolved	Thallium (Tl)-Dissolved	Thorium (Th)-Dissolved	Tin (Sn)-Dissolved	Titanium (Ti)-Dissolved	Tungsten (W)-Dissolved	Uranium (U)-Dissolved	Vanadium (V)-Dissolved	Zinc (Zn)-Dissolved	Zirconium (Zr)-Dissolved		
Guidelines		Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
		GCDWQ AO Exceedance		0.1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	
		GCDWQ MAC Exceedance		-	0.006	0.01	1	-	-	5	0.005	0.05	-	-	0.01	-	-	-	-	-	0.05	-	-	-	-	-	-	-	-	-	-	0.02	-	-	-	
Banon Creek	2018-04-26 10:45	Surface Water	8042387-02	0.0979	<0.00020	<0.00050	<0.0050	<0.00010	<0.00010	0.0093	<0.000010	<0.00050	<0.00010	<0.00040	<0.00020	<0.00010	<0.00010	<0.00040	<0.050	<0.00050	<1.0	<0.000050	0.0061	<3.0	<0.00050	<0.000020	<0.00010	<0.00020	<0.0050	<0.0010	<0.000020	<0.0010	<0.000020	<0.0010	<0.0040	<0.00010
TW18-1	2018-04-26 11:00	TW18-1	8042387-01	<0.0050	<0.00020	<0.00050	0.0055	<0.00010	<0.00010	0.0164	<0.000010	<0.00050	<0.00010	<0.00040	<0.00020	<0.00010	0.00013	<0.00040	<0.050	<0.00050	5.1	<0.000050	0.0204	<3.0	<0.00050	<0.000020	<0.00010	<0.00020	<0.0050	<0.0010	<0.000020	0.001	0.0074	<0.00010		

Notes:
Guidelines - Health Canada, February 2017, Guidelines for Canadian Drinking Water Quality (GCDWQ), Summary Table.
Violet highlight - Value exceeds the Aesthetic Objectives (AO).
Yellow highlight - Value exceeds the Maximum Acceptable Concentration (MAC).

Table E5. Microbiology Analysis

				Microbiological Analysis				
Sample Location	Sample Date	Field Sample ID	Lab ID	Iron Reducing Bacteria (IRB)	Sulphate Reducing Bacteria (SRB)	E. Coli	Fecal Coliform	Total Coliforms
			Units	-	-	MPN/100mL	CFU/100 ml	MPN/100mL
Guidelines		GCDWQ AO Exceedance		-	-	-	-	-
		GCDWQ MAC Exceedance		-	-	0	0	0
TW18-1	2018-04-26 11:00	TW18-1	8042387-01	ND	ND	0	0	0

Notes:

Guidelines - Health Canada, February 2017, Guidelines for Canadian Drinking Water Quality (GCDWQ), Summary Table.

Violet highlight - Value exceeds the Aesthetic Objectives (AO).

Yellow highlight - Value exceeds the Maximum Acceptable Concentration (MAC).

Client/Code

Waterline Resources Inc.
2430 Jingle Pot Rd
Nanaimo, BC
V9R 6W2

Date 27Apr18 11:17a
Source FWS
Type of Sample water
No. of Samples 1

No. W139835

TEL: 250-585-9114

Comments Arrival temp.: 12.0C
jhermanson@waterlineresources.com Sampler: GN

Sample: Saltair

Site Code	Date	Time	CFU/100 ml		CFU/100 ml		CFU/100 ml
			TC	T-NC	FC	F-NC	E.coli
TW18-1	26Apr18	11:15a	0	0	0	0	0

WATER DISTRICT SCREEN

Sample	Date	Time	Lactose	Coliforms		Total	Sulfur Reducing/ Iron Bacteria	Yeast/Funqi	TPC%
			Fermentors	Total	Fecal				
TW18-1	26Apr18	11:15a	ND	ND	ND	ND	ND / ND	ND / ND	0.92

* all counts are colony forming units per milli-litre

TC = total coliform bacteria

FC = fecal coliform bacteria (aka Thermotolerant Coliforms)

NC = non-coliform bacteria

ND = none detected

TPC = total plate count- spread plate method - 35C/48hr TGEA

FDA/BAM 8th ed, 1995 + Revision A, 1998, May 2009

CFU = colony forming units

Results may be adversely affected if samples are submitted to the laboratory more than 24 to 30 hours after collection.

E. coli = Escherichia coli, FDA/BAM 8th ed, 1995 + Revision A, 1998

Bergey's Manual of Systematic Bacteriology vol 1, AOAC 1984; J.Clin.Micro.,
J.Intern.System.Bact.

M. Milholm
Microbiologist

W. Riggs
Sr. Microbiologist



Client/Code

Waterline Resources Inc.
2430 Jingle Pot Rd
Nanaimo, BC
V9R 6W2

Date 27Apr18 11:24a
Source FWS
Type of Sample filter(s)
No. of Samples 1

No. W139836

TEL: 250-585-9114

Comments Arrival temp.: 12.0C

jhermanson@waterlineresources.com CC:gnordstrom@waterlineresources.com

Sample: TW18-1 26Apr18 07:30a 07:30am - 11:30am

MICROSCOPIC PARTICULATE ANALYSIS *Processing Information:Laboratory Examination

Date & Time of Sample: 03Sep02 13:15p

Total volume filtered 240 gal
Filter sediment collected 3.2mL
Vol. sucrose sediment 0.85 mL
Vol. float. pellet/100gal 0.25 mL

Microscopy: phase contrast
DIC + fluorescence
Type of Material Examined:
original sediment
all floatation pellets

<u>Indicator Elements</u>	<u>Count/100 gal</u>	<u>Table #1 Range Rating**</u>	<u>Table #2 Relative Risk***</u>
Giardia	ND	NS	0
Cryptosporidium	ND	NS	0
Coccidia	ND	NS	0
Diatoms	ND	NS	0
Algae (chlorophyll +)	ND	NS	0
Protozoa (chlorophyll -)	ND	n/a	n/a
Insects (or parts)	ND	NS	0
Rotifers	ND	NS	0
Plant Debris	1666	EH	3

ND = none detected EH = extremely heavy
n/a = not applicable H = heavy
 M = moderate
 R = rare
 NS = not significant

Risk of surface water contamination: (3 = ≤ 9) = LOW RISK

* method used: US EPA Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA), Vasconcelos, J., S. Harris., 1992

** Table 1 Numerical range of each primary bio-indicator per 100 gal

*** Table 2 Relative surface water risk factors associated with scoring of primary bio-indicators

M. Milholm
Phycologist

W. Riggs
Sr. Microbiologist



CERTIFICATE OF ANALYSIS

REPORTED TO Waterline Resources Inc. - Nanaimo
2430 Jingle Pot Road
Nanaimo, BC V9R 6W2

ATTENTION Jolene Hermanson

PO NUMBER 2768-18-001

PROJECT 2768-18-001

PROJECT INFO CVRD Saltair TW

WORK ORDER 8042387

RECEIVED / TEMP 2018-04-27 09:25 / 12°C

REPORTED 2018-05-14 14:40

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve



Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

Work Order Comments:

This is a revised report; please refer to Appendix 3 for details.

If you have any questions or concerns, please contact me at hmaleki@caro.ca

Authorized By:

Helen Maleki, Dipl T
Client Service Representative

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7

TEST RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
---------	--------	-----------	----	-------	----------	-----------

TW18-1 (8042387-01) | Matrix: Water | Sampled: 2018-04-26 10:30

Anions

Chloride	1.11	AO ≤ 250	0.10	mg/L	2018-04-29	
Fluoride	0.11	MAC = 1.5	0.10	mg/L	2018-04-29	
Nitrate (as N)	0.083	MAC = 10	0.010	mg/L	2018-04-29	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2018-04-29	
Sulfate	1.2	AO ≤ 500	1.0	mg/L	2018-04-29	

General Parameters

Alkalinity, Total (as CaCO ₃)	23.4	N/A	1.0	mg/L	2018-05-01	
Alkalinity, Phenolphthalein (as CaCO ₃)	< 1.0	N/A	1.0	mg/L	2018-05-01	
Alkalinity, Bicarbonate (as CaCO ₃)	23.4	N/A	1.0	mg/L	2018-05-01	
Alkalinity, Carbonate (as CaCO ₃)	< 1.0	N/A	1.0	mg/L	2018-05-01	
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	N/A	1.0	mg/L	2018-05-01	
Bicarbonate (HCO ₃)	28.6	N/A	1.22	mg/L	N/A	
Carbonate (CO ₃)	< 0.600	N/A	0.600	mg/L	N/A	
Hydroxide (OH)	< 0.340	N/A	0.340	mg/L	N/A	
Ammonia, Total (as N)	0.059	None Required	0.020	mg/L	2018-04-29	
Carbon, Total Organic	< 0.50	N/A	0.50	mg/L	2018-04-29	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	2018-05-02	
Conductivity (EC)	49.7	N/A	2.0	µS/cm	2018-05-01	
Nitrogen, Total Kjeldahl	0.126	N/A	0.050	mg/L	2018-05-04	
pH	6.98	7.0-10.5	0.10	pH units	2018-05-02	HT2
Sulfide, Total	< 0.020	AO ≤ 0.05	0.020	mg/L	2018-05-02	
Turbidity	0.17	OG < 1	0.10	NTU	2018-04-29	

Calculated Parameters

Hardness, Total (as CaCO ₃)	17.2	None Required	0.500	mg/L	N/A	
Langelier Index	-0.3	N/A	-5.0	-	2018-05-04	
Nitrogen, Organic	0.0670	N/A	0.0500	mg/L	N/A	
Solids, Total Dissolved	25	AO ≤ 500	10	mg/L	2018-05-04	

Dissolved Metals

Aluminum, dissolved	< 0.0050	N/A	0.0050	mg/L	2018-04-30	
Antimony, dissolved	< 0.00020	N/A	0.00020	mg/L	2018-04-30	
Arsenic, dissolved	< 0.00050	N/A	0.00050	mg/L	2018-04-30	
Barium, dissolved	0.0055	N/A	0.0050	mg/L	2018-04-30	
Beryllium, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Bismuth, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Boron, dissolved	0.0164	N/A	0.0050	mg/L	2018-04-30	
Cadmium, dissolved	< 0.000010	N/A	0.000010	mg/L	2018-04-30	
Calcium, dissolved	5.40	N/A	0.20	mg/L	2018-04-30	
Chromium, dissolved	< 0.00050	N/A	0.00050	mg/L	2018-04-30	
Cobalt, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Copper, dissolved	< 0.00040	N/A	0.00040	mg/L	2018-04-30	

TEST RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
---------	--------	-----------	----	-------	----------	-----------

TW18-1 (8042387-01) | Matrix: Water | Sampled: 2018-04-26 10:30, Continued

Dissolved Metals, Continued

Iron, dissolved	0.020	N/A	0.010	mg/L	2018-04-30	
Lead, dissolved	< 0.00020	N/A	0.00020	mg/L	2018-04-30	
Lithium, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Magnesium, dissolved	0.890	N/A	0.010	mg/L	2018-04-30	
Manganese, dissolved	0.00388	N/A	0.00020	mg/L	2018-04-30	
Molybdenum, dissolved	0.00013	N/A	0.00010	mg/L	2018-04-30	
Nickel, dissolved	< 0.00040	N/A	0.00040	mg/L	2018-04-30	
Phosphorus, dissolved	< 0.050	N/A	0.050	mg/L	2018-04-30	
Potassium, dissolved	0.28	N/A	0.10	mg/L	2018-04-30	
Selenium, dissolved	< 0.00050	N/A	0.00050	mg/L	2018-04-30	
Silicon, dissolved	5.1	N/A	1.0	mg/L	2018-04-30	
Silver, dissolved	< 0.000050	N/A	0.000050	mg/L	2018-04-30	
Sodium, dissolved	1.94	N/A	0.10	mg/L	2018-04-30	
Strontium, dissolved	0.0204	N/A	0.0010	mg/L	2018-04-30	
Sulfur, dissolved	< 3.0	N/A	3.0	mg/L	2018-04-30	
Tellurium, dissolved	< 0.00050	N/A	0.00050	mg/L	2018-04-30	
Thallium, dissolved	< 0.000020	N/A	0.000020	mg/L	2018-04-30	
Thorium, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Tin, dissolved	< 0.00020	N/A	0.00020	mg/L	2018-04-30	
Titanium, dissolved	< 0.0050	N/A	0.0050	mg/L	2018-04-30	
Tungsten, dissolved	< 0.0010	N/A	0.0010	mg/L	2018-04-30	
Uranium, dissolved	< 0.000020	N/A	0.000020	mg/L	2018-04-30	
Vanadium, dissolved	0.0010	N/A	0.0010	mg/L	2018-04-30	
Zinc, dissolved	0.0074	N/A	0.0040	mg/L	2018-04-30	
Zirconium, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	

Total Metals

Aluminum, total	0.0054	OG < 0.1	0.0050	mg/L	2018-05-03	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2018-05-03	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2018-05-03	
Barium, total	0.0058	MAC = 1	0.0050	mg/L	2018-05-03	
Beryllium, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Bismuth, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Boron, total	0.0140	MAC = 5	0.0050	mg/L	2018-05-03	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2018-05-03	
Calcium, total	5.68	None Required	0.20	mg/L	2018-05-03	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2018-05-03	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Copper, total	0.00044	AO ≤ 1	0.00040	mg/L	2018-05-03	
Iron, total	0.031	AO ≤ 0.3	0.010	mg/L	2018-05-03	
Lead, total	< 0.00020	MAC = 0.01	0.00020	mg/L	2018-05-03	
Lithium, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Magnesium, total	1.01	None Required	0.010	mg/L	2018-05-03	

TEST RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
---------	--------	-----------	----	-------	----------	-----------

TW18-1 (8042387-01) | Matrix: Water | Sampled: 2018-04-26 10:30, Continued

Total Metals, Continued

Manganese, total	0.00433	AO ≤ 0.05	0.00020	mg/L	2018-05-03	
Mercury, total	< 0.000040	MAC = 0.001	0.000040	mg/L	2018-05-03	
Molybdenum, total	0.00013	N/A	0.00010	mg/L	2018-05-03	
Nickel, total	< 0.00040	N/A	0.00040	mg/L	2018-05-03	
Phosphorus, total	< 0.050	N/A	0.050	mg/L	2018-05-03	
Potassium, total	0.27	N/A	0.10	mg/L	2018-05-03	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2018-05-03	
Silicon, total	5.4	N/A	1.0	mg/L	2018-05-03	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2018-05-03	
Sodium, total	2.08	AO ≤ 200	0.10	mg/L	2018-05-03	
Strontium, total	0.0205	N/A	0.0010	mg/L	2018-05-03	
Sulfur, total	< 3.0	N/A	3.0	mg/L	2018-05-03	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2018-05-03	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2018-05-03	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2018-05-03	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2018-05-03	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2018-05-03	
Uranium, total	< 0.000020	MAC = 0.02	0.000020	mg/L	2018-05-03	
Vanadium, total	0.0011	N/A	0.0010	mg/L	2018-05-03	
Zinc, total	0.0118	AO ≤ 5	0.0040	mg/L	2018-05-03	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	

Surface Water (8042387-02) | Matrix: Water | Sampled: 2018-04-26 10:45

Anions

Chloride	0.77	AO ≤ 250	0.10	mg/L	2018-04-29	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	2018-04-29	
Nitrate (as N)	0.014	MAC = 10	0.010	mg/L	2018-04-29	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2018-04-29	
Sulfate	< 1.0	AO ≤ 500	1.0	mg/L	2018-04-29	

General Parameters

Alkalinity, Total (as CaCO ₃)	3.2	N/A	2.0	mg/L	2018-05-04	
Bicarbonate (HCO ₃)	3.9	N/A	2.0	mg/L	2018-05-04	
Carbonate (CO ₃)	< 2.0	N/A	2.0	mg/L	2018-05-04	
Hydroxide (OH)	< 2.0	N/A	2.0	mg/L	2018-05-04	
Conductivity (EC)	12.8	N/A	2.0	µS/cm	2018-05-02	
pH	6.60	7.0-10.5	0.10	pH units	2018-05-02	HT2

Calculated Parameters

Cation-Anion Balance	5.40	N/A	%	2018-05-04	
Hardness, Total (as CaCO ₃)	4.33	None Required	0.500	mg/L	N/A

TEST RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
---------	--------	-----------	----	-------	----------	-----------

Surface Water (8042387-02) | Matrix: Water | Sampled: 2018-04-26 10:45, Continued

Calculated Parameters, Continued

Solids, Total Dissolved	< 10	AO ≤ 500	10	mg/L	2018-05-04	
-------------------------	------	----------	----	------	------------	--

Dissolved Metals

Aluminum, dissolved	0.0979	N/A	0.0050	mg/L	2018-04-30	
Antimony, dissolved	< 0.00020	N/A	0.00020	mg/L	2018-04-30	
Arsenic, dissolved	< 0.00050	N/A	0.00050	mg/L	2018-04-30	
Barium, dissolved	< 0.0050	N/A	0.0050	mg/L	2018-04-30	
Beryllium, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Bismuth, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Boron, dissolved	0.0093	N/A	0.0050	mg/L	2018-04-30	
Cadmium, dissolved	< 0.000010	N/A	0.000010	mg/L	2018-04-30	
Calcium, dissolved	1.36	N/A	0.20	mg/L	2018-04-30	
Chromium, dissolved	< 0.00050	N/A	0.00050	mg/L	2018-04-30	
Cobalt, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Copper, dissolved	< 0.00040	N/A	0.00040	mg/L	2018-04-30	
Iron, dissolved	0.012	N/A	0.010	mg/L	2018-04-30	
Lead, dissolved	< 0.00020	N/A	0.00020	mg/L	2018-04-30	
Lithium, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Magnesium, dissolved	0.223	N/A	0.010	mg/L	2018-04-30	
Manganese, dissolved	< 0.00020	N/A	0.00020	mg/L	2018-04-30	
Molybdenum, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Nickel, dissolved	< 0.00040	N/A	0.00040	mg/L	2018-04-30	
Phosphorus, dissolved	< 0.050	N/A	0.050	mg/L	2018-04-30	
Potassium, dissolved	< 0.10	N/A	0.10	mg/L	2018-04-30	
Selenium, dissolved	< 0.00050	N/A	0.00050	mg/L	2018-04-30	
Silicon, dissolved	< 1.0	N/A	1.0	mg/L	2018-04-30	
Silver, dissolved	< 0.000050	N/A	0.000050	mg/L	2018-04-30	
Sodium, dissolved	0.67	N/A	0.10	mg/L	2018-04-30	
Strontium, dissolved	0.0061	N/A	0.0010	mg/L	2018-04-30	
Sulfur, dissolved	< 3.0	N/A	3.0	mg/L	2018-04-30	
Tellurium, dissolved	< 0.00050	N/A	0.00050	mg/L	2018-04-30	
Thallium, dissolved	< 0.000020	N/A	0.000020	mg/L	2018-04-30	
Thorium, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	
Tin, dissolved	< 0.00020	N/A	0.00020	mg/L	2018-04-30	
Titanium, dissolved	< 0.0050	N/A	0.0050	mg/L	2018-04-30	
Tungsten, dissolved	< 0.0010	N/A	0.0010	mg/L	2018-04-30	
Uranium, dissolved	< 0.000020	N/A	0.000020	mg/L	2018-04-30	
Vanadium, dissolved	< 0.0010	N/A	0.0010	mg/L	2018-04-30	
Zinc, dissolved	< 0.0040	N/A	0.0040	mg/L	2018-04-30	
Zirconium, dissolved	< 0.00010	N/A	0.00010	mg/L	2018-04-30	

Total Metals

Aluminum, total	0.122	OG < 0.1	0.0050	mg/L	2018-05-03	
-----------------	-------	----------	--------	------	------------	--

TEST RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
Surface Water (8042387-02) Matrix: Water Sampled: 2018-04-26 10:45, Continued						
<i>Total Metals, Continued</i>						
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2018-05-03	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2018-05-03	
Barium, total	< 0.0050	MAC = 1	0.0050	mg/L	2018-05-03	
Beryllium, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Bismuth, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Boron, total	0.0070	MAC = 5	0.0050	mg/L	2018-05-03	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2018-05-03	
Calcium, total	1.52	None Required	0.20	mg/L	2018-05-03	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2018-05-03	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Copper, total	0.00069	AO ≤ 1	0.00040	mg/L	2018-05-03	
Iron, total	0.028	AO ≤ 0.3	0.010	mg/L	2018-05-03	
Lead, total	< 0.00020	MAC = 0.01	0.00020	mg/L	2018-05-03	
Lithium, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Magnesium, total	0.261	None Required	0.010	mg/L	2018-05-03	
Manganese, total	0.00063	AO ≤ 0.05	0.00020	mg/L	2018-05-03	
Molybdenum, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Nickel, total	< 0.00040	N/A	0.00040	mg/L	2018-05-03	
Phosphorus, total	< 0.050	N/A	0.050	mg/L	2018-05-03	
Potassium, total	< 0.10	N/A	0.10	mg/L	2018-05-03	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2018-05-03	
Silicon, total	1.5	N/A	1.0	mg/L	2018-05-03	
Silver, total	< 0.000050	None Required	0.000050	mg/L	2018-05-03	
Sodium, total	0.71	AO ≤ 200	0.10	mg/L	2018-05-03	
Strontium, total	0.0063	N/A	0.0010	mg/L	2018-05-03	
Sulfur, total	< 3.0	N/A	3.0	mg/L	2018-05-03	
Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2018-05-03	
Thallium, total	< 0.000020	N/A	0.000020	mg/L	2018-05-03	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	
Tin, total	0.00029	N/A	0.00020	mg/L	2018-05-03	
Titanium, total	< 0.0050	N/A	0.0050	mg/L	2018-05-03	
Tungsten, total	< 0.0010	N/A	0.0010	mg/L	2018-05-03	
Uranium, total	< 0.000020	MAC = 0.02	0.000020	mg/L	2018-05-03	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2018-05-03	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2018-05-03	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2018-05-03	

Sample Qualifiers:

- HT1 The sample was prepared and/or analyzed past the recommended holding time.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analysis Description	Method Ref.	Technique	Location
Alkalinity in Water	SM 2320 B* (2011)	Titration with H2SO4	Edmonton
Ammonia, Total in Water	SM 4500-NH3 G* (2011)	Automated Colorimetry (Phenate)	Kelowna
Anions in Water	SM 4110 B (2011)	Ion Chromatography	Kelowna
Carbon, Total Organic in Water	SM 5310 B (2011)	Combustion, Infrared CO2 Detection	Kelowna
Cation-Anion Balance in Water	SM 1030 E (2011)	Calculation: $100 \times ([\text{Cations}] - [\text{Anions}]) / ([\text{Cations}] + [\text{Anions}])$	N/A
Colour, True in Water	SM 2120 C (2011)	Spectrophotometry (456 nm)	Kelowna
Conductivity in Water	SM 2510 B (2011)	Conductivity Meter	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Hardness in Water	SM 2340 B (2011)	Calculation: $2.497 [\text{diss Ca}] + 4.118 [\text{diss Mg}]$	N/A
Ion Balance in Water	SM 1030 E (2011)	Calculation: $100 \times ([\text{Cations}] - [\text{Anions}]) / ([\text{Cations}] + [\text{Anions}])$	N/A
Langelier Index in Water	SM 2330 B (2010)	Calculation	N/A
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2011)	Block Digestion and Flow Injection Analysis	Kelowna
pH in Water	SM 4500-H+ B (2011)	Electrometry	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2011)	Calculation: $100 \times ([\text{Cations}] - [\text{Anions}]) / ([\text{Cations}] + [\text{Anions}])$	N/A
Sulfide, Total in Water	SM 4500-S2 D* (2011)	Colorimetry (Methylene Blue)	Edmonton
Total Metals in Water	EPA 200.2* / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Turbidity in Water	SM 2130 B (2011)	Nephelometry	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

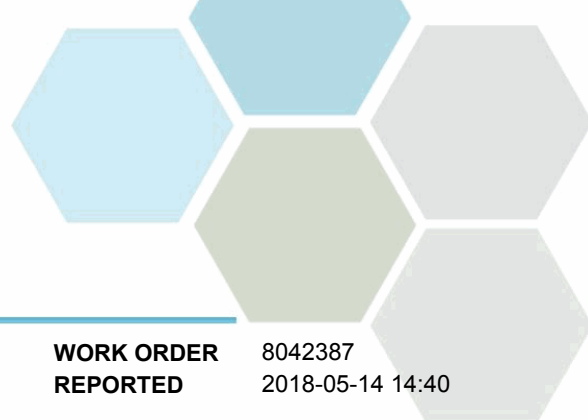
Glossary of Terms:

RL	Reporting Limit (default)
%	Percent
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
AO	Aesthetic Objective
CU	Colour Units (referenced against a platinum cobalt standard)
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, Feb 2017\)](#)

Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user



APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO Waterline Resources Inc. - Nanaimo
PROJECT 2768-18-001

WORK ORDER 8042387
REPORTED 2018-05-14 14:40

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS):** A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS):** A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM):** A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
---------	--------	----------	-------------	---------------	-------	-----------	-------	-----------	-----------

Anions, Batch B8D2121

Blank (B8D2121-BLK1)			Prepared: 2018-05-01, Analyzed: 2018-05-01						
Chloride	< 0.10	0.10 mg/L							
Fluoride	< 0.10	0.10 mg/L							
Nitrate (as N)	< 0.010	0.010 mg/L							
Nitrite (as N)	< 0.010	0.010 mg/L							
Sulfate	< 1.0	1.0 mg/L							

LCS (B8D2121-BS1)			Prepared: 2018-05-01, Analyzed: 2018-05-01						
Chloride	16.2	0.10 mg/L	16.0		101	90-110			
Fluoride	4.09	0.10 mg/L	4.00		102	88-108			
Nitrate (as N)	3.93	0.010 mg/L	4.00		98	93-108			
Nitrite (as N)	2.05	0.010 mg/L	2.00		102	85-114			
Sulfate	16.1	1.0 mg/L	16.0		101	91-109			

Duplicate (B8D2121-DUP1)			Source: 8042387-02		Prepared: 2018-05-01, Analyzed: 2018-05-01				
Chloride	0.76	0.10 mg/L		0.77			1	10	
Fluoride	< 0.10	0.10 mg/L		< 0.10				10	
Nitrate (as N)	0.015	0.010 mg/L		0.014				10	
Nitrite (as N)	< 0.010	0.010 mg/L		< 0.010				6	
Sulfate	< 1.0	1.0 mg/L		< 1.0				6	

Matrix Spike (B8D2121-MS1)			Source: 8042387-02		Prepared: 2018-05-01, Analyzed: 2018-05-01				
Chloride	16.6	0.10 mg/L	16.0	0.77	99	75-125			
Fluoride	3.87	0.10 mg/L	4.00	< 0.10	96	75-125			
Nitrate (as N)	4.02	0.010 mg/L	4.00	0.014	100	75-125			
Nitrite (as N)	2.06	0.010 mg/L	2.00	< 0.010	103	80-120			
Sulfate	16.3	1.0 mg/L	16.0	< 1.0	97	75-125			

Dissolved Metals, Batch B8D2091

Blank (B8D2091-BLK1)			Prepared: 2018-04-30, Analyzed: 2018-04-30						
Aluminum, dissolved	< 0.0050	0.0050 mg/L							
Antimony, dissolved	< 0.00020	0.00020 mg/L							
Arsenic, dissolved	< 0.00050	0.00050 mg/L							
Barium, dissolved	< 0.0050	0.0050 mg/L							
Beryllium, dissolved	< 0.00010	0.00010 mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
---------	--------	----------	-------------	---------------	-------	-----------	-------	-----------	-----------

Dissolved Metals, Batch B8D2091, Continued

Blank (B8D2091-BLK1), Continued

Prepared: 2018-04-30, Analyzed: 2018-04-30

Bismuth, dissolved	< 0.00010	0.00010 mg/L							
Boron, dissolved	< 0.0050	0.0050 mg/L							
Cadmium, dissolved	< 0.000010	0.000010 mg/L							
Calcium, dissolved	< 0.20	0.20 mg/L							
Chromium, dissolved	< 0.00050	0.00050 mg/L							
Cobalt, dissolved	< 0.00010	0.00010 mg/L							
Copper, dissolved	< 0.00040	0.00040 mg/L							
Iron, dissolved	< 0.010	0.010 mg/L							
Lead, dissolved	< 0.00020	0.00020 mg/L							
Lithium, dissolved	< 0.00010	0.00010 mg/L							
Magnesium, dissolved	< 0.010	0.010 mg/L							
Manganese, dissolved	< 0.00020	0.00020 mg/L							
Molybdenum, dissolved	< 0.00010	0.00010 mg/L							
Nickel, dissolved	< 0.00040	0.00040 mg/L							
Phosphorus, dissolved	< 0.050	0.050 mg/L							
Potassium, dissolved	< 0.10	0.10 mg/L							
Selenium, dissolved	< 0.00050	0.00050 mg/L							
Silicon, dissolved	< 1.0	1.0 mg/L							
Silver, dissolved	< 0.000050	0.000050 mg/L							
Sodium, dissolved	< 0.10	0.10 mg/L							
Strontium, dissolved	< 0.0010	0.0010 mg/L							
Sulfur, dissolved	< 3.0	3.0 mg/L							
Tellurium, dissolved	< 0.00050	0.00050 mg/L							
Thallium, dissolved	< 0.000020	0.000020 mg/L							
Thorium, dissolved	< 0.00010	0.00010 mg/L							
Tin, dissolved	< 0.00020	0.00020 mg/L							
Titanium, dissolved	< 0.0050	0.0050 mg/L							
Tungsten, dissolved	< 0.0010	0.0010 mg/L							
Uranium, dissolved	< 0.000020	0.000020 mg/L							
Vanadium, dissolved	< 0.0010	0.0010 mg/L							
Zinc, dissolved	< 0.0040	0.0040 mg/L							
Zirconium, dissolved	< 0.00010	0.00010 mg/L							

LCS (B8D2091-BS1)

Prepared: 2018-04-30, Analyzed: 2018-04-30

Aluminum, dissolved	0.0178	0.0050 mg/L	0.0200		89	80-120			
Antimony, dissolved	0.0202	0.00020 mg/L	0.0200		101	80-120			
Arsenic, dissolved	0.0195	0.00050 mg/L	0.0200		97	80-120			
Barium, dissolved	0.0195	0.0050 mg/L	0.0200		98	80-120			
Beryllium, dissolved	0.0188	0.00010 mg/L	0.0200		94	80-120			
Bismuth, dissolved	0.0200	0.00010 mg/L	0.0200		100	80-120			
Boron, dissolved	0.0193	0.0050 mg/L	0.0200		97	80-120			
Cadmium, dissolved	0.0191	0.000010 mg/L	0.0200		95	80-120			
Calcium, dissolved	2.10	0.20 mg/L	2.00		105	80-120			
Chromium, dissolved	0.0186	0.00050 mg/L	0.0200		93	80-120			
Cobalt, dissolved	0.0188	0.00010 mg/L	0.0200		94	80-120			
Copper, dissolved	0.0185	0.00040 mg/L	0.0200		92	80-120			
Iron, dissolved	1.92	0.010 mg/L	2.00		96	80-120			
Lead, dissolved	0.0194	0.00020 mg/L	0.0200		97	80-120			
Lithium, dissolved	0.0192	0.00010 mg/L	0.0200		96	80-120			
Magnesium, dissolved	1.86	0.010 mg/L	2.00		93	80-120			
Manganese, dissolved	0.0186	0.00020 mg/L	0.0200		93	80-120			
Molybdenum, dissolved	0.0190	0.00010 mg/L	0.0200		95	80-120			
Nickel, dissolved	0.0171	0.00040 mg/L	0.0200		86	80-120			
Phosphorus, dissolved	1.78	0.050 mg/L	2.00		89	80-120			
Potassium, dissolved	1.86	0.10 mg/L	2.00		93	80-120			
Selenium, dissolved	0.0184	0.00050 mg/L	0.0200		92	80-120			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B8D2091, Continued									
LCS (B8D2091-BS1), Continued				Prepared: 2018-04-30, Analyzed: 2018-04-30					
Silicon, dissolved	1.9	1.0 mg/L	2.00		97	80-120			
Silver, dissolved	0.0189	0.000050 mg/L	0.0200		94	80-120			
Sodium, dissolved	1.91	0.10 mg/L	2.00		95	80-120			
Strontium, dissolved	0.0190	0.0010 mg/L	0.0200		95	80-120			
Sulfur, dissolved	4.0	3.0 mg/L	5.00		80	80-120			
Tellurium, dissolved	0.0199	0.00050 mg/L	0.0200		99	80-120			
Thallium, dissolved	0.0193	0.000020 mg/L	0.0200		97	80-120			
Thorium, dissolved	0.0191	0.00010 mg/L	0.0200		96	80-120			
Tin, dissolved	0.0198	0.00020 mg/L	0.0200		99	80-120			
Titanium, dissolved	0.0196	0.0050 mg/L	0.0200		98	80-120			
Tungsten, dissolved	0.0168	0.0010 mg/L	0.0200		84	80-120			
Uranium, dissolved	0.0218	0.000020 mg/L	0.0200		109	80-120			
Vanadium, dissolved	0.0184	0.0010 mg/L	0.0200		92	80-120			
Zinc, dissolved	0.0164	0.0040 mg/L	0.0200		82	80-120			
Zirconium, dissolved	0.0199	0.00010 mg/L	0.0200		100	80-120			
Duplicate (B8D2091-DUP1)				Source: 8042387-01	Prepared: 2018-04-30, Analyzed: 2018-04-30				
Aluminum, dissolved	< 0.0050	0.0050 mg/L		< 0.0050				11	
Antimony, dissolved	< 0.00020	0.00020 mg/L		< 0.00020				20	
Arsenic, dissolved	< 0.00050	0.00050 mg/L		< 0.00050				8	
Barium, dissolved	0.0057	0.0050 mg/L		0.0055				7	
Beryllium, dissolved	< 0.00010	0.00010 mg/L		< 0.00010				14	
Bismuth, dissolved	< 0.00010	0.00010 mg/L		< 0.00010				20	
Boron, dissolved	0.0195	0.0050 mg/L		0.0164				13	
Cadmium, dissolved	< 0.000010	0.000010 mg/L		< 0.000010				20	
Calcium, dissolved	5.92	0.20 mg/L		5.40			9	8	
Chromium, dissolved	< 0.00050	0.00050 mg/L		< 0.00050				14	
Cobalt, dissolved	< 0.00010	0.00010 mg/L		< 0.00010				10	
Copper, dissolved	< 0.00040	0.00040 mg/L		< 0.00040				20	
Iron, dissolved	0.021	0.010 mg/L		0.020				14	
Lead, dissolved	< 0.00020	0.00020 mg/L		< 0.00020				20	
Lithium, dissolved	< 0.00010	0.00010 mg/L		< 0.00010				14	
Magnesium, dissolved	0.957	0.010 mg/L		0.890			7	6	
Manganese, dissolved	0.00424	0.00020 mg/L		0.00388			9	9	
Molybdenum, dissolved	0.00010	0.00010 mg/L		0.00013				19	
Nickel, dissolved	< 0.00040	0.00040 mg/L		< 0.00040				20	
Phosphorus, dissolved	< 0.050	0.050 mg/L		< 0.050				14	
Potassium, dissolved	0.29	0.10 mg/L		0.28				8	
Selenium, dissolved	< 0.00050	0.00050 mg/L		< 0.00050				20	
Silicon, dissolved	< 1.0	1.0 mg/L		5.1				12	
Silver, dissolved	0.000075	0.000050 mg/L		< 0.000050				20	
Sodium, dissolved	2.06	0.10 mg/L		1.94			6	6	
Strontium, dissolved	0.0219	0.0010 mg/L		0.0204			7	6	
Sulfur, dissolved	< 3.0	3.0 mg/L		< 3.0				20	
Tellurium, dissolved	< 0.00050	0.00050 mg/L		< 0.00050				20	
Thallium, dissolved	< 0.000020	0.000020 mg/L		< 0.000020				13	
Thorium, dissolved	< 0.00010	0.00010 mg/L		< 0.00010				20	
Tin, dissolved	< 0.00020	0.00020 mg/L		< 0.00020				20	
Titanium, dissolved	< 0.0050	0.0050 mg/L		< 0.0050				20	
Tungsten, dissolved	< 0.0010	0.0010 mg/L		< 0.0010				20	
Uranium, dissolved	< 0.000020	0.000020 mg/L		< 0.000020				14	
Vanadium, dissolved	0.0011	0.0010 mg/L		0.0010				20	
Zinc, dissolved	0.0069	0.0040 mg/L		0.0074				11	
Zirconium, dissolved	< 0.00010	0.00010 mg/L		< 0.00010				20	

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B8D2091, Continued									
Reference (B8D2091-SRM1)				Prepared: 2018-04-30, Analyzed: 2018-04-30					
Aluminum, dissolved	0.212	0.0050 mg/L	0.233		91	79-114			
Antimony, dissolved	0.0453	0.00020 mg/L	0.0430		105	89-123			
Arsenic, dissolved	0.442	0.00050 mg/L	0.438		101	87-113			
Barium, dissolved	3.44	0.0050 mg/L	3.35		103	85-114			
Beryllium, dissolved	0.209	0.00010 mg/L	0.213		98	79-122			
Boron, dissolved	1.57	0.0050 mg/L	1.74		90	79-117			
Cadmium, dissolved	0.217	0.000010 mg/L	0.224		97	89-112			
Calcium, dissolved	7.84	0.20 mg/L	7.69		102	85-120			
Chromium, dissolved	0.429	0.00050 mg/L	0.437		98	87-113			
Cobalt, dissolved	0.124	0.00010 mg/L	0.128		97	90-117			
Copper, dissolved	0.840	0.00040 mg/L	0.844		100	90-115			
Iron, dissolved	1.23	0.010 mg/L	1.29		95	86-112			
Lead, dissolved	0.115	0.00020 mg/L	0.112		103	90-113			
Lithium, dissolved	0.102	0.00010 mg/L	0.104		98	77-127			
Magnesium, dissolved	6.51	0.010 mg/L	6.92		94	84-116			
Manganese, dissolved	0.330	0.00020 mg/L	0.345		96	85-113			
Molybdenum, dissolved	0.411	0.00010 mg/L	0.426		97	87-112			
Nickel, dissolved	0.802	0.00040 mg/L	0.840		95	90-114			
Phosphorus, dissolved	0.423	0.050 mg/L	0.495		85	74-119			
Potassium, dissolved	2.97	0.10 mg/L	3.19		93	78-119			
Selenium, dissolved	0.0318	0.00050 mg/L	0.0331		96	89-123			
Sodium, dissolved	17.6	0.10 mg/L	19.1		92	81-117			
Strontium, dissolved	0.876	0.0010 mg/L	0.916		96	82-111			
Thallium, dissolved	0.0383	0.000020 mg/L	0.0393		97	90-113			
Uranium, dissolved	0.256	0.000020 mg/L	0.266		96	87-113			
Vanadium, dissolved	0.841	0.0010 mg/L	0.869		97	85-110			
Zinc, dissolved	0.859	0.0040 mg/L	0.881		98	88-114			

General Parameters, Batch B8D1945

Blank (B8D1945-BLK1)				Prepared: 2018-04-29, Analyzed: 2018-04-29					
Carbon, Total Organic	< 0.50	0.50 mg/L							
Blank (B8D1945-BLK2)				Prepared: 2018-04-29, Analyzed: 2018-04-29					
Carbon, Total Organic	< 0.50	0.50 mg/L							
LCS (B8D1945-BS1)				Prepared: 2018-04-29, Analyzed: 2018-04-29					
Carbon, Total Organic	9.21	0.50 mg/L	10.0		92	78-116			
LCS (B8D1945-BS2)				Prepared: 2018-04-29, Analyzed: 2018-04-29					
Carbon, Total Organic	9.45	0.50 mg/L	10.0		94	78-116			

General Parameters, Batch B8D2019

Blank (B8D2019-BLK1)				Prepared: 2018-05-01, Analyzed: 2018-05-01					
Turbidity	< 0.10	0.10 NTU							
Blank (B8D2019-BLK2)				Prepared: 2018-05-01, Analyzed: 2018-05-01					
Turbidity	< 0.10	0.10 NTU							
LCS (B8D2019-BS1)				Prepared: 2018-05-01, Analyzed: 2018-05-01					
Turbidity	38.6	0.10 NTU	40.0		96	90-110			
LCS (B8D2019-BS2)				Prepared: 2018-05-01, Analyzed: 2018-05-01					
Turbidity	38.9	0.10 NTU	40.0		97	90-110			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
---------	--------	----------	-------------	---------------	-------	-----------	-------	-----------	-----------

General Parameters, Batch B8D2034

Blank (B8D2034-BLK1)			Prepared: 2018-04-29, Analyzed: 2018-04-29						
Ammonia, Total (as N)	< 0.020	0.020 mg/L							
LCS (B8D2034-BS1)			Prepared: 2018-04-29, Analyzed: 2018-04-29						
Ammonia, Total (as N)	1.06	0.020 mg/L	1.00		106	90-115			

General Parameters, Batch B8D2041

Blank (B8D2041-BLK1)			Prepared: 2018-05-02, Analyzed: 2018-05-02						
Colour, True	< 5.0	5.0 CU							
Blank (B8D2041-BLK2)			Prepared: 2018-05-02, Analyzed: 2018-05-02						
Colour, True	< 5.0	5.0 CU							
LCS (B8D2041-BS1)			Prepared: 2018-05-02, Analyzed: 2018-05-02						
Colour, True	10	5.0 CU	10.0		101	85-115			
LCS (B8D2041-BS2)			Prepared: 2018-05-02, Analyzed: 2018-05-02						
Colour, True	10	5.0 CU	10.0		103	85-115			

General Parameters, Batch B8E0072

Blank (B8E0072-BLK1)			Prepared: 2018-05-01, Analyzed: 2018-05-01						
Alkalinity, Total (as CaCO ₃)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalein (as CaCO ₃)	< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate (as CaCO ₃)	< 1.0	1.0 mg/L							
Alkalinity, Carbonate (as CaCO ₃)	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	1.0 mg/L							
Conductivity (EC)	< 1.0	1.0 µS/cm							
Blank (B8E0072-BLK2)			Prepared: 2018-05-01, Analyzed: 2018-05-01						
Alkalinity, Total (as CaCO ₃)	< 1.0	1.0 mg/L							
Alkalinity, Phenolphthalein (as CaCO ₃)	< 1.0	1.0 mg/L							
Alkalinity, Bicarbonate (as CaCO ₃)	< 1.0	1.0 mg/L							
Alkalinity, Carbonate (as CaCO ₃)	< 1.0	1.0 mg/L							
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	1.0 mg/L							
Conductivity (EC)	< 1.0	1.0 µS/cm							
LCS (B8E0072-BS1)			Prepared: 2018-05-01, Analyzed: 2018-05-01						
Alkalinity, Total (as CaCO ₃)	98.7	1.0 mg/L	100		99	92-106			
LCS (B8E0072-BS2)			Prepared: 2018-05-01, Analyzed: 2018-05-01						
Alkalinity, Total (as CaCO ₃)	98.4	1.0 mg/L	100		98	92-106			
LCS (B8E0072-BS3)			Prepared: 2018-05-01, Analyzed: 2018-05-01						
Conductivity (EC)	1400	1.0 µS/cm	1410		99	95-104			
LCS (B8E0072-BS4)			Prepared: 2018-05-01, Analyzed: 2018-05-01						
Conductivity (EC)	1410	1.0 µS/cm	1410		100	95-104			

General Parameters, Batch B8E0160

Blank (B8E0160-BLK1)			Prepared: 2018-05-02, Analyzed: 2018-05-02						
Sulfide, Total	< 0.020	0.020 mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B8E0160, Continued									
LCS (B8E0160-BS1)				Prepared: 2018-05-02, Analyzed: 2018-05-02					
Sulfide, Total	0.492	0.020 mg/L	0.500		98	82-116			
General Parameters, Batch B8E0209									
Reference (B8E0209-SRM1)				Prepared: 2018-05-02, Analyzed: 2018-05-02					
pH	7.02	0.10 pH units	7.01		100	98-102			HT2
Reference (B8E0209-SRM2)				Prepared: 2018-05-03, Analyzed: 2018-05-03					
pH	7.02	0.10 pH units	7.01		100	98-102			HT2
General Parameters, Batch B8E0267									
Blank (B8E0267-BLK1)				Prepared: 2018-05-03, Analyzed: 2018-05-04					
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
Blank (B8E0267-BLK2)				Prepared: 2018-05-03, Analyzed: 2018-05-04					
Nitrogen, Total Kjeldahl	< 0.050	0.050 mg/L							
LCS (B8E0267-BS1)				Prepared: 2018-05-03, Analyzed: 2018-05-04					
Nitrogen, Total Kjeldahl	0.905	0.050 mg/L	1.00		90	84-121			
LCS (B8E0267-BS2)				Prepared: 2018-05-03, Analyzed: 2018-05-04					
Nitrogen, Total Kjeldahl	0.924	0.050 mg/L	1.00		92	84-121			
General Parameters, Batch B8E0414									
Blank (B8E0414-BLK1)				Prepared: 2018-05-04, Analyzed: 2018-05-04					
Alkalinity, Total (as CaCO ₃)	< 2.0	2.0 mg/L							
Bicarbonate (HCO ₃)	< 2.0	2.0 mg/L							
Carbonate (CO ₃)	< 2.0	2.0 mg/L							
Hydroxide (OH)	< 2.0	2.0 mg/L							
LCS (B8E0414-BS1)				Prepared: 2018-05-04, Analyzed: 2018-05-04					
Alkalinity, Total (as CaCO ₃)	246	2.0 mg/L	250		99	94-108			
Total Metals, Batch B8E0009									
Blank (B8E0009-BLK1)				Prepared: 2018-05-01, Analyzed: 2018-05-03					
Aluminum, total	< 0.0050	0.0050 mg/L							
Antimony, total	< 0.00020	0.00020 mg/L							
Arsenic, total	< 0.00050	0.00050 mg/L							
Barium, total	< 0.0050	0.0050 mg/L							
Beryllium, total	< 0.00010	0.00010 mg/L							
Bismuth, total	< 0.00010	0.00010 mg/L							
Boron, total	< 0.0050	0.0050 mg/L							
Cadmium, total	< 0.000010	0.000010 mg/L							
Calcium, total	< 0.20	0.20 mg/L							
Chromium, total	< 0.00050	0.00050 mg/L							
Cobalt, total	< 0.00010	0.00010 mg/L							
Copper, total	< 0.00040	0.00040 mg/L							
Iron, total	< 0.010	0.010 mg/L							
Lead, total	< 0.00020	0.00020 mg/L							
Lithium, total	< 0.00010	0.00010 mg/L							
Magnesium, total	< 0.010	0.010 mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B8E0009, Continued									
Blank (B8E0009-BLK1), Continued				Prepared: 2018-05-01, Analyzed: 2018-05-03					
Manganese, total	< 0.00020	0.00020 mg/L							
Mercury, total	< 0.000040	0.000040 mg/L							
Molybdenum, total	< 0.00010	0.00010 mg/L							
Nickel, total	< 0.00040	0.00040 mg/L							
Phosphorus, total	< 0.050	0.050 mg/L							
Potassium, total	< 0.10	0.10 mg/L							
Selenium, total	< 0.00050	0.00050 mg/L							
Silicon, total	< 1.0	1.0 mg/L							
Silver, total	< 0.000050	0.000050 mg/L							
Sodium, total	< 0.10	0.10 mg/L							
Strontium, total	< 0.0010	0.0010 mg/L							
Sulfur, total	< 3.0	3.0 mg/L							
Tellurium, total	< 0.00050	0.00050 mg/L							
Thallium, total	< 0.000020	0.000020 mg/L							
Thorium, total	< 0.00010	0.00010 mg/L							
Tin, total	< 0.00020	0.00020 mg/L							
Titanium, total	< 0.0050	0.0050 mg/L							
Tungsten, total	< 0.0010	0.0010 mg/L							
Uranium, total	< 0.000020	0.000020 mg/L							
Vanadium, total	< 0.0010	0.0010 mg/L							
Zinc, total	< 0.0040	0.0040 mg/L							
Zirconium, total	< 0.00010	0.00010 mg/L							
LCS (B8E0009-BS1)				Prepared: 2018-05-01, Analyzed: 2018-05-03					
Aluminum, total	0.0239	0.0050 mg/L	0.0200		119	80-120			
Antimony, total	0.0226	0.00020 mg/L	0.0200		113	80-120			
Arsenic, total	0.0214	0.00050 mg/L	0.0200		107	80-120			
Barium, total	0.0212	0.0050 mg/L	0.0200		106	80-120			
Beryllium, total	0.0209	0.00010 mg/L	0.0200		104	80-120			
Bismuth, total	0.0223	0.00010 mg/L	0.0200		111	80-120			
Boron, total	0.0223	0.0050 mg/L	0.0200		112	80-120			
Cadmium, total	0.0218	0.000010 mg/L	0.0200		109	80-120			
Calcium, total	2.26	0.20 mg/L	2.00		113	80-120			
Chromium, total	0.0198	0.00050 mg/L	0.0200		99	80-120			
Cobalt, total	0.0204	0.00010 mg/L	0.0200		102	80-120			
Copper, total	0.0216	0.00040 mg/L	0.0200		108	80-120			
Iron, total	1.99	0.010 mg/L	2.00		100	80-120			
Lead, total	0.0223	0.00020 mg/L	0.0200		111	80-120			
Lithium, total	0.0223	0.00010 mg/L	0.0200		112	80-120			
Magnesium, total	2.10	0.010 mg/L	2.00		105	80-120			
Manganese, total	0.0195	0.00020 mg/L	0.0200		98	80-120			
Mercury, total	0.000854	0.000040 mg/L	0.00100		85	80-120			
Molybdenum, total	0.0209	0.00010 mg/L	0.0200		105	80-120			
Nickel, total	0.0208	0.00040 mg/L	0.0200		104	80-120			
Phosphorus, total	1.91	0.050 mg/L	2.00		96	80-120			
Potassium, total	1.97	0.10 mg/L	2.00		99	80-120			
Selenium, total	0.0220	0.00050 mg/L	0.0200		110	80-120			
Silicon, total	2.1	1.0 mg/L	2.00		105	80-120			
Silver, total	0.0219	0.000050 mg/L	0.0200		109	80-120			
Sodium, total	2.04	0.10 mg/L	2.00		102	80-120			
Strontium, total	0.0198	0.0010 mg/L	0.0200		99	80-120			
Sulfur, total	4.0	3.0 mg/L	5.00		80	80-120			
Tellurium, total	0.0225	0.00050 mg/L	0.0200		112	80-120			
Thallium, total	0.0221	0.000020 mg/L	0.0200		111	80-120			
Thorium, total	0.0220	0.00010 mg/L	0.0200		110	80-120			
Tin, total	0.0221	0.00020 mg/L	0.0200		110	80-120			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B8E0009, Continued									
LCS (B8E0009-BS1), Continued				Prepared: 2018-05-01, Analyzed: 2018-05-03					
Titanium, total	0.0200	0.0050 mg/L	0.0200		100	80-120			
Tungsten, total	0.0162	0.0010 mg/L	0.0200		81	80-120			
Uranium, total	0.0204	0.000020 mg/L	0.0200		102	80-120			
Vanadium, total	0.0193	0.0010 mg/L	0.0200		97	80-120			
Zinc, total	0.0233	0.0040 mg/L	0.0200		117	80-120			
Zirconium, total	0.0207	0.00010 mg/L	0.0200		104	80-120			
Reference (B8E0009-SRM1)				Prepared: 2018-05-01, Analyzed: 2018-05-03					
Aluminum, total	0.301	0.0050 mg/L	0.303		99	82-114			
Antimony, total	0.0516	0.00020 mg/L	0.0511		101	88-115			
Arsenic, total	0.120	0.00050 mg/L	0.118		101	88-111			
Barium, total	0.799	0.0050 mg/L	0.823		97	83-110			
Beryllium, total	0.0492	0.00010 mg/L	0.0496		99	80-119			
Boron, total	3.47	0.0050 mg/L	3.45		101	80-118			
Cadmium, total	0.0499	0.000010 mg/L	0.0495		101	90-110			
Calcium, total	10.9	0.20 mg/L	11.6		94	85-113			
Chromium, total	0.230	0.00050 mg/L	0.250		92	88-111			
Cobalt, total	0.0370	0.00010 mg/L	0.0377		98	90-114			
Copper, total	0.489	0.00040 mg/L	0.486		101	90-117			
Iron, total	0.472	0.010 mg/L	0.488		97	90-116			
Lead, total	0.211	0.00020 mg/L	0.204		103	90-110			
Lithium, total	0.408	0.00010 mg/L	0.403		101	79-118			
Magnesium, total	3.77	0.010 mg/L	3.79		100	88-116			
Manganese, total	0.0987	0.00020 mg/L	0.109		91	88-108			
Mercury, total	0.00468	0.000040 mg/L	0.00489		96	80-120			
Molybdenum, total	0.194	0.00010 mg/L	0.198		98	88-110			
Nickel, total	0.242	0.00040 mg/L	0.249		97	90-112			
Phosphorus, total	0.184	0.050 mg/L	0.227		81	72-118			
Potassium, total	6.76	0.10 mg/L	7.21		94	87-116			
Selenium, total	0.127	0.00050 mg/L	0.121		105	90-122			
Sodium, total	7.24	0.10 mg/L	7.54		96	86-118			
Strontium, total	0.346	0.0010 mg/L	0.375		92	86-110			
Thallium, total	0.0842	0.000020 mg/L	0.0805		105	90-113			
Uranium, total	0.0316	0.000020 mg/L	0.0306		103	88-112			
Vanadium, total	0.351	0.0010 mg/L	0.386		91	87-110			
Zinc, total	2.47	0.0040 mg/L	2.49		99	90-113			

QC Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 3: REVISION HISTORY

REPORTED TO PROJECT Waterline Resources Inc. - Nanaimo
2768-18-001

WORK ORDER REPORTED 8042387
2018-05-14 14:40

Sample ID	Changed	Change	Analysis	Analyte(s)
8042387-01	2018-05-07	Added	Metals, Dissolved by ICPMS (All) Pkg	
8042387-01	2018-05-07	Added	Metals, Total by ICPMS (All) Pkg	
8042387-01	2018-05-07	Analyte Removed	Total Metals by ICPMS	Aluminum, total, Antimony, total, Arsenic, total, Barium, total, Beryllium, total, Boron, total, Cadmium, total, Calcium, total, Chromium, total, Cobalt, total, Copper, total, Iron, total, Lead, total, Lithium, total, Magnesium, total, Manganese, total, Mercury, total, Molybdenum, total, Nickel, total, Selenium, total, Silver, total, Sodium, total, Strontium, total, Thallium, total, Tin, total, Titanium, total, Tungsten, total, Uranium, total, Vanadium, total, Zinc, total
8042387-02	2018-05-07	Analyte Removed	Dissolved Metals by ICPMS	Aluminum, dissolved, Antimony, dissolved, Arsenic, dissolved, Barium, dissolved, Beryllium, dissolved, Boron, dissolved, Cadmium, dissolved, Calcium, dissolved, Chromium, dissolved, Cobalt, dissolved, Copper, dissolved, Iron, dissolved, Lead, dissolved, Lithium, dissolved, Magnesium, dissolved, Manganese, dissolved, Molybdenum, dissolved, Nickel, dissolved, Potassium, dissolved, Selenium, dissolved, Silver, dissolved, Sodium, dissolved, Strontium, dissolved, Thallium, dissolved, Tin, dissolved, Titanium, dissolved, Tungsten, dissolved, Uranium, dissolved, Vanadium, dissolved, Zinc, dissolved
8042387-02	2018-05-07	Added	Metals, Dissolved by ICPMS (All) Pkg	
8042387-02	2018-05-07	Added	Metals, Total by ICPMS (All) Pkg	
8042387-01	2018-05-14	Added	Alkalinity w/ Calc Pkg	

Page 18 of 19

MINIMUM WATER QUALITY PARAMETERS TO BE ANALYZED

SHALLOW WELLS, DEEP WELLS, and SPRINGS

MICROBIOLOGICAL¹

Escherichia coli
Total coliform
Non-coliform bacteria
Iron and sulphur Bacteria (deep wells)
Heterotrophic Plate Counts

NOTE: Microbiology and UVT NOT required for April 26, 2018 analysis (CVRD Saltair).

PHYSICAL/CHEMICAL

Alkalinity ✓
Ammonia ✓
Arsenic ✓
Chloride ✓
Colour ✓
Conductivity² ✓
Corrosiveness³ ✓

Fluoride ✓
Hardness ✓
Metals Scan⁶ (total and dissolved)
Nitrite ✓
Nitrate ✓
Organic Nitrogen ✓
pH ✓

Selenium ✓
Sulphate ✓
Sulphide (as hydrogen sulphide)⁴ ✓
Total Dissolved Solids ✓
Total Organic Carbon^{4,5} ✓
Turbidity ✓
UVT⁷

1. Analysis of additional parameters may be required based on the results of initial analysis and on potential impact by nearby sources of contamination or polluting sources. If industrial, agricultural or pesticide pollution is suspected, identify what chemicals may have been used and analyze for most likely indicator parameters. If petroleum pollution is suspected (underground fuel storage) analyze for alkyl benzene compounds. If parasitic pollution is suspected, *Giardia lamblia* and/or *cryptosporidium* analysis may be required.
2. Analyses must be sufficiently accurate so that the minimum detectable concentration is less than 10% of Guidelines for Canadian Drinking Water Quality, the **Drinking Water Protection Act** or the **Drinking Water Protection Regulation** where applicable. Other analysis must provide sufficient information to reasonably assess the water suitability for drinking purposes and to determine what, if any, treatment might be needed. Analyses must be conducted in accordance with methods prescribed in "Standard Methods for the Examination of Water and Wastewater" (latest edition) or other acceptable procedure.

- 1 Bacterial analysis must be conducted at an approved laboratory (<http://lm1abs.phsa.ca/about-us/who-we-are/bc-centre-for-disease-control-public-health-laboratory>)
- 2 Conductance/Specific Conductance
- 3 Calcium Carbonate saturation/Langelier's index
- 4 For deep wells: On site or preserve sample, or use alternative method of confirming that water has satisfactory odour
- 5 If Turbidity is less than 1.0 mg/L, Dissolved Organic Carbon may be used as an alternative to Total Organic Carbon.
- 6 At least: aluminum, barium, boron, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, molybdenum, nickel, phosphorous, potassium, silver, sodium, zinc (expand if mineralized to include mercury).
- 7 Where UV is being considered as part of the water treatment process, %UVT, calculated from UVA.