SUMMIT
ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

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May 29, 2015

Michael Palumbo
President
Mountain Shadows Developments Ltd. Subdivision
Box 316, 1416 Golden View Road
Golden, B.C., V0A 1H0
Submitted via email to: mike@snowpeakrentals.com

Re: REPORT - HYDROGEOLOGICAL AND HYDROLOGICAL ASSESSMENTS OF PROPOSED SUBDIVISION (LOT 3, SEC 6, TP 27, RGE 21, W5M KOOTENAY DISTRICT, PLAN 16263)

Dear Mr. Palumbo:

Summit Environmental Consultants Inc. (Summit) was retained to (1) assess water quality at a spring and (2) complete pumping tests and aquifer assessments for the two wells at the above-mentioned property south of Golden, B.C. in the Columbia Shuswap Regional District (CSRD).

1 BACKGROUND AND OBJECTIVES

We understand that you are planning to subdivide your property into three pieces with each serviced by a different water supply, as follows:

- Lot 1: water supply will be from Abbot Spring (herein referred to as "the spring").
- Lot 2: water supply will be from an existing drilled well (Well Plate ID No. [WPID] 32048; referred to as the South Well in previous reports).
- Remainder Lot: water supply will be from an existing drilled well (WPID 32047; referred to as the North Well in previous reports).

To complete the subdivision application, you require a water quantity and quality study (i.e. a hydrogeological assessment) for each well, and a water quality study (i.e. a hydrological assessment) for the spring.[1] You also require that a report be prepared and submitted to the CSRD by a professional engineer or geoscientist registered with the Association of Professional Engineers and Geoscientists of B.C. (APEGBC). These assessments are intended to satisfy the applicable sections of CSRD Subdivision Servicing Bylaw No. 641[2] ("the Bylaw") regarding assessment and demonstration of potable water. The

[1] The CSRD has accepted the transfer of the water licence as proof of water quantity for the spring; therefore, a quantity assessment is not required. The water licence states that the "maximum quantity of water which may be diverted is 500 Imperial gallons a day (2,275 L/day) (Conditional Licence 72200)."
[2] CSRD Subdivision and Servicing Bylaw No. 641-1. February 3, 2014. http://www.csrd.bc.ca/sites/default/files/bylaws/BL641%20Consolidated.pdf

Bylaw requirements for subdivisions that need this professional-directed approach (i.e. assessments by a Qualified Professional) are listed in Table 1.

Table 1: Proof of water quantity and quality requirements under CSRD Bylaw 641

	Bylaw Requirements
Source Yield	A Qualified Professional must submit written confirmation that the sustainable well yield is at least 2,275 L/day.
Well Recovery	A Qualified Professional must submit written confirmation that well recovery is adequate to support the intended use of the well (minimum 2,275 L/day).
Drawdown Interference	A Qualified Professional must submit written confirmation that the operation of the proposed well at the desired rate (minimum 2,275 L/day) will not: • reduce the amount of available water for any well within 250 m of the tested well; or • result in changes to the water balance of the aquifer, considering cumulative impacts that could result in long-term environmental changes and/or reduced yield on a regional scale.
Proof of Water Quality	A Qualified Professional must review the water quality results, prepare a water system design (including treatment and disinfection system components if required), and provide written confirmation that the water will be potable, as defined in the Bylaw, when the recommended system is properly installed and operated.

Source: Requirements for Independent On-site Water System (CSRD Bylaw 641)

Pumping tests were performed previously on both wells in October 2011. WPID 32047 satisfied the Bylaw, whereas the volume of water pumped from WPID 32048 was less than the required amount. The well test data from this previous assessment are attached in Appendix A. New pumping tests were required because (1) insufficient water volume was removed from WPID 32048, (2) a professional-directed approach is required, and (3) neither well was tested for water quality during the previous assessment.

2 METHODS

2.1 SOURCE YIELD AND WELL RECOVERY

To meet the *Source Yield* and *Well Recovery* Bylaw requirements (Table 1), Summit coordinated and supervised aquifer pumping tests on WPID 32048 and WPID 32047 on May 6-7, 2015. WPID 32048 was pumped at 6 L/min for 420 minutes and WPID 32047 was pumped at 13.7 L/min for 170 minutes. During both tests, water levels were monitored during pumping and after pump shut-off (recovery).

The resulting data from each pumping test were subjected to the B.C. Certification of Public Convenience and Necessity (CPCN).[3] This method extrapolates water levels to 100 days and calculates a sustainable pumping rate based on this extrapolation. The sustainable pumping rate is then reduced by a safety factor of 30% to account for changes in water levels over seasons, and over longer periods in cases where water level fluctuations are unknown. Because the tests were completed in May, when groundwater levels are typically higher, the pumping test data were also analyzed using the static water level recorded in October 2011 (i.e. during the original well tests). This approach, combined with the 30% safety factor applied to the data, allows for estimation of seasonal changes in water availability.

2.2 DRAWDOWN INTERFERENCE

To meet the *Drawdown Interference* Bylaw requirement (Table 1), Summit completed a search of the B.C. Water Resource Atlas and interviewed you to assess the number of wells within 250 m of the subject property. Three water supply wells were identified within 250 m:

- WPID 32048;
- WPID 32047; and
- the "Pumphouse Well," which supplies water to a trailer park located off the property. This well was not accessible, and therefore water levels could not be monitored. An additional test well (i.e. a non-supply well) is located next to the Pumphouse Well. This well (referred to as WPID 20465) is not currently in use but was accessible for water level monitoring.

Site plans showing the locations of these wells are attached in Appendix B.'

[3] British Columbia Ministry of Environment. 2007. Evaluating Long-term Well Capacity for a Certificate of Public Convenience and Necessity: a guidance document. http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/library/eval_well/index.html.

The following methods were used to assess drawdown interference between the identified wells:

- During the May 2015 pumping test of WPID 32048, water levels in WPID 32047 and WPID 20465 were monitored.
- During the May 2015 pumping test of WPID 32047, the Pumphouse Well was also pumped while water levels in WPID 32048 and in WPID 20465 were monitored.

2.3 PROOF OF WATER QUALITY

To meet the *Proof of Water Quality* Bylaw requirement (Table 1), Summit collected a groundwater sample from each well during the last 30 minutes of the pumping tests on May 6-7, and collected a surface water sample from the spring (i.e. three samples total). Standard sampling procedures[4] were used and the samples were submitted to an accredited laboratory (CARO Analytical Services in Kelowna, B.C.) for analysis. The water samples were analyzed for the following parameters, based on the Bylaw requirements and Summit's recommendations:

- Groundwater samples (WPID 32048 and WPID 32047): alkalinity, chloride, colour (true), conductivity, fluoride, nitrate, nitrite, pH, sulphate, total dissolved solids, turbidity, total metals, dissolved metals, total coliforms, and *Escherichia coli.*
- Surface water sample (the spring): alkalinity, chloride, colour (true), conductivity, fluoride, nitrate, nitrite, pH, sulphate, total dissolved solids, turbidity, total metals, total coliforms, *E. coli*, total and dissolved organic carbon, and cyanobacterial toxins.

The results were compared with the Guidelines for Canadian Drinking Water Quality (GCDWQ).[5] Guideline levels specified in the GCDWQ are designated as either "maximum acceptable concentrations" (MAC) or "aesthetic objectives" (AO). The MAC guidelines are health-based, and are determined based on the known health effects associated with the substance. The AO guidelines apply to those variables that affect taste or laundry (e.g. by staining), but do not pose a health hazard.

[4] British Columbia Ministry of Environment. British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples. January 2003. http://www.env.gov.bc.ca/epd/wamr/labsys/field_man_ pdfs/fld_man_03.pdf

[5] Health Canada. Guidelines for Canadian Drinking Water Quality. http://www.hc-sc.gc.ca/ewh semt/pubs/water-eau/2012-sum_guide-res_recom/index-eng.php

3 RESULTS

3.1 SOURCE YIELD AND WELL RECOVERY

The following summarizes the findings of the source yield and well recovery assessment:

- **WPID 32048 (Lot 2):** A total of 2,520 L of water was removed and the well recovered 100% within 320 minutes of pump shut-off. The sustainable pumping rate, calculated using the CPCN method and taking into account well interference measurements, the static water level in October 2011, and a safety factor of 30%, exceeds the Bylaw required amount of 2,275 L/day. **Therefore, WPID 32048 meets the Bylaw requirement regarding source yield and well recovery.**

- **WPID 32047 (Remainder Lot):** A total of 2,330 L of water was removed and the well recovered 100% within 170 minutes of pump shut-off. The sustainable pumping rate, calculated as described for WPID 32048 above, exceeds the Bylaw required amount of 2,275 L/day. **Therefore, WPID 32047 meets the Bylaw requirement regarding source yield and well recovery.**

The data from these pumping tests, including raw data, calculation summary tables, and figures showing drawdown extrapolated to 100 days and interference effects, are attached in Appendix C.

3.2 DRAWDOWN INTERFERENCE

The following summarizes the findings of the drawdown interference assessment:

- Pumping of the Pumphouse Well caused no drawdown in the other two wells; therefore, it is reasonable to expect that pumping of the other wells will not have a significant drawdown effect on the Pumphouse Well. If the Pumphouse Well's pumping rate increases in future, water levels should be monitored in WPID 320407 and WPID 32048 to assess well interference.

- During pumping of WPID 32048, there was 0.532 m of drawdown in WPID 32047 and 0.071 m of drawdown in WPID 20465. During pumping of WPID 32047, there was 0.185 m of drawdown in WPID 32048 and 0.007 m of drawdown in WPID 20465. This indicates that pumping of WPID 32048 interferes with WPID 32047, and vice versa. To address this, the sustainable yield for each well was calculated using an available drawdown level that accounted for these interference effects. An additional 30% was removed to account for fluctuating annual groundwater levels.

3.3 PROOF OF WATER QUALITY

The results indicated that all tested parameters met their respective health-based GCDWQ MAC values. Total dissolved solids (TDS), iron, and manganese exceeded their respective GCDWQ AO values (Table 1). All results, tabulated and compared with the GCDWQ, are attached in Appendix D. The original laboratory report is attached in Appendix E.

Table 1: Concentrations of parameters that exceeded aesthetic-based drinking water guidelines

Parameter	Guideline level (mg/L)	Concentrations in Samples (mg/L)		
		Spring	WPID 32048	WPID 32047
TDS	500	**501**	**606**	**693**
Total iron (dissolved iron)	0.3[1]	<0.01	**2.25** **(1.71)**	**0.49** (<0.10)
Total manganese (dissolved manganese)	0.05[1]	<0.002	**0.054** **(0.054)**	0.026 (0.008)

Notes:
Bolded values exceeded the Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives (GCDWQ AO).

Details regarding the guidelines for each of these three parameters are as follows:

- **TDS:** Concentrations in excess of 500 mg/L may be associated with excessive water hardness, mineral deposition, and corrosion.[6] The primary concern with elevated TDS is the effect on taste. According to Health Canada, drinking water with TDS less than 600 mg/L is considered good with respect to taste. Drinking water with TDS greater than 1,200 mg/L is generally considered unpalatable. There is no health-based guideline for TDS.

- **Iron:** Concentrations in excess of 0.3 mg/L can stain laundry and plumbing fixtures, and can affect the taste of the water.[7] There is no health-based guideline for total iron.

[6] Health Canada. 1991. Guidelines for Canadian Drinking Water Quality - Supporting Documents - Total Dissolved Solids. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/tds-mdt/index-eng.php
[7] Health Canada. 1978. Guidelines for Canadian Drinking Water Quality - Supporting Documents - Iron. Health Canada. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/iron-fer/index-eng.php

- **Manganese:** Concentrations above 0.15 mg/L can stain laundry and plumbing fixtures, and may affect the taste of the water.[8] Manganese can form coatings on plumbing fixtures even at concentrations of approximately 0.02 mg/L; however, it is difficult to achieve levels this low even with treatment. Therefore, the GCDWQ AO is set at 0.05 mg/L. There is no health-based guideline for manganese.

4 RECOMMENDATIONS

4.1.1 Recommendations for Water Treatment: WPID 32048 and WPID 32047

Because the results met the GCDWQ MAC, the water from WPID 32048 and WPID 32047 can be considered safe to drink. However, you may wish to treat the water for iron and manganese, particularly in WPID 32048 where GCDWQ AO exceedances of the dissolved and total forms of iron and manganese were detected. Treatment methods for iron and manganese can be found on Health Canada's website (http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/iron-fer/index-eng.php#a4) and in documents provided by the B.C. Groundwater Association (https://www.for.gov.bc.ca/hfd/library/documents/bib106076_iron_manganese .pdf).

4.1.2 Recommendations for Water Treatment: The Spring

According to Health Canada, surface water cannot be considered safe for human consumption without treatment.[9] Treatment for surface water should include filtration (or other technology that provides an equivalent log reduction) and disinfection. The reason for this is that pathogenic protozoa (i.e. *Giardia* and *Cryptosporidium*), bacteria (total coliforms and *E. coli*), and enteric viruses can be found in surface water. Bacteria and enteric viruses can be treated using disinfection (chlorine or iodine); however, this may not provide sufficient protection against protozoa.[10] Protozoa can be removed using microfiltration (≤0.1 micrometre).[10] Treatment with ultraviolet light can also be effective against protozoa, bacteria, and viruses, but a pre-filter should be used to reduce turbidity, as this can interfere with the ultraviolet light treatment process. When selecting a treatment system, look for ones that are certified by an accredited body to meet the appropriate NSF International/American National Standards Institute standards.

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[8] Health Canada. 1987. Guidelines for Canadian Drinking Water Quality - Supporting Documents - Manganese. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/manganese/index-eng.php

[9] Health Canada. Drinking Water In The Great Canadian Outdoors. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/outdoor-plein_air-eng.php

[10] Health Canada. Water Treatment Devices for Disinfection of Drinking Water. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/disinfect-desinfection-eng.php

5 CLOSURE

We trust this completes our assessment to your satisfaction. Please contact the undersigned if you have any questions.

Yours truly,

PROFESSIONAL GEOSCIENTIST PROVINCE OF BRITISH COLUMBIA M. C. GREEN #30867 29-MAY-2015

Marta Green, P.Geo.
Hydrogeologist

Paul Hague, RPF
Water and Earth Sciences Group Manager

Attachments
Appendix A: Original well test data
Appendix B: Site plans
Appendix C: 2015 pumping test results
Appendix D: Water quality results compared with drinking water guidelines
Appendix E: Laboratory analytical report

Summit's Standard Disclaimer for Groundwater Well Capacity Investigations

Subject to the following conditions and limitations, the investigation described in this report has been conducted in a manner consistent with a reasonable level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area.

1. The scope of the investigation described in this report has been limited by the budget set for the investigation in the work program. The scope of the investigation has been reasonable having regard to that budget constraint.

2. The pump test analysis results are solely intended to demonstrate individual well compliance with water production requirements specified in the applicable regional or local district bylaws, and the test and water production results or findings may not be applicable at higher water production rates.

3. The investigation described in this report has been limited to the scope of work described.

4. The investigation described in this report has relied upon information provided by third parties concerning the history of well development and borehole stratigraphy and of well response to groundwater pumping (i.e. changes in water level over time). Except as stated in this report, we have not made an independent verification of such information.

5. The investigation described in this report has been made in the context of existing government regulations generally promulgated at the date of this report. Except as specifically noted, the investigation did not take account of any government regulations not in effect and generally promulgated at the date of this report.

6. The findings and conclusions are valid only for the specific properties identified in the report.

7. Since site conditions may change over time, the report is intended for immediate use. The well owner should anticipate that the well and pump system will require maintenance from time to time in order to maintain adequate well yield.

This report is intended for the exclusive use of Mountain Shadows Developments Ltd. Subdivision and immediate family members. It may not be used or relied upon in any manner whatsoever, or for any purpose whatsoever, by any other party. Summit Environmental Consultants Inc. makes no representation of fact or opinion of any nature whatsoever to any person or entity other than Michael Palumbo.

In accepting delivery of this report, Michael Palumbo hereby agrees that any and all claims which it may have against Summit Environmental Consultants Inc. or any of its servants, agents, or employees arising out of or in any way connected with the investigation described in this report or the preparation of this report, whether such claims are in contract or in tort, and whether such claims are based on negligence or otherwise, shall be limited to a total amount equal to the fees payable to Summit Environmental Consultants Inc. under our contract with Michael Palumbo.

APPENDIX A: ORIGINAL WELL TEST DATA

SCHEDULE "H"

~~REGIONAL DISTRICT OF EAST KOOTENAY~~

WELL PUMPING TEST & RECOVERY INFORMATION

Owner: Mike - Plumbob

Date: Oct 3rd 2011

Legal Description: South well

Well ID Plate No: 32048

Well Pump Installer: Tim Hoechsmann

Well Pump Installer Registration #: 0280501

Length of Pipe Above Ground: 1 ft ~~metres~~

Static Water Level: 45 ft ~~metres~~

Pumping Rate: 1.5 (US) Imp. Gal. (circle one)

60 ft Deep

Must monitor well until water level has recovered to at least 95%.

CLOCK TIME	ELAPSED TIME (MIN)	DEPTH TO WATER BELOW PIPE ~~(metres)~~ ft	DRAWDOWN BELOW STATIC WATER LEVEL ~~(metres)~~ ft	REMARKS PROBLEMS, DATES, ETC.
2:00	0	45 ft	0	
2:00	30 sec	46 ft	1	3 Gpm
2:01	1 min	47	2	
2:02	2 min	48	3	
2:03	3 min	48	3	
2:04	4 min	49	4	
2:05	5 min	50	5	1.5 Gpm
2:10	10 min	50	5	
2:15	15 min	51	6	
2:20	20 min	50	5	
2:30	30 min			
2:45	45 min			
3:00	60 min			
3:30	90 min			
4:00	120 min			
RECOVERY				
4:00	Shut Pump Off	50	5	
4:00	30 sec	49	4	
4:01	1 min	49	4	
4:02	2 min	50	5	
4:03	3 min	48	3	
4:04	4 min	48	3	
4:05	5 min	48	3	
4:10	10 min	47	2	
4:15	15 min	46	1	
4:20	20 min	46	1	
4:25	25 min	45.5	.5	
4:30	30 min	45.5	.5	
4:45	45 min	46	0	
5:00	60 min			
5:30	90 min			
6:00	120 min			

WELL TEST

1. Measure depth to water from top of well casing (static water level).
2. Conduct pumping test for a two hour period. Record rate of pumping. Record depth to water as shown on pumping test and recovery form.
3. Record cumulative draw down.
4. Start recording recovery time as soon as pump is shut off.
5. Record recovery time as shown on back of this form for 2 hours, then hourly for 5 hours or until water reaches the same level as at the start of the pump test, whichever is sooner.
6. Record a description of the well, including depth of well, size of casing, how well was constructed and name of well driller. Provide a sketch of well location. A well driller's log may be used to provide this information.
7. Return completed documents to the Regional District of East Kootenay.

I confirm that this well is capable of producing 2,270 litres of water per day.

Pump Installer's Signature

SCHEDULE "H"

~~REGIONAL DISTRICT OF EAST KOOTENAY~~

WELL PUMPING TEST & RECOVERY INFORMATION

Owner: Mike Polumbo

Date: Oct 3rd 2011

Legal Description: North well

Well ID Plate No: 32047

Well Pump Installer: Tim Hoogsmann

Well Pump Installer Registration #: 0005601

Length of Pipe Above Ground: 1 ft metres

Static Water Level: 51' ft ~~metres~~

Pumping Rate: 6 (US / Imp. Gal. (circle one)

70 ft Deep

Must monitor well until water level has recovered to at least 95%.

CLOCK TIME	ELAPSED TIME (MIN)	DEPTH TO WATER BELOW PIPE (metres) ft	DRAWDOWN BELOW STATIC WATER LEVEL (~~metres~~) ft	REMARKS PROBLEMS, DATES, ETC.
8:00	0	51	0	
8:00	30 sec	58	7	
8:01	1 min	60	9	
8:02	2 min	56	5	
8:03	3 min	57	6	6 Gpm
8:04	4 min	56.5	5.5	
8:05	5 min	57	6	
8:10	10 min	59	8	
8:15	15 min	59	8	
8:20	20 min	59	8	
8:30	30 min			
8:45	45 min			
9:00	60 min			
9:30	90 min			
10:00	120 min			

RECOVERY

10:00	Shut Pump Off	59	8	
10:00	30 sec	57	6	
10:01	1 min	53	2	
10:02	2 min	52	1	
10:03	3 min	52	1	
10:04	4 min	52	1	
10:05	5 min	51	0	
10:10	10 min	51	0	
10:15	15 min			
10:20	20 min			
10:25	25 min			
10:30	30 min			
10:45	45 min			
11:00	60 min			
11:30	90 min			
12:00	120 min			

WELL TEST

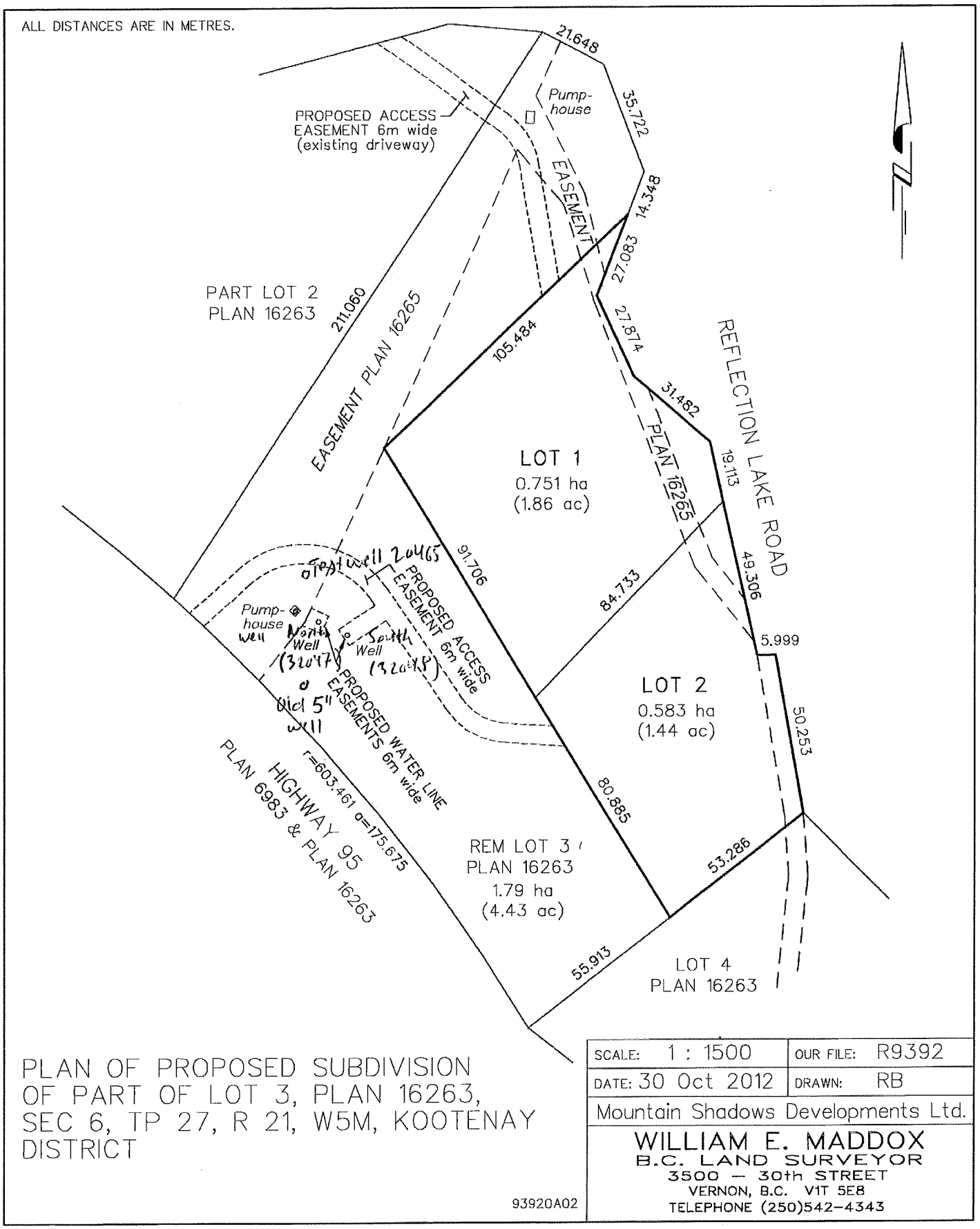
1. Measure depth to water from top of well casing (static water level).
2. Conduct pumping test for a two hour period. Record rate of pumping. Record depth to water as shown on pumping test and recovery form.
3. Record cumulative draw down.
4. Start recording recovery time as soon as pump is shut off.
5. Record recovery time as shown on back of this form for 2 hours, then hourly for 5 hours or until water reaches the same level as at the start of the pump test, whichever is sooner.
6. Record a description of the well, including depth of well, size of casing, how well was constructed and name of well driller. Provide a sketch of well location. A well driller's log may be used to provide this information.
7. Return completed documents to the Regional District of East Kootenay.

I confirm that this well is capable of producing 2,270 litres of water per day.

Pump Installer's Signature

APPENDIX B: SITE PLANS

Site Plan with Well Locations



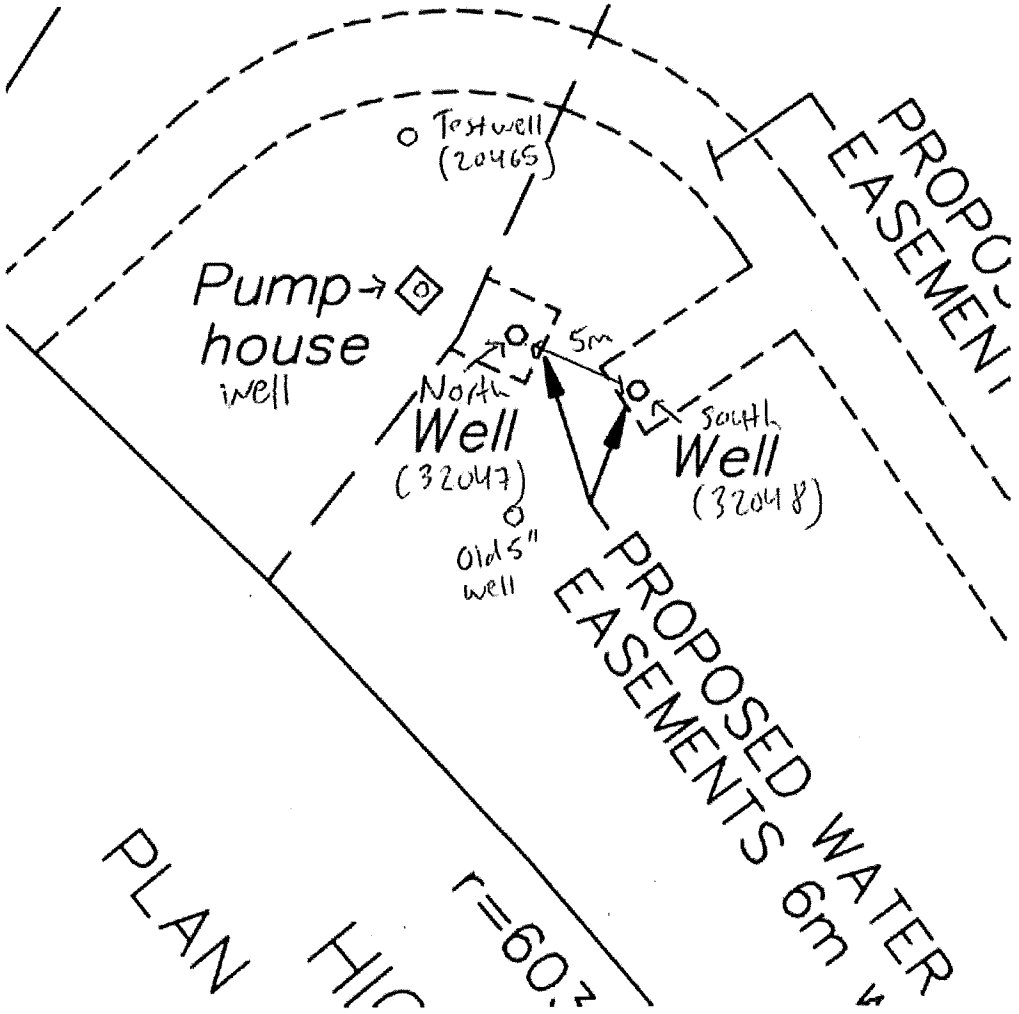
PLAN OF PROPOSED SUBDIVISION OF PART OF LOT 3, PLAN 16263, SEC 6, TP 27, R 21, W5M, KOOTENAY DISTRICT

93920A02

SCALE: 1 : 1500	OUR FILE: R9392
DATE: 30 Oct 2012	DRAWN: RB
Mountain Shadows Developments Ltd.	

WILLIAM E. MADDOX
B.C. LAND SURVEYOR
3500 – 30th STREET
VERNON, B.C. V1T 5E8
TELEPHONE (250)542-4343

Close-up View of Well Locations
(locations are approximate)



APPENDIX C: 2015 PUMPING TEST RESULTS

Table C-1:
Pumping Test Data for WPID 32048

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
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Well ID:	South Well (Well 1)	**Static Water Level (mbtoc)**	8.90
Start Date/Time	5/6/14 1:00 PM	**Pre-Test Water Level (mbtoc)**	9.26
Client	Mike Palumbo	**Total Well Depth (m)**	22.46
Project	2015-8086	**Pump Intake Depth (mbtoc)**	19.46
Test	Constant Rate	**Pump Used**	Monsoon (120 ft DTW)
Contractor	Summit Environmental	**Pumping Rate (L/s)**	0.10

Clock Time	Time Elapsed (min)	Depth to Water (m)	Drawdown (m)	Comments
5/6/15 13:00:00	0.00	9.26	0.00	
5/6/15 13:00:30	0.50	9.50	0.24	
5/6/15 13:01:00	1.00	9.67	0.41	
5/6/15 13:03:00	3.00	10.01	0.75	
5/6/15 13:04:00	4.00	10.07	0.81	
5/6/15 13:05:00	5.00	10.18	0.92	
5/6/15 13:06:00	6.00	10.33	1.07	
5/6/15 13:07:30	7.50	10.54	1.28	
5/6/15 13:08:30	8.50	10.67	1.41	
5/6/15 13:09:00	9.00	10.73	1.47	
5/6/15 13:10:00	10.00	10.84	1.58	
5/6/15 13:12:00	12.00	11.07	1.81	
5/6/15 13:14:30	14.50	11.32	2.06	
5/6/15 13:16:00	16.00	11.47	2.21	
5/6/15 13:18:00	18.00	11.65	2.39	
5/6/15 13:20:00	20.00	11.82	2.56	
5/6/15 13:25:00	25.00	12.23	2.97	
5/6/15 13:30:00	30.00	12.60	3.34	
5/6/15 13:35:00	35.00	12.93	3.67	
5/6/15 13:40:00	40.00	13.20	3.94	
5/6/15 13:45:00	45.00	13.49	4.23	
5/6/15 13:50:00	50.00	13.73	4.47	
5/6/15 14:09:00	69.00	14.47	5.21	
5/6/15 14:10:30	70.50	14.52	5.26	
5/6/15 14:20:00	80.00	14.80	5.54	
5/6/15 14:30:00	90.00	15.05	5.79	
5/6/15 14:50:00	110.00	15.48	6.22	
5/6/15 15:01:00	121.00	15.67	6.41	
5/6/15 15:20:00	140.00	15.91	6.65	
5/6/15 15:40:00	160.00	15.90	6.64	
5/6/15 16:00:00	180.00	15.79	6.53	Battery dying on pump - hooked up to truck battery
5/6/15 16:25:00	205.00	16.24	6.98	
5/6/15 17:10:00	250.00	16.67	7.41	
5/6/15 18:00:00	300.00	16.89	7.63	
5/6/15 18:50:00	350.00	16.96	7.70	
5/6/15 19:44:00	404.00	17.03	7.77	
5/6/15 20:00:00	420.00	17.02	7.76	Shut off pump - Recovery
5/6/15 20:00:30	420.50	16.83	7.57	
5/6/15 20:01:30	421.50	16.64	7.38	

Table C-1:
Pumping Test Data for WPID 32048

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

Clock Time	Time Elapsed (min)	Depth to Water (m)	Drawdown (m)	Comments
5/6/15 20:02:00	422.00	16.56	7.30	
5/6/15 20:03:00	423.00	16.40	7.14	
5/6/15 20:04:00	424.00	16.26	7.00	
5/6/15 20:05:30	425.50	16.08	6.82	
5/6/15 20:06:00	426.00	16.02	6.76	
5/6/15 20:07:00	427.00	15.90	6.64	
5/6/15 20:08:00	428.00	15.79	6.53	
5/6/15 20:09:00	429.00	15.69	6.43	
5/6/15 20:10:00	430.00	15.58	6.32	
5/6/15 20:15:00	435.00	15.10	5.84	
5/6/15 20:20:00	440.00	14.68	5.42	
5/6/15 20:25:00	445.00	14.22	4.96	
5/6/15 20:30:00	450.00	13.95	4.69	
5/6/15 20:40:00	460.00	13.34	4.08	
5/6/15 20:50:00	470.00	12.84	3.58	
5/6/15 21:00:30	480.50	12.39	3.13	
5/6/15 21:20:00	500.00	11.72	2.46	
5/6/15 21:40:00	520.00	11.20	1.94	
5/6/15 22:00:00	540.00	10.79	1.53	
5/6/15 23:00:00	600.00	10.01	0.75	
5/6/15 23:17:00	617.00	9.86	0.60	
5/6/15 23:18:00	618.00	9.96	0.70	23:32 start pumphouse well (Well 3)
5/6/15 23:40:00	640.00	9.71	0.45	
5/6/15 23:45:00	645.00	9.68	0.42	
5/6/15 23:50:00	650.00	9.65	0.39	
5/6/15 23:55:00	655.00	9.61	0.35	
5/7/15 0:00:00	660.00	9.59	0.33	
5/7/15 0:05:00	665.00	9.56	0.30	
5/7/15 0:10:00	670.00	9.52	0.26	
5/7/15 0:15:00	675.00	9.51	0.25	
5/7/15 0:20:00	680.00	9.48	0.22	
5/7/15 0:25:00	685.00	9.46	0.20	
5/7/15 0:30:00	690.00	9.44	0.18	
5/7/15 0:35:00	695.00	9.42	0.16	
5/7/15 0:40:00	700.00	9.39	0.13	
5/7/15 0:45:00	705.00	9.37	0.11	
5/7/15 0:50:00	710.00	9.35	0.09	
5/7/15 0:55:00	715.00	9.33	0.07	
5/7/15 1:00:00	720.00	9.32	0.05	
5/7/15 1:05:00	725.00	9.30	0.04	
5/7/15 1:10:00	730.00	9.28	0.02	
5/7/15 1:15:00	735.00	9.27	0.01	
5/7/15 1:20:00	740.00	9.26	0.00	100% Recovered
5/7/15 1:25:00	745.00	9.24	-0.02	
5/7/15 1:30:00	750.00	9.23	-0.03	
5/7/15 1:35:00	755.00	9.22	-0.04	

Table C-1:
Pumping Test Data for WPID 32048

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

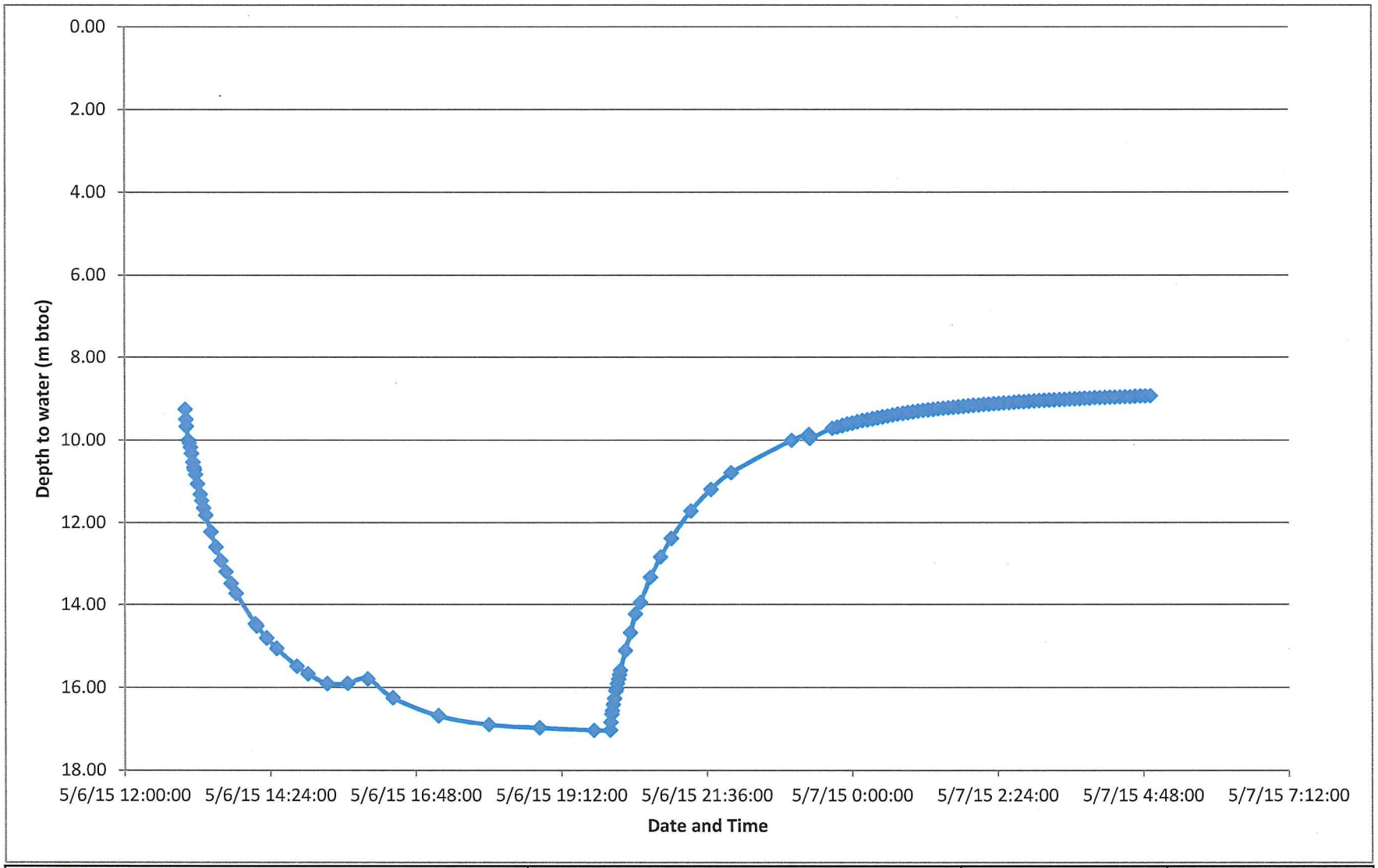
Clock Time	Time Elapsed (min)	Depth to Water (m)	Drawdown (m)	Comments
5/7/15 1:40:00	760.00	9.21	-0.05	
5/7/15 1:45:00	765.00	9.19	-0.07	
5/7/15 1:50:00	770.00	9.18	-0.08	
5/7/15 1:55:00	775.00	9.17	-0.09	
5/7/15 2:00:00	780.00	9.16	-0.10	
5/7/15 2:05:00	785.00	9.16	-0.10	
5/7/15 2:10:00	790.00	9.14	-0.12	
5/7/15 2:15:00	795.00	9.13	-0.13	
5/7/15 2:20:00	800.00	9.12	-0.14	
5/7/15 2:25:00	805.00	9.11	-0.15	
5/7/15 2:30:00	810.00	9.11	-0.15	
5/7/15 2:35:00	815.00	9.10	-0.16	
5/7/15 2:40:00	820.00	9.09	-0.17	
5/7/15 2:45:00	825.00	9.08	-0.18	
5/7/15 2:50:00	830.00	9.08	-0.19	
5/7/15 2:55:00	835.00	9.06	-0.20	
5/7/15 3:00:00	840.00	9.05	-0.21	
5/7/15 3:05:00	845.00	9.05	-0.21	
5/7/15 3:10:00	850.00	9.04	-0.22	
5/7/15 3:15:00	855.00	9.03	-0.23	
5/7/15 3:20:00	860.00	9.03	-0.23	
5/7/15 3:25:00	865.00	9.03	-0.23	
5/7/15 3:30:00	870.00	9.02	-0.24	
5/7/15 3:35:00	875.00	9.01	-0.25	
5/7/15 3:40:00	880.00	9.01	-0.25	
5/7/15 3:45:00	885.00	9.00	-0.26	
5/7/15 3:50:00	890.00	8.99	-0.27	
5/7/15 3:55:00	895.00	8.99	-0.27	
5/7/15 4:00:00	900.00	8.98	-0.28	
5/7/15 4:05:00	905.00	8.98	-0.28	
5/7/15 4:10:00	910.00	8.97	-0.29	
5/7/15 4:15:00	915.00	8.97	-0.29	
5/7/15 4:20:00	920.00	8.97	-0.29	
5/7/15 4:25:00	925.00	8.96	-0.30	
5/7/15 4:30:00	930.00	8.95	-0.31	
5/7/15 4:35:00	935.00	8.95	-0.31	
5/7/15 4:40:00	940.00	8.94	-0.32	
5/7/15 4:45:00	945.00	8.94	-0.32	
5/7/15 4:50:00	950.00	8.94	-0.32	
5/7/15 4:55:00	955.00	8.93	-0.33	Start Pump Test on Well 2

Table C-2:
Pumping Test Calculations for WPID 32048

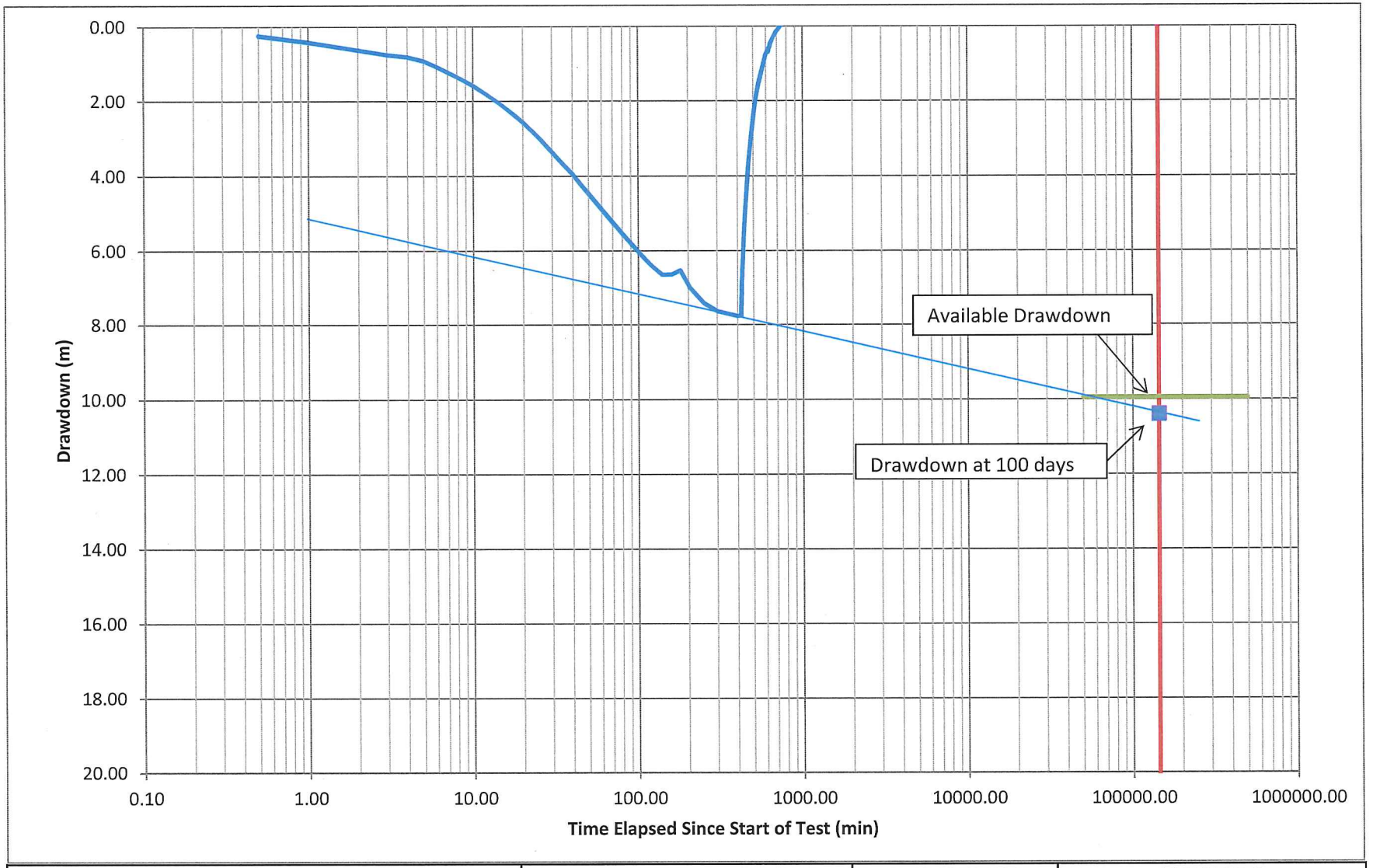
	Calculations using May 2015 static water level	Calculations using October 2011 static water level
PUMPING SPECIFICATIONS	———	———
Pumping rate (L/s)	0.10	0.10
Test duration (hours)	7.00	7.00
Depth of pump intake (mbtoc)	19.46	19.46
Static water level (mbtoc)	8.90	13.70
Depth to top of screen (mbtoc)	unknown	unknown
Depth of well (mbgl)	22.46	22.46
RECOVERY	———	———
Length of recovery (min)	320	320
% recovered	100	100
CPCN INPUTS	———	———
Pumping rate (L/s)	0.10	0.10
Available drawdown[1] (m)	9.95	5.15
Drawdown at 100 days (m)	10.4	10.4
CPCN OUTPUTS	———	———
Specific capacity (L/s/m)	0.010	0.010
Sustainable pumping rate (L/s)	0.10	0.05
Sustainable pumping rate with BC safety factor of 30% (L/s)	0.07	0.03
Sustainable pumping rate (L/d)	8,268	4,280
Sustainable pumping ate with BC safety factor of 30% (L/d)	5,787	2,996
Sustainable pumping rate (USGPM)	1.5	0.8
Sustainable pumping rate with BC safety factor of 30% (USGPM)	1.1	0.5

Note:

1 - Available drawdown is calculated as the difference between the bottom of the well (22.46 m) and static water level. 3 m is then subtracted from this to account for pump intake above an assumed top of screen that is 2 m above bottom. A further 0.532 m (maximum drawdown observed in Well 2) and 0.071 m (maximum drawdown observed in Well 4) were subtracted.



SUMMIT ENVIRONMENTAL CONSULTANTS INC. A Member of the Associated Engineering Group of Companies	PROJECT: 2015-8086 DATE: 28-May-15 DRAWN BY: MAW	PREPARED FOR	FIGURE C-1
		Mountain Shadows Developments Ltd.	Pump Test of WPID 32048 (South Well)



SUMMIT ENVIRONMENTAL CONSULTANTS INC. A Member of the Associated Engineering Group of Companies	PROJECT: 2015-8086.000.000 DATE: 28-May-15 DRAWN BY: MAW	PREPARED FOR	FIGURE C-2
		Mountain Shadows Developments Ltd.	Drawdown vs Time Elapsed since start of pumping of WPID 32048 (South Well)

Table C-3:
Pumping Test Data for WPID 32047

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

Well ID:	WPID 32047 (North Well)	**Static Water Level (mbtoc)**	9.25
Start Date/Time	5/7/15 4:55 AM	**Pre-Test Water Level (mbtoc)**	8.98
Client	Mountain Shadows	**Total Well Depth (m)**	22.50
Project	2015-8086.000.000	**Pump Intake Depth (mbtoc)**	unknown
Test	Constant Rate	**Pump Used**	Existing Pump
Contractor	Summit	**Pumping Rate (L/s)**	0.23

Clock Time	Time Elapsed (min)	Depth to Water (m)	Drawdown (m)	Comments
5/7/15 4:55:00	0.00	8.98	0.00	Well 3 continuously pumping, started at 23:32 May 6, 2015
5/7/15 4:55:30	0.50	9.30	0.32	
5/7/15 4:56:00	1.00	9.55	0.57	
5/7/15 4:56:30	1.50	9.78	0.80	
5/7/15 4:57:00	2.00	10.00	1.02	
5/7/15 4:57:30	2.50	10.18	1.20	
5/7/15 4:58:00	3.00	10.34	1.36	
5/7/15 4:59:30	4.50	10.70	1.72	
5/7/15 5:00:00	5.00	10.79	1.81	
5/7/15 5:01:00	6.00	10.95	1.97	
5/7/15 5:02:00	7.00	11.06	2.08	
5/7/15 5:03:00	8.00	11.15	2.17	
5/7/15 5:04:00	9.00	11.21	2.23	
5/7/15 5:05:00	10.00	11.26	2.28	
5/7/15 5:07:00	12.00	11.33	2.35	
5/7/15 5:10:00	15.00	11.39	2.41	
5/7/15 5:13:00	18.00	11.41	2.44	
5/7/15 5:15:00	20.00	11.43	2.45	
5/7/15 5:20:00	25.00	11.45	2.47	
5/7/15 5:25:00	30.00	11.47	2.49	
5/7/15 5:30:00	35.00	11.48	2.51	
5/7/15 5:35:00	40.00	11.48	2.50	
5/7/15 5:45:00	50.00	11.50	2.52	
5/7/15 5:56:00	61.00	11.56	2.58	
5/7/15 6:05:00	70.00	11.57	2.59	
5/7/15 6:15:00	80.00	11.59	2.61	
5/7/15 6:25:00	90.00	11.60	2.62	
5/7/15 6:35:00	100.00	11.61	2.63	
5/7/15 6:55:00	120.00	11.64	2.66	
5/7/15 7:15:00	140.00	11.66	2.68	
5/7/15 7:25:00	150.00	11.66	2.68	
5/7/15 7:45:00	170.00	11.67	2.69	
5/7/15 7:45:30	170.50	11.67	2.69	Shut off pump - Recovery
5/7/15 7:46:00	171.00	11.37	2.39	
5/7/15 7:46:30	171.50	11.07	2.09	
5/7/15 7:47:00	172.00	10.83	1.85	
5/7/15 7:49:00	174.00	10.12	1.14	
5/7/15 7:51:00	176.00	9.70	0.72	
5/7/15 7:53:30	178.50	9.44	0.46	

Table C-3:
Pumping Test Data for WPID 32047

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

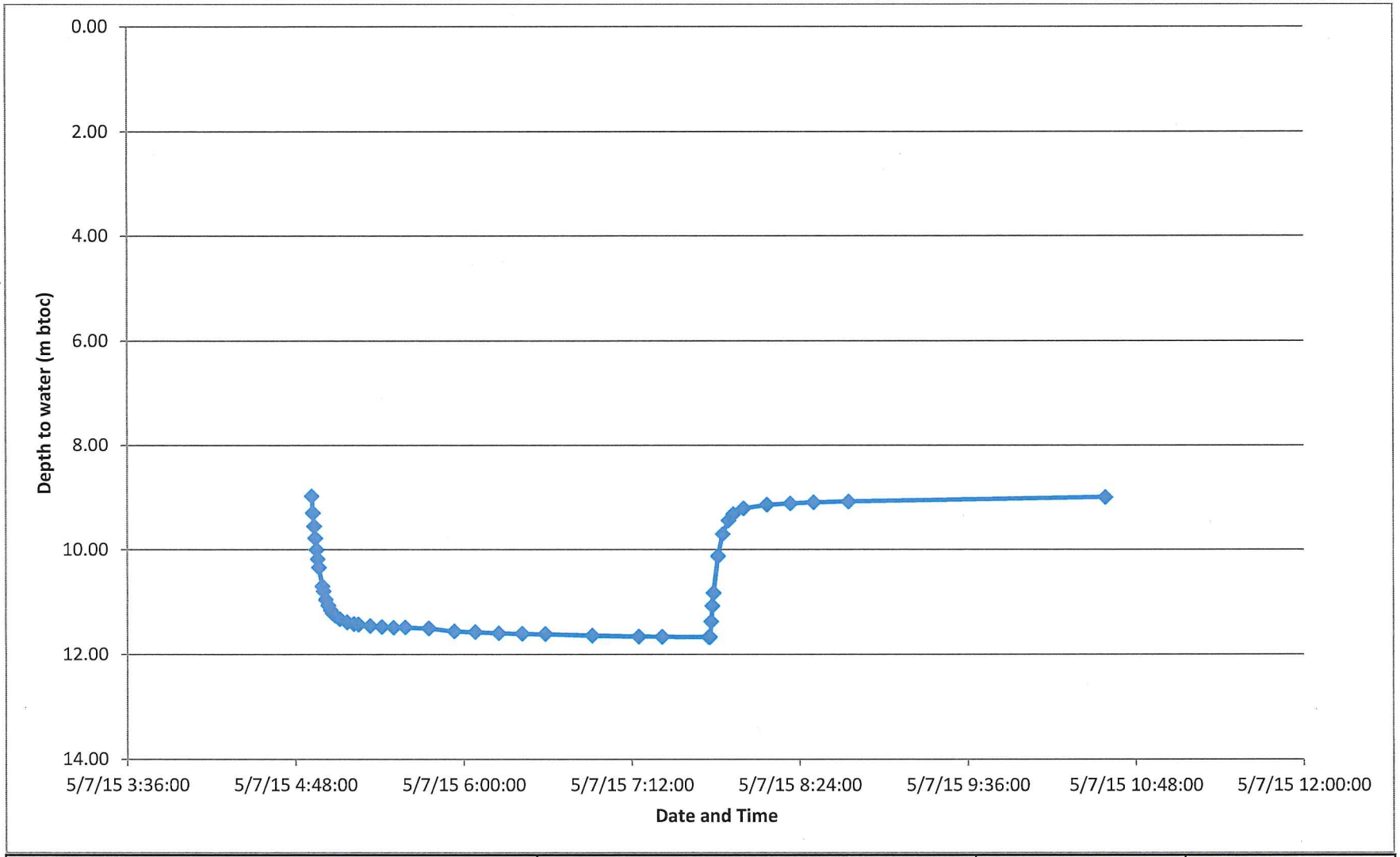
Clock Time	Time Elapsed (min)	Depth to Water (m)	Drawdown (m)	Comments
5/7/15 7:55:30	180.50	9.32	0.34	
5/7/15 8:00:00	185.00	9.21	0.23	
5/7/15 8:10:00	195.00	9.14	0.16	
5/7/15 8:20:00	205.00	9.12	0.14	
5/7/15 8:30:00	215.00	9.10	0.12	
5/7/15 8:45:00	230.00	9.08	0.10	Well 3 turned off automatically
5/7/15 10:35:00	340.00	9.00	0.02	

Table C-4:
Pumping Test Calculations for WPID 32047

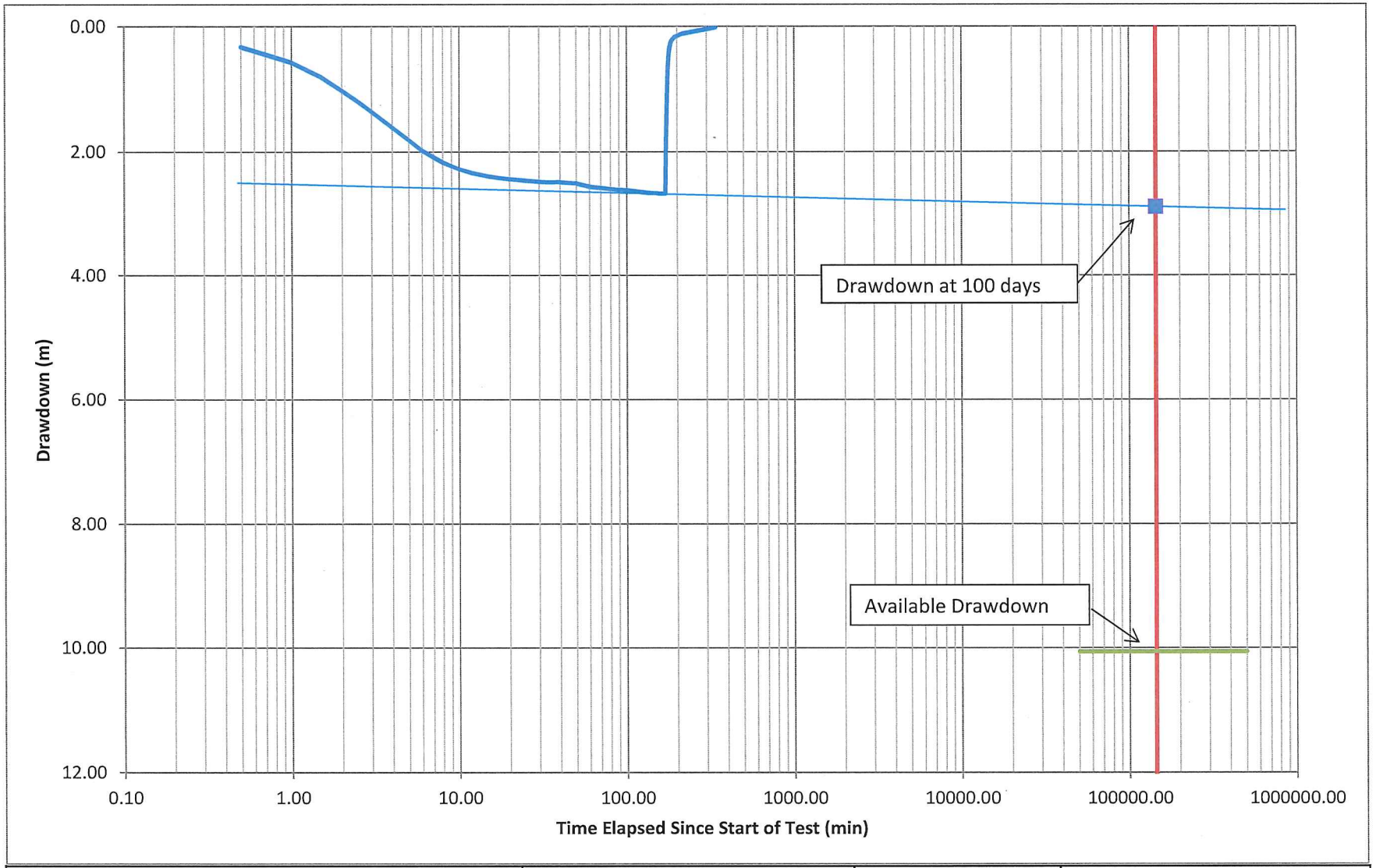
	Calculations using May 2015 static water level	Calculations using October 2011 static water level
PUMPING SPECIFICATIONS	———	———
Pumping rate (L/s)	0.23	0.23
Test duration (hours)	2.84	2.84
Depth of pump intake (mbtoc)	unknown	unknown
Static water level (mbtoc)	9.25	15.5
Depth to top of screen (mbtoc)	unknown	unknown
Depth of well (mbgl)	22.50	22.50
RECOVERY	———	———
Length of recovery (min)	170	170
% recovered	100	100
CPCN INPUTS	———	———
Pumping rate (L/s)	0.23	0.23
Available drawdown (m)[1]	10.06	3.81
Drawdown at 100 days (m)	2.9	2.9
CPCN OUTPUTS	———	———
Specific capacity (L/s/m)	0.079	0.079
Sustainable pumping rate (L/s)	0.79	0.30
Sustainable pumping rate with BC safety factor of 30% (L/s)	0.55	0.21
Sustainable pumping rate (L/d)	68,449	25,905
Sustainable pumping ate with BC safety factor of 30% (L/d)	47,915	18,133
Sustainable pumping rate (USGPM)	13	5
Sustainable pumping rate with BC safety factor of 30% (USGPM)	9	3

Note:

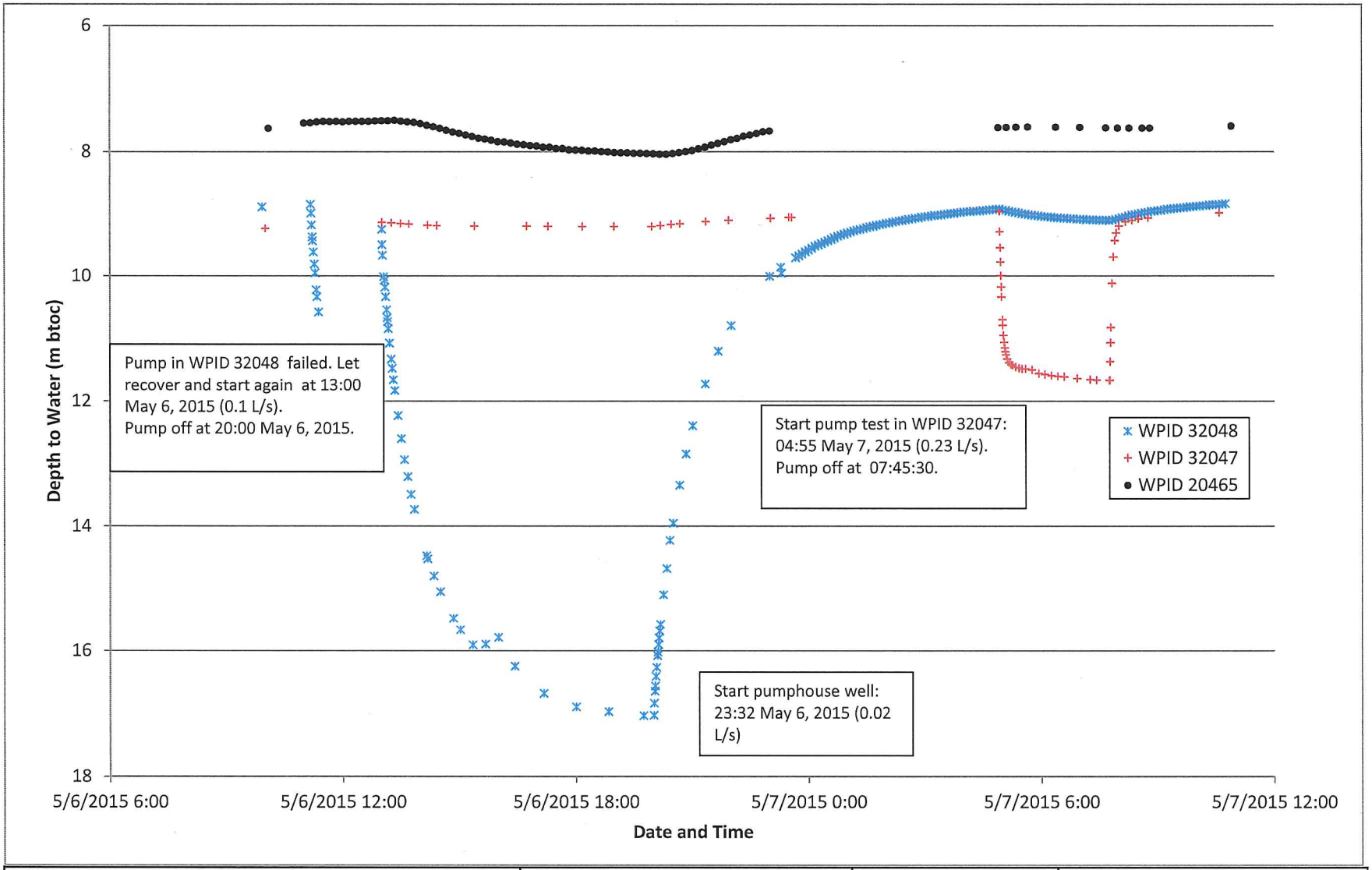
1 - Available drawdown is calculated as the difference between the bottom of the well and static water level. 3 m is then subtracted from this to account for pump intake above an assumed top of screen that is 2 m above bottom. A further 0.185 m (maximum drawdown observed in Well 1) and 0.007 m (maximum drawdown observed in Well 4) were subtracted.



SUMMIT ENVIRONMENTAL CONSULTANTS INC. A Member of the Associated Engineering Group of Companies	PROJECT: 2015-8086.000.000 DATE: 28-May-15 DRAWN BY: MAW	PREPARED FOR	FIGURE C-3
		Mountain Shadows Development Ltd.	Pump Test of WPID 32047 (North Well)



SUMMIT ENVIRONMENTAL CONSULTANTS INC. A Member of the Associated Engineering Group of Companies	PROJECT: 2015-8086.000.000 DATE: 28-May-15 DRAWN BY: MAW	PREPARED FOR	FIGURE C-4
		Mountain Shadows Developments Ltd.	Drawdown vs Time Elapsed since start of pumping of WPID 32047 (North Well)



SUMMIT ENVIRONMENTAL CONSULTANTS INC. A Member of the Associated Engineering Group of Companies	PROJECT: 2015-8086.000.000 DATE: 28-May-15 DRAWN BY: MAW	PREPARED FOR	FIGURE C-5
		Mountain Shadows Developments Ltd.	Water levels measured during pumping tests of WPID 32048 and WPID 32047

APPENDIX D: WATER QUALITY RESULTS COMPARED WITH DRINKING WATER GUIDELINES

Mountain Shadows Developments Ltd.

Water Quality Results

Analyte	Unit	Guideline		Sampling Location	Abbott Spring	WPID 32048	WPID 32047
				Date Sampled	07-May-15	06-May-15	07-May-15
				Lab Sample ID	5050525-03	5050525-01	5050525-02
				Sample Type	Normal	Normal	Normal
		GCDWQ MAC	GCDWQ AO				
Field Results							
Conductivity	µS/cm	NG	NG		798	980	1160
Oxidation reduction potential	mV	NG	NG		495	94	773
pH		NG	6.5 - 8.5		7.54	7.41	7.21
Temperature	°C	NG	15		6.4	8.2	8.9
Turbidity	NTU	N [1.1]	NG		0.85	1.40	1.36
Lab Results							
General							
Alkalinity (total, as CaCO3)	mg/L	NG	NG		304	387	433
Chloride	mg/L	NG	250		1.30	23.2	35.4
Colour	CU	NG	15		<5	<5	<5
Conductivity	µS/cm	NG	NG		757	915	1070
Dissolved organic carbon	mg/L	NG	NG		2.9		
Fluoride	mg/L	1.5	NG		0.17	0.34	0.15
Hardness, total (dissolved as CaCO3)	mg/L	NG	NG			543	620
Hardness, Total (total as CaCO3)	mg/L	NG	NG		470	556	629
Microcystin-LR	mg/L	0.0015	NG		<0.00014		
pH		NG	6.5 - 8.5		8.02	7.97	7.93
Sulphate	mg/L	NG	500 [2.1]		154	161	179
Total dissolved solids	mg/L	NG	500		**501**	**606**	**693**
Total organic carbon	mg/L	NG	NG		2.9		
Turbidity	NTU	N [1.2]	NG		0.1	15.2	1.2
UV transmittance at 254 nm	%	NG	NG		90.9		
Metals							
Aluminum (dissolved)	mg/L	NG	N [2.2]			<0.05	<0.05
Aluminum (total)	mg/L	NG	N [2.3]		0.05	<0.05	<0.05
Antimony (dissolved)	mg/L	0.006	NG			<0.001	<0.001
Antimony (total)	mg/L	0.006	NG		<0.001	<0.001	<0.001
Arsenic (dissolved)	mg/L	0.010 [1.3]	NG			<0.005	<0.005
Arsenic (total)	mg/L	0.010 [1.4]	NG		<0.005	<0.005	<0.005
Barium (dissolved)	mg/L	1.0	NG			<0.05	<0.05
Barium (total)	mg/L	1.0	NG		<0.05	<0.05	<0.05
Beryllium (dissolved)	mg/L	NG	NG			<0.001	<0.001
Beryllium (total)	mg/L	NG	NG		<0.001	<0.001	<0.001
Bismuth (dissolved)	mg/L	NG	NG			<0.001	<0.001
Bismuth (total)	mg/L	NG	NG		<0.001	<0.001	<0.001
Boron (dissolved)	mg/L	5	NG			<0.04	0.04
Boron (total)	mg/L	5	NG		<0.04	<0.04	0.05
Cadmium (dissolved)	mg/L	0.005	NG			<0.0001	<0.0001

Mountain Shadows Developments Ltd.

Water Quality Results

Analyte	Unit	Guideline		Sampling Location	Abbott Spring	WPID 32048	WPID 32047
				Date Sampled	07-May-15	06-May-15	07-May-15
				Lab Sample ID	5050525-03	5050525-01	5050525-02
				Sample Type	Normal	Normal	Normal
		GCDWQ MAC	GCDWQ AO				
Cadmium (total)	mg/L	0.005	NG		<0.0001	<0.0001	<0.0001
Calcium (dissolved)	mg/L	NG	NG			73.2	91.3
Calcium (total)	mg/L	NG	NG		90.6	73.4	93.3
Chromium (dissolved)	mg/L	0.05	NG			<0.005	<0.005
Chromium (total)	mg/L	0.05	NG		<0.005	<0.005	<0.005
Cobalt (dissolved)	mg/L	NG	NG			<0.0005	<0.0005
Cobalt (total)	mg/L	NG	NG		<0.0005	<0.0005	<0.0005
Copper (dissolved)	mg/L	NG	1.0			<0.002	<0.002
Copper (total)	mg/L	NG	1.0		<0.002	<0.002	0.003
Iron (dissolved)	mg/L	NG	0.3			**1.71**	<0.10
Iron (total)	mg/L	NG	0.3		<0.10	**2.25**	**0.49**
Lead (dissolved)	mg/L	0.010	NG			<0.001	<0.001
Lead (total)	mg/L	0.010	NG		<0.001	<0.001	<0.001
Lithium (dissolved)	mg/L	NG	NG			0.013	0.013
Lithium (total)	mg/L	NG	NG		0.009	0.014	0.015
Magnesium (dissolved)	mg/L	NG	NG			87.5	95.1
Magnesium (total)	mg/L	NG	NG		59.2	90.4	96.2
Manganese (dissolved)	mg/L	NG	0.05			**0.054**	0.008
Manganese (total)	mg/L	NG	0.05		<0.002	**0.054**	0.026
Mercury (dissolved)	mg/L	0.001	NG			<0.0002	<0.0002
Mercury (total)	mg/L	0.001	NG		<0.0002	<0.0002	<0.0002
Molybdenum (dissolved)	mg/L	NG	NG			<0.001	<0.001
Molybdenum (total)	mg/L	NG	NG		0.001	<0.001	<0.001
Nickel (dissolved)	mg/L	NG	NG			<0.002	<0.002
Nickel (total)	mg/L	NG	NG		<0.002	<0.002	<0.002
Selenium (dissolved)	mg/L	0.05	NG			<0.005	<0.005
Selenium (total)	mg/L	0.05	NG		<0.005	<0.005	<0.005
Silicon (dissolved, as Si)	mg/L	NG	NG			11	12
Silicon (total, as Si)	mg/L	NG	NG		9	10	11
Silver (dissolved)	mg/L	NG	NG			<0.0005	<0.0005
Silver (total)	mg/L	NG	NG		<0.0005	<0.0005	<0.0005
Sodium (dissolved)	mg/L	NG	200			21.6	29.6
Sodium (total)	mg/L	NG	200		5.2	21.2	29.4
Strontium (dissolved)	mg/L	NG	NG			0.53	0.65
Strontium (total)	mg/L	NG	NG		0.35	0.52	0.64
Sulphur (dissolved)	mg/L	NG	NG			57	56
Sulphur (total)	mg/L	NG	NG		40	57	60
Tellurium (dissolved)	mg/L	NG	NG			<0.002	<0.002
Tellurium (total)	mg/L	NG	NG		<0.002	<0.002	<0.002
Thallium (dissolved)	mg/L	NG	NG			<0.0002	<0.0002
Thallium (total)	mg/L	NG	NG		<0.0002	<0.0002	<0.0002

Mountain Shadows Developments Ltd.

Water Quality Results

Analyte	Unit	Guideline		Sampling Location	Abbott Spring	WPID 32048	WPID 32047
				Date Sampled	07-May-15	06-May-15	07-May-15
				Lab Sample ID	5050525-03	5050525-01	5050525-02
				Sample Type	Normal	Normal	Normal
		GCDWQ MAC	GCDWQ AO				
Thorium (dissolved)	mg/L	NG	NG			<0.001	<0.001
Thorium (total)	mg/L	NG	NG		<0.001	<0.001	<0.001
Tin (dissolved)	mg/L	NG	NG			<0.002	<0.002
Tin (total)	mg/L	NG	NG		<0.002	<0.002	<0.002
Titanium (dissolved)	mg/L	NG	NG			<0.05	<0.05
Titanium (total)	mg/L	NG	NG		<0.05	<0.05	<0.05
Uranium (dissolved)	mg/L	0.02	NG			0.0051	0.0077
Uranium (total)	mg/L	0.02	NG		0.0061	0.0053	0.0084
Vanadium (dissolved)	mg/L	NG	NG			<0.01	<0.01
Vanadium (total)	mg/L	NG	NG		<0.01	<0.01	<0.01
Zinc (dissolved)	mg/L	NG	5.0			<0.04	<0.04
Zinc (total)	mg/L	NG	5.0		<0.04	<0.04	<0.04
Zirconium (dissolved)	mg/L	NG	NG			<0.001	<0.001
Zirconium (total)	mg/L	NG	NG		<0.001	<0.001	<0.001
Microbiological							
E. coli (counts)	CFU/100 mL	0 [1.5]	NG		<1	<1	<1
Total coliforms (counts)	CFU/100 mL	0 [1.6]	NG		<1	<1	<1
Nutrients							
Nitrate (as N)	mg/L	10	NG		<0.010	<0.010	2.43
Nitrate + Nitrite (as N)	mg/L	10 [1.7]	NG		<0.020	<0.020	2.43
Nitrate + Nitrite (as N) (calculated)	mg/L	10 [1.8]	NG		<0.014	<0.014	2.43
Nitrite (as N)	mg/L	1	NG		<0.010	<0.010	<0.010
Phosphorus (dissolved, by ICPMS/ICPC	mg/L	NG	NG			<0.2	<0.2
Phosphorus (total, by ICPMS/ICPOES)	mg/L	NG	NG		<0.2	<0.2	<0.2
Potassium (dissolved)	mg/L	NG	NG			3.2	3.8
Potassium (total)	mg/L	NG	NG		2.1	3.6	4.2

Legend	
<	Less than reported detection limit
N	Narrative type of guideline or standard, or Result Note.
NG	No Guideline
GCDWQ AO	Highlighted value exceeds the Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives
GCDWQ MAC	Highlighted value exceeds the Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations

WIRELESS WATER

Guideline Notes:

1. Notes for Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations (GCDWQ MAC)

Note 1.1 for Turbidity:
Waterworks systems that use a surface water source or a groundwater source under the direct influence of surface water should filter the source water to meet health-based turbidity limits, as defined for specific treatment technologies. Where possible, filtration systems should be designed and operated to reduce turbidity levels as low as possible, with a treated water turbidity target of less than 0.1 NTU at all times. Where this is not achievable, the treated water turbidity levels from individual filters should meet the requirements described in GCDWQ.
For systems that use groundwater that is not under the direct influence of surface water, which are considered less vulnerable to faecal contamination, turbidity should generally be below 1.0 NTU.
For effective operation of the distribution system, it is good practice to ensure that water entering the distribution system has turbidity levels below 1.0 NTU.

Note 1.2 for Turbidity:
Waterworks systems that use a surface water source or a groundwater source under the direct influence of surface water should filter the source water to meet health-based turbidity limits, as defined for specific treatment technologies. Where possible, filtration systems should be designed and operated to reduce turbidity levels as low as possible, with a treated water turbidity target of less than 0.1 NTU at all times. Where this is not achievable, the treated water turbidity levels from individual filters should meet the requirements described in GCDWQ.
For systems that use groundwater that is not under the direct influence of surface water, which are considered less vulnerable to faecal contamination, turbidity should generally be below 1.0 NTU.
For effective operation of the distribution system, it is good practice to ensure that water entering the distribution system has turbidity levels below 1.0 NTU.

Note 1.3 for Arsenic (dissolved):
Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 1.4 for Arsenic (total):
Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 1.5 for E. coli (counts):
MAC is none detectable per 100 mL

Note 1.6 for Total coliforms (counts):
The maximum acceptable concentration (MAC) of total coliforms in water leaving a treatment plant and in non-disinfected groundwater leaving the well is none detectable per 100 mL.
Total coliforms should be monitored in the distribution system because they are used to indicate changes in water quality. Detection of total coliforms from consecutive samples from the same site or from more than 10% of the samples collected in a given sampling period should be investigated.

Note 1.7 for Nitrate + Nitrite (as N):
The MAC for Nitrate (as N) is 10 mg/L

Note 1.8 for Nitrate + Nitrite (as N) (calculated):
The MAC for Nitrate (as N) is 10 mg/L

2. Notes for Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives (GCDWQ AO)

Note 2.1 for Sulphate:
There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L. Health authorities should be notified of drinking water sources containing above 500 mg/L.

Note 2.2 for Aluminum (dissolved):
This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants. The operational guidance value of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.

Note 2.3 for Aluminum (total):
This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants. The operational guidance value of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.

APPENDIX E: LABORATORY ANALYTICAL REPORT

CERTIFICATE OF ANALYSIS

REPORTED TO	Summit Environmental Consultants Inc. (Vernon) #200 - 2800 29th Street Vernon, BC V1T 9P9	**TEL** **FAX**	(250) 545-3672 (250) 545-3654
ATTENTION	Nicole Penner		

WORK ORDER	5050525		
PO NUMBER		**RECEIVED / TEMP**	May-07-15 15:42 / 4°C
PROJECT	2015-8086.000	**REPORTED**	May-28-15
PROJECT INFO	Mountain Shadows Well Test		

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition 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.

Work Order Comments:

May 28 2015 This is an amended report. Please note the change in sample IDs - SG

Authorized By: **Brent Coates, B.Sc.**
Division Manager, Richmond

Please contact CARO if more information is needed or to provide feedback on our services.

Locations:

#110 4011 Viking Way
Richmond, BC V6V 2K9
Tel: 604-279-1499 Fax: 604-279-1599

#102 3677 Highway 97N
Kelowna, BC V1X 5C3
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17225 109 Avenue
Edmonton, AB T5S 1H7
Tel: 780-489-9100 Fax: 780-489-9700

www.caro.ca

CARO ANALYTICAL SERVICES

ANALYSIS INFORMATION

REPORTED TO Summit Environmental Consultants Inc. (Vernon)
PROJECT 2015-8086.000

WORK ORDER 5050525
REPORTED May-28-15

Analysis Description	Method Reference	Technique	Location
Alkalinity (Total)	APHA 2320 B	Titration with H2SO4 to pH 4.5	Kelowna
Anions in Water by IC	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Carbon, Dissolved Organic	APHA 5310 B	High Temperature Combustion, Infrared CO2 Detection	Kelowna
Carbon, Total Organic in Water	APHA 5310 B	High Temperature Combustion, Infrared CO2 Detection	Kelowna
Colour, True	APHA 2120 C	Spectrophotometry (456 nm)	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Cyanobacterial Toxins- Microcystin	Custom	N/A	Sublet
Dissolved Metals	APHA 3030 B / APHA 3125 B	0.45 µm Filtration / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
E. coli (Partition)	APHA 9222 G	Membrane Filtration / Nutrient Agar with MUG	Kelowna
Hardness (as CaCO3)	APHA 2340 B	Calculation	N/A
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Total Coliforms (Endo)	APHA 9222 B	Membrane Filtration / Endo Agar	Kelowna
Total Dissolved Solids (Gravimetric)	APHA 2540 C*	Gravimetry (Dried at 103-105C)	Kelowna
Total Recoverable Metals	APHA 3030E* / APHA 3125 B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Transmissivity at 254 nm	APHA 5910 B	Ultraviolet Absorption	Kelowna
Turbidity	APHA 2130 B	Nephelometry	Kelowna

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

Method Reference Descriptions:

APHA	Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
AO	Aesthetic objective
MAC	Maximum acceptable concentration (health based)
OG	Operational guideline (treated water)
% T	Percent Transmittance
CFU/100 mL	Colony Forming Units per 100 millilitres
CU	Colour Units (referenced against a platinum cobalt standard)
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, ph > 7 = basic
µg/L	Micrograms per litre
µS/cm	Microsiemens per centimetre

CARO ANALYTICAL SERVICES

SAMPLE ANALYTICAL DATA

REPORTED TO Summit Environmental Consultants Inc. (Vernon)
PROJECT 2015-8086.000

WORK ORDER 5050525
REPORTED May-28-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: WPID 32048 (5050525-01) [Water] Sampled: May-06-15 19:45						
Anions						
Chloride	**23.2**	0.10	mg/L	N/A	May-09-15	
Fluoride	**0.34**	0.10	mg/L	N/A	May-09-15	
Nitrate as N	< 0.010	0.010	mg/L	N/A	May-09-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	May-09-15	
Sulfate	**161**	1.0	mg/L	N/A	May-09-15	
General Parameters						
Alkalinity, Total as CaCO3	**387**	1	mg/L	N/A	May-09-15	
Colour, True	< 5	5	CU	N/A	May-09-15	
Conductivity (EC)	**915**	2	µS/cm	N/A	May-09-15	
pH	**7.97**	0.01	pH units	N/A	May-12-15	HT2
Solids, Total Dissolved	**606**	10	mg/L	N/A	May-12-15	
Turbidity	**15.2**	0.1	NTU	N/A	May-08-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**556**	5.0	mg/L	N/A	N/A	
Hardness, Total (Diss. as CaCO3)	**543**	5.0	mg/L	N/A	N/A	
Nitrate+Nitrite as N	< 0.020	0.020	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.05	0.05	mg/L	N/A	May-14-15	
Antimony, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Arsenic, dissolved	< 0.005	0.005	mg/L	N/A	May-14-15	
Barium, dissolved	< 0.05	0.05	mg/L	N/A	May-14-15	
Beryllium, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Bismuth, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Boron, dissolved	< 0.04	0.04	mg/L	N/A	May-14-15	
Cadmium, dissolved	< 0.0001	0.0001	mg/L	N/A	May-14-15	
Calcium, dissolved	**73.2**	2.0	mg/L	N/A	May-14-15	
Chromium, dissolved	< 0.005	0.005	mg/L	N/A	May-14-15	
Cobalt, dissolved	< 0.0005	0.0005	mg/L	N/A	May-14-15	
Copper, dissolved	< 0.002	0.002	mg/L	N/A	May-14-15	
Iron, dissolved	**1.71**	0.10	mg/L	N/A	May-14-15	
Lead, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Lithium, dissolved	**0.013**	0.001	mg/L	N/A	May-14-15	
Magnesium, dissolved	**87.5**	0.1	mg/L	N/A	May-14-15	
Manganese, dissolved	**0.054**	0.002	mg/L	N/A	May-14-15	
Mercury, dissolved	< 0.0002	0.0002	mg/L	N/A	May-14-15	
Molybdenum, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Nickel, dissolved	< 0.002	0.002	mg/L	N/A	May-14-15	
Phosphorus, dissolved	< 0.2	0.2	mg/L	N/A	May-14-15	
Potassium, dissolved	**3.2**	0.2	mg/L	N/A	May-14-15	
Selenium, dissolved	< 0.005	0.005	mg/L	N/A	May-14-15	
Silicon, dissolved	**11**	5	mg/L	N/A	May-14-15	
Silver, dissolved	< 0.0005	0.0005	mg/L	N/A	May-14-15	
Sodium, dissolved	**21.6**	0.2	mg/L	N/A	May-14-15	
Strontium, dissolved	**0.53**	0.01	mg/L	N/A	May-14-15	

REPORTED TO Summit Environmental Consultants Inc. (Vernon)
PROJECT 2015-8086.000

WORK ORDER 5050525
REPORTED May-28-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: WPID 32048 (5050525-01) [Water] Sampled: May-06-15 19:45, Continued						
Dissolved Metals, Continued						
Sulfur, dissolved	**57**	10	mg/L	N/A	May-14-15	
Tellurium, dissolved	< 0.002	0.002	mg/L	N/A	May-14-15	
Thallium, dissolved	< 0.0002	0.0002	mg/L	N/A	May-14-15	
Thorium, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Tin, dissolved	< 0.002	0.002	mg/L	N/A	May-14-15	
Titanium, dissolved	< 0.05	0.05	mg/L	N/A	May-14-15	
Uranium, dissolved	**0.0051**	0.0002	mg/L	N/A	May-14-15	
Vanadium, dissolved	< 0.01	0.01	mg/L	N/A	May-14-15	
Zinc, dissolved	< 0.04	0.04	mg/L	N/A	May-14-15	
Zirconium, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Total Recoverable Metals						
Aluminum, total	< 0.05	0.05	mg/L	May-13-15	May-14-15	
Antimony, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Arsenic, total	< 0.005	0.005	mg/L	May-13-15	May-14-15	
Barium, total	< 0.05	0.05	mg/L	May-13-15	May-14-15	
Beryllium, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Bismuth, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Boron, total	< 0.04	0.04	mg/L	May-13-15	May-14-15	
Cadmium, total	< 0.0001	0.0001	mg/L	May-13-15	May-14-15	
Calcium, total	**73.4**	2.0	mg/L	May-13-15	May-14-15	
Chromium, total	< 0.005	0.005	mg/L	May-13-15	May-14-15	
Cobalt, total	< 0.0005	0.0005	mg/L	May-13-15	May-14-15	
Copper, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Iron, total	**2.25**	0.10	mg/L	May-13-15	May-14-15	
Lead, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Lithium, total	**0.014**	0.001	mg/L	May-13-15	May-14-15	
Magnesium, total	**90.4**	0.1	mg/L	May-13-15	May-14-15	
Manganese, total	**0.054**	0.002	mg/L	May-13-15	May-14-15	
Mercury, total	< 0.0002	0.0002	mg/L	May-13-15	May-14-15	
Molybdenum, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Nickel, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Phosphorus, total	< 0.2	0.2	mg/L	May-13-15	May-14-15	
Potassium, total	**3.6**	0.2	mg/L	May-13-15	May-14-15	
Selenium, total	< 0.005	0.005	mg/L	May-13-15	May-14-15	
Silicon, total	**10**	5	mg/L	May-13-15	May-14-15	
Silver, total	< 0.0005	0.0005	mg/L	May-13-15	May-14-15	
Sodium, total	**21.2**	0.2	mg/L	May-13-15	May-14-15	
Strontium, total	**0.52**	0.01	mg/L	May-13-15	May-14-15	
Sulfur, total	**57**	10	mg/L	May-13-15	May-14-15	
Tellurium, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Thallium, total	< 0.0002	0.0002	mg/L	May-13-15	May-14-15	
Thorium, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Tin, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Titanium, total	< 0.05	0.05	mg/L	May-13-15	May-14-15	
Uranium, total	**0.0053**	0.0002	mg/L	May-13-15	May-14-15	

REPORTED TO Summit Environmental Consultants Inc. (Vernon)
PROJECT 2015-8086.000

WORK ORDER 5050525
REPORTED May-28-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: WPID 32048 (5050525-01) [Water] Sampled: May-06-15 19:45, Continued						
Total Recoverable Metals, Continued						
Vanadium, total	< 0.01	0.01	mg/L	May-13-15	May-14-15	
Zinc, total	< 0.04	0.04	mg/L	May-13-15	May-14-15	
Zirconium, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Microbiological Parameters						
Coliforms, Total	< 1	1	CFU/100 mL	May-07-15	May-08-15	
E. coli	< 1	1	CFU/100 mL	May-07-15	May-08-15	
Sample ID: WPID 32047 (5050525-02) [Water] Sampled: May-07-15 07:30						
Anions						
Chloride	**35.4**	0.10	mg/L	N/A	May-09-15	
Fluoride	**0.15**	0.10	mg/L	N/A	May-09-15	
Nitrate as N	**2.43**	0.010	mg/L	N/A	May-09-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	May-09-15	
Sulfate	**179**	1.0	mg/L	N/A	May-09-15	
General Parameters						
Alkalinity, Total as CaCO3	**433**	1	mg/L	N/A	May-09-15	
Colour, True	< 5	5	CU	N/A	May-09-15	
Conductivity (EC)	**1070**	2	µS/cm	N/A	May-09-15	
pH	**7.93**	0.01	pH units	N/A	May-12-15	HT2
Solids, Total Dissolved	**693**	10	mg/L	N/A	May-12-15	
Turbidity	**1.2**	0.1	NTU	N/A	May-08-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**629**	5.0	mg/L	N/A	N/A	
Hardness, Total (Diss. as CaCO3)	**620**	5.0	mg/L	N/A	N/A	
Nitrate+Nitrite as N	**2.43**	0.020	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.05	0.05	mg/L	N/A	May-14-15	
Antimony, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Arsenic, dissolved	< 0.005	0.005	mg/L	N/A	May-14-15	
Barium, dissolved	< 0.05	0.05	mg/L	N/A	May-14-15	
Beryllium, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Bismuth, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Boron, dissolved	**0.04**	0.04	mg/L	N/A	May-14-15	
Cadmium, dissolved	< 0.0001	0.0001	mg/L	N/A	May-14-15	
Calcium, dissolved	**91.3**	2.0	mg/L	N/A	May-14-15	
Chromium, dissolved	< 0.005	0.005	mg/L	N/A	May-14-15	
Cobalt, dissolved	< 0.0005	0.0005	mg/L	N/A	May-14-15	
Copper, dissolved	< 0.002	0.002	mg/L	N/A	May-14-15	
Iron, dissolved	< 0.10	0.10	mg/L	N/A	May-14-15	
Lead, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Lithium, dissolved	**0.013**	0.001	mg/L	N/A	May-14-15	
Magnesium, dissolved	**95.1**	0.1	mg/L	N/A	May-14-15	

REPORTED TO Summit Environmental Consultants Inc. (Vernon)
PROJECT 2015-8086.000

WORK ORDER 5050525
REPORTED May-28-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: WPID 32047 (5050525-02) [Water] Sampled: May-07-15 07:30, Continued						
Dissolved Metals, Continued						
Manganese, dissolved	**0.008**	0.002	mg/L	N/A	May-14-15	
Mercury, dissolved	< 0.0002	0.0002	mg/L	N/A	May-14-15	
Molybdenum, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Nickel, dissolved	< 0.002	0.002	mg/L	N/A	May-14-15	
Phosphorus, dissolved	< 0.2	0.2	mg/L	N/A	May-14-15	
Potassium, dissolved	**3.8**	0.2	mg/L	N/A	May-14-15	
Selenium, dissolved	< 0.005	0.005	mg/L	N/A	May-14-15	
Silicon, dissolved	**12**	5	mg/L	N/A	May-14-15	
Silver, dissolved	< 0.0005	0.0005	mg/L	N/A	May-14-15	
Sodium, dissolved	**29.6**	0.2	mg/L	N/A	May-14-15	
Strontium, dissolved	**0.65**	0.01	mg/L	N/A	May-14-15	
Sulfur, dissolved	**56**	10	mg/L	N/A	May-14-15	
Tellurium, dissolved	< 0.002	0.002	mg/L	N/A	May-14-15	
Thallium, dissolved	< 0.0002	0.0002	mg/L	N/A	May-14-15	
Thorium, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Tin, dissolved	< 0.002	0.002	mg/L	N/A	May-14-15	
Titanium, dissolved	< 0.05	0.05	mg/L	N/A	May-14-15	
Uranium, dissolved	**0.0077**	0.0002	mg/L	N/A	May-14-15	
Vanadium, dissolved	< 0.01	0.01	mg/L	N/A	May-14-15	
Zinc, dissolved	< 0.04	0.04	mg/L	N/A	May-14-15	
Zirconium, dissolved	< 0.001	0.001	mg/L	N/A	May-14-15	
Total Recoverable Metals						
Aluminum, total	< 0.05	0.05	mg/L	May-13-15	May-14-15	
Antimony, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Arsenic, total	< 0.005	0.005	mg/L	May-13-15	May-14-15	
Barium, total	< 0.05	0.05	mg/L	May-13-15	May-14-15	
Beryllium, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Bismuth, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Boron, total	**0.05**	0.04	mg/L	May-13-15	May-14-15	
Cadmium, total	< 0.0001	0.0001	mg/L	May-13-15	May-14-15	
Calcium, total	**93.3**	2.0	mg/L	May-13-15	May-14-15	
Chromium, total	< 0.005	0.005	mg/L	May-13-15	May-14-15	
Cobalt, total	< 0.0005	0.0005	mg/L	May-13-15	May-14-15	
Copper, total	**0.003**	0.002	mg/L	May-13-15	May-14-15	
Iron, total	**0.49**	0.10	mg/L	May-13-15	May-14-15	
Lead, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Lithium, total	**0.015**	0.001	mg/L	May-13-15	May-14-15	
Magnesium, total	**96.2**	0.1	mg/L	May-13-15	May-14-15	
Manganese, total	**0.026**	0.002	mg/L	May-13-15	May-14-15	
Mercury, total	< 0.0002	0.0002	mg/L	May-13-15	May-14-15	
Molybdenum, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Nickel, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Phosphorus, total	< 0.2	0.2	mg/L	May-13-15	May-14-15	
Potassium, total	**4.2**	0.2	mg/L	May-13-15	May-14-15	
Selenium, total	< 0.005	0.005	mg/L	May-13-15	May-14-15	

REPORTED TO Summit Environmental Consultants Inc. (Vernon)
PROJECT 2015-8086.000

WORK ORDER 5050525
REPORTED May-28-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: WPID 32047 (5050525-02) [Water] Sampled: May-07-15 07:30, Continued						
Total Recoverable Metals, Continued						
Silicon, total	**11**	5	mg/L	May-13-15	May-14-15	
Silver, total	< 0.0005	0.0005	mg/L	May-13-15	May-14-15	
Sodium, total	**29.4**	0.2	mg/L	May-13-15	May-14-15	
Strontium, total	**0.64**	0.01	mg/L	May-13-15	May-14-15	
Sulfur, total	**60**	10	mg/L	May-13-15	May-14-15	
Tellurium, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Thallium, total	< 0.0002	0.0002	mg/L	May-13-15	May-14-15	
Thorium, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Tin, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Titanium, total	< 0.05	0.05	mg/L	May-13-15	May-14-15	
Uranium, total	**0.0084**	0.0002	mg/L	May-13-15	May-14-15	
Vanadium, total	< 0.01	0.01	mg/L	May-13-15	May-14-15	
Zinc, total	< 0.04	0.04	mg/L	May-13-15	May-14-15	
Zirconium, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Microbiological Parameters						
Coliforms, Total	< 1	1	CFU/100 mL	May-08-15	May-09-15	
E. coli	< 1	1	CFU/100 mL	May-08-15	May-09-15	
Sample ID: Abbott Spring (5050525-03) [Water] Sampled: May-07-15 10:10						
Anions						
Chloride	**1.30**	0.10	mg/L	N/A	May-09-15	
Fluoride	**0.17**	0.10	mg/L	N/A	May-09-15	
Nitrate as N	< 0.010	0.010	mg/L	N/A	May-09-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	May-09-15	
Sulfate	**154**	1.0	mg/L	N/A	May-09-15	
General Parameters						
Alkalinity, Total as CaCO3	**304**	1	mg/L	N/A	May-09-15	
Carbon, Total Organic	**2.9**	0.5	mg/L	N/A	May-08-15	
Carbon, Dissolved Organic	**2.9**	0.5	mg/L	N/A	May-08-15	
Colour, True	< 5	5	CU	N/A	May-09-15	
Conductivity (EC)	**757**	2	µS/cm	N/A	May-09-15	
pH	**8.02**	0.01	pH units	N/A	May-12-15	HT2
Solids, Total Dissolved	**501**	10	mg/L	N/A	May-12-15	
Turbidity	**0.1**	0.1	NTU	N/A	May-08-15	
UV Transmittance @ 254nm	**90.9**	0.1	% T	N/A	May-09-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**470**	5.0	mg/L	N/A	N/A	
Nitrate+Nitrite as N	< 0.020	0.020	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	**0.05**	0.05	mg/L	May-13-15	May-14-15	
Antimony, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Arsenic, total	< 0.005	0.005	mg/L	May-13-15	May-14-15	

REPORTED TO	Summit Environmental Consultants Inc. (Vernon)	**WORK ORDER**	5050525
PROJECT	2015-8086.000	**REPORTED**	May-28-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Abbott Spring (5050525-03) [Water] Sampled: May-07-15 10:10, Continued						
Total Recoverable Metals, Continued						
Barium, total	< 0.05	0.05	mg/L	May-13-15	May-14-15	
Beryllium, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Bismuth, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Boron, total	< 0.04	0.04	mg/L	May-13-15	May-14-15	
Cadmium, total	< 0.0001	0.0001	mg/L	May-13-15	May-14-15	
Calcium, total	**90.6**	2.0	mg/L	May-13-15	May-14-15	
Chromium, total	< 0.005	0.005	mg/L	May-13-15	May-14-15	
Cobalt, total	< 0.0005	0.0005	mg/L	May-13-15	May-14-15	
Copper, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Iron, total	< 0.10	0.10	mg/L	May-13-15	May-14-15	
Lead, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Lithium, total	**0.009**	0.001	mg/L	May-13-15	May-14-15	
Magnesium, total	**59.2**	0.1	mg/L	May-13-15	May-14-15	
Manganese, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Mercury, total	< 0.0002	0.0002	mg/L	May-13-15	May-14-15	
Molybdenum, total	**0.001**	0.001	mg/L	May-13-15	May-14-15	
Nickel, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Phosphorus, total	< 0.2	0.2	mg/L	May-13-15	May-14-15	
Potassium, total	**2.1**	0.2	mg/L	May-13-15	May-14-15	
Selenium, total	< 0.005	0.005	mg/L	May-13-15	May-14-15	
Silicon, total	**9**	5	mg/L	May-13-15	May-14-15	
Silver, total	< 0.0005	0.0005	mg/L	May-13-15	May-14-15	
Sodium, total	**5.2**	0.2	mg/L	May-13-15	May-14-15	
Strontium, total	**0.35**	0.01	mg/L	May-13-15	May-14-15	
Sulfur, total	**40**	10	mg/L	May-13-15	May-14-15	
Tellurium, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Thallium, total	< 0.0002	0.0002	mg/L	May-13-15	May-14-15	
Thorium, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Tin, total	< 0.002	0.002	mg/L	May-13-15	May-14-15	
Titanium, total	< 0.05	0.05	mg/L	May-13-15	May-14-15	
Uranium, total	**0.0061**	0.0002	mg/L	May-13-15	May-14-15	
Vanadium, total	< 0.01	0.01	mg/L	May-13-15	May-14-15	
Zinc, total	< 0.04	0.04	mg/L	May-13-15	May-14-15	
Zirconium, total	< 0.001	0.001	mg/L	May-13-15	May-14-15	
Microbiological Parameters						
Microcystin-LR	< 0.14	0.14	µg/L	N/A	May-19-15	
Coliforms, Total	< 1	1	CFU/100 mL	May-08-15	May-09-15	
E. coli	< 1	1	CFU/100 mL	May-08-15	May-09-15	

Sample / Analysis Qualifiers:

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

CARO ANALYTICAL SERVICES

QUALITY CONTROL DATA

REPORTED TO	Summit Environmental Consultants Inc. (Vernon)	**WORK ORDER**	5050525
PROJECT	2015-8086.000	**REPORTED**	May-28-15

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)**: Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup)**: Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS)**: A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM)**: A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are 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 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	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B5E0472										
Blank (B5E0472-BLK1)				Prepared: May-09-15, Analyzed: May-09-15						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.01	0.10	mg/L							
Nitrate as N	< 0.010	0.010	mg/L							
Nitrite as N	< 0.010	0.010	mg/L							
Sulfate	< 0.5	1.0	mg/L							
Blank (B5E0472-BLK2)				Prepared: May-09-15, Analyzed: May-09-15						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.01	0.10	mg/L							
Nitrate as N	< 0.010	0.010	mg/L							
Nitrite as N	< 0.010	0.010	mg/L							
Sulfate	< 0.5	1.0	mg/L							
Blank (B5E0472-BLK3)				Prepared: May-09-15, Analyzed: May-09-15						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.01	0.10	mg/L							
Nitrate as N	< 0.010	0.010	mg/L							
Nitrite as N	< 0.010	0.010	mg/L							
Sulfate	< 0.5	1.0	mg/L							
LCS (B5E0472-BS1)				Prepared: May-09-15, Analyzed: May-09-15						
Chloride	16.0	0.10	mg/L	16.0		100	85-115			
Fluoride	3.97	0.10	mg/L	4.00		99	85-115			
Nitrate as N	3.99	0.010	mg/L	4.00		100	85-115			
Nitrite as N	2.01	0.010	mg/L	2.00		100	85-115			
Sulfate	15.8	1.0	mg/L	16.0		99	85-115			
LCS (B5E0472-BS2)				Prepared: May-09-15, Analyzed: May-09-15						
Chloride	16.2	0.10	mg/L	16.0		101	85-115			
Fluoride	3.97	0.10	mg/L	4.00		99	85-115			
Nitrate as N	4.00	0.010	mg/L	4.00		100	85-115			
Nitrite as N	2.01	0.010	mg/L	2.00		101	85-115			
Sulfate	16.0	1.0	mg/L	16.0		100	85-115			

REPORTED TO Summit Environmental Consultants Inc. (Vernon)
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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B5E0472, Continued										
LCS (B5E0472-BS3)				Prepared: May-09-15, Analyzed: May-09-15						
Chloride	15.9	0.10	mg/L	16.0		100	85-115			
Fluoride	3.95	0.10	mg/L	4.00		99	85-115			
Nitrate as N	3.86	0.010	mg/L	4.00		97	85-115			
Nitrite as N	2.01	0.010	mg/L	2.00		100	85-115			
Sulfate	16.0	1.0	mg/L	16.0		100	85-115			
Dissolved Metals, Batch B5E0762										
Blank (B5E0762-BLK1)				Prepared: May-14-15, Analyzed: May-14-15						
Aluminum, dissolved	< 0.05	0.05	mg/L							
Antimony, dissolved	< 0.001	0.001	mg/L							
Arsenic, dissolved	< 0.005	0.005	mg/L							
Barium, dissolved	< 0.05	0.05	mg/L							
Beryllium, dissolved	< 0.001	0.001	mg/L							
Bismuth, dissolved	< 0.001	0.001	mg/L							
Boron, dissolved	< 0.04	0.04	mg/L							
Cadmium, dissolved	< 0.0001	0.0001	mg/L							
Calcium, dissolved	< 2.0	2.0	mg/L							
Chromium, dissolved	< 0.005	0.005	mg/L							
Cobalt, dissolved	< 0.0005	0.0005	mg/L							
Copper, dissolved	< 0.002	0.002	mg/L							
Iron, dissolved	< 0.10	0.10	mg/L							
Lead, dissolved	< 0.001	0.001	mg/L							
Lithium, dissolved	< 0.001	0.001	mg/L							
Magnesium, dissolved	< 0.1	0.1	mg/L							
Manganese, dissolved	< 0.002	0.002	mg/L							
Mercury, dissolved	< 0.0002	0.0002	mg/L							
Molybdenum, dissolved	< 0.001	0.001	mg/L							
Nickel, dissolved	< 0.002	0.002	mg/L							
Phosphorus, dissolved	< 0.2	0.2	mg/L							
Potassium, dissolved	< 0.2	0.2	mg/L							
Selenium, dissolved	< 0.005	0.005	mg/L							
Silicon, dissolved	< 5	5	mg/L							
Silver, dissolved	< 0.0005	0.0005	mg/L							
Sodium, dissolved	< 0.2	0.2	mg/L							
Strontium, dissolved	< 0.01	0.01	mg/L							
Sulfur, dissolved	< 10	10	mg/L							
Tellurium, dissolved	< 0.002	0.002	mg/L							
Thallium, dissolved	< 0.0002	0.0002	mg/L							
Thorium, dissolved	< 0.001	0.001	mg/L							
Tin, dissolved	< 0.002	0.002	mg/L							
Titanium, dissolved	< 0.05	0.05	mg/L							
Uranium, dissolved	< 0.0002	0.0002	mg/L							
Vanadium, dissolved	< 0.01	0.01	mg/L							
Zinc, dissolved	< 0.04	0.04	mg/L							
Zirconium, dissolved	< 0.001	0.001	mg/L							
Duplicate (B5E0762-DUP1)				**Source: 5050525-01**	Prepared: May-14-15, Analyzed: May-14-15					
Aluminum, dissolved	< 0.05	0.05	mg/L		< 0.05				16	
Antimony, dissolved	< 0.001	0.001	mg/L		< 0.001				21	
Arsenic, dissolved	< 0.005	0.005	mg/L		< 0.005				10	
Barium, dissolved	< 0.05	0.05	mg/L		< 0.05				6	
Beryllium, dissolved	< 0.001	0.001	mg/L		< 0.001				20	
Bismuth, dissolved	< 0.001	0.001	mg/L		< 0.001				20	
Boron, dissolved	< 0.04	0.04	mg/L		< 0.04				13	
Cadmium, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				24	

REPORTED TO Summit Environmental Consultants Inc. (Vernon)
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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B5E0762, Continued										
Duplicate (B5E0762-DUP1), Continued		**Source: 5050525-01**		Prepared: May-14-15, Analyzed: May-14-15						
Calcium, dissolved	73.2	2.0	mg/L		73.2			< 1	10	
Chromium, dissolved	< 0.005	0.005	mg/L		< 0.005				7	
Cobalt, dissolved	< 0.0005	0.0005	mg/L		< 0.0005				12	
Copper, dissolved	< 0.002	0.002	mg/L		< 0.002				20	
Iron, dissolved	1.68	0.10	mg/L		1.71			2	10	
Lead, dissolved	< 0.001	0.001	mg/L		< 0.001				14	
Lithium, dissolved	0.013	0.001	mg/L		0.013			< 1	15	
Magnesium, dissolved	88.2	0.1	mg/L		87.5			< 1	9	
Manganese, dissolved	0.053	0.002	mg/L		0.054			3	10	
Mercury, dissolved	< 0.0002	0.0002	mg/L		< 0.0002				20	
Molybdenum, dissolved	0.001	0.001	mg/L		< 0.001				16	
Nickel, dissolved	< 0.002	0.002	mg/L		< 0.002				14	
Phosphorus, dissolved	< 0.2	0.2	mg/L		< 0.2				23	
Potassium, dissolved	3.5	0.2	mg/L		3.2			7	17	
Selenium, dissolved	0.005	0.005	mg/L		< 0.005				23	
Silicon, dissolved	12	5	mg/L		11				10	
Silver, dissolved	< 0.0005	0.0005	mg/L		< 0.0005				20	
Sodium, dissolved	21.1	0.2	mg/L		21.6			2	9	
Strontium, dissolved	0.53	0.01	mg/L		0.53			1	9	
Sulfur, dissolved	57	10	mg/L		57			2	27	
Tellurium, dissolved	< 0.002	0.002	mg/L		< 0.002				20	
Thallium, dissolved	< 0.0002	0.0002	mg/L		< 0.0002				12	
Thorium, dissolved	< 0.001	0.001	mg/L		< 0.001				20	
Tin, dissolved	< 0.002	0.002	mg/L		< 0.002				20	
Titanium, dissolved	< 0.05	0.05	mg/L		< 0.05				20	
Uranium, dissolved	0.0052	0.0002	mg/L		0.0051			1	11	
Vanadium, dissolved	< 0.01	0.01	mg/L		< 0.01				14	
Zinc, dissolved	< 0.04	0.04	mg/L		< 0.04				11	
Zirconium, dissolved	< 0.001	0.001	mg/L		< 0.001				20	
Reference (B5E0762-SRM1)				Prepared: May-14-15, Analyzed: May-14-15						
Aluminum, dissolved	0.25	0.05	mg/L	0.233		107	58-142			
Antimony, dissolved	0.050	0.001	mg/L	0.0430		117	75-125			
Arsenic, dissolved	0.451	0.005	mg/L	0.438		103	81-119			
Barium, dissolved	3.40	0.05	mg/L	3.35		101	83-117			
Beryllium, dissolved	0.209	0.001	mg/L	0.213		98	80-120			
Boron, dissolved	1.80	0.04	mg/L	1.74		103	74-117			
Cadmium, dissolved	0.225	0.0001	mg/L	0.224		100	83-117			
Calcium, dissolved	7.8	2.0	mg/L	7.69		101	76-124			
Chromium, dissolved	0.451	0.005	mg/L	0.437		103	81-119			
Cobalt, dissolved	0.138	0.0005	mg/L	0.128		108	76-124			
Copper, dissolved	0.934	0.002	mg/L	0.844		111	84-116			
Iron, dissolved	1.39	0.10	mg/L	1.29		108	74-126			
Lead, dissolved	0.131	0.001	mg/L	0.112		117	72-128			
Lithium, dissolved	0.106	0.001	mg/L	0.104		102	60-140			
Magnesium, dissolved	7.1	0.1	mg/L	6.92		102	81-119			
Manganese, dissolved	0.356	0.002	mg/L	0.345		103	84-116			
Molybdenum, dissolved	0.452	0.001	mg/L	0.426		106	83-117			
Nickel, dissolved	0.883	0.002	mg/L	0.840		105	74-126			
Phosphorus, dissolved	0.5	0.2	mg/L	0.495		97	68-132			
Potassium, dissolved	3.3	0.2	mg/L	3.19		103	74-126			
Selenium, dissolved	0.040	0.005	mg/L	0.0331		122	70-130			
Sodium, dissolved	19.6	0.2	mg/L	19.1		103	72-128			
Strontium, dissolved	0.92	0.01	mg/L	0.916		100	84-113			
Thallium, dissolved	0.0418	0.0002	mg/L	0.0393		106	57-143			
Uranium, dissolved	0.275	0.0002	mg/L	0.266		103	85-115			
Vanadium, dissolved	0.88	0.01	mg/L	0.869		101	87-113			

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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B5E0762, Continued										
Reference (B5E0762-SRM1), Continued				Prepared: May-14-15, Analyzed: May-14-15						
Zinc, dissolved	0.91	0.04	mg/L	0.881		103	72-128			
General Parameters, Batch B5E0433										
Blank (B5E0433-BLK1)				Prepared: May-08-15, Analyzed: May-08-15						
Carbon, Total Organic	< 0.5	0.5	mg/L							
Carbon, Dissolved Organic	< 0.5	0.5	mg/L							
Blank (B5E0433-BLK2)				Prepared: May-08-15, Analyzed: May-08-15						
Carbon, Total Organic	< 0.5	0.5	mg/L							
Carbon, Dissolved Organic	< 0.5	0.5	mg/L							
LCS (B5E0433-BS1)				Prepared: May-08-15, Analyzed: May-08-15						
Carbon, Total Organic	8.9	0.5	mg/L	10.0		89	78-116			
Carbon, Dissolved Organic	8.7	0.5	mg/L	10.0		87	80-120			
LCS (B5E0433-BS2)				Prepared: May-08-15, Analyzed: May-08-15						
Carbon, Total Organic	9.1	0.5	mg/L	10.0		91	78-116			
Carbon, Dissolved Organic	8.5	0.5	mg/L	10.0		85	80-120			
Duplicate (B5E0433-DUP1)		**Source: 5050525-03**		Prepared: May-08-15, Analyzed: May-08-15						
Carbon, Total Organic	2.9	0.5	mg/L		2.9			1	16	
Carbon, Dissolved Organic	2.7	0.5	mg/L		2.9			6	15	
General Parameters, Batch B5E0454										
Blank (B5E0454-BLK1)				Prepared: May-12-15, Analyzed: May-12-15						
Solids, Total Dissolved	< 10	10	mg/L							
Reference (B5E0454-SRM1)				Prepared: May-12-15, Analyzed: May-12-15						
Solids, Total Dissolved	218	10	mg/L	240		91	85-115			
General Parameters, Batch B5E0469										
Blank (B5E0469-BLK1)				Prepared: May-08-15, Analyzed: May-08-15						
Turbidity	< 0.1	0.1	NTU							
LCS (B5E0469-BS1)				Prepared: May-08-15, Analyzed: May-08-15						
Turbidity	38.5	0.1	NTU	40.0		96	85-115			
General Parameters, Batch B5E0529										
Blank (B5E0529-BLK1)				Prepared: May-09-15, Analyzed: May-09-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 2	2	µS/cm							
LCS (B5E0529-BS1)				Prepared: May-09-15, Analyzed: May-09-15						
Alkalinity, Total as CaCO3	104	1	mg/L	100		104	96-108			
LCS (B5E0529-BS2)				Prepared: May-09-15, Analyzed: May-09-15						
Conductivity (EC)	1390	2	µS/cm	1410		98	93-104			
General Parameters, Batch B5E0548										

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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B5E0548, Continued										
Blank (B5E0548-BLK1)				Prepared: May-13-15, Analyzed: May-13-15						
Colour, True	< 5	5	CU							
Blank (B5E0548-BLK2)				Prepared: May-13-15, Analyzed: May-13-15						
Colour, True	< 5	5	CU							
LCS (B5E0548-BS1)				Prepared: May-13-15, Analyzed: May-13-15						
Colour, True	10	5	CU	10.0		101	85-115			
LCS (B5E0548-BS2)				Prepared: May-13-15, Analyzed: May-13-15						
Colour, True	11	5	CU	10.0		106	85-115			
General Parameters, Batch B5E0589										
Blank (B5E0589-BLK1)				Prepared: May-09-15, Analyzed: May-09-15						
UV Transmittance @ 254nm	< 0.1	0.1	% T							
Reference (B5E0589-SRM1)				Prepared: May-09-15, Analyzed: May-09-15						
UV Transmittance @ 254nm	87.5	0.1	% T	80.2		109	90-110			
General Parameters, Batch B5E0617										
Reference (B5E0617-SRM1)				Prepared: May-12-15, Analyzed: May-12-15						
pH	6.98	0.01	pH units	7.00		100	98-102			
Microbiological Parameters, Batch B5E0374										
Blank (B5E0374-BLK1)				Prepared: May-07-15, Analyzed: May-08-15						
Coliforms, Total	< 1	1	CFU/100 mL							
E. coli	< 1	1	CFU/100 mL							
Microbiological Parameters, Batch B5E0458										
Blank (B5E0458-BLK1)				Prepared: May-08-15, Analyzed: May-09-15						
Coliforms, Total	< 1	1	CFU/100 mL							
E. coli	< 1	1	CFU/100 mL							
Blank (B5E0458-BLK2)				Prepared: May-08-15, Analyzed: May-09-15						
Coliforms, Total	< 1	1	CFU/100 mL							
E. coli	< 1	1	CFU/100 mL							
Duplicate (B5E0458-DUP1)			**Source: 5050525-02**	Prepared: May-08-15, Analyzed: May-09-15						
Coliforms, Total	< 1	1	CFU/100 mL		< 1				53	RS2
Duplicate (B5E0458-DUP2)			**Source: 5050525-03**	Prepared: May-08-15, Analyzed: May-09-15						
E. coli	< 1	1	CFU/100 mL		< 1				79	RS2
Total Recoverable Metals, Batch B5E0769										
Blank (B5E0769-BLK1)				Prepared: May-13-15, Analyzed: May-14-15						
Aluminum, total	< 0.05	0.05	mg/L							
Antimony, total	< 0.001	0.001	mg/L							
Arsenic, total	< 0.005	0.005	mg/L							
Barium, total	< 0.05	0.05	mg/L							
Beryllium, total	< 0.001	0.001	mg/L							
Bismuth, total	< 0.001	0.001	mg/L							

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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Recoverable Metals, Batch B5E0769, Continued										
Blank (B5E0769-BLK1), Continued				Prepared: May-13-15, Analyzed: May-14-15						
Boron, total	< 0.04	0.04	mg/L							
Cadmium, total	< 0.0001	0.0001	mg/L							
Calcium, total	< 2.0	2.0	mg/L							
Chromium, total	< 0.005	0.005	mg/L							
Cobalt, total	< 0.0005	0.0005	mg/L							
Copper, total	< 0.002	0.002	mg/L							
Iron, total	< 0.10	0.10	mg/L							
Lead, total	< 0.001	0.001	mg/L							
Lithium, total	< 0.001	0.001	mg/L							
Magnesium, total	< 0.1	0.1	mg/L							
Manganese, total	< 0.002	0.002	mg/L							
Mercury, total	< 0.0002	0.0002	mg/L							
Molybdenum, total	< 0.001	0.001	mg/L							
Nickel, total	< 0.002	0.002	mg/L							
Phosphorus, total	< 0.2	0.2	mg/L							
Potassium, total	< 0.2	0.2	mg/L							
Selenium, total	< 0.005	0.005	mg/L							
Silicon, total	< 5	5	mg/L							
Silver, total	< 0.0005	0.0005	mg/L							
Sodium, total	< 0.2	0.2	mg/L							
Strontium, total	< 0.01	0.01	mg/L							
Sulfur, total	< 10	10	mg/L							
Tellurium, total	< 0.002	0.002	mg/L							
Thallium, total	< 0.0002	0.0002	mg/L							
Thorium, total	< 0.001	0.001	mg/L							
Tin, total	< 0.002	0.002	mg/L							
Titanium, total	< 0.05	0.05	mg/L							
Uranium, total	< 0.0002	0.0002	mg/L							
Vanadium, total	< 0.01	0.01	mg/L							
Zinc, total	< 0.04	0.04	mg/L							
Zirconium, total	< 0.001	0.001	mg/L							
Blank (B5E0769-BLK2)				Prepared: May-13-15, Analyzed: May-14-15						
Aluminum, total	< 0.05	0.05	mg/L							
Antimony, total	< 0.001	0.001	mg/L							
Arsenic, total	< 0.005	0.005	mg/L							
Barium, total	< 0.05	0.05	mg/L							
Beryllium, total	< 0.001	0.001	mg/L							
Bismuth, total	< 0.001	0.001	mg/L							
Boron, total	< 0.04	0.04	mg/L							
Cadmium, total	< 0.0001	0.0001	mg/L							
Calcium, total	< 2.0	2.0	mg/L							
Chromium, total	< 0.005	0.005	mg/L							
Cobalt, total	< 0.0005	0.0005	mg/L							
Copper, total	< 0.002	0.002	mg/L							
Iron, total	< 0.10	0.10	mg/L							
Lead, total	< 0.001	0.001	mg/L							
Lithium, total	< 0.001	0.001	mg/L							
Magnesium, total	< 0.1	0.1	mg/L							
Manganese, total	< 0.002	0.002	mg/L							
Mercury, total	< 0.0002	0.0002	mg/L							
Molybdenum, total	< 0.001	0.001	mg/L							
Nickel, total	< 0.002	0.002	mg/L							
Phosphorus, total	< 0.2	0.2	mg/L							
Potassium, total	< 0.2	0.2	mg/L							
Selenium, total	< 0.005	0.005	mg/L							
Silicon, total	< 5	5	mg/L							

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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Recoverable Metals, Batch B5E0769, Continued										
Blank (B5E0769-BLK2), Continued				Prepared: May-13-15, Analyzed: May-14-15						
Silver, total	< 0.0005	0.0005	mg/L							
Sodium, total	< 0.2	0.2	mg/L							
Strontium, total	< 0.01	0.01	mg/L							
Sulfur, total	< 10	10	mg/L							
Tellurium, total	< 0.002	0.002	mg/L							
Thallium, total	< 0.0002	0.0002	mg/L							
Thorium, total	< 0.001	0.001	mg/L							
Tin, total	< 0.002	0.002	mg/L							
Titanium, total	< 0.05	0.05	mg/L							
Uranium, total	< 0.0002	0.0002	mg/L							
Vanadium, total	< 0.01	0.01	mg/L							
Zinc, total	< 0.04	0.04	mg/L							
Zirconium, total	< 0.001	0.001	mg/L							
Duplicate (B5E0769-DUP1)		**Source: 5050525-02**		Prepared: May-13-15, Analyzed: May-14-15						
Aluminum, total	< 0.05	0.05	mg/L		< 0.05				27	
Antimony, total	< 0.001	0.001	mg/L		< 0.001				24	
Arsenic, total	< 0.005	0.005	mg/L		< 0.005				14	
Barium, total	< 0.05	0.05	mg/L		< 0.05				16	
Beryllium, total	< 0.001	0.001	mg/L		< 0.001				20	
Bismuth, total	< 0.001	0.001	mg/L		< 0.001				20	
Boron, total	0.04	0.04	mg/L		0.05				15	
Cadmium, total	< 0.0001	0.0001	mg/L		< 0.0001				40	
Calcium, total	95.7	2.0	mg/L		93.3			3	14	
Chromium, total	< 0.005	0.005	mg/L		< 0.005				17	
Cobalt, total	< 0.0005	0.0005	mg/L		< 0.0005				17	
Copper, total	0.005	0.002	mg/L		0.003				30	
Iron, total	0.48	0.10	mg/L		0.49				28	
Lead, total	< 0.001	0.001	mg/L		< 0.001				19	
Lithium, total	0.015	0.001	mg/L		0.015			1	18	
Magnesium, total	93.0	0.1	mg/L		96.2			3	13	
Manganese, total	0.023	0.002	mg/L		0.026			14	19	
Mercury, total	< 0.0002	0.0002	mg/L		< 0.0002				40	
Molybdenum, total	< 0.001	0.001	mg/L		< 0.001				24	
Nickel, total	0.002	0.002	mg/L		0.002				33	
Phosphorus, total	< 0.2	0.2	mg/L		< 0.2				24	
Potassium, total	3.9	0.2	mg/L		4.2			7	22	
Selenium, total	< 0.005	0.005	mg/L		< 0.005				21	
Silicon, total	11	5	mg/L		11				25	
Silver, total	< 0.0005	0.0005	mg/L		< 0.0005				23	
Sodium, total	29.0	0.2	mg/L		29.4			1	17	
Strontium, total	0.63	0.01	mg/L		0.64			2	11	
Sulfur, total	54	10	mg/L		60			12	41	
Tellurium, total	< 0.002	0.002	mg/L		< 0.002				31	
Thallium, total	< 0.0002	0.0002	mg/L		< 0.0002				21	
Thorium, total	< 0.001	0.001	mg/L		< 0.001				46	
Tin, total	< 0.002	0.002	mg/L		< 0.002				30	
Titanium, total	< 0.05	0.05	mg/L		< 0.05				60	
Uranium, total	0.0084	0.0002	mg/L		0.0084			< 1	17	
Vanadium, total	< 0.01	0.01	mg/L		< 0.01				27	
Zinc, total	< 0.04	0.04	mg/L		< 0.04				26	
Zirconium, total	< 0.001	0.001	mg/L		< 0.001				60	
Reference (B5E0769-SRM1)				Prepared: May-13-15, Analyzed: May-14-15						
Aluminum, total	0.32	0.05	mg/L	0.296		108	81-129			
Antimony, total	0.054	0.001	mg/L	0.0505		107	88-114			
Arsenic, total	0.128	0.005	mg/L	0.122		105	88-114			

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Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Recoverable Metals, Batch B5E0769, Continued										
Reference (B5E0769-SRM1), Continued				Prepared: May-13-15, Analyzed: May-14-15						
Barium, total	0.68	0.05	mg/L	0.777		87	72-104			
Beryllium, total	0.050	0.001	mg/L	0.0488		102	76-131			
Boron, total	3.79	0.04	mg/L	3.40		111	75-121			
Cadmium, total	0.0526	0.0001	mg/L	0.0490		107	89-111			
Calcium, total	9.8	2.0	mg/L	10.2		96	86-121			
Chromium, total	0.258	0.005	mg/L	0.242		107	89-114			
Cobalt, total	0.0389	0.0005	mg/L	0.0366		106	91-113			
Copper, total	0.551	0.002	mg/L	0.487		113	91-115			
Iron, total	0.54	0.10	mg/L	0.469		116	77-124			
Lead, total	0.212	0.001	mg/L	0.193		110	92-113			
Lithium, total	0.427	0.001	mg/L	0.390		109	85-115			
Magnesium, total	3.6	0.1	mg/L	3.31		109	78-120			
Manganese, total	0.116	0.002	mg/L	0.109		106	90-114			
Mercury, total	0.0049	0.0002	mg/L	0.00456		107	50-150			
Molybdenum, total	0.214	0.001	mg/L	0.197		109	90-111			
Nickel, total	0.259	0.002	mg/L	0.242		107	90-111			
Phosphorus, total	0.2	0.2	mg/L	0.233		92	85-115			
Potassium, total	6.2	0.2	mg/L	5.93		105	84-113			
Selenium, total	0.116	0.005	mg/L	0.115		101	85-115			
Sodium, total	8.3	0.2	mg/L	7.64		109	82-123			
Strontium, total	0.38	0.01	mg/L	0.363		106	88-112			
Thallium, total	0.0881	0.0002	mg/L	0.0794		111	91-114			
Uranium, total	0.0210	0.0002	mg/L	0.0192		109	85-120			
Vanadium, total	0.39	0.01	mg/L	0.376		103	86-111			
Zinc, total	2.53	0.04	mg/L	2.42		105	85-111			
Reference (B5E0769-SRM2)				Prepared: May-13-15, Analyzed: May-14-15						
Aluminum, total	0.33	0.05	mg/L	0.296		113	81-129			
Antimony, total	0.053	0.001	mg/L	0.0505		105	88-114			
Arsenic, total	0.125	0.005	mg/L	0.122		103	88-114			
Barium, total	0.67	0.05	mg/L	0.777		87	72-104			
Beryllium, total	0.050	0.001	mg/L	0.0488		102	76-131			
Boron, total	3.80	0.04	mg/L	3.40		112	75-121			
Cadmium, total	0.0532	0.0001	mg/L	0.0490		109	89-111			
Calcium, total	10.0	2.0	mg/L	10.2		98	86-121			
Chromium, total	0.256	0.005	mg/L	0.242		106	89-114			
Cobalt, total	0.0395	0.0005	mg/L	0.0366		108	91-113			
Copper, total	0.548	0.002	mg/L	0.487		112	91-115			
Iron, total	0.54	0.10	mg/L	0.469		115	77-124			
Lead, total	0.213	0.001	mg/L	0.193		110	92-113			
Lithium, total	0.428	0.001	mg/L	0.390		110	85-115			
Magnesium, total	3.6	0.1	mg/L	3.31		109	78-120			
Manganese, total	0.115	0.002	mg/L	0.109		105	90-114			
Mercury, total	0.0051	0.0002	mg/L	0.00456		112	50-150			
Molybdenum, total	0.215	0.001	mg/L	0.197		109	90-111			
Nickel, total	0.258	0.002	mg/L	0.242		107	90-111			
Phosphorus, total	0.2	0.2	mg/L	0.233		103	85-115			
Potassium, total	6.1	0.2	mg/L	5.93		102	84-113			
Selenium, total	0.102	0.005	mg/L	0.115		89	85-115			
Sodium, total	8.2	0.2	mg/L	7.64		107	82-123			
Strontium, total	0.38	0.01	mg/L	0.363		106	88-112			
Thallium, total	0.0877	0.0002	mg/L	0.0794		110	91-114			
Uranium, total	0.0208	0.0002	mg/L	0.0192		108	85-120			
Vanadium, total	0.38	0.01	mg/L	0.376		102	86-111			
Zinc, total	2.53	0.04	mg/L	2.42		105	85-111			

CARO ANALYTICAL SERVICES

QUALITY CONTROL DATA

REPORTED TO	Summit Environmental Consultants Inc. (Vernon)	**WORK ORDER**	5050525
PROJECT	2015-8086.000	**REPORTED**	May-28-15

QC Qualifiers:

RS2 Reported Detection Limits (RDL) for this sample have been raised due to limited sample volume.