

**Attachment 2**  
**Covenant No. CA9920305**  
**(Page 1 of 51)**

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1. Application

**Michele Buick, Legal Assistant**  
**HEATH LAW LLP**  
**200-1808 Bowen Road**  
**Nanaimo BC V9S 5W4**  
**250-824-2080**

File: 54562-3  
 Tel: (250) 824-2080  
 Type: Covenant Rezoning Amendment

2. Description of Land

| PID/Plan Number    | Legal Description  |
|--------------------|--|
| <b>009-456-295</b> | <b>THE EASTERLY 60 ACRES OF SECTION 16, RANGE 3, MOUNTAIN DISTRICT EXCEPT THAT PART IN PLAN 29404, VIP68415, VIP68636 AND VIP72060</b> |

3. Nature of Interest

| Type            | Number | Additional Information            |
|-----------------|--------|-----------------------------------|
| <b>COVENANT</b> |        | <b>Section 219 Land Title Act</b> |

4. Terms

Part 2 of this instrument consists of:  
**(b) Express Charge Terms Annexed as Part 2**

5. Transferor(s)

**T. & R. VENTURES LTD., NO.BC1112945**

6. Transferee(s)

**REGIONAL DISTRICT OF NANAIMO**  
 6300 HAMMOND BAY ROAD  
 NANAIMO BC V9T 6N2

7. Additional or Modified Terms



8. Execution(s)

This instrument creates, assigns, modifies, enlarges, discharges or governs the priority of the interest(s) described in Item 3 and the Transferor(s) and every other signatory agree to be bound by this instrument, and acknowledge(s) receipt of a true copy of the filed standard charge terms, if any.

Witnessing Officer Signature

\_\_\_\_\_

**BRIAN J. SENINI**  
**Barrister & Solicitor**  
 200 - 1808 BOWEN ROAD  
 NANAIMO BC V9S 5W4

Execution Date

YYYY-MM-DD

**2022-05-09**

Transferor Signature(s)

**T. & R. VENTURES LTD.**  
 By their Authorized Signatory

\_\_\_\_\_

**TANNIS MILNER**

**Officer Certification**

Your signature constitutes a representation that you are a solicitor, notary public or other person authorized by the *Evidence Act*, R.S.B.C. 1996, c.124, to take affidavits for use in British Columbia and certifies the matters set out in Part 5 of the *Land Title Act* as they pertain to the execution of this instrument.

Witnessing Officer Signature

\_\_\_\_\_

**CAROL LOUDON**  
**Commissioner for Taking Affidavits**  
**for British Columbia**  
 6300 HAMMOND BAY ROAD  
 NANAIMO BC V9T 6N2

Execution Date

YYYY-MM-DD

**2022-05-04**

Transferor Signature(s)

**REGIONAL DISTRICT OF NANAIMO**  
 By their Authorized Signatory

\_\_\_\_\_

**Delcy Wells, Acting CAO**

\_\_\_\_\_

**Jessica Bagnall, Deputy Corporate Officer**

**Officer Certification**

Your signature constitutes a representation that you are a solicitor, notary public or other person authorized by the *Evidence Act*, R.S.B.C. 1996, c.124, to take affidavits for use in British Columbia and certifies the matters set out in Part 5 of the *Land Title Act* as they pertain to the execution of this instrument.

**Electronic Signature**

Your electronic signature is a representation that you are a designate authorized to certify this document under section 168.4 of the *Land Title Act*, RSBC 1996 c.250, that you certify this document under section 168.41(4) of the act, and that an execution copy, or a true copy of that execution copy, is in your possession.

**Brian James Senini IAT7J9**

Digitally signed by  
 Brian James Senini IAT7J9  
 Date: 2022-05-11  
 12:01:24 -07:00

**TERMS OF INSTRUMENT - PART 2.**  
**REZONING COVENANT**  
(Section 219 *Land Title Act*)

THIS AGREEMENT dated for reference the 4<sup>th</sup> day of May, 2022.

BETWEEN:

**T. & R. VENTURES LTD.** (Inc. No. BC1112945)  
2240 Jeffs Road, Nanaimo, BC V9S 5P7

(hereinafter called the “**Owner**”)

AND:

**REGIONAL DISTRICT OF NANAIMO**  
6300 Hammond Bay Road, Nanaimo, BC V9T 6N2

(hereinafter called the “**RDN**”)

**WHEREAS:**

- A. The Owner is the registered owner in fee simple of the lands and premises located at 3452 Jingle Pot Road in Electoral Area C of the Regional District of Nanaimo, in the Province of British Columbia and having a parcel identifier number 009-456-295 and legally described as The Easterly 60 acres of Section 16, Range 3, Mountain District, Except that part in Plan 29404, VIP68415, VIP68636 and VIP72060 (hereinafter called the “**Parent Parcel**”).
- B. The Owner has applied to the RDN under Application No. PL2018-213 to rezone a portion of the Parent Parcel from Agriculture 1 (AG1) Zone to a new Comprehensive Development Zone 56 (CD56), under the “Regional District of Nanaimo Land Use and Subdivision Bylaw No. 500, 1987 (Bylaw No. 500.432)” (hereinafter called “**Bylaw No. 500.432**”), which new zoning would allow for the development of a Montessori Farm School (hereinafter called the “**School**”) in accordance with Agricultural Land Commission Resolutions #174/2017 and #3/2020.
- C. On January 25, 2021 the Board of the RDN granted Third Reading of Bylaw No. 500.432.
- D. That part of the Parent Parcel zoned to new Comprehensive Development Zone 56 (CD56) is hereinafter called the “**Lands**”.
- E. The RDN requires the Owner to register this covenant against the title of the Parent Parcel as one of the conditions required for final adoption of Bylaw No. 500.432.
- F. Section 219 of the *Land Title Act* provides that a covenant, whether of a negative or of a positive nature, may be granted by an owner of land in favour of a Regional District to be registered as a charge against the title of the land and which may include provisions respecting the use of land or any building on the land and other specified matters.



- G. The Owner has agreed to enter into this Covenant in favour of the RDN and to register this Covenant against the title of the Parent Parcel as a Covenant pursuant to S.219 of the *Land Title Act*.
- H. The Owner has agreed not to build on or develop the Lands, except in accordance with the terms and conditions of this Covenant.

**WITNESS THAT** pursuant to Section 219 of the *Land Title Act*, and in consideration of the premises and the mutual covenants and agreements contained herein and for other good and valuable consideration (the receipt and sufficiency of which is hereby acknowledged by the Owner and the RDN), the Owner and the RDN covenant and agree with each other as follows:

## **1. DEFINITIONS AND SCHEDULES**

### **1.1 Definitions**

In this Covenant, the Definitions in the RDN Zoning Bylaw No. 500, as amended from time to time, (the "Zoning Bylaw") shall apply to the interpretation of the terms of this Covenant, unless otherwise defined herein.

### **1.2 Schedules**

The following Schedules are attached hereto and form part of this Covenant:

- (a) Schedule A – Hydrogeological Assessment Report prepared by GW Solutions dated June 10, 2020
- (b) Schedule B – Transportation Impact Assessment prepared by Bunt & Associates dated April 29, 2021

## **2. SECTION 219 LAND TITLE ACT COVENANT**

### **2.1 Grant of Covenant**

The Owner hereby covenants and agrees with the RDN, as a covenant in favour of the RDN pursuant to Section 219 of the *Land Title Act*, it being the intention and agreement of the Owner that the provisions in this Covenant be annexed to and run with and be a charge upon the Lands and that the Lands will be used and built on only in strict compliance with the terms and conditions of this Covenant.

### **2.2 No Build**

Save and except as otherwise provided for herein, and notwithstanding that the Owner may be entitled:

- (a) the Lands will not be built on, constructed or developed in any manner;
- (b) the Owner will not apply for any Building Permit in connection with any development on the Lands; and

- (c) the RDN will have no obligation to review any Building Permit applications, carry out any inspections, or issue any Permit,

until the conditions applicable to the Lands as provided for herein have been complied with to the satisfaction of the RDN.

### **2.3 Required Works**

The restrictions contained in Section 2.2 herein do not apply to any of the works, development or permits contemplated in connection with any of the matters required to be completed by the Owner in satisfaction of the covenants contained in Sections 2.5 to 2.11 herein, which works, development or permits in connection therewith are hereinafter collectively called the "Works".

### **2.4 No Occupancy**

Notwithstanding that the Owner may be entitled:

- (a) the Lands will not be occupied in any manner, including in connection with the development provided for herein (the "Development");
- (b) the Owner will not apply for a final inspection permitting occupancy or for any permit or authorization permitting occupancy on the Lands, including the Development; and
- (c) the RDN will have no obligation to review any applications, carry out any inspections, or issue any occupancy permit or authorization,

until the conditions applicable to occupancy of the Lands as provided for herein have been complied with to the satisfaction of the RDN.

### **2.5 Hydrogeological Assessment**

The Development of the Lands must occur in a manner consistent with the Hydrogeological Assessment of the Lands prepared by GW Solutions dated June 10, 2020, a copy of which is attached hereto and marked as "Schedule A" and, without in any way restricting the recommendations contained in the Hydrogeological Assessment, the following requirements must be completed prior to final building inspection:

- (a) the installation of a rainwater harvesting system for non-potable, irrigation use designed by a Qualified Professional and adequate volume to accommodate planted and landscaped areas adjacent to the School to the satisfaction of the Regional District of Nanaimo;
- (b) the installation of low flush toilets; and
- (c) the installation of a drip irrigation system for landscaped areas adjacent to the School.

### **2.6 Stormwater Management**

The Owner must provide the RDN with a stormwater management plan prepared by a professional

engineer for the proposed Development to the satisfaction of the RDN prior to the issuance of a building permit.

## **2.7 Traffic Impact Assessment**

The Development of the Lands must occur in a manner consistent with the Transportation Impact Assessment prepared by Bunt & Associates dated April 29, 2021, a copy of which is attached hereto and marked as "Schedule B" including completion of the following requirements prior to final building inspection:

- (a) clearly marked parking spaces with signage identifying short-term and long-term spaces for student drop-off and pick-up, including limiting long-term parking to a maximum of 10 minutes;
- (b) concrete or similar curb-stops to delineate each parking space; and
- (c) ensure pick-up and drop-off spaces in the centre drive aisle are drive-through so vehicles are not required to reverse into the main circulation aisle to exit.

## **2.8 Road Improvements**

The Owner must obtain a new access permit or other approval in principle from the Ministry of Transportation & Infrastructure concerning vehicle access to the Lands, including confirmation of a right-turn lane from Jingle Pot Road and reduced speed limit and no parking signage within the road right-of-way and must construct and/or install all required road related improvements as approved by the Ministry of Transportation & Infrastructure, prior to final building inspection.

## **2.9 Fire Protection Equipment**

The Owner must install as part of the Development a water storage tank or tanks having a minimum capacity of 66,000 gallons, together with a fire hydrant or other appropriate connection for fire protection purposes to the satisfaction of the RDN prior to final building inspection.

## **2.10 Site Improvements**

The Owner must complete the following improvements as part of the Development to the satisfaction of the RDN prior to final building permit:

- (a) all exterior site lighting shall be dark sky compliant;
- (b) the parking lot is required to be a durable gravel or similar permeable surface that does not produce dust; and
- (c) the entrance aisle within the property is to include traffic calming textured roadway.

## **2.11 Potable Water Improvements**

The Owner must obtain as part of the Development a secured water source approval from the Vancouver Island Health Authority, Public Health Engineering, Third Floor – 6475 Metral Drive, Nanaimo, British Columbia, V9T 2L9, together with a Non-domestic Water License from the Ministry of Environment and Climate Change Strategy prior to the issuance of a building permit save and except where these required approvals are obtained prior to the adoption of Bylaw No. 500.432.

### 3. GENERAL

- 3.1 The Owner agrees to do everything reasonably necessary, at the Owner's expense, to ensure that this Agreement is registered against title to the Parent Parcel with priority over all financial charges registered, or the registration of which is pending, at the time of application for registration of this Agreement.
- 3.2 The Owner covenants and agrees to execute all other documents and provide all other assurances necessary to give effect to the covenants contained in this Agreement.
- 3.3 The Owner shall reimburse the RDN for any expense that may be incurred by the RDN as a result of a breach of a covenant under this Agreement.
- 3.4 The Owner hereby releases and forever discharges the RDN of and from any claim, cause of action, suit, demand, expenses, costs and legal fees whatsoever which the Owner can or may have against the RDN for any loss, damage, deprivation or injury, including economic loss, that the Owner may sustain or suffer arising out of the restrictions or requirements in this Agreement, or connected with the breach of any covenant in this Agreement.
- 3.5 The Owner covenants and agrees to indemnify and save harmless the RDN from any and all claims, causes of action, suits, demands, expenses, costs and legal fees whatsoever that anyone might have as owner, occupier or user of the Lands, or by a person who has an interest in or comes onto the Lands, or by anyone who suffers loss of life or injury to his person or property, or whatsoever which anyone has or may have against the RDN or which the RDN incurs as a result of any loss, damage, deprivation or injury, including economic loss, arising out of the restrictions or requirements in this Agreement, or connected with the breach of any covenant in this Agreement.
- 3.6 The Owner and the RDN agree that every obligation and covenant of the Owner in this Agreement constitutes both a contractual obligation and a covenant granted under s. 219 of the *Land Title Act* in respect of the Parent Parcel and this Agreement burdens the Parent Parcel and runs with it and binds the successors in title to the Parent Parcel. This Agreement burdens and charges the Parent Parcel and any parcel into which they may be subdivided by any means and any parcel into which any of the Parent Parcel is consolidated. The Owner is only liable for breaches of this Agreement that occur while the Owner is the registered owner of the Parent Parcel.
- 3.7 The Owner and the RDN agree that the enforcement of this Covenant shall be entirely within the discretion of the RDN and that the execution and registration of this covenant against the title to the Parent Parcel shall not be interpreted as creating any duty on the part of the RDN to the Owner or to any other person to enforce any provision or the breach of any provision of this Covenant and Agreement or to perform any act or to incur any expense in respect of this Agreement.
- 3.8 The Owner and the RDN agree that nothing contained or implied herein shall prejudice or affect the rights and powers of the RDN in the exercise of its functions under any public or private statutes, bylaws, orders and regulations, all of which may be fully and effectively exercised in relation to the Parent Parcel as if this Agreement had not been executed and delivered by the parties hereto.

- 3.9 The Owner covenants and agrees that the RDN may withhold development permits, building permits and occupancy certificates as necessary to ensure compliance with these covenants, and that the issuance of a development permit, building permit or occupancy certificate does not act as a representation or warranty by the RDN that these covenants have been satisfied.
- 3.10 The Owner and the RDN acknowledge and agree that the RDN has made no representations, covenants, warranties, guarantees, promises or agreements (oral or otherwise) with the Owner other than those contained in this Agreement.
- 3.11 The Owner covenants and agrees that, where the RDN is required or permitted by this Agreement to form an opinion, exercise a discretion, express satisfaction, make a determination or give its consent, that the RDN is under no public law duty of fairness or natural justice in that regard and agrees that the RDN may do any of those things in the same manner as if it were a private party and not a public body.
- 3.12 The Owner and the RDN agree that any opinion, decision, act or expression of satisfaction provided for in this Agreement is to be taken or made by the Chief Administrative Officer for the RDN or his or her delegate authorized as such in writing.
- 3.13 The Owner and the RDN acknowledge and agree that an alleged waiver of any breach of this Agreement is effective only if it is an express waiver in writing of the breach in respect of which the waiver is asserted. A waiver of a breach of this Agreement does not operate as a waiver of any other breach of this Agreement.
- 3.14 If any part of this Agreement is held to be invalid, illegal or unenforceable by a court having the jurisdiction to do so, that part is to be considered to have been severed from the rest of this Agreement and the rest of this Agreement remains in force unaffected by that holding or by the severance of that part.
- 3.15. Where there is a reference in this Agreement to an enactment, the enactment referred to is an enactment of the Province of British Columbia unless otherwise so stated and any reference to an enactment shall include any amendments thereto or replacements thereof.
- 3.16 This Agreement shall be interpreted according to the laws of the Province of British Columbia.
- 3.17 This Agreement is the entire agreement between the parties regarding its subject.
- 3.18 This Agreement shall enure to the benefit of and be binding upon the parties hereto and their respective heirs, administrators, executors, successors and assigns, as the case may be, and wherever the singular or masculine is used, it shall be construed as if the plural or the feminine or body corporate, as the case may be, had been used, where the parties or the context hereto so require the rest of the sentence shall be construed as if the grammatical and terminological changes thereby rendered necessary had been made.

3.19 This Agreement may be executed in any number of counterparts, each of which will be deemed to be an original, but which taken together shall constitute one and the same instrument. Counterparts may be delivered by facsimile or other electronic means and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.

**IN WITNESS OF THIS AGREEMENT** the RDN and the Owner have executed this Agreement by signing the "Form C - General Instrument - Part 1" attached hereto.



(Via email)

Attention: Ms. Cynthia Dyer, Executive Director of Discover Montessori Society

**Re: Preliminary Hydrogeological Assessment for the Proposed Rezoning of  
3452 Jingle Pot Road, Regional District of Nanaimo, BC - Revised version**

GW Solutions Inc. (GW Solutions) is pleased to present the following letter-report summarizing our assessment of the hydrogeological conditions at and in the vicinity of the above-noted property (the Property) for a rezoning application within the Regional District of Nanaimo (RDN).

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GW Solutions Inc.  
201 – 5180 Dublin Way, Nanaimo, BC, V9T 0H2  
Tel. (250) 756-4538 \* gw@gwsolutions.ca

## 1 BACKGROUND

We understand that Discover Montessori Society has plans to build a school on the Property (delineation on Figure 1). The population of the school would be approximately 200 people, most of which would be children accompanied by 25 adult staff.

The Regional District of Nanaimo (RDN) requires, at the rezoning stage, confirmation that the potable water needs of the proposed lot can be met (Policy B1.21):

1. a minimum year-round potable water supply to support the proposed use can be provided on the parcel, and that,
2. the proposed well(s) are not anticipated to have adverse impacts on groundwater resources, existing groundwater users, and hydraulically-connected streams.

The objectives of GW Solutions' work have been to:

- Review available information to assess the hydrogeological conditions of the area and water usage; and
- Provide a professional opinion on the suitability of the existing water source for the proposed use and/or the potential to access a reliable new water source on the Property.

## 2 SCOPE

As part of GW Solutions' assessment, the following tasks have been completed:

- Review of background information on soils, aquifers, surface water features, and water levels;
- Review of existing infrastructure within the Property and estimation of water demand;
- Site visit;
- Interpretation of a 6-hour pumping test performed by BC Aquifer; and
- Report (this report) describing the local hydrogeological conditions and an opinion on the likelihood of obtaining an adequate potable water source on the proposed property and its potential impacts on neighbouring wells and the environment.



### 3 INFORMATION SOURCES

During the course of the study, and along with information provided by the owners, GW Solutions accessed the following sources of data (BC Provincial database):

- bedrock and quaternary geology;
- BC Soil Information Finder Tool;
- wells and water levels;
- aquifer mapping; and
- surface water features.

A summary of the information and our assessment are presented in the remainder of this letter-report.

### 4 SITE LOCATION AND GEOMORPHOLOGY

The Property is located within Area C of the Regional District of Nanaimo (RDN) half-way between Brannen Lake and Westwood Lake. It has an area of approximately 8.8 ha (21.8 acres) (Figure 1). It ranges from elevation 125 to 116 m above sea level sloping towards the north-east. The proposed school area is 0.55 ha (blue polygon in Figure 1).

McClure Creek, that originates from Mount Benson, crosses the Property near the north-west corner and flows year-round, according to the owner; McClure Creek is currently fully recorded. According to the owner, there is another creek crossing the Property that flows seasonally.



Figure 1. Location of the Property. Numbers show Well Tag Number.

## 5 PROPOSED USE AND EXISTING INFRASTRUCTURE

The new school will be built around the old market building that will be kept on the Property (see plan in Appendix 1). About 200 children and 25 adult staff members are expected during the day, Monday to Friday. There won't be any boarding students. Use of the facility will be minimal in July and August. Water demand for students and staff was estimated based on the BC Sewerage System Standard Practice manual (version 3 – Sept 2014) at between 4,250 L/d to 7,875 L/d. The estimated water demand for school operation is summarized in Table 1.

There will be small greenspaces around the classrooms dedicated for small crops (vegetables). They will be manually watered, possibly using water from a rainwater collection system. This water demand will be minimal, estimated at 0.124 USgpm based on the BC Agriculture Water Demand calculator for an irrigated area of 100 m<sup>2</sup> (see in Appendix 2).

If possible, about 4,500 m<sup>2</sup> of land is planned to be used to grow vegetables and will be irrigated using a drip system. This zone is already partially irrigated with the current well; it is located outside of the proposed area to be re-zoned on the Property (see location in Figure 1). The water demand for irrigation was estimated using the BC Agriculture Water Demand calculator (see in Appendix 2) at a peak flow of 5.6 US gpm.

**Table 1. Estimated Water Demand for School Operation**

|                          | Students | Staff | Total (L/d)  | Total (US gpm) |
|--------------------------|----------|-------|--------------|----------------|
| Count                    | 200      | 25    |              |                |
| Min water use L/day/pers | 15       | 50    |              |                |
| Max water use L/day/pers | 30       | 75    |              |                |
| Total min water use      | 3,000    | 1,250 | <b>4,250</b> | <b>0.78</b>    |
| Total max water use      | 6,000    | 1,875 | <b>7,875</b> | <b>1.44</b>    |

There is a drilled well located in a pumphouse (Figure 1 and Photo 1). It is a 6-inch diameter well and has an ID plate number of 13315; however, it is not registered in the BC Database and no well log could be found after inquiries with local drillers. The previous owner mentioned it was drilled to a depth of approximately 122 m (400 ft). With such a depth, the well is assumed to be completed in the bedrock aquifer.



According to the BC Database, a well was dug on the Property in 1963. Lithology information is described as blue clay; therefore, the well was likely completed in low permeability till material and would not be suitable for a water supply source (well construction report is in Appendix 1). According to the well owner, the dug well is located near the drilled well, but we could not find it during our site visit.

It is understood that the drilled well currently services domestic use for two persons living in the rental unit, a small irrigation field (vegetables), some livestock (cows and horses) and toilets in the existing market building. The water fills a 3000 US gallon water tank before distribution. The current landowner mentioned the water source for the existing dwellers will be switched to the dug well once the school opens, but the feasibility of that has to be verified.

The Property holds two current surface water licences on McClure Creek:

- Licence No. C130855 for 6,170 m<sup>3</sup>/yr, which is equivalent to 3.1 US gpm. The licence is registered under the name T&R Ventures for the purpose of Stream storage - Non-power.
- Licence No. C130847 for 1.36 m<sup>3</sup>/d, which is equivalent to 0.25 US gpm. The licence is registered under the name T&R Ventures for the purpose of livestock and animal.



Photo 1. Drilled Well ID#13315 on the Property

## 6 SURFICIAL GEOLOGY

Surficial geology around the Property is divided between deep moraine sediments in the southern portion of the Property and marine sediments in the northern portion of the Property including the proposed school area. The moraine deposits are described as clay, hardpan or till on well logs directly surrounding the Property. The thickness of unconsolidated sediments averages 14.6 m (47.8 ft) within a 500-meter radius around the Property.

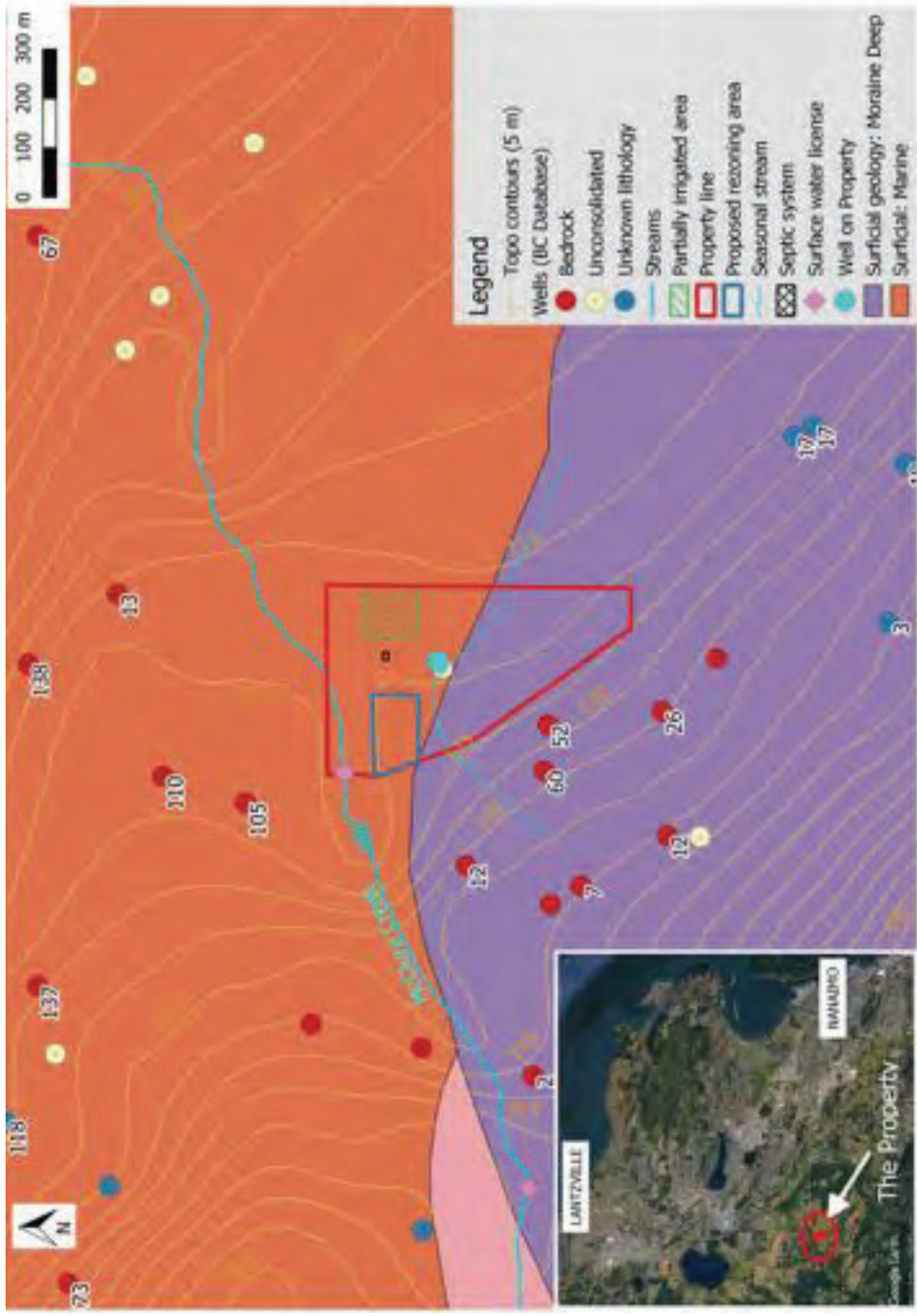


Figure 2. Surficial geology near the Property. Numbers show thickness of overburden (in feet)



## 7 BEDROCK GEOLOGY

Bedrock underlying the Property consists of sedimentary rocks of the Nanaimo Group (BC Geological Survey); reported on well logs as sandstone and layers of shale (Figure 3). Basaltic volcanic rock belonging to the Vancouver Group is also occasionally reported on well logs, usually underlying the sandstone. No major fault line is reported near the Property.

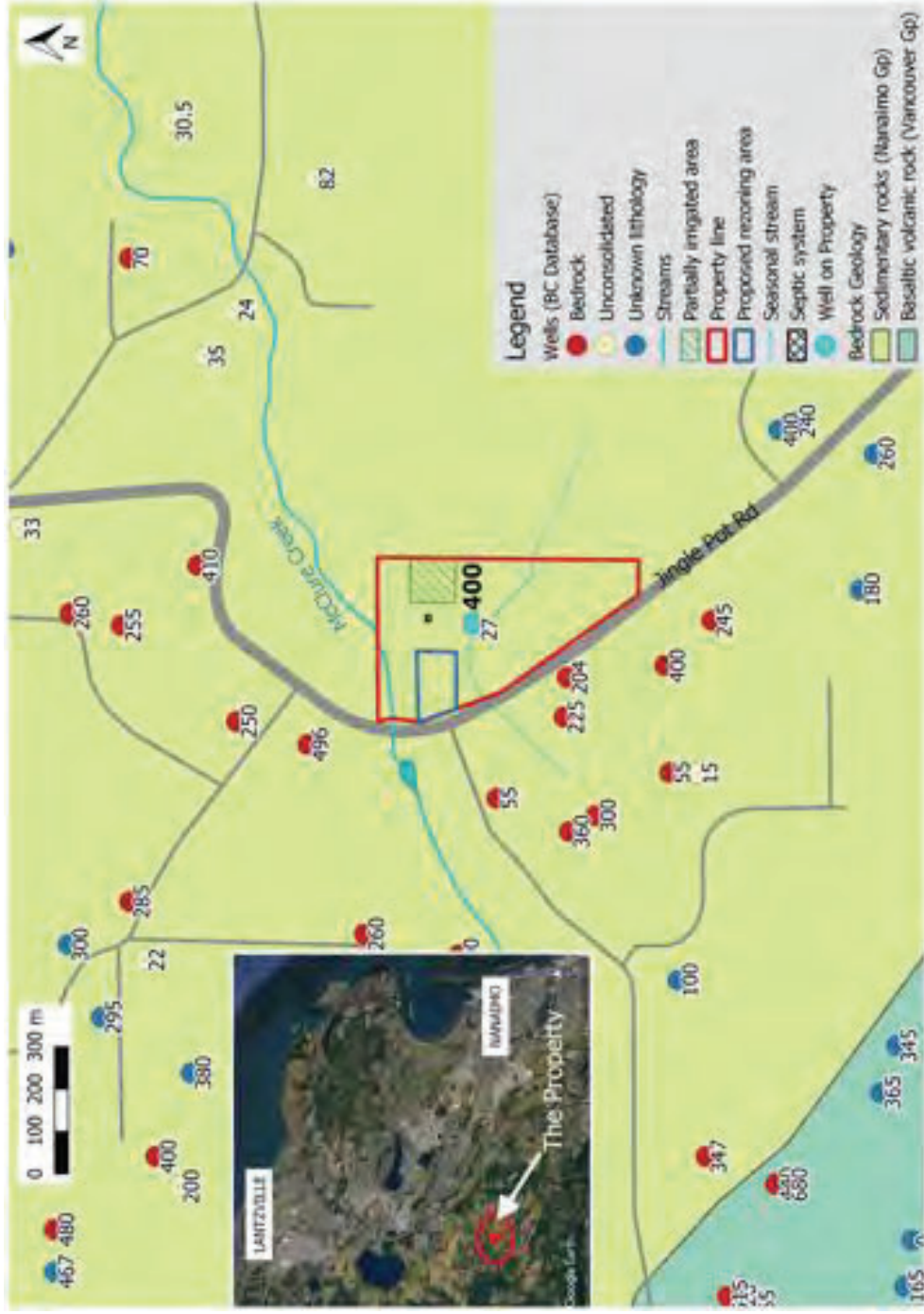


Figure 3. Bedrock geology near the Property. Numbers show depth of wells (in feet)

## 8 GROUNDWATER RESOURCES AND GROUNDWATER SUPPLY POTENTIAL

According to aquifer mapping by the BC Ministry of Environment, the Property lies over Aquifer 211 (Nanaimo Aquifer), which consists of fractured bedrock and Aquifer 167 consisting of sand and gravel. The mapping of aquifers is based partly on available well logs at the time the mapping was carried out. Well logs suggest that Aquifer 167 is not present under the Property, because the lithological descriptions indicate clay, hardpan or till (as explained in Section 6). In addition, wells are mostly completed in bedrock (thus in Aquifer 211) around the Property. Aquifer 211 is described as having a low productivity and a moderate demand and vulnerability; it is mostly used for domestic purposes.

Figure 4 includes estimated well yields and well depths. Driller's estimates of well yields in Aquifer 211 range from 0.02 US gpm to 15 US gpm within a 500 m radius around the Property. Average yield is 3.3 US gpm, which is considered as low productivity.

Water bearing fractures have been reported at depths ranging between 34 m (112 ft) and 151 m (495 ft) near the Property.

Depth to water (observed at the time of drilling) averages 14 m (46 ft) within a 500 m radius around the Property. It ranges between 0.6 m (2 ft) and 6 m (20 ft) in the immediate vicinity of the Property (Figure 4).

On September 9, 2019, BC Aquifer performed a 6-hour pumping test on the drilled well on the Property. Water level in the well during the test is shown in Figure 5 as well as flow rate measurements. We considered that the well was tested in driest conditions (see section 9.3). Based on this limited duration pumping test, the existing drilled well likely produces between 1 and 1.5 US gpm. However, we cannot properly rate the well according to standard BC practices because the test was not long enough, and the location of the water-bearing fractures is unknown.

The water demand for the school operation alone was estimated between 0.8 and 1.4 US gpm (Section 5). GW Solutions recommends that a new well be drilled and tested on the Property. GW Solutions considers it likely that a new well drilled on the Property could meet the maximum demand for the school operation, the irrigation demand for the small crops (0.124 USgpm), and possibly part of the irrigation demand (5.6 US gpm). The following options could also be considered for the irrigation demand:

- Use a rainwater collection system;
- Use the surface water licence on McClure Creek that allows for 0.25 US gpm;





Figure 4. Groundwater resources near the Property – Aquifer location. Numbers represent estimated yields (in US gpm) followed in brackets by depth to water (in feet).



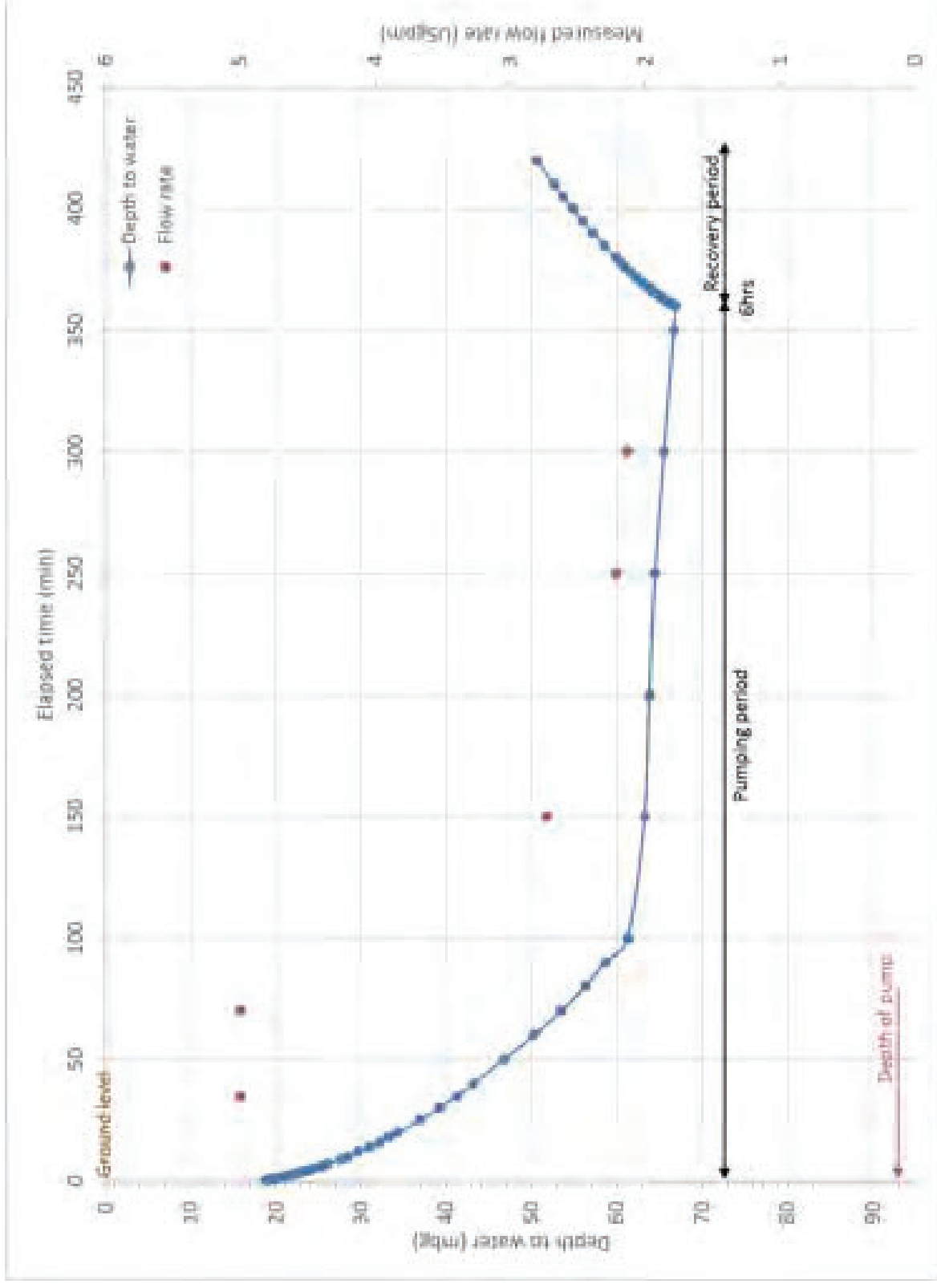


Figure 5. Pumping test performed on Well ID#13315

## 9 GROUNDWATER QUALITY

A water sample was collected at the end of the pumping test by BC Aquifer and sent to the accredited laboratory MB Labs Ltd. for potability analysis. The original laboratory report is found in Appendix 4.

Table 2 shows a summary of some parameters and how their concentrations compare to the Canadian Drinking Water Quality Guideline (CDWQG). The following observations were made:

- Total coliforms exceed the Maximum Acceptable Concentration (MAC) for drinking water.
- Total Iron and colour exceed the Aesthetic Objective (AO) for drinking water.
- Turbidity exceeds the operational guideline.
- Total plate count bacteria, an indicator tool for potential bacterial development, exceeds 500 CFU/mL, thus treatment is recommended.

**Table 2. Summary of water quality exceedances**

| Well ID | Sampling Date | Parameter                  | Reported Concentration | Unit       | Limit Concentration | Exceedance Category |
|---------|---------------|----------------------------|------------------------|------------|---------------------|---------------------|
| 13315   | Sept 10, 2019 | Total Iron (Fe)            | 1.52                   | mg/L       | 0.3                 | Exceeds AO          |
|         |               | Total coliforms            | 4                      | CFU/100 mL | 0                   | Exceeds MAC         |
|         |               | Total Plate Count Bacteria | 7616                   | CFU/mL     | 500                 | Indicator tool      |
|         |               | Turbidity                  | 30.1                   | NTU        | 1                   | Exceed OG           |
|         |               | Colour                     | 19.1                   | TCU        | 15                  | Exceeds AO          |

## 10 POTENTIAL IMPACTS ON SURROUNDING WELLS, GROUNDWATER RESOURCES, AND RECEIVING WATERS

### 10.1 Well Interference

Drawdowns in bedrock can spread several hundred meters, but the groundwater usage and well yield in the area are small; therefore, pumping from the future production well(s) should have a minimal impact on other well users given the distance that separates them (>200m). The future well will have to be sited far enough away from the existing well on the property to not negatively interfere with each other resulting in loss of capacity.

### 10.2 Groundwater Quality

Siting of a new well on the proposed lot should be given careful consideration to ensure compliance with the BC Groundwater Regulation, the BC Sewerage System Regulation and the BC Health Hazards Regulation, which specify a minimum setback of 30 m between a drinking water well and a sewerage system or any other probable source of contamination (compost pile, animal pens/runs, areas of fertilizers/herbicides use or storage, etc.). The wellhead design will have to comply with the BC Groundwater Protection Regulation (surface seal, stick-up, well cap, etc.). The well will not have a negative impact on groundwater quality if it is built, operated and maintained in compliance with these regulations.

### 10.3 Groundwater Quantity

Every aquifer is susceptible to depletion when abstraction rates exceed recharge rates for extended periods of time, and particularly during summer and droughts. A bedrock aquifer is particularly at risk of depletion by over pumping. While Aquifer 211 has served as a reliable source of potable water for several decades, signs of aquifer stress have been reported in the RDN State of Our Aquifers (GW Solutions, 2017). Indeed, groundwater level decline has been observed in the Provincial Observation Well 388, located 1.2 km south of the Property. Over seven years, winter water levels have dropped from 5 to 10 m below ground and summer water levels from 14 to more than 25 m below ground (Figure 6). The aquifer represents a shared resource, which is capable of sustaining moderate flows in perpetuity; however, its use has to be managed to avoid depletion. To help protect the aquifer from further depletion, the Discover Montessori Society proposes to use a rainwater collection system and a drip irrigation system that minimize water usage. Also, low-flush toilets are considered to minimize water usage for the school operation.

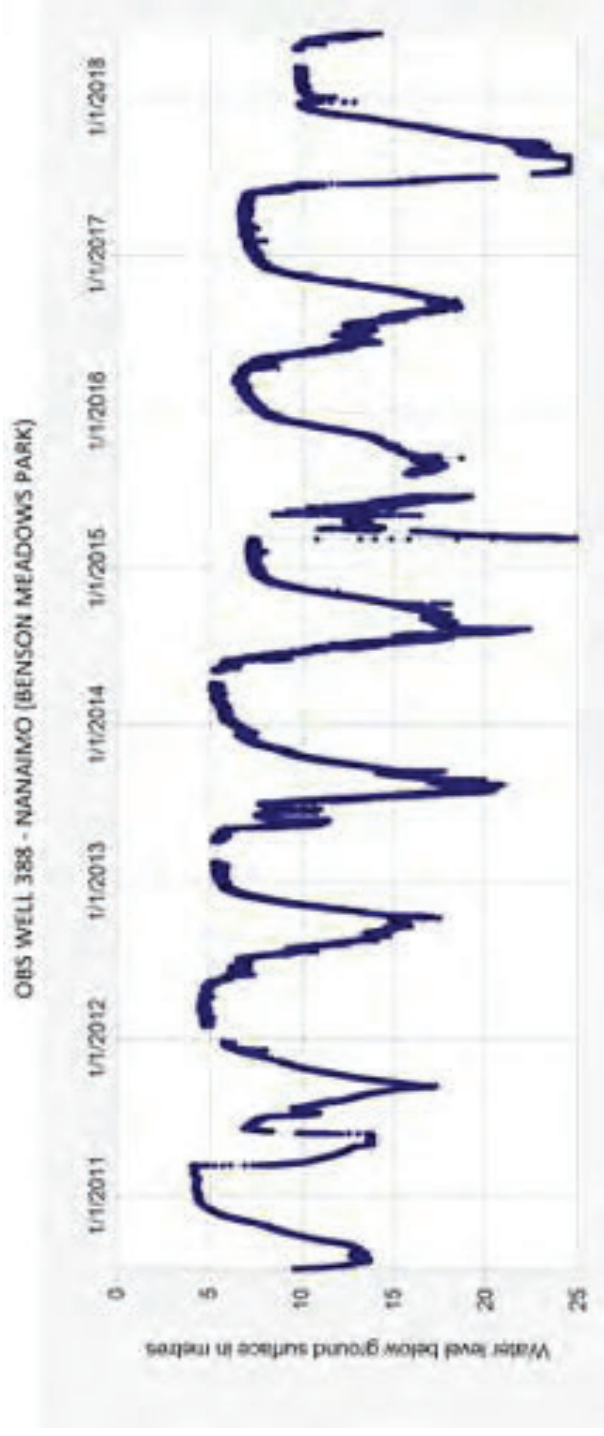


Figure 6. Water levels recorded at Provincial Observation Well 388 completed to 165 ft deep in volcanic formation

#### 10.4 Connection with Surface Water

Given the thickness of the low permeable sediment layer above the bedrock, hydraulic connection between groundwater and McClure Creek or the unnamed seasonal creek is unlikely near the Property. Therefore, withdrawal from Aquifer 211 should not have an impact on surface water flows in McClure Creek and the unnamed seasonal creek.

#### 10.5 Receiving Waters

The use of groundwater will not have an impact on the receiving environment if an adequate sewage system is designed and built.

## 11 CONCLUSIONS AND RECOMMENDATIONS

Based on the completed work and the available information reviewed, we draw the following conclusions:

1. Water demand for students and staff was estimated at between 4,250 L/d to 7,875 L/d (0.8 to 1.4 US gpm). The water demand for irrigating small crops near the classrooms is 0.124 USgpm. The water demand for the larger irrigation area outside of the proposed rezoning area was estimated at a peak flow of 5.6 US gpm.
2. There are a lot of unknowns regarding the existing drilled well (ID#13315) on the Property. The location of the water-bearing fractures and construction details are unknown. It is also unclear whether the rental unit will still continue using this well as a source of water after the school opens. Based on the short pumping test performed on September 9, 2019, the well may produce between 1 and 1.5 US gpm.
3. GW Solutions recommends that a new well be drilled and tested on the Property. GW Solutions considers it likely that a new well drilled on the Property could meet the maximum demand for the school operation, the irrigation demand for the small crops (0.124 USgpm), and possibly part of the irrigation demand (5.6 US gpm) (RDN requirement No. 1). The following options could also be considered for the irrigation demand:
  - o Use a rainwater collection system;
  - o Use the surface water licence on McClure Creek that allows for 0.25 US gpm.
4. Water from a newly built well will likely have similar water quality as existing well ID#13315. Water quality in well ID#13315 exceeds the Maximum Admissible Concentration for total coliforms, the Aesthetic Objectives for iron and colour, and the Operational Guideline for turbidity. Therefore, water from the new well will likely have to be treated.
5. It is unlikely that the new well will have adverse impacts on existing groundwater users given the distance from other wells and the relatively low water demand (RDN requirement No. 2).
6. It is unlikely that the new well will have adverse impacts on groundwater resources if water conservation measures are undertaken (e.g., rainwater collection, drip watering system, low-flush toilets) (RDN requirement No. 2).
7. Withdrawal from Aquifer 211 should not have an impact on surface water flows in McClure Creek and the unnamed seasonal creek given the thickness of the low permeable sediment layer above the bedrock (RDN requirement No. 2).

Considering the available options, GW Solutions considers that the RDN Policy B1.21 requirements will likely be met.





The RDN Policy B1.21 states that “Prior to bylaw adoption the applicant must receive and demonstrate to the RDN: - an approved groundwater license from the Province [...] – a source approval from the Vancouver Island Health Authority”. Therefore, we recommend discussing the options proposed in this report with representatives from Island Health and the Province before drilling and testing the new well.

## 12 REFERENCES

GW Solutions Inc, 2017. State of our aquifers, Aquifer 211, Regional District of Nanaimo.

## 13 STUDY LIMITATIONS

This document was prepared for the exclusive use of the Discover Montessori Society. The inferences concerning the data, site and receiving environment conditions contained in this document are based on information obtained during investigations conducted at the site by GW Solutions and others and are based solely on the condition of the site at the time of the site studies. Soil, surface water and groundwater conditions may vary with location, depth, time, sampling methodology, analytical techniques and other factors.

In evaluating the subject study area and water quality data, GW Solutions has relied in good faith on information provided. The factual data, interpretations and recommendations pertain to a specific project as described in this document, based on the information obtained during the assessment by GW Solutions on the dates cited in the document, and are not applicable to any other project or site location. GW Solutions accepts no responsibility for any deficiency or inaccuracy contained in this document as a result of reliance on the aforementioned information.

The findings and conclusions documented in this document have been prepared for the specific application to this project and have been developed in a manner consistent with that level of care normally exercised by hydrogeologists currently practicing under similar conditions in the jurisdiction.

GW Solutions makes no other warranty, expressed or implied and assumes no liability with respect to the use of the information contained in this document at the subject site, or any other site, for other than its intended purpose. Any use which a third party makes of this document, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. GW Solutions accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or action based on this document. All third parties relying on this document do so at their own risk. Electronic media is susceptible to unauthorized modification, deterioration and incompatibility and therefore no party can rely

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GW Solutions makes no other representation whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this document, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein.

If new information is discovered during future work, including excavations, sampling, soil boring, predictive geochemistry or other investigations, GW Solutions should be requested to re-evaluate the conclusions of this document and to provide amendments, as required, prior to any reliance upon the information presented herein. The validity of this document is affected by any change of site conditions, purpose, development plans or significant delay from the date of this document in initiating or completing the project.

The produced graphs, images, and maps have been generated to visualize results and assist in presenting information in a spatial and temporal context. The conclusions and recommendations presented in this document are based on the review of information available at the time the work was completed, and within the time and budget limitations of the scope of work.

The Discover Montessori Society may rely on the information contained in this memorandum subject to the above limitations.

## 14 CLOSURE

Conclusions and recommendations presented herein are based on available information at the time of the study. The work has been carried out in accordance with generally accepted engineering practice. No other warranty is made, either expressed or implied. Engineering judgement has been applied in producing this letter-report.

This letter report was prepared by personnel with professional experience in the fields covered. Reference should be made to the General Conditions and Limitations attached in Appendix 5.

GW Solutions was pleased to produce this document. If you have any questions, please contact me.

Yours truly,

**GW Solutions Inc.**



Dr. Sandra Richard,  
Ph.D. in hydrogeology


Gilles Wendling, Ph.D., P.Eng.  
President





## **APPENDIX 1**

### **PROPOSED SCHOOL PLAN**



Notes:  
 1. All dimensions are in feet and inches (F'-IN").  
 2. All dimensions are to the center of the structure unless otherwise noted.  
 3. All dimensions are to the center of the structure unless otherwise noted.  
 4. All dimensions are to the center of the structure unless otherwise noted.  
 5. All dimensions are to the center of the structure unless otherwise noted.

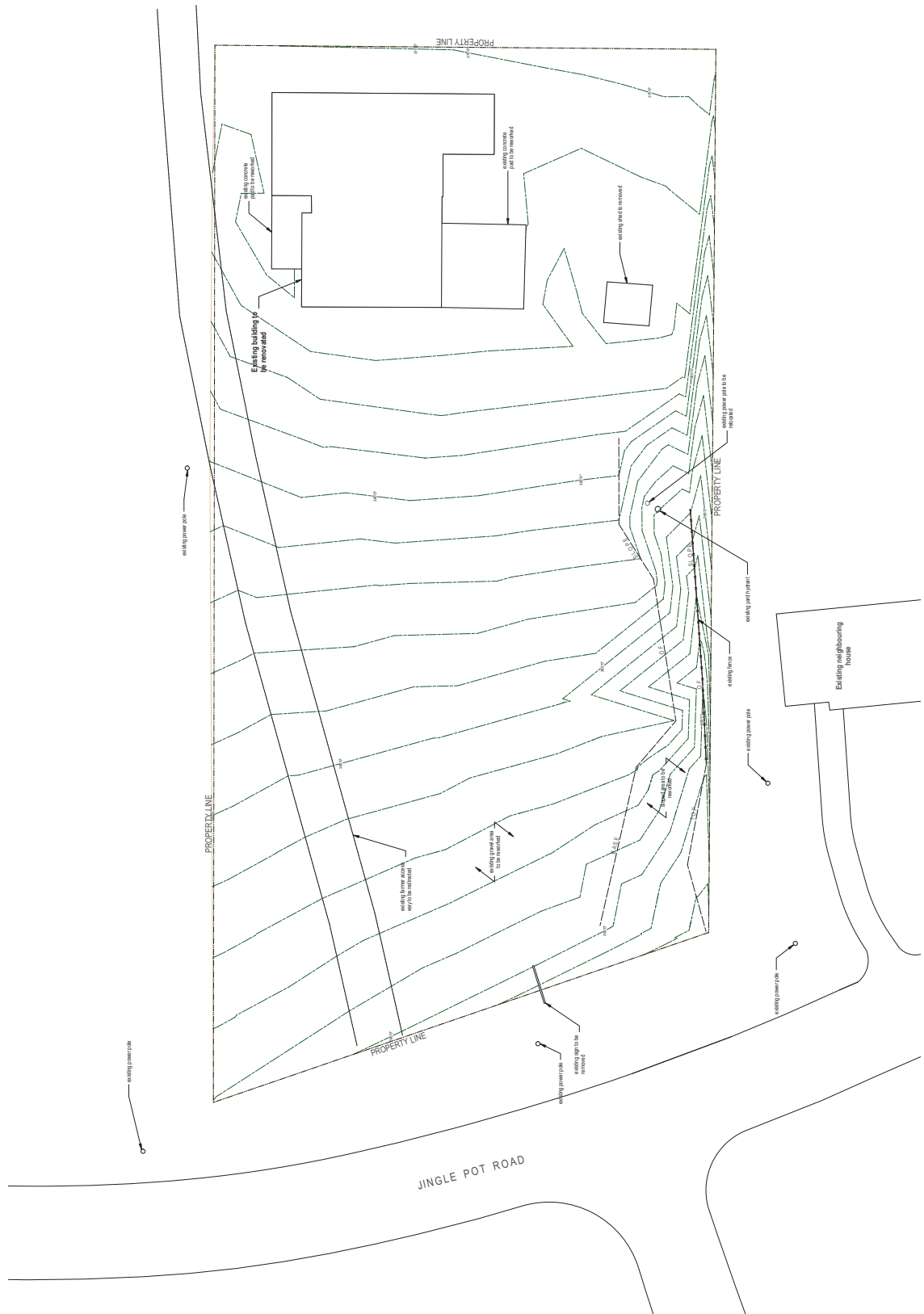
**Building Areas**  
 New building: 12,492 sf.  
 Existing building: 4,292 sf.

**1 Site Plan**  
 A01 1/200

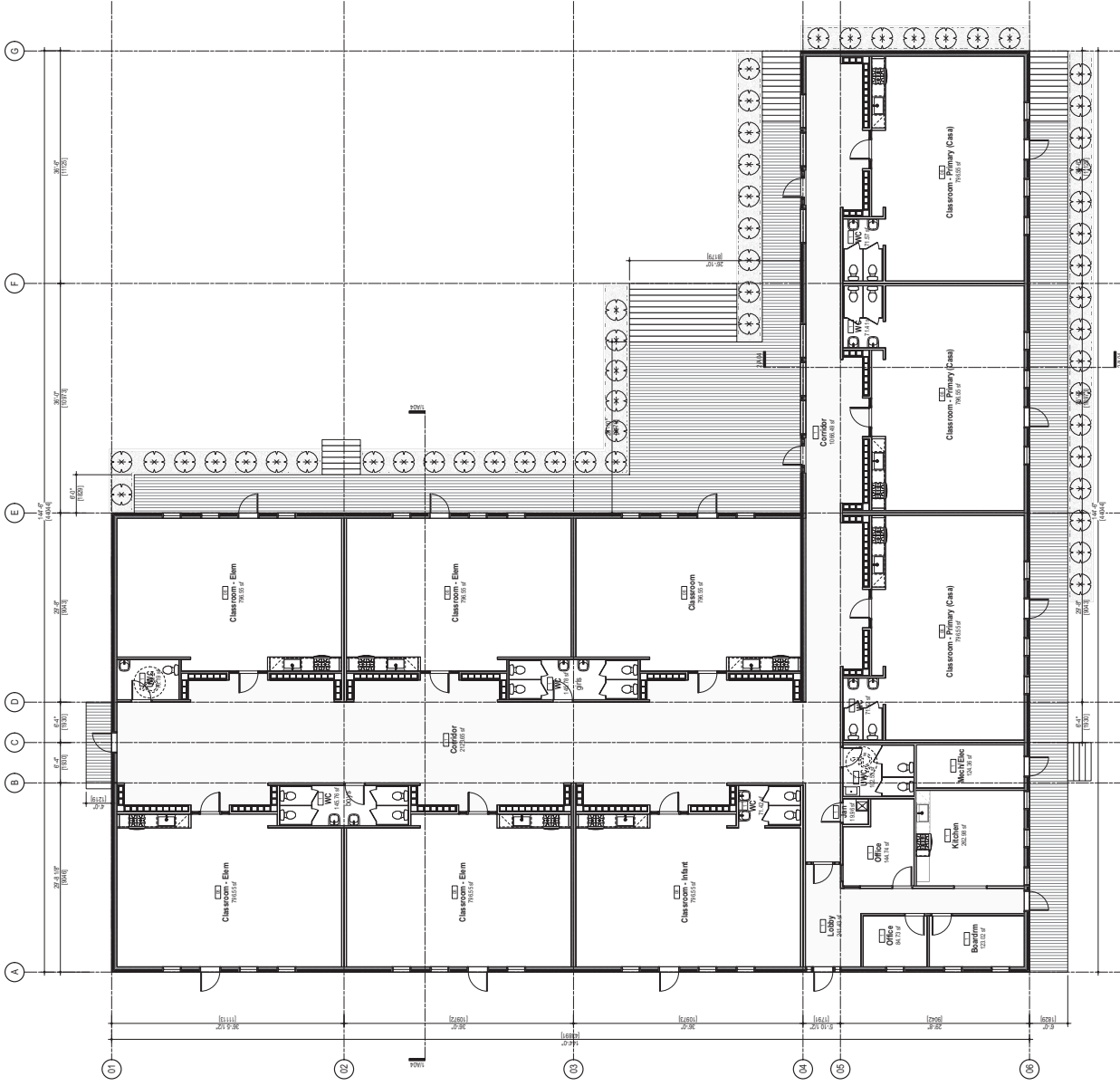
**CHESKITCH ARCHITECTS INC.**  
 440 Commercial Street, Nanaimo, BC V9R 5G2  
 250.744.9899  
 www.cheskitch.com  
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**Discover Montessori**  
 3452 Jingle Pot Road, Nanaimo, BC

NOT FOR CONSTRUCTION - FOR REVIEW ONLY  
 Sheet Number: **A01**  
 Project Name: Discover Montessori  
 Date: 2020.05.21  
 Author: JC  
 Reviewer: Review



**Discover Montessori**  
 3452 Jingle Pot Road, Nanaimo, BC

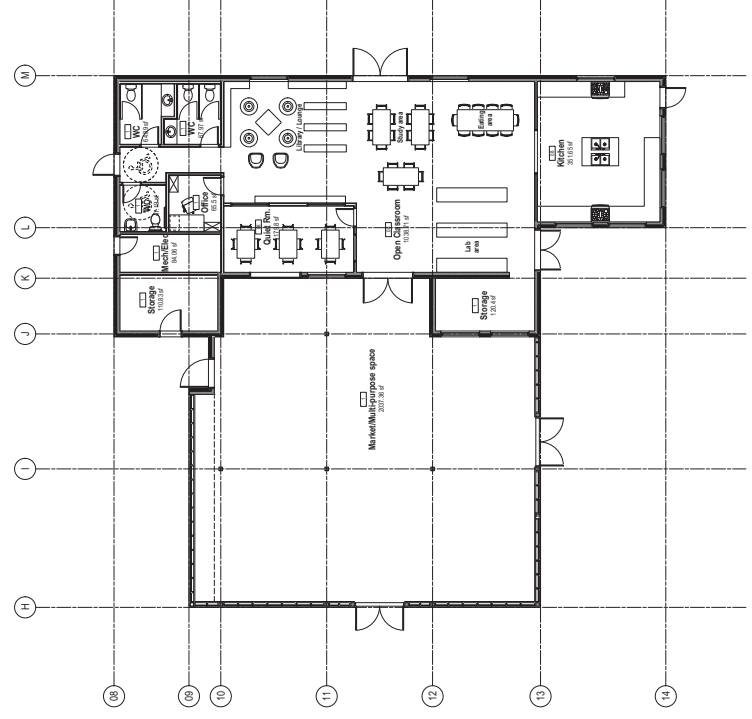


1. Floor Plan [New Building]  
A02 1:100

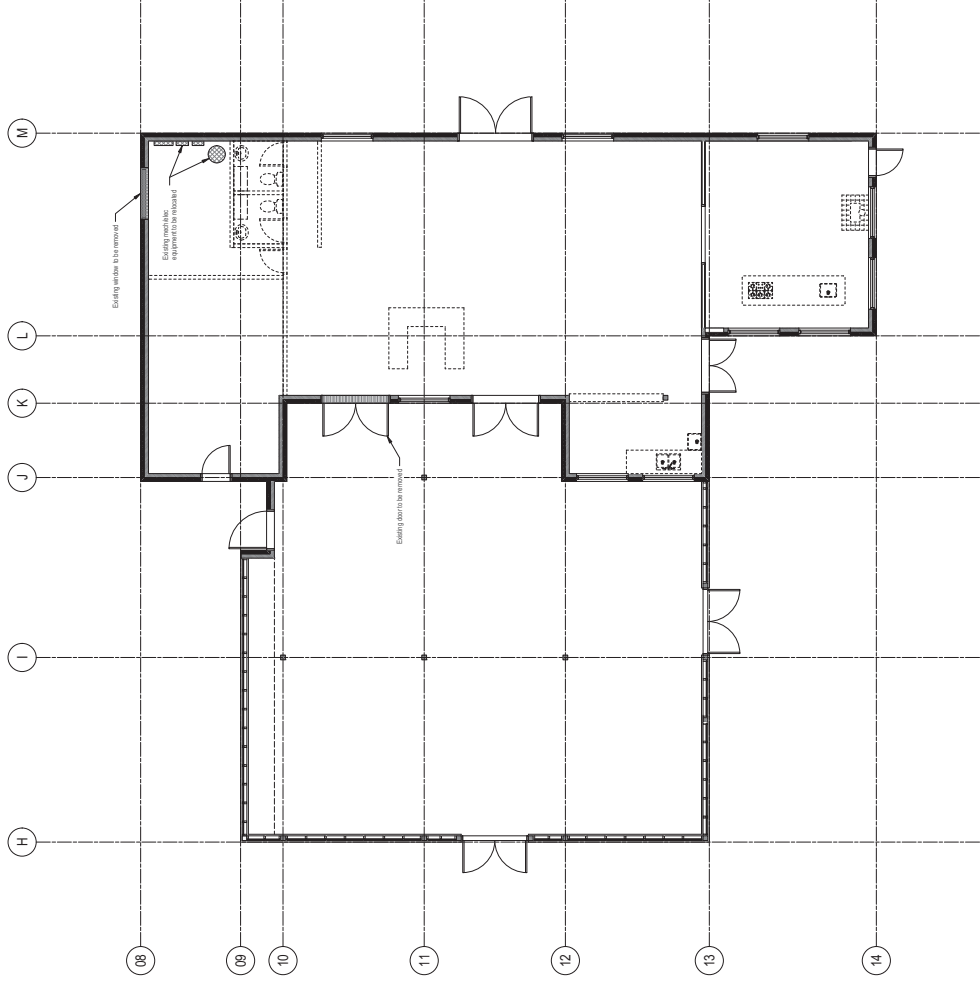
**CHECKSWITCH ARCHITECTS**  
 440 Commercial Street, Nanaimo, BC V9R 5G3  
 250.244.9090  
 www.checkswitch.ca  
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**Discover Montessori**  
 3452 Jingle Pot Road, Nanaimo, BC

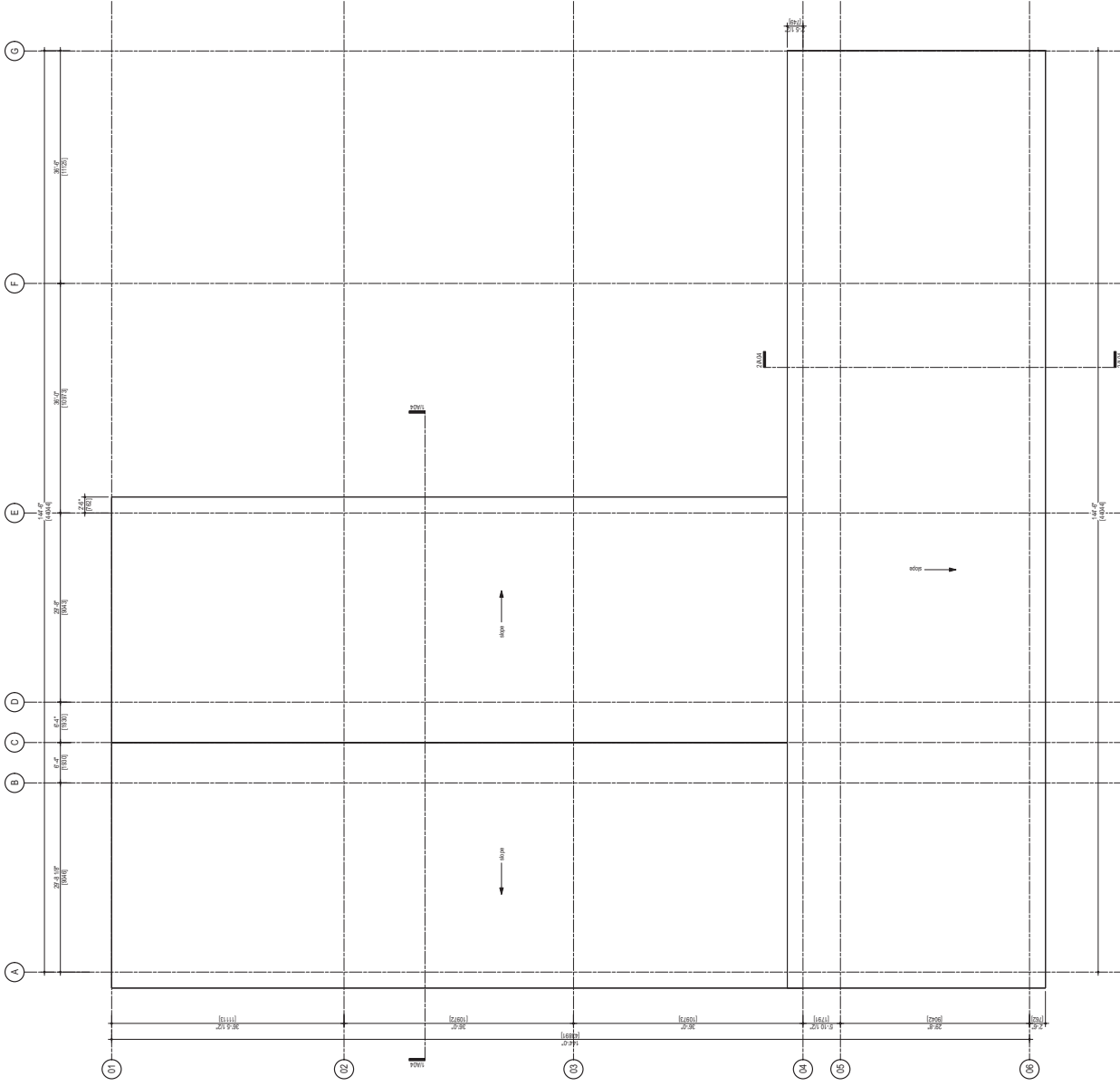
NOT FOR CONSTRUCTION - FOR REVIEW ONLY  
 Project Number: **A02**  
 Client: **Discover Montessori**  
 Designer: **JC**  
 Date: **2020.05.21**  
 Scale: **1:15**  
 Title: **Floor Plans**  
 Reviewer: **BC**



2. Floor Plan [Existing Building]  
A02 1:100



- Existing to be removed
- Existing to be relocated
- Existing opening to be filled

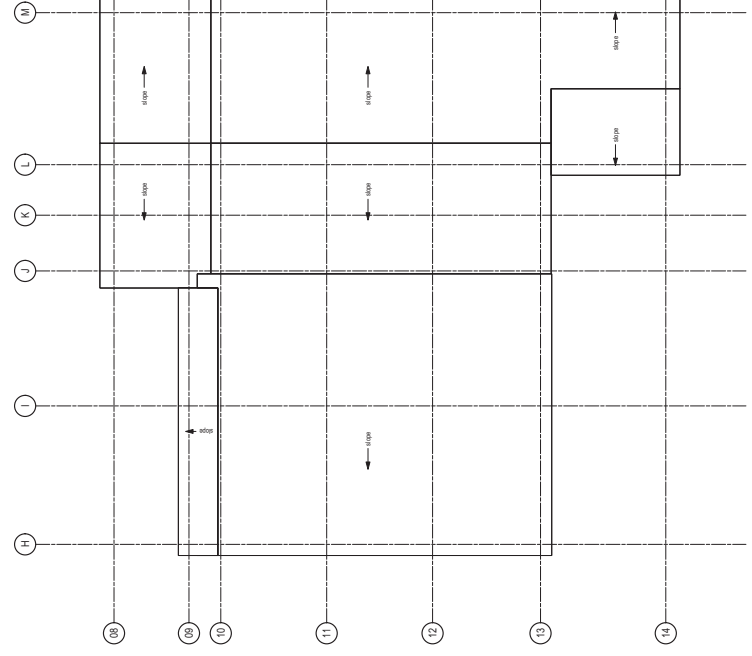


1 Roof Plan [New Building]  
A03 1:100

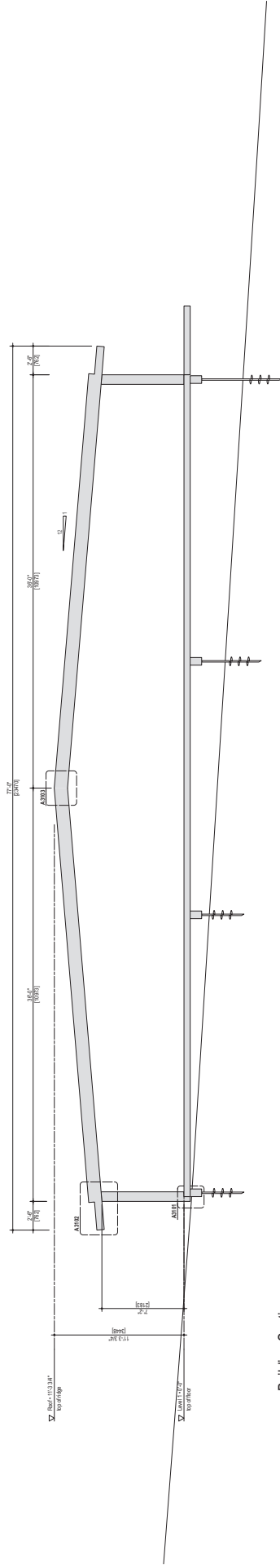
**CHECKSWITCH ARCHITECTS**  
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250.744.9800  
www.checkswitch.com

**Discover Montessori**  
3452 Jingle Pot Road, Nanaimo, BC

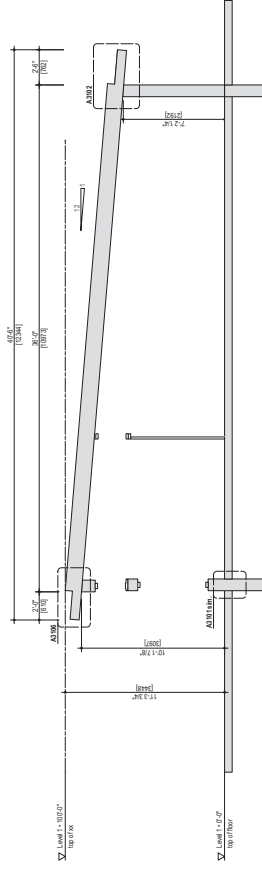
NOT FOR CONSTRUCTION - FOR REVIEW ONLY  
Project Number: **A03**  
Drawn By: **JC**  
Checked By: **BC**  
Date: **2020.05.21**  
Scale: **1:5**  
Title: **Roof Plans**  
Revision: **Review**



2 Roof Plan [Existing Building]  
A03 1:100



1 Building Section  
A04 1/30



2 Building Section  
A04 1/30

## **APPENDIX 2**

### **BC AGRICULTURE WATER DEMAND CALCULATOR**



# Agriculture Water Demand Report

Generated by: [www.bcagriculturewatercalculator.ca](http://www.bcagriculturewatercalculator.ca) (v2.0.1)

Date: Feb. 21, 2020

## Property

**Property ID (PID):** 009456295

**Total Area:** 72,650 m<sup>2</sup>

## Irrigation

**Irrigated Area:** 100 m<sup>2</sup>

**Crop:** Vegetable

**Soil:** Clay

**Irrigation Type:** Handline

**Climate ID:** 25661797

**Peak Evapotranspiration (ET):** 5 mm/day

**Peak Flow Rate:** 0.124 gpm

**Irrigation season:** May 1 - Sep 15 (138 days)

### Irrigation water demand by month:

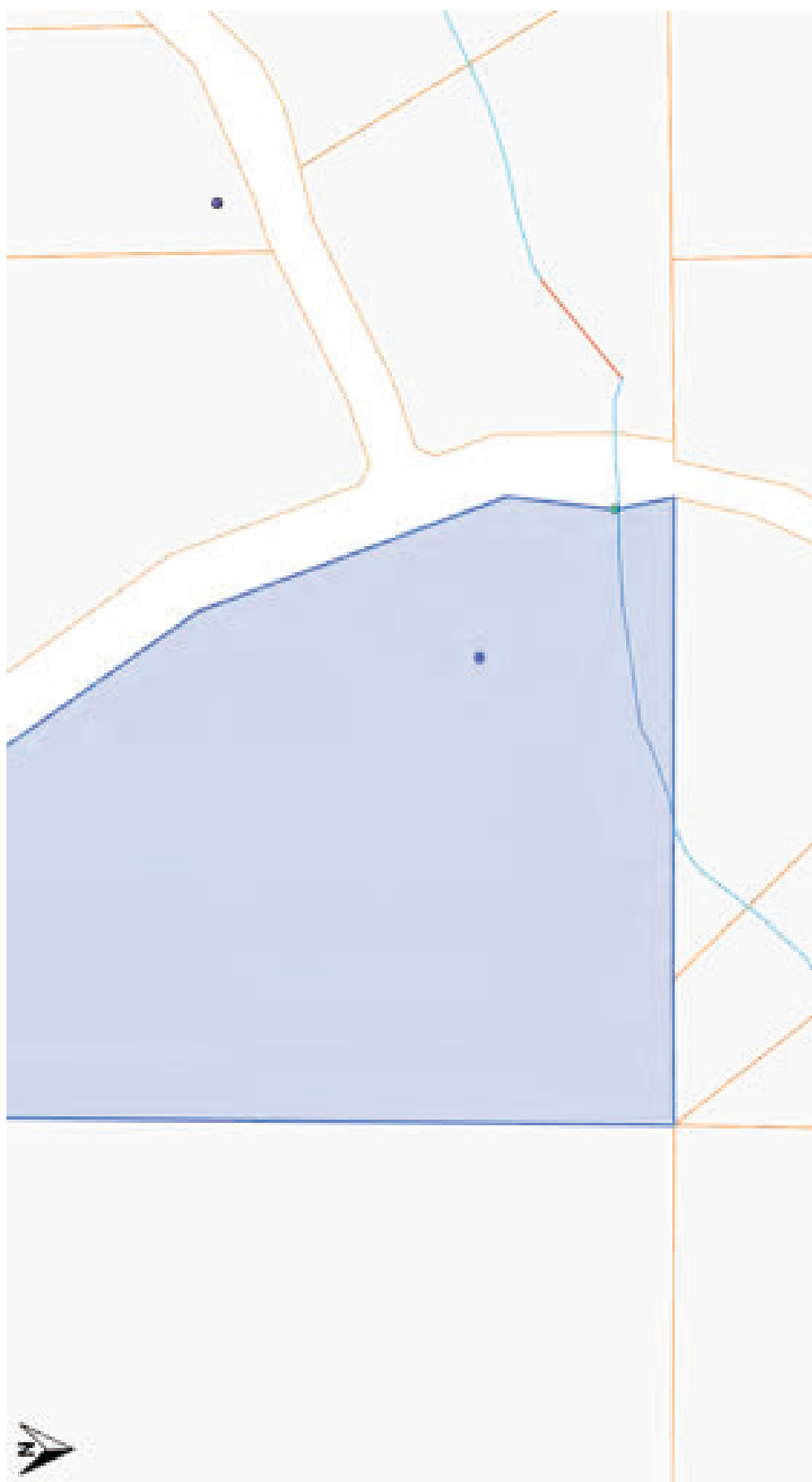
|           |                    |
|-----------|--------------------|
| January   | -                  |
| February  | -                  |
| March     | -                  |
| April     | -                  |
| May       | 1.4 m <sup>3</sup> |
| June      | 4.5 m <sup>3</sup> |
| July      | 6 m <sup>3</sup>   |
| August    | 4.6 m <sup>3</sup> |
| September | 1.1 m <sup>3</sup> |
| October   | -                  |
| November  | -                  |
| December  | -                  |

**Annual irrigation water demand:** 18 m<sup>3</sup>

## Livestock

No Livestock

**Total annual water demand:** 18 m<sup>3</sup>



# Agriculture Water Demand Report

Generated by: [www.bcagriculturewatercalculator.ca](http://www.bcagriculturewatercalculator.ca) (v1.4.0)

Date: Sep. 19, 2019

## Property

**Property ID (PID):** 009456295

**Total Area:** 72,650 m<sup>2</sup>

## Irrigation

**Irrigated Area:** 4,500 m<sup>2</sup>

**Crop:** Vegetable

**Soil:** Clay

**Irrigation Type:** Drip

**Climate ID:** 25661797

**Peak Evapotranspiration (ET):** 5 mm/day

**Peak Flow Rate:** 5.6 gpm

**Irrigation season:** May 1 - Sep 15 (138 days)

### Irrigation water demand by month:

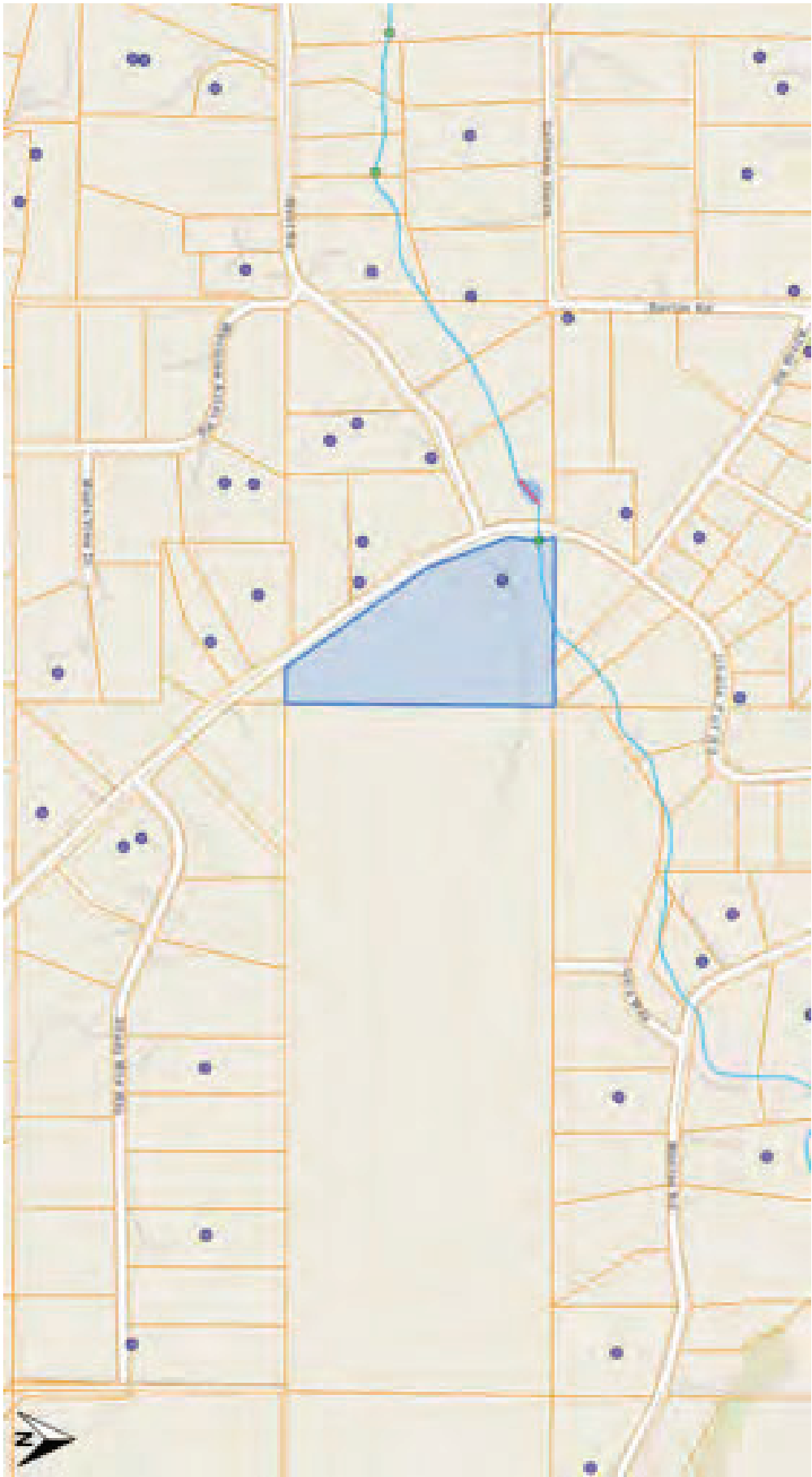
|           |                     |
|-----------|---------------------|
| January   | -                   |
| February  | -                   |
| March     | -                   |
| April     | -                   |
| May       | 49.1 m <sup>3</sup> |
| June      | 160 m <sup>3</sup>  |
| July      | 210 m <sup>3</sup>  |
| August    | 160 m <sup>3</sup>  |
| September | 39 m <sup>3</sup>   |
| October   | -                   |
| November  | -                   |
| December  | -                   |

**Annual irrigation water demand:** 618 m<sup>3</sup>

## Livestock

No Livestock

**Total annual water demand:** 620 m<sup>3</sup>



## Water sources on the selected property

### ● Wells

- Location (WGS84): 49.18773601,-124.04357758  
Tag: 13048  
Depth (ft): 27

### ● Points of Diversion

- Location (WGS84): 49.1882296,-124.0444017  
License #: C130855  
Source: McClure Creek
- Location (WGS84): 49.1882296,-124.0444017  
License #: C130847  
Source: McClure Creek



## **APPENDIX 3**

### EXISTING WELL CONSTRUCTION REPORT (WTN 13048)

092F-020.4.4.3

R 6.3 SEC 16

1-3

WATER RIGHTS BRANCH, DEPT. OF LANDS AND FORESTS, VICTORIA, B.C.

LOCATION: COMPLETE (LAND) OR PARTIAL (WATER) Section 9.3, Chehalis District

OWNER'S NAME: Holtz ADDRESS: Klybort Pt

DRIER'S NAME: ADDRESS: DATE OF COMPLETION:

DEPTH: 27' SELECTION OF COLLAR: 390' CASING DIA: LENGTH: TYPE:

METHOD OF DRILLING: SCREEN:  SIZE: LENGTH: TYPE:

PERFORATED CASING:  LENGTH: SIZE: SPEARMAN: REVOLVED:  DESCRIBE: WTM: 1300

DRIVEL BACK:  LENGTH: DOWN: SEE UNRAVEL, ETC.

PUMP:  TYPE: POWER:

CAPACITY: OTHER DATA:

ROD: WELL: PUMP: PUMP HOUSE: ETC.

MAINTENANCE:

DISTANCE TO WATER:  ESTIMATED ELEVATION: 390' FLUCTUATION:

MEASUREMENTS: MEASURED ELEVATION: OBSERVATION DATA:  FILE NO:

WATER USE:

WELL RATE: ESTIMATED:  MEASURED:

TEMPERATURE: PUMPS SAND:

CLOGS SCREEN:  TYPE: CORRECT: ADJUSTED DATA: Shelley

CHARGE NO: DATE: LEGEND: AMOUNT:

DATE APPLICABLE: (SEE)



LOCATION: BASES: INDICATE WITH:

WATER QUALITY: Air supply

WATER QUALITY: Well located in creek bed

WATER QUALITY: Well located in creek bed

WATER QUALITY: Well located in creek bed

WATER QUALITY: Well located in creek bed

WATER QUALITY: Well located in creek bed

| FROM | TO | DESCRIPTION | DAYS |
|------|----|-------------|------|
|      |    |             |      |
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|      |    |             |      |

SAMPLE NO. \_\_\_\_\_ DATE \_\_\_\_\_

LAB \_\_\_\_\_  
 SOLUTION COLONIES \_\_\_\_\_  
 TOTAL BACTERIA \_\_\_\_\_

COLOR \_\_\_\_\_ DOOR \_\_\_\_\_  
 TASTE \_\_\_\_\_

PUMPING TEST SUMMARY

TEST BY \_\_\_\_\_  
 DATE \_\_\_\_\_ FILE NO. \_\_\_\_\_  
 SPECIFIC CAPACITY \_\_\_\_\_ PERMEABILITY \_\_\_\_\_  
 STORAGE COEFF. \_\_\_\_\_ POROSITY \_\_\_\_\_  
 REMARKS \_\_\_\_\_

OTHER DATA

SEE ANALYSIS ETC. \_\_\_\_\_

LAB BY: J.C. DATE: 12-2-63  
 ANALYSIS: R.S.C.

| ANALYSIS           |  | UNIT |
|--------------------|--|------|
| Total Acidities    |  |      |
| Carbonate Hard     |  |      |
| Non-carbonate Hard |  |      |
| Ca                 |  |      |
| Mg                 |  |      |
| Total Solids       |  |      |
| Turbidity          |  |      |
| Color              |  |      |
| Iron               |  |      |
| Manganese          |  |      |
| Fluoride           |  |      |
| Oil                |  |      |
| Residue            |  |      |
| Temperature        |  |      |
| Loss of Weight     |  |      |
| Moisture           |  |      |
| Loss on Ignition   |  |      |
| Other              |  |      |

## **APPENDIX 4**

### **WATER QUALITY REPORT**



**Client/Code**

A.C. Aquifer - Duncan BR - F211 Date received 12/22/06 No. 414-9785  
 3299 Transit Canada Hwy Source well  
 Duncan, BC Type of Sample water  
 V8L 372 No. of Samples 1

FEL: (250) 246-4041 Comments arrived clean. FPC  
 email: info@caquifer.ca sampler: Curt

Sample Description: Montessori, 3451 Jingle Pot Road

| Site Code | Date       | Time  | CFU/100 ml |      | CFU/100 ml |      | CFU/100 ml |      | Total | Coliform Bacteria |      | Total |
|-----------|------------|-------|------------|------|------------|------|------------|------|-------|-------------------|------|-------|
|           |            |       | T          | F-48 | T          | F-48 | T          | F-48 |       | Iron              | Iron |       |
| See cell  | 2006/12/22 | 08:50 | 0          | 0    | 0          | 0    | 0          | 0    | 0     | 0                 | 0    | 0     |

| Sample   | Date       | Time  | Lactose |       | Coliform |      | Total | Coliform Bacteria |         | Total |
|----------|------------|-------|---------|-------|----------|------|-------|-------------------|---------|-------|
|          |            |       | Present | Count | Total    | F-48 |       | Iron              | Iron    |       |
| See cell | 2006/12/22 | 08:50 | 0.00    | 0.00  | 00       | 00   | 00    | 00 / 00           | 00 / 00 | 000   |

\* all counts are colony forming units per millilitre

T = total coliform bacteria Tc = total coliform bacteria (aka Thermotolerant Coliforms)

F = fecal coliform bacteria F- = feces detected

TFC = total plate count- spread plate method - 20C/48hr 100ul F0/100ul 100ul 100ul + Revision 4, 1998, No. 2007

CFU = colony forming units

Results may be adversely affected if samples are submitted to the laboratory more than 24 to 36 hours after collection.

E. coli - Escherichia coli, F0/100 (10 ul, 1995) + Revision 4, 1998  
 Berg's Manual of Systematic Bacteriology vol 1, 1980-1994; J.Clin.Micro.,  
 3, 1994; Syst.Bact.

**Comments**

For Interpretation of Results:

Total, Faecal Coliforms or E.coli present greater than 6 CFU/100ml (0 CFU/ml).

If Coliform numbers exceed safe limits for drinking water, water is not suitable for drinking without treatment.

Total fecal coliform bacteria (Lactose Fermenters) equal to or greater than 100 CFU/100ml (2.0 CFU/ml).

If the number organisms present exceed recommended guidelines for drinking water, treatment is strongly recommended.

If Total Plate Count Bacteria are -

A) greater than 100 CFU/ml.

High numbers of microbial organisms indicate that this water supply should be considered as a microbial hazard.

B) greater than 500 CFU/ml.

The number of organisms present exceed recommended guidelines for drinking water; treatment is strongly recommended.

- See following page for chemistry results -

E. Ferguson-Martinez  
 Microbiologist

M. Figg  
 Sr. Microbiologist





## Client/Code

B.L. Aquifer - Duncan 58 - 8/1  
 5295 Frere Canada Way  
 Duncan, BC  
 V9L 5J2

Date 10Sep19 13:32p  
 Source Well  
 Type of Sample water  
 No. of Samples 1

No. W44795-02

TEL: (250) 756-5001  
 email: info@bcquifer.ca

Comments: arrival temp: 9.0C  
 Sampler: Cert

Supplier: Discovery Multisari, 5811 Irving Pk Road - New Mill, RM5017 04150

| ELEMENT                            |            | SAMPLE |       | UNITS | Maximum Limits Permissible<br>in Drinking Water* |
|------------------------------------|------------|--------|-------|-------|--|
| 1)                                 | Aluminium  | Al     | 6.62  | mg/L  | no limit listed                                  |
| 2)                                 | Antimony   | Sb     | 0.000 | mg/L  | 6.00 mg/L  |
| 3)                                 | Arsenic    | As     | 0.000 | mg/L  | 10.0 mg/L  |
| 4)                                 | Barium     | Ba     | 0.000 | mg/L  | 1.00 mg/L  |
| 5)                                 | Beryllium  | Be     | 0.000 | mg/L  | no limit listed                                  |
| 6)                                 | Boron      | B      | 1.22  | mg/L  | 3.00 mg/L  |
| 7)                                 | Cadmium    | Cd     | 0.000 | mg/L  | 0.00 mg/L  |
| 8)                                 | Calcium    | Ca     | 4.05  | mg/L  | 200 mg/L   |
| 9)                                 | Chromium   | Cr     | 0.000 | mg/L  | 0.050 mg/L                                       |
| 10)                                | Cobalt     | Co     | 0.000 | mg/L  | no limit listed                                  |
| 11)                                | Copper     | Cu     | 0.000 | mg/L  | 1.00 mg/L  |
| 12)                                | Cold       | Cu     | 0.040 | mg/L  | no limit listed                                  |
| 13)                                | Iron       | Fe     | 3.53  | mg/L  | 0.300 mg/L                                       |
| 14)                                | Lithium    | Li     | 0.000 | mg/L  | no limit listed                                  |
| 15)                                | Lead       | Pb     | 0.000 | ug/L  | 5.00 mg/L  |
| 16)                                | Magnesium  | Mg     | 0.520 | mg/L  | 50.0 mg/L  |
| 17)                                | Manganese  | Mn     | 0.000 | mg/L  | 0.100 mg/L                                       |
| 18)                                | Mercury    | Hg     | 0.000 | mg/L  | 1.00 mg/L  |
| 19)                                | Molybdenum | Mo     | 0.000 | mg/L  | no limit listed                                  |
| 20)                                | Nickel     | Ni     | 0.000 | mg/L  | no limit listed                                  |
| 21)                                | Phosphorus | P      | 0.000 | mg/L  | no limit listed                                  |
| 22)                                | Potassium  | K      | 0.680 | mg/L  | no limit listed                                  |
| 23)                                | Selenium   | Se     | 0.000 | mg/L  | no limit listed                                  |
| 24)                                | Selenium   | Se     | 0.000 | ug/L  | 0.0 mg/L   |
| 25)                                | Silicon    | Si     | 3.77  | mg/L  | no limit listed                                  |
| 26)                                | Silver     | Ag     | 0.000 | mg/L  | no limit listed                                  |
| 27)                                | Sodium     | Na     | 120   | mg/L  | 200 mg/L   |
| 28)                                | Strontium  | Sr     | 0.000 | mg/L  | no limit listed                                  |
| 29)                                | Tin        | Sn     | 0.000 | mg/L  | no limit listed                                  |
| 30)                                | Titanium   | Ti     | 0.000 | mg/L  | no limit listed                                  |
| 31)                                | Zinc       | Zn     | 0.000 | mg/L  | no limit listed                                  |
| 32)                                | Zinc       | Zn     | 0.000 | mg/L  | 0.00 mg/L  |
| 33)                                | Zinc       | Zn     | 0.000 | mg/L  | 0.00 mg/L  |
| Hardness (mg/L CaCO <sub>3</sub> ) |            |        | 11.2  | mg/L  | 0-70 mg/L = soft                                 |
| pH                                 |            |        | 8.75  | units | 6.5 to 8.5                                       |

\* As per Canadian or B.C. Health Act Safe Drinking Water Regulation BC Reg 250/92, 4 396 Sch 1/2, 2001. Task Force of the Canadian Council of Ministers and Environment Ministers - Guidelines for Canadian Drinking Water Quality, 2018.

## Comments:

Iron: high amounts of iron can cause staining of laundry, porcelain and dishes.  
 Fluoride: has proven an undesirable taste. Essential for health.

High extremes in pH can lead to corrosion (too low 6.5) or incrustation (too high 8.5) of pipes & plumbing fixtures. Water with low pH allows metals to dissolve into water; water with high pH reduces disinfection efficacy; increases DMG-scale formations.



ANALYTICAL & TESTING SERVICES P.O. BOX 2103, SIDNEY, B.C. V8L 3S8

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 Analytical Chemist

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 Sr. Analytical Chemist

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## Client/Code

B.C. Aquifer - Duncan 38 - 8/11  
 5293 Truss Canada Hwy  
 Duncan, BC  
 YR 332

Date: 12/12/11  
 Source: Well  
 Type of Sample: water  
 No. of Samples: 1

NO. W49915 031

TEL: (250) 748-4844  
 email: info@bcaquifer.ca

Comments: Analytical Report: 0.05  
 Sampler: Gork

## Sample Discovery Worksheet - 2011 Single Shot Test

| SAMPLE     | DATE    | TIME  | QUALITY      | NO. 1        | Cl           | Color         | T.C.        |
|------------|---------|-------|--------------|--------------|--------------|---------------|-------------|
| Raw Well   |         |       | (%)          | (mg/L)       | (mg/L)       | (mg/L)        | (mg/L)      |
| Lab Blank  | 09Dec11 | 04:50 | 175          | 41.8         | 78.8         | 5.1           | 51          |
|            |         |       | 85           | 85           | 85           | 85            | 85          |
| $S_d$      |         |       | 3.0%         | 0.251        | 0.012        | 0.209         | 0.188       |
| REF. VALUE |         |       | 100          | 10.0         | 100          | 3.00          | 107         |
| STO ± SD   |         |       | 199 ± 11.4   | 28.7 ± 1.41  | 106 ± 8.12   | 4.91 ± 0.144  | 143 ± 8.91  |
| SAMPLE     | DATE    | TIME  | QUALITY      | F            | SP           | TH            | NO. 4       |
| Raw Well   |         |       | (%)          | (mg/L)       | (mg/L)       | (mg/L)        | (mg/L)      |
| Lab Blank  | 09Dec11 | 04:50 | 125          | 0.125        | 80           | 0.991         | 21.4        |
|            |         |       | 85           | 85           | 85           | 85            | 85          |
| $S_d$      |         |       |              | 0.001 mg/L   | 0.001        | 0.002         | 0.188       |
| REF. VALUE |         |       |              | 1.00         | 50.0         | 1.000         | 20.0        |
| STO ± SD   |         |       |              | 1.07 ± 0.082 | 35.0 ± 4.47  | 0.104 ± 0.001 | 43.7 ± 2.47 |
| SAMPLE     | DATE    | TIME  | NO. 1        | NO. 2        | T.C.         | TH            | TH          |
| Raw Well   |         |       | (mg/L)       | (mg/L)       | (mg/L)       | (mg/L)        | (mg/L)      |
| Lab Blank  | 09Dec11 | 04:50 | 85           | 4.26         | 0.498        | 1.471         | 23          |
|            |         |       | 85           | 85           | 85           | 85            | 85          |
| $S_d$      |         |       | 4.209        | 0.073        | 0.200        | 0.079         | 0.100       |
| REF. VALUE |         |       | 10.0         | 10.0         | 10.0         | 1.00          | 200         |
| STO ± SD   |         |       | 3.91 ± 0.103 | 10.4 ± 0.700 | 3.79 ± 0.119 | 0.93 ± 0.082  | 179 ± 18.4  |
| SAMPLE     | DATE    | TIME  | QUALITY      | APP          | TH           | TH            | TH          |
| Raw Well   |         |       | (%)          | (%)          | (mg/L)       | (mg/L)        | (mg/L)      |
| Lab Blank  | 09Dec11 | 04:50 | 101          | 61.1         |              |               |             |
|            |         |       | 85           | 85           |              |               |             |
| $S_d$      |         |       | 0.015        | 0.001        |              |               |             |
| REF. VALUE |         |       | 48.0         | 80.0         |              |               |             |
| STO ± SD   |         |       | 48.8 ± 1.88  | 80.2 ± 4.02  |              |               |             |

SD = standard deviation

STO = secondary standard calibrated to primary standard reference material

$S_d$  = standard deviation at zero analyte concentration: method detection limit

is generally considered to be  $S_d$   $S_d$  value

ND = non detected n/a = not applicable



R. Hodson  
 Analytical Director

R. Hodson  
 Dr. Analytical Director

## **APPENDIX 5**

### **GW SOLUTIONS INC. GENERAL CONDITIONS AND LIMITATIONS**

This report incorporates and is subject to these “General Conditions and Limitations”.

### 1.0 USE OF REPORT

This report pertains to a specific area, a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment. This report and the assessments and recommendations contained in it are intended for the sole use of GW SOLUTIONS's client. GW SOLUTIONS does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than GW SOLUTIONS's client unless otherwise authorized in writing by GW SOLUTIONS. Any unauthorized use of the report is at the sole risk of the user. This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of GW SOLUTIONS. Additional copies of the report, if required, may be obtained upon request.

### 2.0 LIMITATIONS OF REPORT

This report is based solely on the conditions which existed within the study area or on site at the time of GW SOLUTIONS's investigation. The client, and any other parties using this report with the express written consent of the client and GW SOLUTIONS, acknowledge that conditions affecting the environmental assessment of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive. The client, and any other party using this report with the express written consent of the client and GW SOLUTIONS, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the area or subject site and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made. The client acknowledges that GW SOLUTIONS is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the client.

### 2.1 INFORMATION PROVIDED TO GW SOLUTIONS BY OTHERS

During the performance of the work and the preparation of this report, GW SOLUTIONS may have relied on information provided by persons other than the client. While GW SOLUTIONS endeavours to verify the accuracy of such information when instructed to do so by the client, GW SOLUTIONS accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

### 3.0 LIMITATION OF LIABILITY

The client recognizes that property containing contaminants and hazardous wastes creates a high risk of claims brought by third parties arising out of the presence of those materials. In consideration of these risks, and in consideration of GW SOLUTIONS providing the services requested, the client agrees that GW SOLUTIONS's liability to the client, with respect to any issues relating to contaminants or other hazardous wastes located on the subject site shall be limited as follows:

- (1) With respect to any claims brought against GW SOLUTIONS by the client arising out of the provision or failure to provide services hereunder shall be limited to the amount of fees paid by the client to GW SOLUTIONS under this Agreement, whether the action is based on breach of contract or tort;
- (2) With respect to claims brought by third parties arising out of the presence of contaminants or hazardous wastes on the subject site, the client agrees to indemnify, defend and hold harmless GW SOLUTIONS from and against any and all claim or claims, action or actions, demands, damages, penalties, fines, losses, costs and expenses of every nature and kind whatsoever, including solicitor-client costs, arising or alleged to arise either in whole or part out of services provided by GW SOLUTIONS, whether the claim be brought against GW SOLUTIONS for breach of contract or tort.

### 4.0 JOB SITE SAFETY

GW SOLUTIONS is only responsible for the activities of its employees on the job site and is not responsible for the supervision of any other persons whatsoever. The presence of GW SOLUTIONS personnel on site shall not be construed in any way to relieve the



client or any other persons on site from their responsibility for job site safety.

#### **5.0 DISCLOSURE OF INFORMATION BY CLIENT**

The client agrees to fully cooperate with GW SOLUTIONS with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The client acknowledges that in order for GW SOLUTIONS to properly provide the service, GW SOLUTIONS is relying upon the full disclosure and accuracy of any such information.

#### **6.0 STANDARD OF CARE**

Services performed by GW SOLUTIONS for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Engineering judgement has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

#### **7.0 EMERGENCY PROCEDURES**

The client undertakes to inform GW SOLUTIONS of all hazardous conditions, or possible hazardous conditions which are known to it. The client recognizes that the activities of GW SOLUTIONS may uncover previously unknown hazardous materials or conditions and that such discovery may result in the necessity to undertake emergency procedures to protect GW SOLUTIONS employees, other persons and the environment. These procedures may involve additional costs outside of any budgets previously agreed upon. The client agrees to pay GW SOLUTIONS for any expenses incurred as a result of such discoveries and to compensate GW SOLUTIONS through payment of additional fees and expenses for time spent by GW SOLUTIONS to deal with the consequences of such discoveries.

#### **8.0 NOTIFICATION OF AUTHORITIES**

The client acknowledges that in certain instances the discovery of hazardous substances or conditions and materials may require that

regulatory agencies and other persons be informed, and the client agrees that notification to such bodies or persons as required may be done by GW SOLUTIONS in its reasonably exercised discretion.

#### **9.0 OWNERSHIP OF INSTRUMENTS OF SERVICE**

The client acknowledges that all reports, plans, and data generated by GW SOLUTIONS during the performance of the work and other documents prepared by GW SOLUTIONS are considered its professional work product and shall remain the copyright property of GW SOLUTIONS.

#### **10.0 ALTERNATE REPORT FORMAT**

Where GW SOLUTIONS submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed GW SOLUTIONS's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by GW SOLUTIONS shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by GW SOLUTIONS shall be deemed to be the overall original for the Project. The Client agrees that both electronic file and hard copy versions of GW SOLUTIONS's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except GW SOLUTIONS. The Client warrants that GW SOLUTIONS's instruments of professional service will be used only and exactly as submitted by GW SOLUTIONS. The Client recognizes and agrees that electronic files submitted by GW SOLUTIONS have been prepared and submitted using specific software and hardware systems. GW SOLUTIONS makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.