



File No.: GB-RZ-2022.1 (Moen)

DATE OF MEETING: January 23, 2025

TO: Gabriola Island Local Trust Committee

FROM: Stephen Baugh, Island Planner
Northern Team

SUBJECT: GB-RZ-2022.1 – OCP and LUB Amendments for commercial and residential development of Wild Rose Garden Centre
Applicant: Kent Moen
Location: 750 Tin Can Alley, Gabriola Island
Lot B, Plan VIP50373, Section 19, District 32 (PID 023-005-629)

RECOMMENDATION

1. That the Gabriola Island Local Trust Committee Bylaw No. 318 cited as “Gabriola Official Community Plan (Gabriola) Bylaw No. 166, 1997, Amendment No. 1, 2024” be read a first time.
2. That the Gabriola Island Local Trust Committee Bylaw No. 319 cited as “Gabriola Island Land Use Bylaw, 1999, Amendment No. 1, 2024” be read a first time.
3. That Proposed Bylaws No. 318 and 319 be referred to First Nations, Local Governments and agencies for comment.
4. That the Gabriola Island Local Trust Committee has reviewed the Islands Trust Policy Statement Directives Only Checklist and determined that Bylaw No. 318 cited as “Gabriola Official Community Plan (Gabriola) Bylaw No. 166, 1997, Amendment No. 1, 2024” is not contrary to or at variance with the Islands Trust Policy Statement.
5. That the Gabriola Island Local Trust Committee has reviewed the Islands Trust Policy Statement Directives Only Checklist and determined that Bylaw No. 319 cited as “Gabriola Island Land Use Bylaw, 1999, Amendment No. 1, 2024” is not contrary to or at variance with the Islands Trust Policy Statement.

REPORT SUMMARY

This report introduces two draft bylaws, one to amend the Gabriola Island Official Community Plan (OCP) and the other to amend the Gabriola Island Land Use Bylaw (LUB). The draft bylaws include changes requested by the LTC. Staff recommend that the draft bylaws in Attachments 1 and 2 of this report be given First Reading, that referrals be sent to First Nations, local governments and other agencies, and that the LTC confirm the bylaws are not contrary to or at variance with the Islands Trust Policy Statement.

BACKGROUND

The Gabriola Island Local Trust Committee passed the following resolutions related to this application on September 29, 2022 requesting staff to draft bylaw amendments:

GB-2022-072

It was MOVED and SECONDED

that the Gabriola Island Local Trust Committee request staff to prepare draft amendments to the Gabriola Island Official Community Plan that will remove references to the Wild Rose Garden Centre business name and include Lot B, Plan VIP50373, Section 19, District 32 (750 Tin Can Alley, Gabriola Island PID 023-005-629) in the ‘Village Commercial’ land use designation and ‘Village Centre’ Development Permit Area No. 7.

GB-2022-073

It was MOVED and SECONDED

that the Gabriola Island Local Trust Committee request staff to draft amendments to the Gabriola Island Land Use Bylaw to rezone Lot B, Plan VIP50373, Section 19, District 32 (750 Tin Can Alley, Gabriola Island PID 023-005-629) to a site specific Village Commercial zone which maintains the existing uses and expands principle commercial and accessory residential uses consistent with the bylaw amendment application; regulates buildings and structures; height; siting requirements including setbacks; lot coverage; parking; and subdivision.

After considering, options related to the Housing Options Toolkit and reviewing information from the Senior Freshwater Specialist, at the November 7, 2024 LTC meeting the following resolution was passed to direct staff to amend the draft bylaw:

GB-2024-076

It was MOVED and SECONDED

that the Gabriola Island Local Trust Committee request staff to amend draft Bylaw No. 319 cited as “Gabriola Island Land Use Bylaw, 1999, Amendment No. 1, 2024” to:

- a. Restrict the location of dwelling units to within the envelope of a commercial building;
- b. Reduce the parking requirements for each dwelling unit from 2 parking spaces to 1; and
- c. Limit the floor area of dwelling units to 90 square metres.

The requested amendments have been made to the draft bylaw and the bylaws are presented for the LTC to consider First Reading.

ANALYSIS

Draft Bylaw No. 318 (OCP):

Draft Bylaw No. 318 (Attachment 1) would amend the Gabriola Official Community Plan to include 750 Tin Can Alley in the Village Commercial land use designation, and in the Village Centre Development Permit Area. A site specific OCP amendment is also necessary in order for the parcel to have a larger average and minimum lot area than other commercial zones and to allow up to two residential dwelling units on the property. One other minor amendment proposed in this OCP bylaw is to remove references to the “Lockinvar Triangle Area” as this area is normally referred to as the Village Centre.

Draft Bylaw No. 319 (LUB):

Draft Bylaw No. 319 (Attachment 2) would amend the Gabriola Land Use Bylaw to create a new, site-specific Village Commercial Zone for 750 Tin Can Alley to allow a broader range of commercial uses and up to two dwelling units. Specifically, the new VC3 zone would allow the new principal uses of:

- retail sales and rentals;
- personal services;

- restaurant;
- limited public market
- bakeries; and
- offices.

The existing uses of garden centre and mini storage would also continue to be permitted. The existing use of “Farm supply centre” is permitted under the current LC3 zoning for this property, although it is not expressly permitted in the new VC3 zone it will remain a permitted use since it is included within retail sales.

The definition of “farm supply centre” is also proposed to be deleted since the term will no longer appear in the Gabriola Land Use Bylaw should the proposed bylaws be adopted; this is because the subject property is the only lot where “farm supply centre” is expressly permitted.

The term “bakeries” is undefined in the Gabriola Land Use Bylaw. Although a bakery could be interpreted as fitting within the “restaurant” use as it is defined in the LUB, the applicant has requested that the “bakeries” use be permitted in the zone. This will be consistent with other zones in the LUB which specifically list “bakeries” as a permitted use. Including this will provide certainty that “bakeries” are permitted in the proposed VC3 zone as well.

Limited Public Market is also listed as a permitted use in the draft VC3 zone although it would be included within the permitted “retail sales” use. This is consistent with some other zones in the Gabriola Land Use Bylaw that list both retail sales and limited public market as permitted uses.

With regards to the proposed density on the subject property, two buildings that are accessory to a dwelling unit are proposed to be permitted in this zone. While other zones allow for up to three, two accessory buildings are proposed in this case since this number is divisible by two, allowing for one accessory building for each dwelling unit. Restricting the number of buildings accessory to a dwelling unit is also appropriate since the principal uses of this lot are proposed to be commercial.

The draft bylaw would permit two accessory dwelling units on the subject property which must be located within the envelope of a commercial building and no larger than 90 square metres in floor area.

Islands Trust Policy Statement:

Staff have reviewed the bylaws against the Islands Trust Policy Statement (ITPS) Directives Only Checklist (Attachment 3 and 4) and have concluded that Draft Bylaw Nos. 318 (OCP) and 319 (LUB) are not contrary to or at variance with the ITPS.

Water Use:

The applicant has provided a report prepared by a qualified professional hydrogeologist, to confirm the aquifer is capable of supporting the proposed commercial and residential uses with no adverse effects on adjacent existing groundwater users. The report (Attachment 5) concludes that a sustainable yield of 0.08L/s can be obtained from the existing well and that if additional water is required there is another location on the lot where an additional well could be drilled. The estimated total water supply available to the lot would be 0.14L/s if an additional well was drilled and there would not be any adverse effects on adjacent groundwater users. The current water usage on the lot totals 0.049L/s which would leave an additional 0.091L/s for future development. The report also notes that much of the current water use on the lot could be provided by rainwater.

Given the potential for rainwater to supply some uses on the lot, the proposed bylaw includes a requirement that buildings to accommodate principal uses in the VC3 zone be connected to a rainwater harvesting and collection system with a minimum storage capacity of 22,500 litres. This is a similar requirement that applies in the nearby RR2 zone and is consistent with the following OCP Policy regarding Water Supply:

7.4.a) Methods of water conservation such as low water use fixtures, retention of rainwater and runoff in cisterns and ponds and other means shall be encouraged.

There are no development plans provided with this application and it is uncertain what the actual water needs of the parcel will be, however, the report from the applicant does show that there is additional water availability for this parcel. Further, a Groundwater License will be required from the province before further commercial development on this property which is an additional layer of regulation to ensure there is sufficient water for the actual uses on the property.

Sewage Capacity:

The LTC also requested the applicant provide a report from a qualified professional engineer, with expertise in wastewater treatment for non-domestic and domestic systems, to confirm the property is capable of supporting a sewage disposal system for the proposed commercial and residential uses. The applicant has submitted a report (Attachment 6) based on a potential build-out of a 60 seat restaurant, retail garden centre, residential unit and coffee shop/bakery which concludes that the subject property "...has sufficient potential to disperse pre-treated wastewater in the ground safely without any degradation of the local environment or contamination of the local drinking water source that under-lays the site." Any future septic system will also be required to be designed by a professional in accordance with the BC Sewerage System Regulation with documents stamped by a professional and submitted to Island Health.

Staff have also noted that the subject property is encumbered by a restrictive covenant (EG124744) which states:

"prior to the construction of buildings or structures on the Land that result in the total combined floor area exceeding 1393.5m² (15,000 sq. ft.), the Transferor must provide written confirmation to the Gabriola Island Local Trust Committee from the relevant public approval authority that all of the sewage generated on the Land can be disposed of on the Land."

Density:

Under the current zoning the subject property meets the minimum lot size to be subdivided into two parcels, with each being permitted one residential dwelling. However, a restrictive covenant (EX9068) is registered on title which restricts the uses on the lot to "one retail garden, farm supply and nursery store business". The proposed bylaws would permit up to two dwellings on the parcel and would remove the potential for subdivision. The applicant has indicated that one of the two dwellings would be restricted to affordable rental housing which would be secured through a housing agreement with the LTC. The restrictive covenant is recommended to be discharged prior to the proposed bylaws being adopted.

Issues and Opportunities

The changes to the draft bylaw will help address concerns about sustainable groundwater use on the subject property by ensuring that the residential uses of the property are considered alongside commercial water license applications. In addition, the parking requirements for the dwellings are reduced to 1 parking space and the maximum floor area of each dwelling is 90 square metres.

Consultation

As this application proposes an amendment to the OCP, the LTC is required to consider opportunities for consultation with persons, organizations and authorities. Following first reading of the bylaws staff recommend referrals to First Nations, provincial agencies, local governments and select referral agencies.

Local Government Act

475 (1) During the development of an official community plan, or the repeal or amendment of an official community plan, the proposing local government must provide one or more opportunities it considers appropriate for consultation with persons, organizations and authorities it considers will be affected.

(2) For the purposes of subsection (1), the local government must

(a) consider whether the opportunities for consultation with one or more of the persons, organizations and authorities should be early and ongoing, and

(b) specifically consider whether consultation is required with the following:

(i) the board of the regional district in which the area covered by the plan is located, in the case of a municipal official community plan;

(ii) the board of any regional district that is adjacent to the area covered by the plan;

(iii) the council of any municipality that is adjacent to the area covered by the plan;

(iv) first nations;

(v) boards of education, greater boards and improvement district boards;

(vi) the Provincial and federal governments and their agencies

Islands Trust Policy 4.1.9 Inter-Local Trust Committee Community Planning Bylaw Referral states that LTC's should consider the potential impacts of OCP and LUB amendments on the adjacent LTC areas. The LTC should indicate if they consider that the proposed bylaw amendments will impact adjacent Local Trust Areas.

Staff are recommending the LTC direct staff to send referrals to First Nations, agencies and organizations that may be affected by the proposed bylaws. These include the following:

First Nations: Cowichan Tribes, Halalt First Nation, Lyackson First Nation, Penelakut Tribe, Snuneymuxw First Nation, Stz'uminus First Nation, Tsu'uubaa-asatx First Nation.

Local Governments and Agencies: Regional District of Nanaimo, Island Health Authority, Ministry of Transportation and Transit, Ministry of Water, Land and Resource Stewardship, School District 68, Gabriola Volunteer Fire Department, Gabriola Advisory Planning Commission, Gabriola Housing Advisory Planning Commission.

Rationale for Recommendation

The staff recommendation on page 1 of this report is supported by the following rationale:

- The draft bylaws are consistent with the Islands Trust Policy Statement;
- The steps are consistent with the legislative process; and
- Referrals will allow for additional input into the proposed changes to Gabriola Island Bylaws.

ALTERNATIVES

The LTC may consider the following alternatives to the recommendation:

1. Amend the draft bylaws

The LTC may amend the draft bylaws prior to consideration of First Reading. If this alternative is selected then the following resolution is recommended:

That the Gabriola Island Local Trust Committee amend Draft Bylaw No. 31X, cited as "...” with the following: [list amendments].

2. Request additional information/defer consideration of First Reading

The LTC can request specific additional information from staff and/or the applicant prior to consideration of First Reading. If this alternative is selected then the following resolution is recommended:

That the Gabriola Island Local Trust Committee request [staff/the applicant] to provide the following [specify information request] prior to further consideration of Draft Bylaws No. 318 (OCP) and 319 (LUB).

3. Proceed no further

The LTC may choose to proceed no further with this application. Staff advise that the implications of this alternative are that the bylaw amendment application file will be closed and the applicant will be refunded the appropriate amount based on the Gabriola Fees Bylaw. Recommended wording for the resolution is as follows:

That the Gabriola Island Local Trust Committee proceed no further with bylaw amendment application GB-RZ-2022.1.

NEXT STEPS

Should the LTC concur with the recommendations, referrals will be sent, requesting a response within 90 days of the date on the referral.

Submitted By:	Stephen Baugh, Island Planner	December 19, 2024
Concurrence:	Renée Jamurat, RPP MCIP, Regional Planning Manager	January 9, 2025

ATTACHMENTS

1. Draft Bylaw No. 318
2. Draft Bylaw No. 319
3. Islands Trust Policy Statement Directive Policies (BL318)
4. Islands Trust Policy Statement Directive Policies (BL319)
5. Hydrogeology Report
6. Septic Report

DRAFT

GABRIOLA ISLAND LOCAL TRUST COMMITTEE BYLAW NO. 318

A BYLAW TO AMEND GABRIOLA ISLAND OFFICIAL COMMUNITY PLAN, 1997

The Gabriola Island Local Trust Committee, being the Trust Committee having jurisdiction in respect of the Gabriola Island Local Trust Area under the *Islands Trust Act*, enacts as follows:

1. Citation

This bylaw may be cited for all purposes as “Gabriola Official Community Plan (Gabriola) Bylaw No. 166, 1997, Amendment No. 1, 2024”.

2. Gabriola Island Local Trust Committee Bylaw No. 166, cited as “Gabriola Island Official Community Plan (Gabriola) Bylaw No. 166, 1997”, is amended as per Schedule “1”, Schedule “2”, and Schedule “3” attached to and forming part of this bylaw

READ A FIRST TIME THIS _____ DAY OF _____ 202x

READ A SECOND TIME THIS _____ DAY OF _____ 202x

PUBLIC HEARING HELD THIS _____ DAY OF _____ 202x

READ A THIRD TIME THIS _____ DAY OF _____ 202x

APPROVED BY THE EXECUTIVE COMMITTEE OF THE ISLANDS TRUST THIS
_____ DAY OF _____ 202x

APPROVED BY THE MINISTER OF MUNICIPAL AFFAIRS AND HOUSING THIS
_____ DAY OF _____ 202x

ADOPTED THIS _____ DAY OF _____ 202x

Chair

Secretary

GABRIOLA ISLAND LOCAL TRUST COMMITTEE
BYLAW NO. 318
Schedule "1"

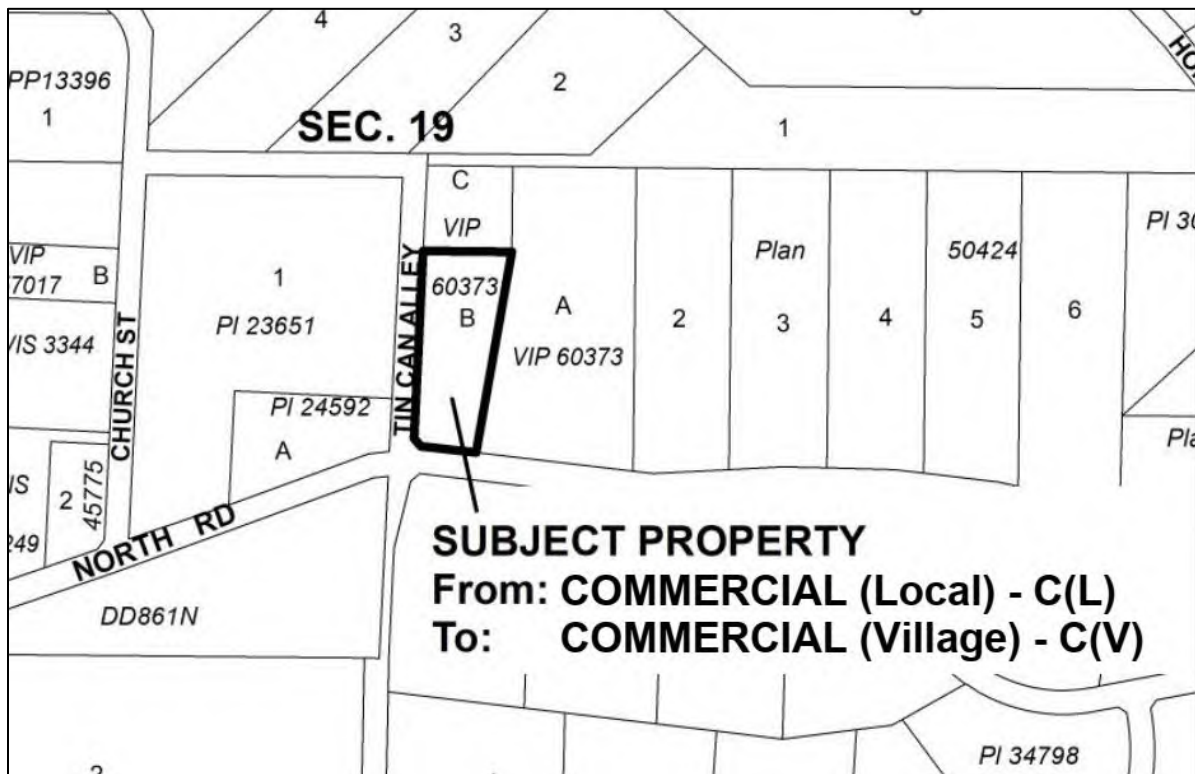
1. **Schedule "A"** of Gabriola Island Official Community Plan (Gabriola) Bylaw, 1997 is amended as follows:
 - 1.1. **Section 3 – Economic Activities**, Subsection **3.1 Commercial Activity, General Commercial Objectives** number 1 is amended by deleting the words "(Lockinvar Triangle area)".
 - 1.2. **Section 3 – Economic Activities**, Subsection **3.1 Commercial Activity, General Commercial Policies** is amended by adding a new clause after clause d) as follows: "e) Despite clause a) and d) a minimum and average parcel size of 1.0 hectare (2.47 acres) and up to 2 dwelling units per parcel may be permitted on the following parcel: LOT B SECTION 19 GABRIOLA ISLAND NANAIMO DISTRICT PLAN VIP60373."
 - 1.3. **Section 3 – Economic Activities**, Subsection **3.2 Village Commercial**, Clause 3.2.a) is amended by deleting the words "(the Lockinvar Triangle area)".
 - 1.4. **Section 3 – Economic Activities**, Subsection **3.4 Local Commercial**, Clause 3.4.a), is amended by deleting Item 3.4.a)ii in its entirety and by making such consequential numbering alterations to effect this change.

**GABRIOLA ISLAND LOCAL TRUST COMMITTEE
 BYLAW NO. 318
 Schedule "2"**

1. **Schedule "B"** of Gabriola Island Official Community Plan (Gabriola) Bylaw, 1997 is amended as follows:

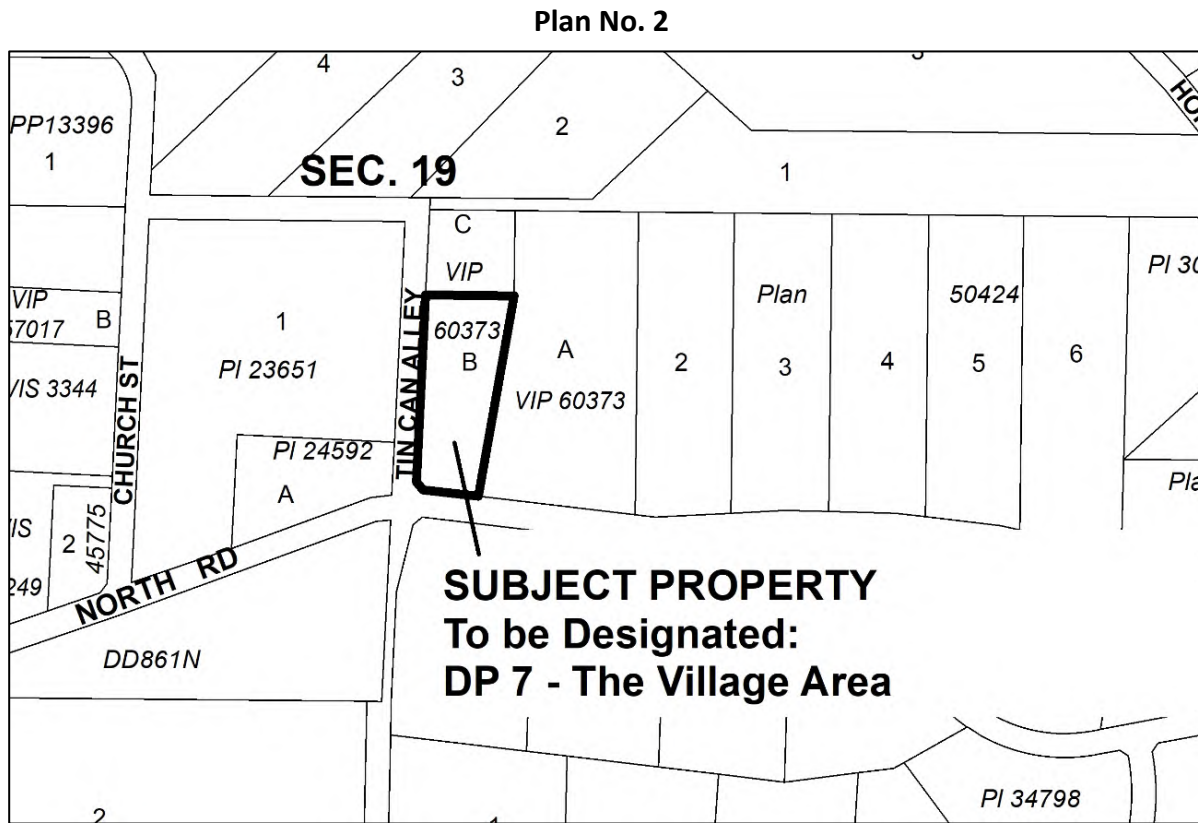
1.1. **Schedule "B" – Land Use Designations – North Sheet**, is amended by changing the land use designation on the lands described as Lot B, Plan VIP50373, Section 19, District 32 (750 Tin Can Alley, Gabriola Island PID 023-005-629) from "Commercial (Local)" to "Village Commercial" as shown on Plan No. 1 attached to and forming part of this bylaw, and by making such alterations to Schedule "B" as are required to effect this change.

Plan No. 1



GABRIOLA ISLAND LOCAL TRUST COMMITTEE
BYLAW NO. 318
Schedule "3"

1. Schedule "D" – Development Permit Areas - OCP B North Sheet, is amended by including the lands described as Lot B, Plan VIP50373, Section 19, District 32 (750 Tin Can Alley, Gabriola Island PID 023-005-629) in the Schedule D map for DP 7 - The Village Centre as shown on Plan No. 2 attached to and forming part of this bylaw, and by making such alterations to Schedule "D" of Bylaw No. 166 as are required to effect this change.



DRAFT

GABRIOLA ISLAND LOCAL TRUST COMMITTEE
BYLAW NO. 319

A BYLAW TO AMEND GABRIOLA ISLAND LAND USE BYLAW, 1999

The Gabriola Island Local Trust Committee, being the Trust Committee having jurisdiction in respect of the Gabriola Island Local Trust Area under the *Islands Trust Act*, enacts as follows:

1. Citation

This bylaw may be cited for all purposes as “Gabriola Island Land Use Bylaw, 1999, Amendment No. 1, 2024”.

2. Gabriola Island Local Trust Committee Bylaw No. 177, cited as “Gabriola Island Land Use Bylaw, 1999” is amended as per Schedule “1” attached to and forming part of this bylaw.

READ A FIRST TIME THIS _____ DAY OF _____ 202x

READ A SECOND TIME THIS _____ DAY OF _____ 202x

PUBLIC HEARING HELD THIS _____ DAY OF _____ 202x

READ A THIRD TIME THIS _____ DAY OF _____ 202x

APPROVED BY THE EXECUTIVE COMMITTEE OF THE ISLANDS TRUST THIS

_____ DAY OF _____ 202x

ADOPTED THIS _____ DAY OF _____ 202x

Chair

Secretary

GABRIOLA ISLAND LOCAL TRUST COMMITTEE
 BYLAW NO. 319

Schedule “1”

1. **Schedule “A”** of Gabriola Island Land Use Bylaw, 1999 is amended as follows:

1.1 **Part B GENERAL REGULATIONS**, Section B.1 **USES, BUILDINGS AND STRUCTURES**, Subsection **B.1.1 Permitted in Any Zone**, Article **B.1.1.1 Uses**, Clause B.1.1.1.c. is amended by replacing “D.3.7. Ferry Parking, D.3.10” with “D.3.8. Ferry Parking, D.3.11”.

1.2 **Part B GENERAL REGULATIONS**, Section B.4 **SIGNS**, Subsection **B.4.1 Number and Total Sign Area**, Article **B.4.1.1**, Table 1 **Sign Regulations**, Column I is amended by adding “VC3,” after “VC2,”.

1.3 **Part B GENERAL REGULATIONS**, Section B.5 **PARKING**, Subsection **B.5.1 Minimum Number of Parking Spaces for Automobiles and Bicycles**, Article **B.5.1.1**, Table 2: **Parking Requirements**, is amended by adding a new row under the “Residential” heading as follows:

<i>dwelling unit</i> in the Village Commercial 3 zone	1 per <i>dwelling unit</i>	None required	None required
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1.4 **Part C ESTABLISHMENT OF ZONES**, Section C.1 **DIVISION INTO ZONES**, Subsection **C.1.1 Land Based Zones**, insert new zone “VC3 Village Commercial 3” after “Village Commercial 2 – Professional Centre” and before “DC1 District Commercial 1”.

1.5 **Part D ZONES**, Section D.3 **COMMERCIAL AND INDUSTRIAL ZONES**, insert new Subsection **D.3.3 Village Commercial 3 (VC3)** after Subsection **D.3.2 Village Commercial 2 – Professional Centre(VC2)** as shown in **Appendix 1** attached to and forming part of this bylaw; and renumber all subsequent subsections chronologically.

1.6 **Part D ZONES**, Section D.3 **COMMERCIAL AND INDUSTRIAL ZONES**, Subsection **D.3.3 District Commercial 1(DC1)**, Article D.3.3.3 **Regulations**, Clause D.3.3.3.b. **Buildings and Structures Siting Requirements**, Item D.3.3.3.b.iii. is amended by replacing “D.3.3.3.ii” with “D.3.4.3.ii”.

1.7 **Part D ZONES**, Section D.3 **COMMERCIAL AND INDUSTRIAL ZONES**, Subsection **D.3.6 Local Commercial 3 – Garden Centres(LC3)**, Article **D.3.6.1 Permitted Uses**, Clause **D.3.6.1.b. Permitted Accessory Uses**, Item **D.3.6.1.b.iii** is amended by deleting the words “except on lands shown on Schedule C, Map 12”.

1.8 **Part D ZONES**, Section D.3 **COMMERCIAL AND INDUSTRIAL ZONES**, Subsection **D.3.6 Local Commercial 3 – Garden Centres(LC3)**, Article **D.3.6.1 Permitted Uses**, Clause **D.3.6.1.b. Permitted Accessory Uses**, Item **D.3.6.1.b.iv** is deleted in its entirety.

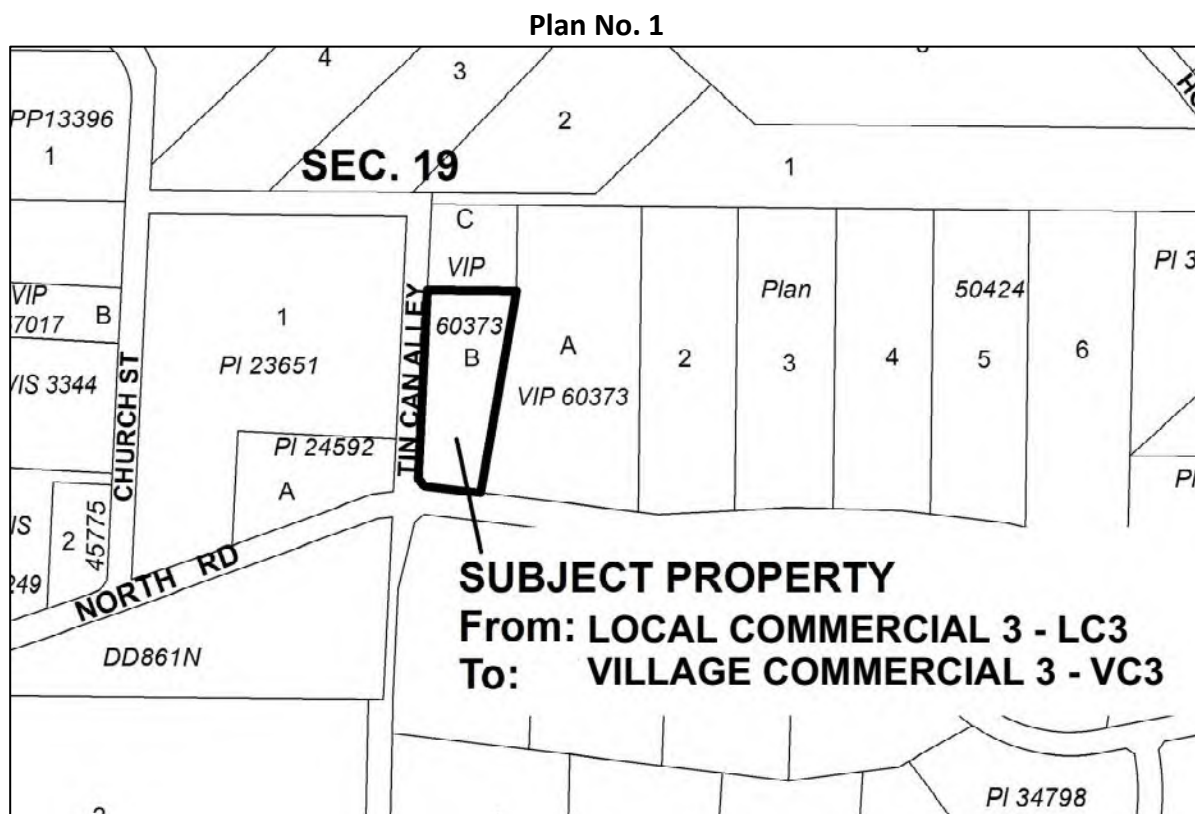
1.9 **Part D ZONES**, Section D.3 **COMMERCIAL AND INDUSTRIAL ZONES**, Subsection **D.3.6 Local Commercial 3 – Garden Centres(LC3)**, Article **D.3.6.2 Buildings and Structures**, Clause **D.3.6.2.a. Permitted Buildings and Structures**, Item **D.3.6.2.a.iv** is deleted in its entirety.

1.10 **Part G**, Section G.1 **DEFINITIONS**, is amended by deleting the following definition:

“farm supply centre a business for the retail sale of farm supplies, but excluding the sale of farm equipment;”

2. **Schedule “B”** of Gabriola Island Land Use Bylaw, 1999 is amended as follows:

2.1. Schedule “B” – North Sheet, is amended by changing the zoning classification of Lot B, Plan VIP50373, Section 19, District 32 (750 Tin Can Alley, Gabriola Island PID 023-005-629) from “Local Commercial 3” to “Village Commercial 3” as shown on Plan No. 1 attached to and forming part of this bylaw, and by making such alterations to Schedule “B” of Bylaw No. 177 as are required to effect this change.



3. **Schedule “C”** of Gabriola Island Land Use Bylaw, 1999 is amended as follows:

3.1. Schedule “C” – Map 10, is amended by replacing “Item d.3.8.1.a.vii” with “Item d.3.9.1.a.vii”.

3.2. Schedule “C” – Map 12, is deleted in its entirety.

- 3.3. Schedule “C” – Map 17, is amended by replacing “Items D.3.8.1.a.v and D.3.8.1.a.viii” with “Items D.3.9.1.a.v and D.3.9.1.a.viii”.

**GABRIOLA ISLAND LOCAL TRUST COMMITTEE
BYLAW NO. 319**

Appendix 1

D.3.3 Village Commercial 3 (VC3)

D.3.3.1 Permitted Uses

The uses permitted in Article B.1.1.1, plus the following uses and no others are permitted in the Village Commercial 3 (VC3) zone:

a. Permitted *Principal* Uses

- i *garden centre*
- ii retail sales and rentals
- iii *personal services*
- iv *restaurant*
- v bakeries
- vi offices
- vii *limited public market*, subject to Subsection B.6.2

b. Permitted *Accessory* Uses

- i *single family residential*
- ii *two family dwelling residential*
- iii mini-storage

D.3.3.2 Buildings and Structures

The *buildings* and *structures* permitted in Article B.1.1.2, plus the following *buildings* and *structures* and no others are permitted in the Village Commercial 3 (VC3) zone:

a. Permitted *Buildings* and *Structures*

- i *Buildings* and *structures* to accommodate *principal* uses set out in this zone which must be connected to a freshwater collection system with a minimum storage capacity of 22,500 litres (5,944 US gallons).
- ii Maximum of:
 - two *dwelling units* per lot; and
 - two *buildings* per lot that exclude a *pump/utility house* and woodshed, and that are *accessory* to a *dwelling unit*.
- iii The maximum permitted floor area of a *dwelling unit* is 90 square metres (968 square feet)
- iv Other *buildings* and *structures* to accommodate the permitted accessory uses set out in this zone.

D.3.3.3 Regulations

The general regulations in Part B, plus the following regulations apply in the Village Commercial 3 (VC3) zone:

a. Buildings and Structures Height Limitations

- i The maximum *height* of *buildings* and *structures* is 9.0 metres (29.5 feet).

b. Buildings and Structures Siting Requirements

- i The minimum *setback* for *buildings* or *structures* except for a sign, *fence*, or *pump/utility house* is:
 - 6.0 metres (19.7 feet) from the *front lot line*;
 - 6.0 metres (9.8 feet) from any *interior lot line*, except where the *interior lot line* abuts a commercial or industrial *zone* in which case there is no *setback* requirement from the *interior lot line*; and
 - 3.0 metres (9.8 feet) from another *building* sited on the same *lot*.
- ii There is no *setback* requirement from any *exterior side lot line*, except for mini-storage units in which case the minimum *setback* is 4.5 metres.
- iii *Dwelling units* must be located within the building envelope of a commercial building.

c. Lot Coverage Limitations

- i The maximum combined *lot coverage* by *buildings* and *structures* is 40 percent of the *lot area*.

d. Lot Area Requirements for Subdivision

- i The minimum average *lot area* and the minimum *lot area* is 1.0 hectare (2.47 acres).

e. Mini-Storage Limitations

- i The maximum *floor area* is 9.3 square metres (100 square feet) per mini-storage unit.
- ii Mini-storage units must be separated from a highway or from land with zoning permitting a *principal* residential use by a landscape screen, subject to subsection B.2.7, not less than 2.0 metres (6.6 feet) in *height*.



ISLANDS TRUST POLICY STATEMENT
DIRECTIVES ONLY CHECKLIST

File No.: GB-RZ-2022.1
File Name: Alley Enterprises Ltd. (Bylaw No. 318)

PURPOSE

To provide staff with the Directives Only Checklist to highlight issues addressed in staff reports and as a means to ensure Local Trust Committees address certain matters in their official community plans and regulatory bylaws, Island Municipalities address certain matters in their official community plans, and to reference any relevant sections of the Policy Statement.

POLICY STATEMENT

The Policy Statement is comprised of several parts. Parts I and II outline the purpose, the Islands Trust object, and Council’s guiding principles. Parts III, IV and V contain the goals and policies relevant to ecosystem preservation and protection, stewardship of resources and sustainable communities.

There are three different kinds of policies within the Policy Statement as follows:

- Commitments of Trust Council which are statements about Council’s position or philosophy on various matters;
- Recommendations of Council to other government agencies, non-government organizations, property owners, residents and visitors; and
- Directive Policies which direct Local Trust Committees and Island Municipalities to address certain matters.

DIRECTIVES ONLY CHECKLIST

The Policy Statement Directives Only Checklist is based on the directive policies from the Policy Statement (Consolidated April 2003) which require Local Trust Committees to address certain matters in their official community plans and regulatory bylaws and Island Municipalities to address certain a matters in their official community plans in a way that implements the policy of Trust Council.

Staff will use the Policy Statement Checklist (Directives Only) to review Local Trust Committee and Island Municipality bylaw amendment applications and proposals to ensure consistency with the Policy Statement. Staff will add the appropriate symbol to the table as follows:

- ✓ if the bylaw is consistent with the policy from the Policy Statement, or
- ✗ if the bylaw is inconsistent (contrary or at variance) with a policy from the Policy Statement, or
- N/A if the policy is not applicable.

PART III: POLICIES FOR ECOSYSTEM PRESERVATION AND PROTECTION

CONSISTENT	No.	DIRECTIVE POLICY
	3.1	Ecosystems
n/a	3.1.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification and protection of the environmentally sensitive areas and significant natural sites, features and landforms in their planning area.
n/a	3.1.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the planning, establishment, and maintenance of a network of protected areas that preserve the representative ecosystems of their planning area and maintain their ecological integrity.
✓	3.1.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the regulation of land use and development to restrict emissions to land, air and water to levels not harmful to humans or other species.
	3.2	Forest Ecosystems
n/a	3.2.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of unfragmented forest ecosystems within their local planning areas from potentially adverse impacts of growth, development, and land-use.
	3.3	Freshwater and Wetland Ecosystems and Riparian Zones
✓	3.3.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address means to prevent further loss or degradation of freshwater bodies or watercourses, wetlands and riparian zones and to protect aquatic wildlife.
	3.4	Coastal and Marine Ecosystems
n/a	3.4.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of sensitive coastal areas.
n/a	3.4.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the planning for and regulation of development in coastal regions to protect natural coastal processes.

PART IV: POLICIES FOR THE STEWARDSHIP OF RESOURCES

CONSISTENT	No.	DIRECTIVE POLICY
	4.1	Agricultural Land
n/a	4.1.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification and preservation of agricultural land for current and future use.
n/a	4.1.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the preservation, protection, and encouragement of farming, the sustainability of farming, and the relationship of farming to other land uses.
n/a	4.1.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the use of adjacent properties to minimize any adverse affects on agricultural land.
	4.1.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the design of road systems and servicing corridors to avoid agricultural lands unless the need for roads outweighs agricultural considerations, in which case appropriate mitigation measures shall be required to derive a net benefit to agriculture.
n/a	4.1.8	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address land uses and activities that support the economic viability of farms without compromising the agriculture capability of agricultural land.
n/a	4.1.9	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the use of Crown lands for agricultural leases.
	4.2	Forests
n/a	4.2.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the need to protect the ecological integrity on a scale of forest stands and landscapes.
n/a	4.2.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the retention of large land holdings and parcel sizes for sustainable forestry use, and the location and construction of roads, and utility and communication corridors to minimize the fragmentation of forests.
n/a	4.2.8	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the designation of forest ecosystem reserves where no extraction will take place to ensure the preservation of native biological diversity.
	4.2.9	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of native biological diversity.
CONSISTENT	No.	DIRECTIVE POLICY

	4.3	Wildlife and Vegetation
	4.4	Freshwater Resources
✓	4.4.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address measures that ensure neither the density nor intensity of land use is increased in areas which are known to have a problem with the quality or quantity of the supply of freshwater, water quality is maintained, and existing, anticipated and seasonal demands for water are considered and allowed for.
✓	4.4.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address measures that ensure water use is not to the detriment of in-stream uses
	4.5	Coastal Areas and Marine Shorelands
n/a	4.5.8	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the needs and locations for marine dependent land uses.
n/a	4.5.9	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the compatibility of the location, size and nature of marinas with the ecosystems and character of their local planning areas.
n/a	4.5.10	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the location of buildings and structures so as to protect public access to, from and along the marine shoreline and minimize impacts on sensitive coastal environments.
n/a	4.5.11	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address opportunities for the sharing of facilities such as docks, wharves, floats, jetties, boat houses, board walks and causeways.
	4.6	Soils and Other Resources
n/a	4.6.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of productive soils.

PART V: POLICIES FOR SUSTAINABLE COMMUNITIES

CONSISTENT	No.	DIRECTIVE POLICY
	5.1	Aesthetic Qualities
n/a	5.1.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of views, scenic areas and distinctive features contributing to the overall visual quality and scenic value of the Trust Area.
	5.2	Growth and Development
✓	5.2.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address policies related to the aesthetic, environmental and social impacts of development.
✓	5.2.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address any potential growth rate and strategies for growth management that ensure that land use is compatible with preservation and protection of the environment, natural amenities, resources and community character.
✓	5.2.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address means for achieving efficient use of the land base without exceeding any density limits defined in their official community plans.
n/a	5.2.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification of areas hazardous to development, including areas subject to flooding, erosion or slope instability, and strategies to direct development away from such hazards.
	5.3	Transportation and Utilities
n/a	5.3.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the development of a classification system of rural roadways, including scenic or heritage road designations, in recognition of the object of the Islands Trust.
n/a	5.3.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the impacts of road location, design, construction and systems.
n/a	5.3.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the designation of areas for the landing of emergency helicopters.
✓	5.3.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the development of land use patterns that encourage establishment of bicycle paths and other local and inter-community transportation systems that reduce dependency on private automobile use.
	5.4	Disposal of Waste
n/a	5.4.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification of acceptable locations for the disposal of solid waste.
CONSISTENT	No.	DIRECTIVE POLICY

	5.5	Recreation
n/a	5.5.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the prohibition of destination gaming facilities such as casinos and commercial bingo halls.
n/a	5.5.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the location and type of recreational facilities so as not to degrade environmentally sensitive areas, and the designation of locations for marinas, boat launches, docks and anchorages so as not to degrade sensitive marine or coastal areas.
n/a	5.5.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification of sites providing safe public access to beaches, the identification and designation of areas of recreational significance, and the designation of locations for community and public boat launches, docks and anchorages.
n/a	5.5.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification and designation of areas for low impact recreational activities and discourage facilities and opportunities for high impact recreational activities.
✓	5.5.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the planning for bicycle, pedestrian and equestrian trail systems.
	5.6	Cultural and Natural Heritage
n/a	5.6.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification, protection, preservation and enhancement of local heritage.
n/a	5.6.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the preservation and protection of the heritage value and character of historic coastal settlement patterns and remains.
	5.7	Economic Opportunities
✓	5.7.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address economic opportunities that are compatible with conservation of resources and protection of community character.
	5.8	Health and Well-being
✓	5.8.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address their community's current and projected housing requirements and the long-term needs for educational, institutional, community and health-related facilities and services, as well as the cultural and recreational facilities and services.

	POLICY STATEMENT COMPLIANCE
✓	<i>In compliance with Trust Policy</i>
	<i>Not in compliance with Trust Policy for the following reasons:</i>



ISLANDS TRUST POLICY STATEMENT
DIRECTIVES ONLY CHECKLIST

File No.: GB-RZ-2022.1
File Name: Alley Enterprises Ltd. (Bylaw No. 319)

PURPOSE

To provide staff with the Directives Only Checklist to highlight issues addressed in staff reports and as a means to ensure Local Trust Committees address certain matters in their official community plans and regulatory bylaws, Island Municipalities address certain matters in their official community plans, and to reference any relevant sections of the Policy Statement.

POLICY STATEMENT

The Policy Statement is comprised of several parts. Parts I and II outline the purpose, the Islands Trust object, and Council’s guiding principles. Parts III, IV and V contain the goals and policies relevant to ecosystem preservation and protection, stewardship of resources and sustainable communities.

There are three different kinds of policies within the Policy Statement as follows:

- Commitments of Trust Council which are statements about Council’s position or philosophy on various matters;
- Recommendations of Council to other government agencies, non-government organizations, property owners, residents and visitors; and
- Directive Policies which direct Local Trust Committees and Island Municipalities to address certain matters.

DIRECTIVES ONLY CHECKLIST

The Policy Statement Directives Only Checklist is based on the directive policies from the Policy Statement (Consolidated April 2003) which require Local Trust Committees to address certain matters in their official community plans and regulatory bylaws and Island Municipalities to address certain a matters in their official community plans in a way that implements the policy of Trust Council.

Staff will use the Policy Statement Checklist (Directives Only) to review Local Trust Committee and Island Municipality bylaw amendment applications and proposals to ensure consistency with the Policy Statement. Staff will add the appropriate symbol to the table as follows:

- ✓ if the bylaw is consistent with the policy from the Policy Statement, or
- ✗ if the bylaw is inconsistent (contrary or at variance) with a policy from the Policy Statement, or
- N/A if the policy is not applicable.

	4.3	Wildlife and Vegetation
	4.4	Freshwater Resources
✓	4.4.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address measures that ensure neither the density nor intensity of land use is increased in areas which are known to have a problem with the quality or quantity of the supply of freshwater, water quality is maintained, and existing, anticipated and seasonal demands for water are considered and allowed for.
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	4.6	Soils and Other Resources
n/a	4.6.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of productive soils.

PART V: POLICIES FOR SUSTAINABLE COMMUNITIES

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	POLICY STATEMENT COMPLIANCE
✓	<i>In compliance with Trust Policy</i>
	<i>Not in compliance with Trust Policy for the following reasons:</i>

ELANCO ENTERPRISES LTD.

Permit to Practice No: 1001505
4965 Cordova Bay Road, Victoria, B.C., V8Y 2K1
Phone 250 744-1357. E-mail: adakin.elanco@gmail.com

Our File: 303

November 2, 2023

By: e-mail

Alley Enterprises Ltd.
750 Tin Can Alley.
Gabriola Island, B.C.
V0R 1X6

Attention: Kent Moen.

Dear Sir.

Re: Assessment of Sustainable Yield for Well on Wild Rose Farm & Garden Property
750 Tin Can Alley, Gabriola Island, B.C.

As requested, I have conducted a hydrogeological assessment of the area on, and around, the subject property and have determined the long term sustainable yield from the existing well on the property. This report provides a summary of the work carried out, sets out my findings on the well yield and addresses potential impacts on neighbouring wells and water quality issues.

Background:

It is understood that Alley Enterprises Ltd. (AEL) is considering applying for rezoning its 1.03 hectare (2.55 acre) 750 Tin Can Alley property (the Property) from a Local Commercial designation and is now applying for additional uses that would include retail, rentals, personal services, restaurants, bakeries, food truck, accessory offices and two 1 to 2 bedroom apartments.. As a requirement for the rezoning, the Islands Trust requires a report “confirming that the aquifer is capable of supporting the proposed commercial and residential uses with no adverse effects on adjacent existing groundwater users”.

Location and Site Plan

The Property is located in the eastern part of the Gabriola Village area in the north eastern quadrant of the intersection of Tin Can Alley and North Road (see Figs. 1 to 3).

Work Carried out

This assessment involved reviewing information on regional water wells, surface drainage, soils and geology, visiting the site on October 12th and 13th, 2023, supervising a pump test on the well on the Property, analyzing data, assessing the long term well yield and preparing a summary report.

Topography and Drainage

The land surface on the Property slopes gently upward from a 96m above sea level (m-asl) elevation in the southwest corner to a 106 m-asl elevation in the northeast corner (see Fig. 3). This represents a 10m elevation difference and an average slope of about 5.8%.

Most of the Property has been cleared of trees, and with the exception of the Recycling Center property in the north, most of the neighbouring properties have a high percentage of tree cover (see Fig. 3).

There are no well defined surface water drainage channels on the Property which is consistent with the well drained characteristics of the underlying soil. Ditches constructed along both sides of Tin Can Alley roadway convey surface drainage into a series of low points where much of the runoff seeps into the soil. For example, it has been noted that even following periods of heavy rain there is no water flowing through the culvert located under the Property access driveway. It is anticipated that during intense storm events runoff in the form of sheet from relatively impervious areas discharges into the ditches and culverts that follow North Road. From there it is discharged southwards into Goodhue Creek, which flows westward and almost parallel to the road (see the location of this creek on Fig. 2).

Facilities on the Property.

The farm and garden center has been in operation on the Property since 1992. There are two garden center buildings and several aggregate bins on the Property, along with a range of large construction items for sale. Servicing for these facilities include a septic wastewater system installed in 1995, a 56.4 metre (m) deep water supply well drilled in 1995 and an 81,700 litre (18,000 gallons) water storage tank. The locations of these features are indicated on Fig. 4.

Water Usage and Future Requirements.

The current water usage is relatively small with two garden hoses running for up to 4 hours per day and one staff washroom with little use that discharges to the septic system. You have indicated that most of the water for garden watering could be sourced from rainwater. The estimated current usage is 0.049 L/s (0.65 lpm or 940 Imperial gallons per day) and most of this water is consumptive, as it is evaporated or used by the plants.

The potential future facilities such as residences and the restaurant will require water but most of which is non consumptive as it is returned to the aquifer via the septic dispersal field. Researchers, such as McQuillan, D and Bassett, E. 2009, have demonstrated that about 80% of the water leaving a sewage effluent dispersal field will recharge the local aquifer. The result is that the net volume intercepted will be relatively small. The aquifer water balance issue is discussed later in this report.

Soils and Surficial Sediments.

According to the regional surface soils map (Kenny et al. 1990), the principal soil type on the Property, and in the surrounding area, is a well drained Saturna soil. This unit is a sandy loam formed from both colluvial processes and glacial drift and is typically less than a metre thick and overlies sedimentary bedrock.

Five test pits were dug on the property in 2021 as part of a geotechnical assessment of the Property (Lewkowich Engineering Associates Ltd, 2021). The locations of these test pits are indicated on Fig. 3. The sediments encountered above sedimentary bedrock were described as loose to compact brown gravel and sand, or gravelly sand with trace percentages of cobbles. The depth to bedrock (inferred to be sandstone) ranged from 0.7 to 1.2m and had a mean depth of 0.86m. The deepest depth to bedrock was in Test pit 3, which was 1.2m.

These depths. are consistent with the thickness of overburden recorded in the log of the well on the Property (WTN 73075) and on the Recycling Center well (WTN 73066), which are 1.7m and 0.9m respectively.

A report on the construction of the wastewater treatment system (an attachment to the Van Isle Septic Services Inc., 2022 report) indicated that the depth to bedrock was about 1.2m and that the soil percolation test results averaged 5mins/2.5cm. This information is consistent with the geotechnical test pit logs and the Saturna Soil designation.

Bedrock Geology

The bedrock geology of Gabriola consists of sedimentary formations of the Upper Cretaceous Nanaimo Group. These formations are characterized as successions of sandstone-conglomerate units inter-bedded with mudstone and fine-grained sandstone. Four units of the Nanaimo Group are present on Gabriola Island, and these are the Gabriola, Spray, Geoffrey and Northumberland formations. The Gabriola and Geoffrey Formations are mainly comprised of sandstone, while mudstone predominantly comprises the Spray and Northumberland Formations.

As indicated on Fig. 1A and the schematic profile on Fig 1B, these units are layered in a relatively uniform synclinal structure over most of the island, with Northumberland formation being the deepest (oldest) and Gabriola the most common unit at the higher elevations.

A profile of the well on the Property is posted on Fig.1B, and this suggests that this well was likely terminated in Gabriola Formation (sandstone and conglomerate). However, driller's logs of local area wells indicate that they penetrated mostly sandstone bedrock, with some "shale" and siltstone layers. For example, the logs of wells profiled on Sections B-B' on Fig 6 and listed on Tables I and II, typically indicate that they penetrated mostly sandstone, with intermittent shale.

Water Well on the Property

The 150mm diameter well on the Property is located near the southeast corner (see locations on Figs. 2 to 4). No identification plate has been installed on the well casing but the Ministry of Environment has assigned a Well Tag Number ((WTN) of 73075 to this well. This well was drilled to a depth of 56.4m and had a reported yield of 0.05 L/s (0.75 USgpm). The borehole penetrated 1.5m of overburden sediments before encountering mostly sandstone bedrock for the remainder of the hole (see the log of the well on Fig. 5). The driller's log indicates that at a depth of 53.3m a 0.05 L/s water source was encountered (likely a water bearing fracture in the bedrock).

There is no evidence of a surface seal being installed. However, the log indicates that the 150mm diameter steel casing was driven about 0.3m into the top of the bedrock (likely into the soft weathered surface of the bedrock) and may have created a seal against surface water intrusion into the well but is not one that meets the current day well completion standard.

Local Area Wells

The locations of identified water wells in the area are indicated on Fig. 2 and the data on these wells is presented on Tables I and II. With the exception of the locations of wells WTN 73066 and 73075, the data and locations are based on the Ministry of Environment's GWELLS database. The locations of wells 73066 and 73075 are based on site specific information.

Google Earth and the 2m interval contours on Fig.3 were used to estimate ground surface datum elevations. It is recognized that many of these wells may not be accurately located and the static water levels have changed since they were constructed. Also, many wells are currently not being used and that the yields indicated on the table are not sustainable.

A review of the compiled information and statistics led to the following observations:

- Of the 16 well records reviewed, none indicated a "dry hole".
- The estimated well yields ranged from 0.001 to 0.6 L/s and median and average values were 0.13 and 0.21 L/s respectively. The maximum was 0.6 L/s and many of the wells neighbouring the Property had relatively high yields.
- Well depths ranged from 9.1 (dug well 5376) to 122m and median and average depths were 55 and 53m, respectively. The deepest well (WTN 73233) had the lowest yield and the elevation of the bottom of the well was 31m below sea level.
- Depths to static water level at the time of well construction ranged from 3.7 to 27.4m and median and average depths to water were 11.9 and 12.2m, respectively. Many of the reported very deep depths to water are not likely true values, as typically they are recorded in low yield wells which require considerable time for the static water level to establish after construction.
- The well logs indicated that the wells typically encountered sandstone bedrock, with intermittent shale layers.

Groundwater Flow Systems

Fractures and bedding planes in the sandstone and shale bedrock below the Property comprise the principal aquifer in the area. With the possible exception of portions of the Goodhue Creek Valley, the surficial sediments are not sufficiently saturated and thick enough to yield useful quantities of water from wells completed in this unit.

The hydrogeological profile presented on Fig. 6, indicates that the static water levels mostly follow a relatively uniform trend. This suggests that although the yields and depths vary considerably from well to well, there is a network of interconnected fractures and formation bedding planes that enable water to flow through the rock in a consistent manner. Information on the water elevations in individual wells was used to provide the piezometric elevation contours presented on Fig. 2.

As can be seen by the arrows on Fig. 2, the groundwater generally follows the topography with a predominant flow towards the southwest. Water levels have been monitored over a 33 year period in a 76.2m deep B.C. government regional monitoring well (OBS Well 194) located near North Road and about 450m west of Church Street. This record shows that the water levels in

the area have not changed much, even though many nearby production wells have been commissioned in the area.

Preparing for Pump Testing of Well 73075 – The Wild Rose Centre Well

Red Williams Well Drilling and Pump Installations Ltd was retained to install 25mm diameter monitoring tube in Well 73075 and in a well located on the Recycling Centre property north of the Property (Well 73066). The Recycling Center well was selected as a monitoring well as it was not being pumped and had relatively easy access to the well casing.

Data loggers were programmed to record water levels at 1-minute intervals and a week prior to initiating the pump test they were installed in the two wells. They were left in these wells during the entire pump testing period and for five days after the constant rate test were terminated.

The depth to the pump in Well 73075 was about 38m below ground and had the capacity to pump water into the 81,700 litre water storage tank, located about 40m north of the well (see locations on Fig. 4). During the pump tests, the water was diverted at the base of the tank and discharged onto the ground in a forested area located immediately east of the tank.

Water Level Trends

Elevations of water levels recorded in Well 73075 are presented on Fig. 7A and the levels in monitoring well 73066 are on Fig. 7C. The range of the water levels over the 14 day monitoring period presented in Fig. 7C is very small (0.06m), while the range Fig. 7A (Well 73075) was tens of metres. Most, if not all, of the range in Fig 7C is due to the datalogger resolution and as can be seen when Well 73075 data was also plotted at the same scale for a 5-day period a similar fluctuation can be observed.

As can be seen in Fig. 7A the non-pumping water level trend remained relatively stable for about 5 days and then slowly rose by about a metre at the end of the 14 day monitoring period. The cause of this upward trend is not known and one possibility is a long term recovery from operational pumping prior to the monitoring period.

The daily precipitation recorded at a Nanaimo station is presented on Fig. 7D. The rainfall prior to October 17th would not have been sufficient to cause any aquifer recharge. However, the very small change in water levels on October 18th could possibly be result of the October 17th rainfall event.

The water level spike on October 11th was likely caused by operational pumping into the water tank. The big spike on October 12th was the step test impact (see details on Fig. 8) and the 3-day drop starting on October 13th was the impact of the constant rate test (see details on Fig. 9).

The elevation of the water level recorded on October 12, 2023 was 91.9 m-asl, while the elevation of the water level recorded soon after the well was constructed in July 1993 was 88.9 m-asl. It is not clear why there is a 3m difference, but clearly the long term impact of pumping water from local wells has not resulted in a lowering the aquifer water levels since 1995.

Step Test of Well 73075

On October 12th, 2023, a step test was run at four progressively increasing rates, each for a period of about 30 minutes. As indicated on Fig 8 these rates were 0.08, 0.17, 0.23 and 0.37 L/s. During the test the pumping rate was measured using the bucket and stopwatch method. Depths to water level were measured manually so that water level trends could be monitored as the test progressed. It was noted that soon after the pumping rate increased to 0.37 L/s and the depth to water in the well was 12.6m below the top of the casing (12.3m below ground) water could be heard cascading into the well. This suggested that the water level in the well was then below a water-bearing fracture that was not noted in the driller's log. After going below the fracture the water level dropped rapidly and continued to do so until the drawdown reached about 20m at the end of the fourth step and the pump was turned off and water level recovery commenced.

The impact of the step test pumping on the natural time scale graph of water elevations can be seen on Fig. 7A and a semi-log graph of the one minute interval water levels recorded using the datalogger is presented on Fig. 8A. The rate of water level recovery following this test can also be seen on these two graphs.

As illustrated in Fig, 8B the specific capacity (ratio of pumping rate to drawdown) did not change very much until the water level in the well dropped below the water bearing fracture. This confirmed that this fracture had a lot of water in storage and if this volume was depleted it could have an impact on the long term well yield.

Based on the plotted water level trends and observed yields during the step test a 0.17 L/s rate was selected for the constant rate test.

72 Hour Pump Testing of Well 73075

On the following day, after the water level had recovered from the step test, the 3 day 0.17 L/s constant rate pumping test was started. As a supplement to the datalogger record, manual measurements of water levels were intermittently made in Wells 73075 and 73066. These data were used to provide a datum for the datalogger record. In addition to checks on the flow rate, pH, temperature, redox and electrical conductivity of the discharge water quality was occasionally recorded. The recorded ranges of values were: pH 8.5 to 8.6, conductivity 201 to 270 mS/cm, redox 155 to 180 mV and temperature remained constant at 11°C. This monitoring showed that the water quality parameters did not change significantly during the test and that the changes recorded did not follow a trend.

A semi-log graph of the adjusted water level trends in Well 73075 is presented on Fig. 9A and, as can be seen, the well could easily sustain the 0.17 L/s rate for the 3 day pumping period and not have the water level go below the upper fracture zone. The adjustment made to the recorded water levels involved calculating the drawdown below the upward trending water levels. The water levels stabilized during the last half day of the test (see detail in Fig. 9B) confirming the influence of the upper fracture zone below.

The water level recovery is also presented on Fig. 9A. The trends on both the pumping and recovery graphs are similar and followed two well defined legs. These trends were used to calculate approximate aquifer transmissivity values using the Jacob method and the results are presented in the small table below Fig. 9B. As there was no response to pumping in the observation well (Well 73066) no regional transmissivity and storativity values could be calculated.

It is noted that the recovery graph intercepted the zero line with a small intercept, which confirmed that the upper fracture held a significant volume of water in storage.

The projected water level trend before the water levels stabilized was used to estimate the drawdown after 100 days of pumping and from this an estimate a 100day specific capacity of 0.007 L/s/m was calculated. If the available drawdown as based on the range between the static water level and the upper fracture (6.6m) and, after applying the standard 75% factor, the estimated sustainable yield would be 0.04 L/s (0.48 lgpm). This ignores the influence of the lower fracture. If the available drawdown was based on this lower fracture (38.2m) the calculated long term yield would be 0.21 L/s (2.8 lgpm). However, based on the results of the last step in the step test and on an analysis of recharge from the capture zone (see Table III) a rate of 0.08 L/s (1.1 lgpm) is a considered a reasonable and conservative long term yield for this well. This value is slightly higher than the 0.75 gpm estimate recorded in the driller's log.

Impact on the Aquifer

As indicated on Table III a well pumping 0.08 L/s has a capture zone with a 129m width, some of which extends south of the property.

After allowing for the estimated current consumptive usage of 0.049 L/s, the net availability for future development using the existing well is 0.032 L/s (see Table IV). As the new developments will have septic system(s) with no irrigation, this means that about 80% of the water used for the new development will be discharged back into the aquifer (McQuillan, D and Bassett, E. 2009). This effectively means that the proposed new development could consume an additional 0.032 L/s and only increase the net withdrawal from the aquifer by 13.5%. This increased pumpage will have no adverse effects on adjacent existing groundwater users.

If additional water is still required for future development of the Property, an additional well could be drilled. As indicated on Fig. 1 another well could be located in the northern part of the Property and a conservative estimate indicates that this well could have a yield of at least 0.06 L/s. The combined yield from the two Property wells would be 0.14 L/s. As indicated on Table IV, after allowing for return flow from the septic system(s) into the aquifer, the net withdrawal from the aquifer under this scenario would be 0.066 L/s, or represent a 21.5% net increase in withdrawal from the aquifer.

Even this potential increase in withdrawal from the local aquifer would have no adverse effects on adjacent existing groundwater users.

Well Water Quality

A water sample had previously been collected from Well 73075 in August 2022 and sent to a laboratory for a complete potability analysis and a copy of the laboratory report is in Appendix A.

This report shows that the water from this well meets all of the Canadian Drinking Water quality criteria, with the exception of total coliforms. The total coliform count was 12 CFU/100mL when the standard is for no coliforms to be present. As there are no obvious sources of coliform bacteria within the well's capture zone it is concluded that the source would be in the sampling equipment and not in the aquifer. This is a common occurrence and experience with similar situations leads to the conclusion that chlorinating the sampling equipment and following a strict sampling procedure will result in a negative result for coliform content.

It is also noted that the nitrate plus nitrite concentration was very low (just above the laboratory detection limit of 0.02 mg/L) and if the source of coliform was from a septic dispersal field this concentration would be substantially higher.

Summary and Conclusions

1. The Gabriola sandstone below the Property is relatively massive with two a moderately permeable water bearing fractures being intercepted by Well 73075.
2. Pumping and water level monitoring in Well 73075 suggests that the upper fracture is likely the more productive of the two and it may act as a drainable perched aquifer when the pumping level goes below this fracture for extended an period, which if drained could have an impact on the long term yield.
3. The recharge area available to sustain Well 73073 is a limiting factor and, based on an analysis of water level trends during the pump tests and the available recharge area the long term yield is not likely to exceed 0.08 L/s (1.1 Igpm).
4. The current water consumption is about 0.049 L/s and when pumpage from the existing well (Well 73073) is increased to its sustainable rate 0.08 L/s for extended periods during the summer months, it will not have no adverse effects on adjacent existing groundwater users.
5. If there is a need for additional water for the proposed future developments on the Property, the chances of developing a new well in the northern part of the property is considered promising and assuming this well can yield 0.06 L/s the net yield from the two wells would be 0.14 L/s.
6. As it is understood that all of the new facilities with higher water usage would have septic system(s), this will result in an 80% return of water to the aquifer via the dispersal fields.
7. Based on the assumption that a new well is required, the proposed new development could consume an additional 0.091 L/s of water and only increase the net withdrawal from the aquifer by 21.5%. This increase would have no adverse effects on adjacent existing groundwater users.
8. After retesting the water for total coliforms, Well 73075 will eventually meet the Canadian Drinking Water Quality criteria for all parameters, including total coliform.

Alley Enterprises Ltd.
Attention: Kent Moen.

-9-

November 2, 2023

Acknowledgements

The efforts of Brian Strachan of Gabriola Waterworks in providing on-site assistance with implementation of the two pumping tests were very much appreciated.

Limitations.

This investigation has been conducted using a standard of care consistent with that expected of scientific and engineering professionals undertaking similar work under similar conditions in B.C. No warranty is expressed or implied.

I trust that this is sufficient for you present purposes.

Yours truly,

Elanco Enterprises Ltd.



R. Allan Dakin, FEC, P. Eng.
Senior Groundwater Engineer



Att.

References and Background Reports

- Elanco Enterprises Ltd. December 2019. Assessment of Well Yields on Proposed Housing Development Property, Paisley Place, Gabriola Island, B.C. Report prepared Gabriola Housing Society. 12pp.
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- Todd, J, Wei, M and Lepitre, M. 2016. Guidance Document for Technical Requirements in Support of an Application for Groundwater Use in British Columbia. BC Government Water Science Series WSS206-08. 19pp
- Van Isle Septic Services Inc. Jan. 11, 2021 Septic System Survey, 750 Tin Can Alley, Gabriola Island, B.C. Report prepared for Alley Enterprises Ltd. 4pp.

Tables

Table I

Information on Local Area Wells - Sorted by WTN

Well Tag Number	Licenced ?	Construction Start Date	Address		Depth to (metres)				Elevation (m-asl)					Yield L/s	
			No	Street	Bedrock	SWL	PWS	Well bottom	Collar	Top Casing	Bedrock	SWL	PWS		Well bottom
5376	No	1-Jan-50	815	North Road	4.6	4.6	na	9.14	96	96.3	91.4	91.7	na	86.9	na
31981	No	6-Jan-75	796	North Road	0.6	7.6	na	24.4	96	96.3	95.4	88.7	na	71.6	0.35
42244	No	1-May-79	811	North Road	0.9	na	na	13.7	96	96.3	95.1	na	na	82.3	0.38
42758	No	1-Jul-79	785	North Road	2.1	3.7	na	21.3	89	89.3	86.9	85.6	na	67.7	0.38
64324	No	11-Mar-89	785	North Road	na	10.7	na	54.9	89	89.3	na	78.6	na	34.1	0.06
64372	No	20-Apr-90	815	North Road	3.4	12.2	36.9	39.6	96	96.3	92.6	84.1	59.1	56.4	0.63
69506	No	3-Sep-92	730	Church Street	2.4	21.3	na	61.0	96	96.3	93.6	75.0	na	35.0	0.13
73066	No	23-Sep-94	700	Tin Can Alley	0.9	27.4	36.6	61.0	108	108.3	107.1	80.9	71.4	47.0	0.06
73075	No	7-Jul-93	750	Tin Can Alley	1.5	9.1	53.3	56.4	97.7	98	96.2	88.9	44.4	41.3	0.05
73096	No	21-Jul-93	790	North Road	1.5	12.2	na	106.7	91	91.3	89.5	79.1	na	-15.7	0.06
73233	No	13-Aug-96	790	North Road	2.4	9.1	na	121.9	91	91.3	88.6	82.2	na	-30.9	0.001
102040	No	6-Jul-07	730	Church Street	na	18.3	na	67.1	96	96.3	na	78.0	na	28.9	0.13
106406	No	29-Oct-03	818	North Road	5.8	3.7	18.3	29.0	104	104.3	98.2	100.6	85.7	75.0	0.13
106527	No	14-Sep-96	790	North Road	na	15.2	na	45.7	91	91.3	na	76.1	na	45.3	0.16
106528	No	14-Sep-96	790	North Road	na	15.2	na	45.7	91	91.3	na	76.1	na	45.3	0.16
106605	Yes	20-Aug-99	785	North Road	0.9	13.7	na	61.0	89	89.3	88.1	75.6	na	28.0	0.13
123439	No	30-Oct-12	730	Church Street	3.7	11.6	na	76.2	94	94.3	90.3	82.7	na	17.8	0.63
Minimum					0.6	3.7		9.1	89		87	75	44	-31	0.001
Median					2.1	11.9		55	96		93	82	65	45	0.13
Average					2.4	12.2		53	95		93	83	65	42	0.21
Maximum					5.8	27.4		122	108		107	101	86	87	0.6

Notes

Number of wells = 16

na = Data not available

1) See locations of wells on Fig. 2

SWL = Static water level at the time of well construction

2) Data on wells is from MOE G-wells website.

PWS = Principal water source entering the bedrock well (see Note 5)

3) Elevations of ground surface are based on Google Earth map and Fig. 3 contours.

4) The casing stick up is assumed to be 0.3m for all wells and all depths to water were measured from the top of the casing.

5) PWS depths are only presented here for Tin Can Alley wells and are only based on driller's logs.

Table II

Information on Local Area Wells - Address

Well Tag Number	Licenced ?	Construction Start Date	Address		Depth to (metres)				Elevation (m-asl)					Yield L/s	
			No	Street	Bedrock	SWL	PWS	Well bottom	Collar	Top Casing	Bedrock	SWL	PWS		Well bottom
69506	No	3-Sep-92	730	Church Street	2.4	21.3	na	61.0	96	96.3	93.6	75.0	na	35.0	0.13
102040	No	6-Jul-07	730	Church Street	na	18.3	na	67.1	96	96.3	na	78.0	na	28.9	0.13
123439	No	30-Oct-12	730	Church Street	3.7	11.6	na	76.2	94	94.3	90.3	82.7	na	17.8	0.63
42758	No	1-Jul-79	785	North Road	2.1	3.7	na	21.3	89	89.3	86.9	85.6	na	67.7	0.38
64324	No	11-Mar-89	785	North Road	na	10.7	na	54.9	89	89.3	na	78.6	na	34.1	0.06
106605	Yes	20-Aug-99	785	North Road	0.9	13.7	na	61.0	89	89.3	88.1	75.6	na	28.0	0.13
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73233	No	13-Aug-96	790	North Road	2.4	9.1	na	121.9	91	91.3	88.6	82.2	na	-30.9	0.00
106527	No	14-Sep-96	790	North Road	na	15.2	na	45.7	91	91.3	na	76.1	na	45.3	0.16
106528	No	14-Sep-96	790	North Road	na	15.2	na	45.7	91	91.3	na	76.1	na	45.3	0.16
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Minimum					0.6	3.7		9.1	89		87	75	44	-31	0.001
Median					2.1	11.9		55	96		93	82	65	45	0.13
Average					2.4	12.2		53	95		93	83	65	42	0.21
Maximum					5.8	27.4		122	108		107	101	86	87	0.6

Notes

Number of wells = 16

na = Data not available

1) See locations of wells on Fig. 2

SWL = Static water level at the time of well construction

2) Data on wells is from MOE G-wells website.

PWS = Principal water source entering the bedrock well (see Note 5)

3) Elevations of ground surface are based on Google Earth map and Fig. 3 contours.

4) The casing stick up is assumed to be 0.3m for all wells and all depths to water were measured from the top of the casing.

5) PWS depths are only presented here for Tin Can Alley wells and are only based on driller's logs.

Table III

Well Capture Zone and Recharge Analysis

Capture Zone

Formula	Symbol	Parameter	Note No	Value	Unit
$Y = Q/2T/i$ $X = Y/\pi$	Q	Pumping rate	1	6.52	m ³ /d
				0.075	L/s
				1.0	lgpm
				1,440	gpd
	T	Transmissivity	2	7.0E-06	m ² /s
				0.6	m ² /d
i	Gradient	3	0.083		
	Y	half width	4	64.7	m
	2Y	Width		129.4	m
	x	down distance	4	20.6	m

Well Recharge Estimate

Annual precipitation	5	925	mm/yr
Infiltration rate	6	15%	%
Area of capture zone	7	18,500	m ²
Recharge to well 73075		2,567	m ³ /yr
		7.0	m ³ /day
		0.08	L/s
		1.1	lgpm

Notes:

- 1) Sustainable pumping rate based on constant rate pumping test analysis.
- 2) Transmissivity from second leg of constant rate test (see Fig. 9)
- 3) Gradient based on estimated piezometric trend indicated on Fig. 2
- 4) See capture zone dimension illustration below
- 5) Annual precipitation based on 30 year average for Nanaimo Airport
- 6) Infiltration factor typical for Saturna well drained soils.
- 7) See capture zone outlined on Fig. 2

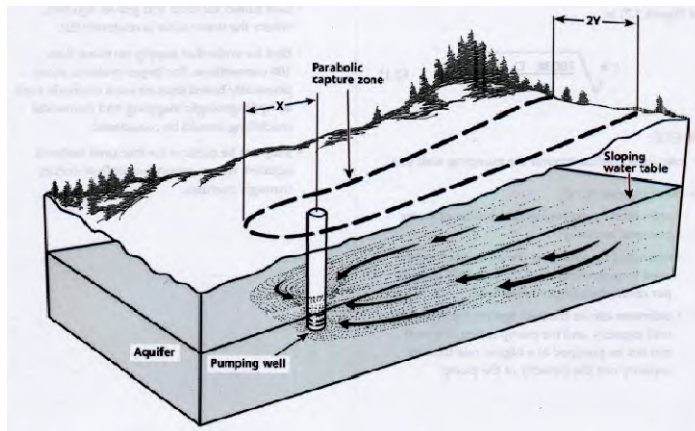


Table IV
Potential Net Withdrawals From Aquifer

Item	Litres/ Day	L/s
Estimated current water usage		
Watering gardens (see Note 1)	4,086	0.047
Washroom discharge to septic system	180	0.002
Total	4,266	0.049
Existing septic system recharge to aquifer (80% of discharge)	144	0.0017
Net withdrawal from aquifer	4,122	0.048
Existing well yield (see Note 2)	6,912	0.08
Water available for future development	2,790	0.032
80% septic system recharge to aquifer, from future development.	2,232	0.026
Net future withdrawal from aquifer	558	0.006
Present and future net withdrawal from aquifer	4,680	0.054
Net increase in aquifer withdrawal after new development	13.5%	13.5%
Conservative estimate of yield from a 2nd well (if required) (Note 3)	5,184	0.060
Yield from two wells	12,096	0.14
Available for future development	7,830	0.091
80% of Septic system recharge to aquifer from future development	6,264	0.073
Existing septic system recharge to aquifer (80% of discharge)	144	0.0017
Total septic system recharge to aquifer	6,408	0.0742
Present and future net withdrawal from aquifer	5,688	0.066
Net increase in aquifer withdrawal resulting from adding a 2nd well.	21.5%	21.5%

Notes

- 1) Watering is based on 3 hours of watering with two garden hoses per day.
- 2) An analysis of the yield from the existing well is presented on Fig. 9.
- 3) The location of a potential future well (if required) is indicated on Fig. 2.

Figures

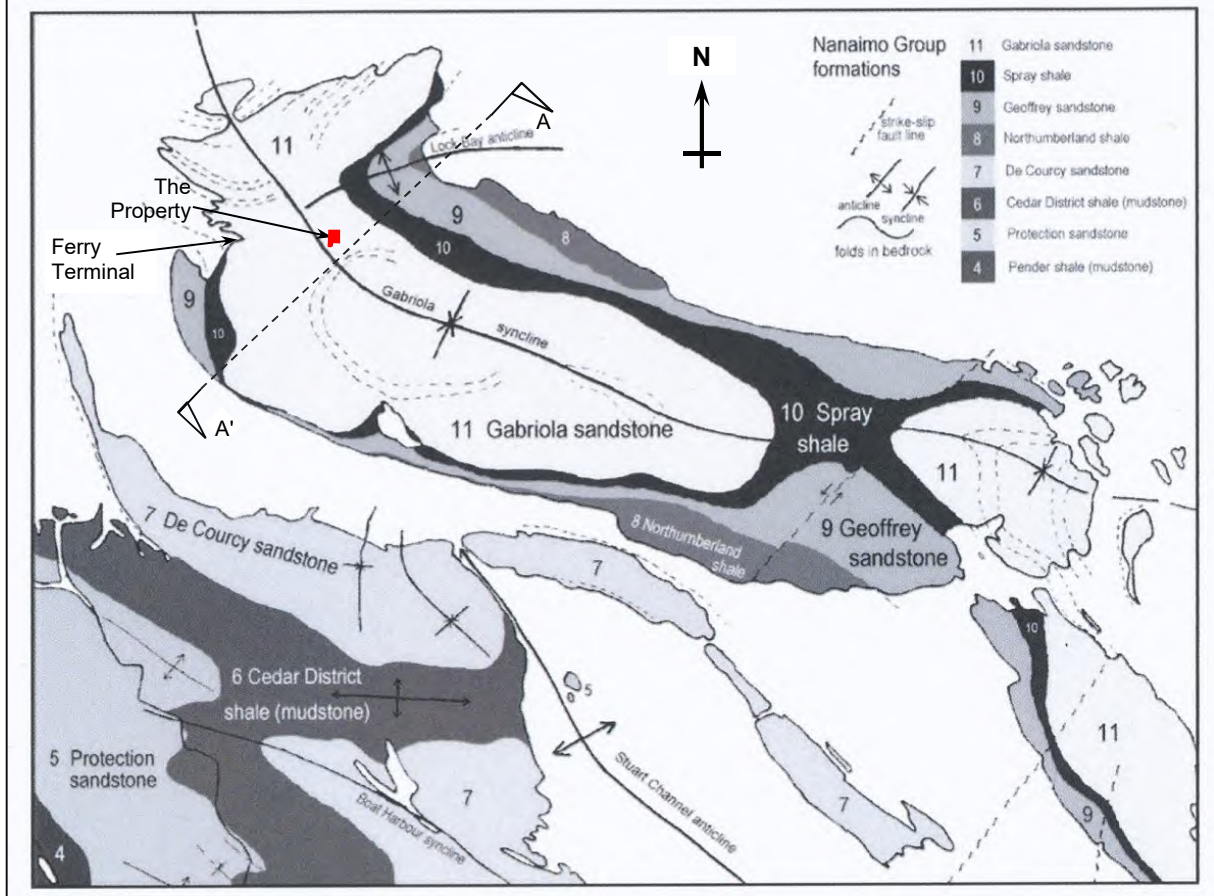


Fig. 1A

Scale (1:100,000)
0 1 2Km

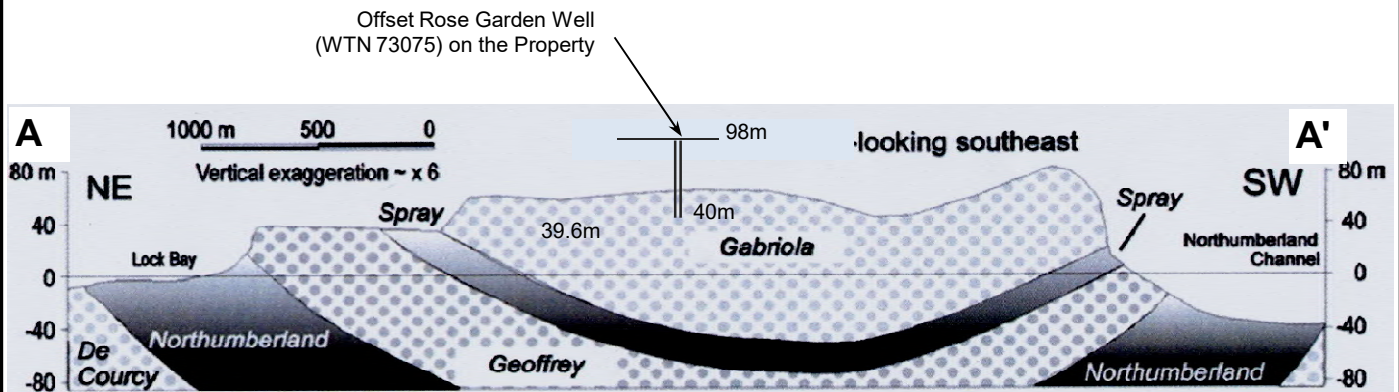
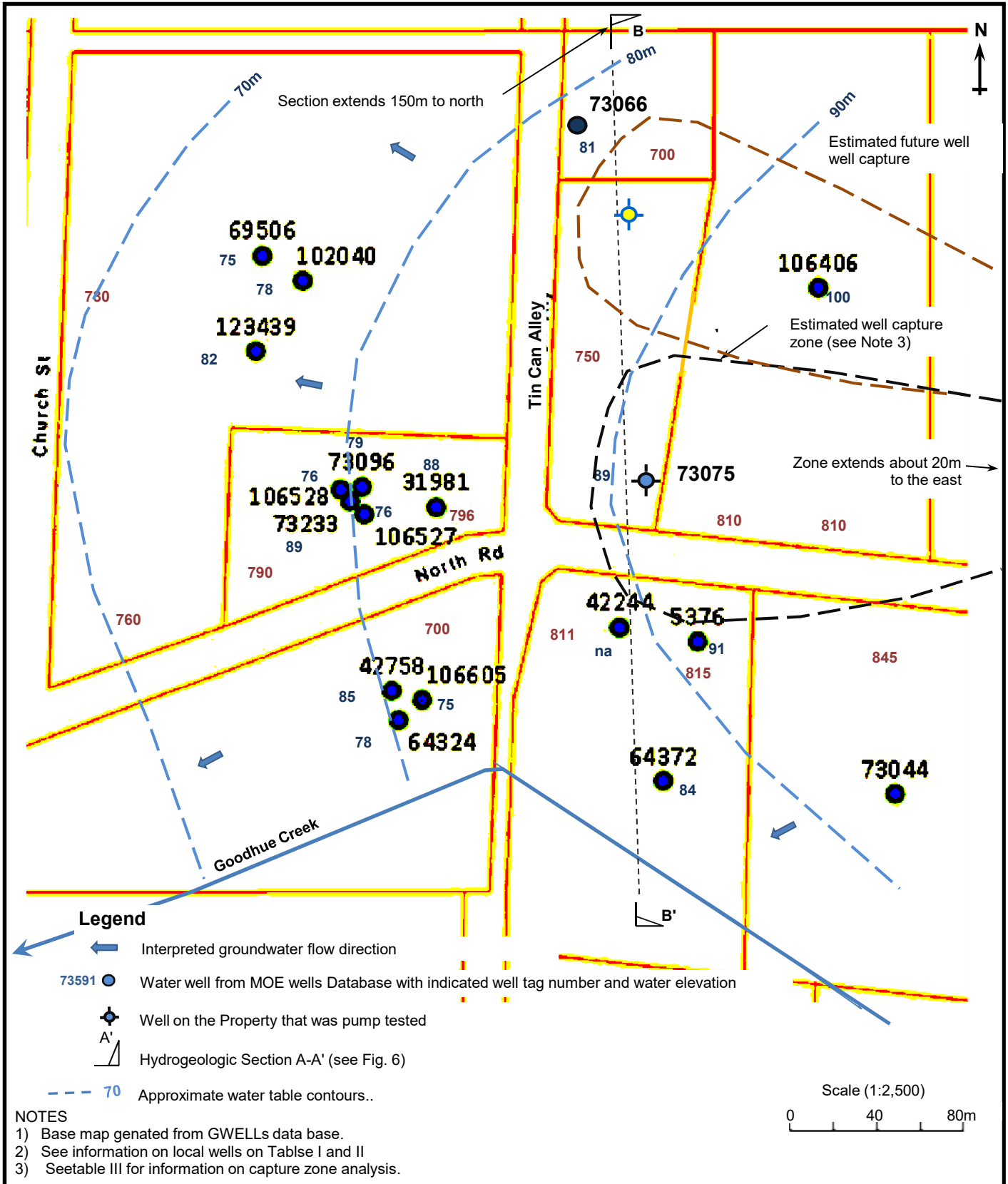


Fig. 1B

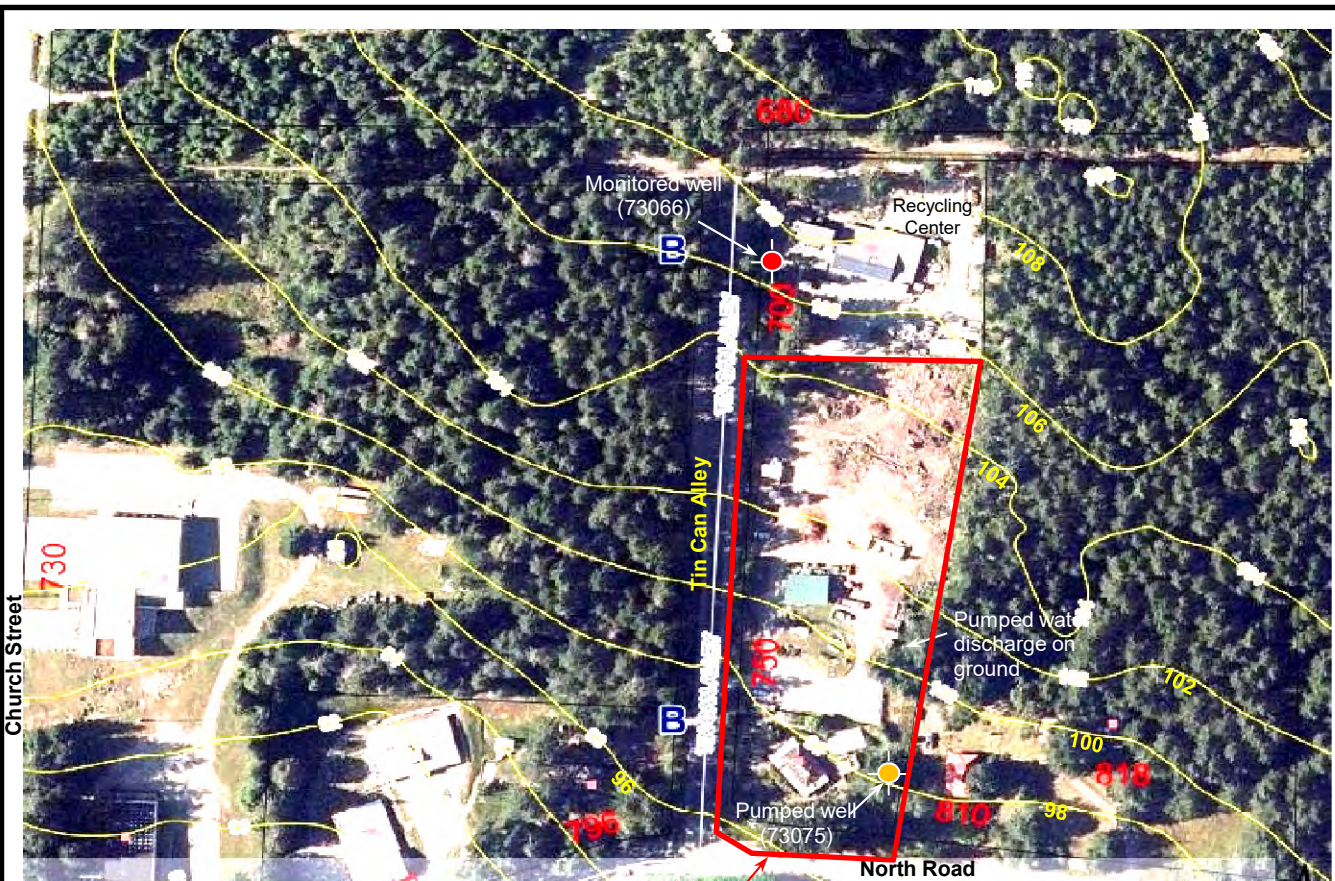
NOTES

1) Diagrams adapted from SRK Consulting April 2013, which were sourced from: SHALE No. 1 2000 and Earle and Krogh 2004

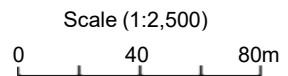
<p>Alley Enterprises Ltd</p>	<p>ELANCO ENTERPRISES LTD. Victoria, B.C. (250 744-1357)</p>				
<p>Assessment of Sustainable Yield from Wild Rose Farm and Garden Centre Well, 750 Tin Can Alley, Gabriola Island, B.C.</p>	<p>Bedrock Geology Nanaimo Group</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Drawn: </td> <td style="width: 50%;">Date Oct. 2023</td> </tr> <tr> <td>Approved:</td> <td>Fig. 1</td> </tr> </table>	Drawn:	Date Oct. 2023	Approved:	Fig. 1
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<p>Alley Enterprises Ltd</p>	<p>ELANCO ENTERPRISES LTD. Victoria, B.C. (250 744-1357) Permit to Practice No: 1001505</p>				
<p>Assessment of Sustainable Yield from Wild Rose Farm and Garden Centre Well, 750 Tin Can Alley, Gabriola Island, B.C.</p>	<p>Property Location Map.</p> <table border="1"> <tr> <td data-bbox="1299 1858 1421 1921"> Drawn: </td> <td data-bbox="1421 1858 1567 1921"> Date Oct. 2023 </td> </tr> <tr> <td data-bbox="1299 1921 1421 2026"> Approved: </td> <td data-bbox="1421 1921 1567 2026"> Fig. 2 </td> </tr> </table>	Drawn:	Date Oct. 2023	Approved:	Fig. 2
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Approved:	Fig. 2				




The Property

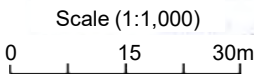
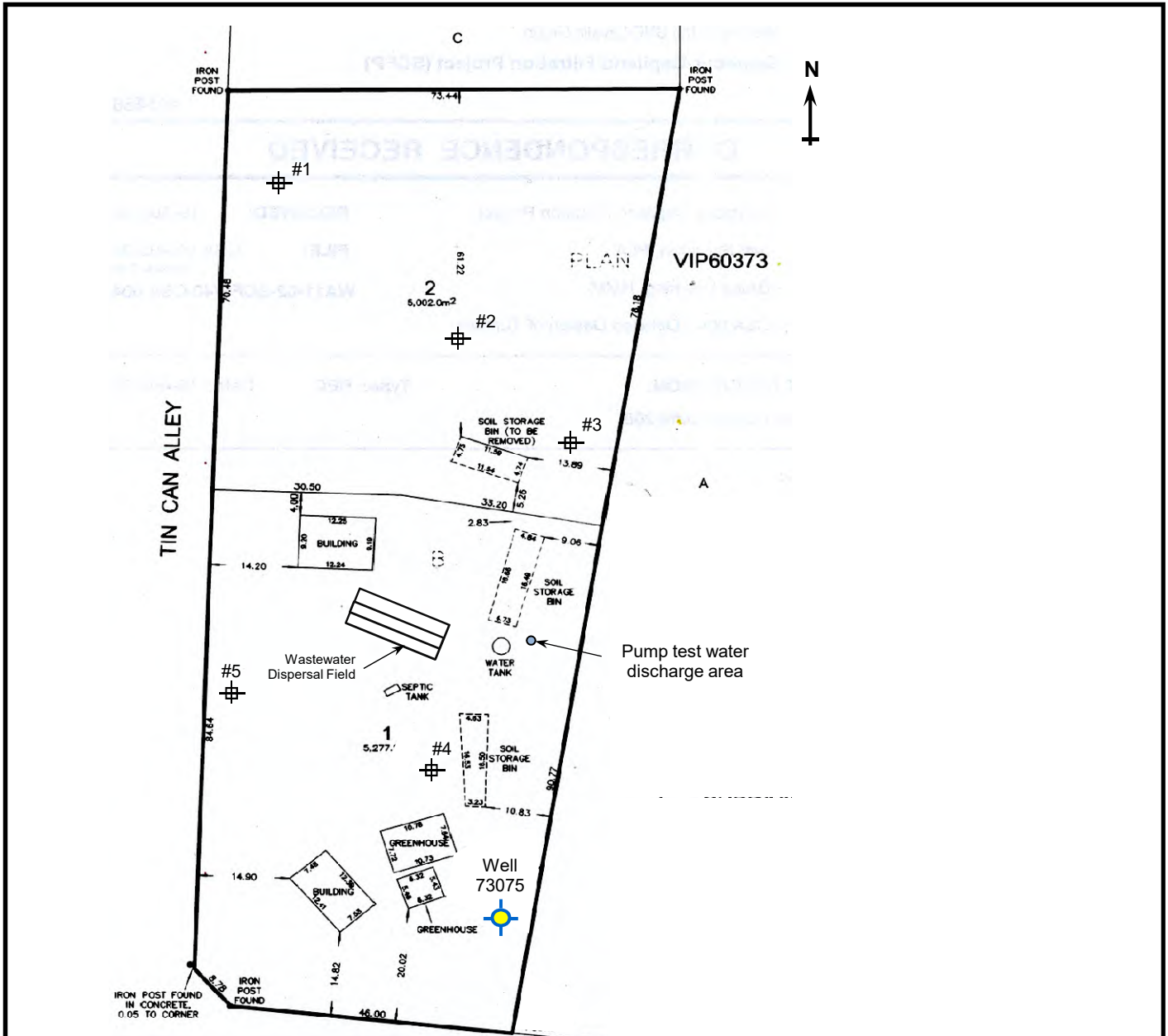


Legend

-  Pumped well (73075)
-  Monitored well (73066)

- NOTES
- 1) Map generated from Regional District of Nanaimo interactive web map.
 - 2) Contours are in m-asl at 2m intervals.

<p>Alley Enterprises Ltd</p>	<p>ELANCO ENTERPRISES LTD. Victoria, B.C. (250 744-1357) Permit to Practice No: 1001505</p>		
<p>Assessment of Sustainable Yield from Wild Rose Farm and Garden Centre Well, 750 Tin Can Alley, Gabriola Island, B.C.</p>	<p>Property Location Map.</p>	<p>Drawn: </p> <p>Approved:</p>	<p>Date Oct. 2023</p> <p>Fig. 3</p>



Legend

NOTES

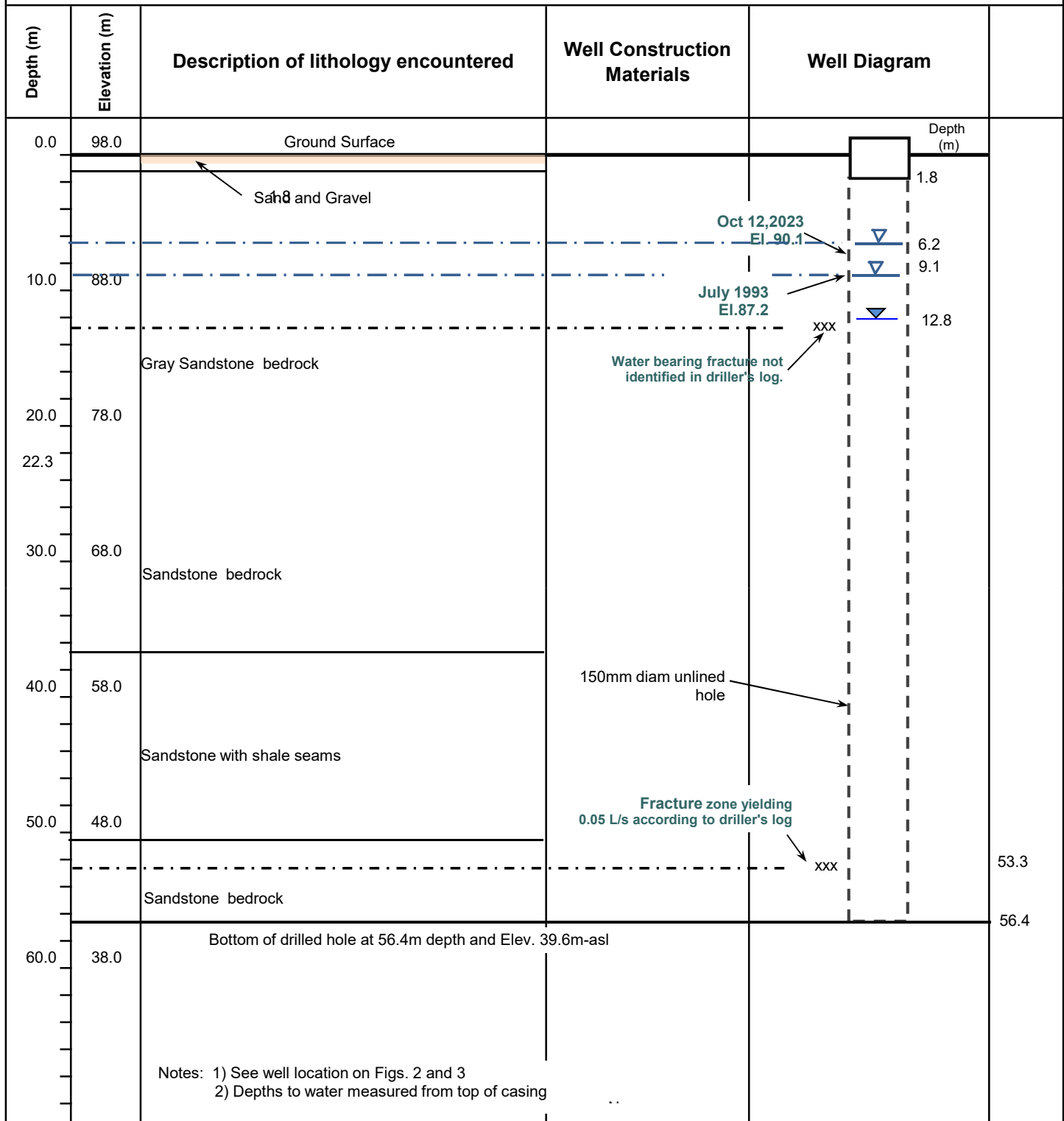
- 1) See location of the Property on Figs.1 and 2.
- 2) Surveyed base map prepared by J.E. Anderson & Associates
- 3) Locations of geotechnical test pits indicated on Lewkowich Engineering Associates Ltd. Map F9892-01.

Alley Enterprises Ltd	ELANCO ENTERPRISES LTD. Victoria, B.C. (250 744-1357) Permit to Practice No: 1001505
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Assessment of Sustainable Yield from Wild Rose Farm and Garden Centre Well, 750 Tin Can Alley, Gabriola Island, B.C.	Plan of the Property	Drawn: Approved:	Date Oct. 2023 Fig. 4
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JOB NUMBER : 249

Borehole No: Wild Rose Well	Well Tag No. 73075	Constructed By: Windecker Water Wells
Date Drilled: July 1993		Hole Diameter: 150 mm
Method: Air rotary		Ground elevation: 98.00 m-asl
Datum above ground (m): 0.30		Depth to water at construction : 70.1 m-below top of casing
Elevation top of flange (m-asl): 98.3		Depth to water below ground: 22.6 m-bg



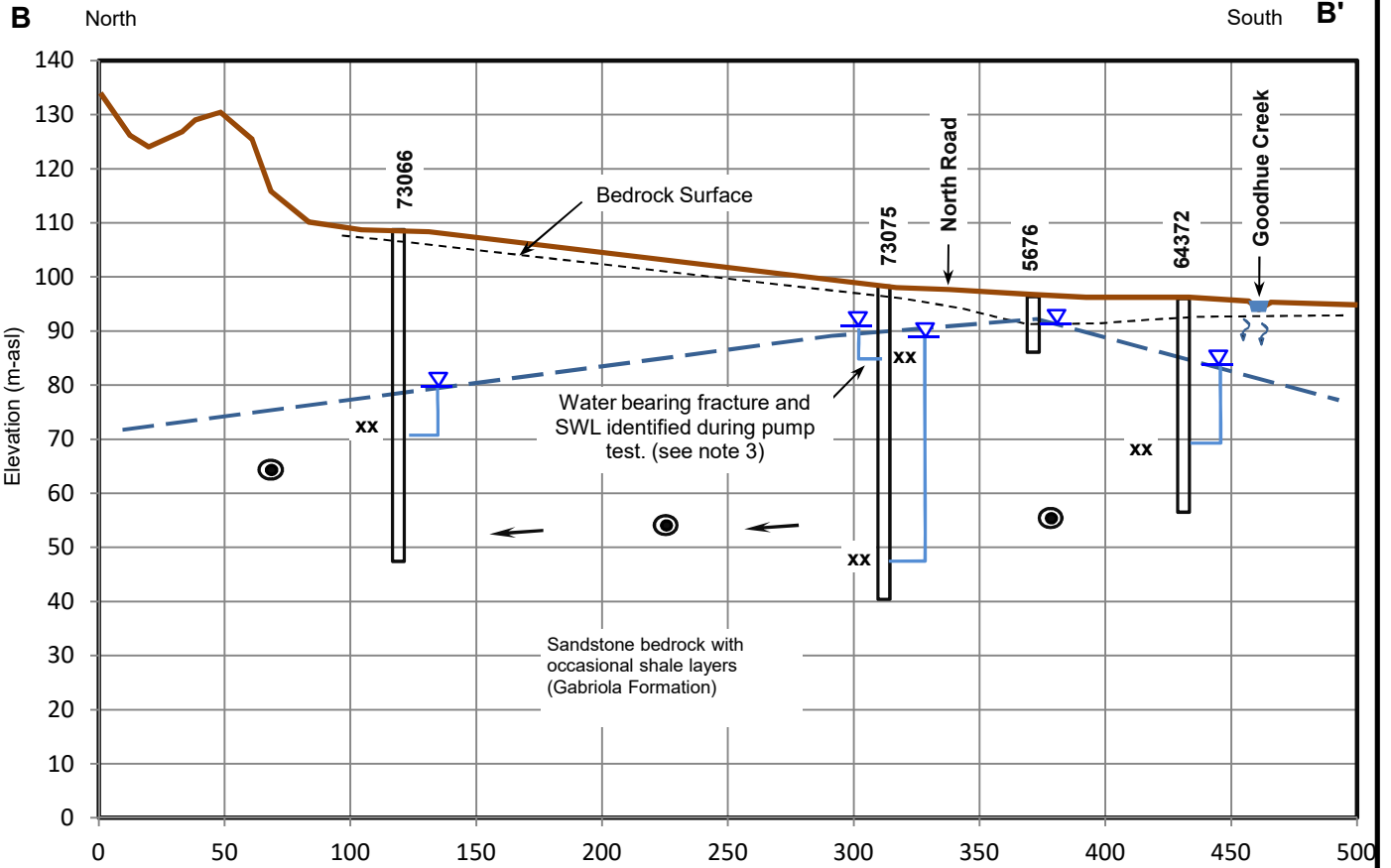
Alley Enterprises Ltd

ELANCO ENTERPRISES LTD.
 Victoria, B.C. (250 744-1357)
 Permit to Practice No: 1001505

Assessment of Sustainable Yield from Wild Rose Farm and Garden Centre Well, 750 Tin Can Alley, Gabriola Island, B.C.

Rose Garden Well

BY: rad	DATE: Oct. 2023
APPROVED:	Fig. 5



Legend

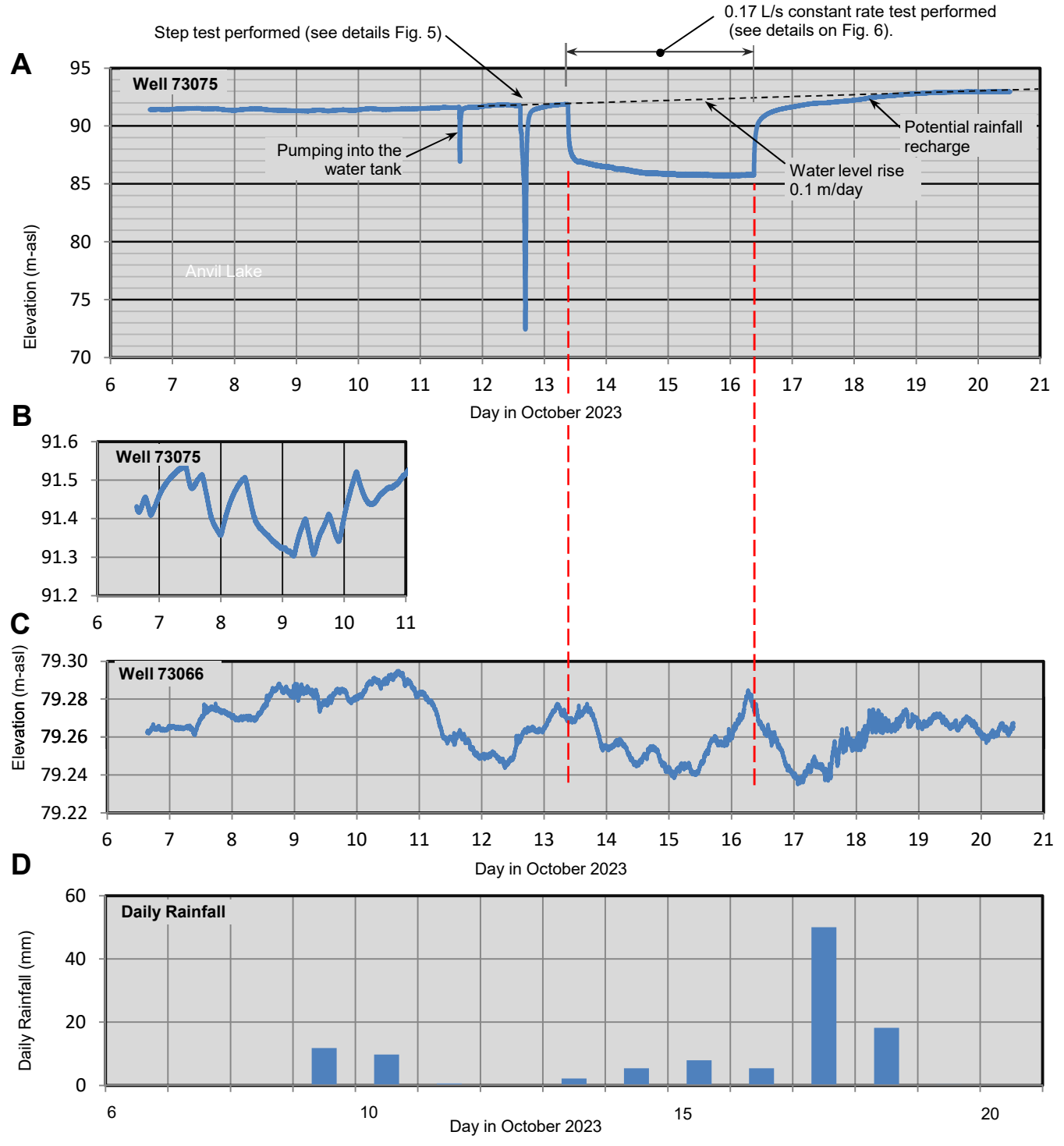
- Well tag number (see data on Table I)
 - Well with indicated piezometric level
 - xx** Water bearing fracture zone identified in the driller's log. Likely the principal water source (PWS), unless determined otherwise.
- Interpreted groundwater flow direction
- In plane of section
 - Into section
 - Out of section

Horizontal Scale (1:3,000)
 0 40 80m
 Vertical exaggeration = 2

NOTES

- 1) See location of Section on Fig. 2. and details of wells on Tables I and II.
- 2) A principal water bearing fracture zone was identified during the pump testing of Well 73075. See details on Fig. 8.

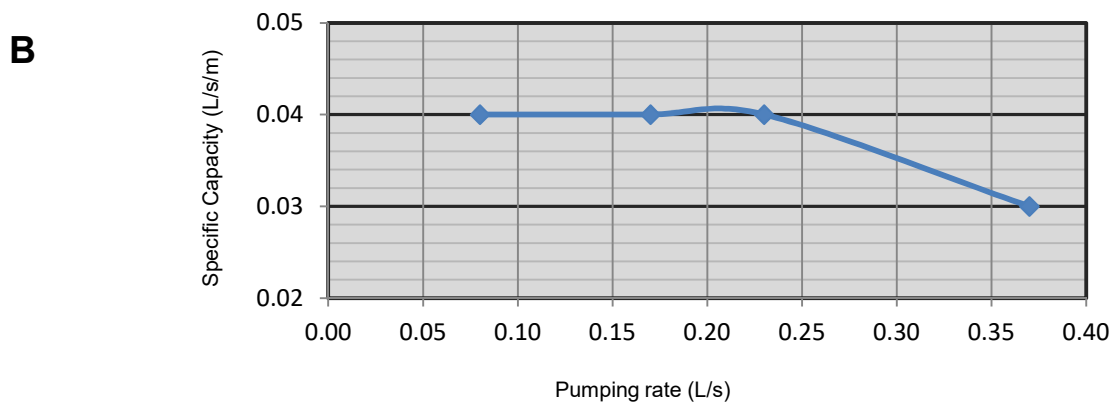
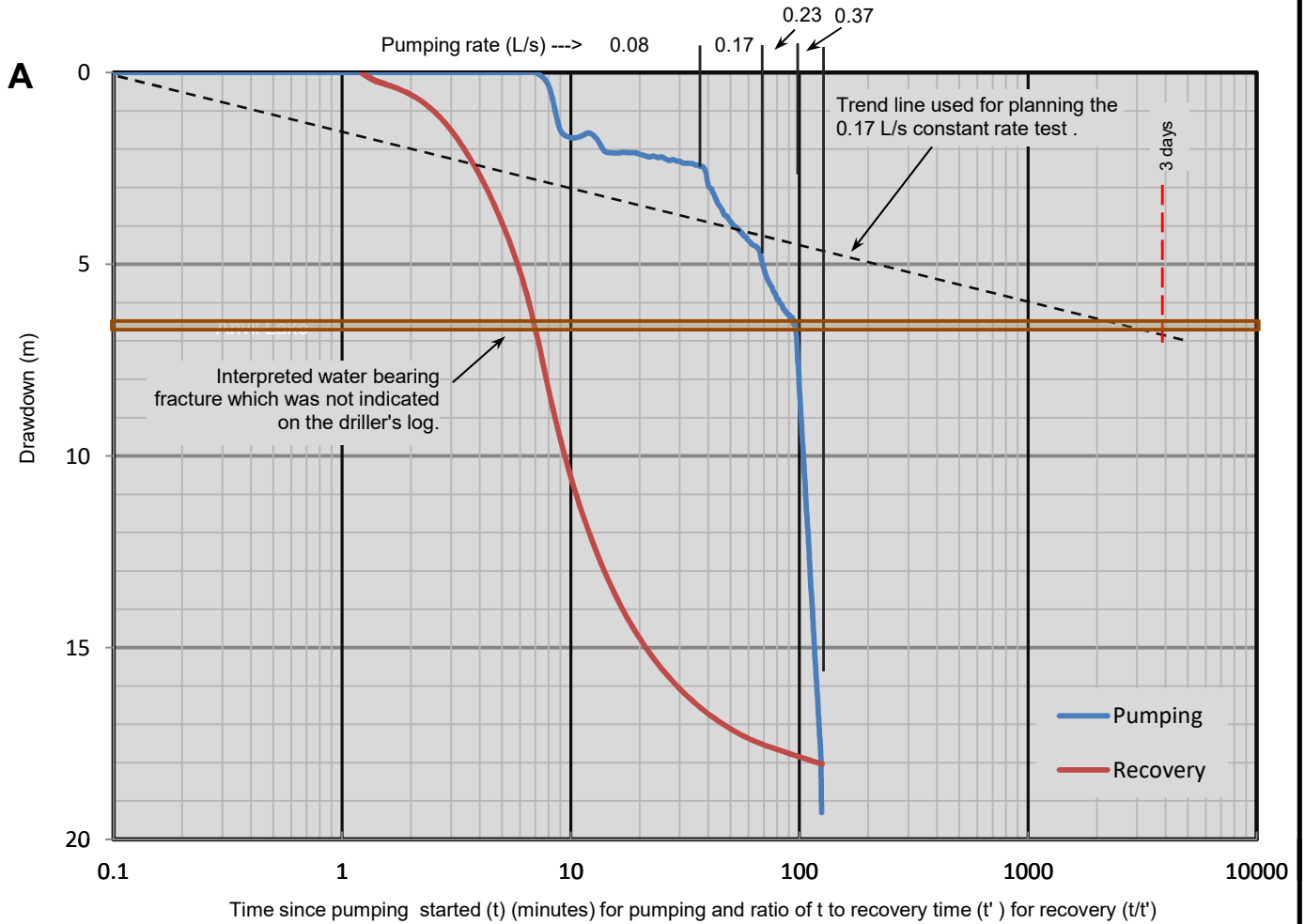
Alley Enterprises Ltd	ELANCO ENTERPRISES LTD. Victoria, B.C. (250 744-1357) Permit to Practice No: 1001505		
Assessment of Sustainable Yield from Wild Rose Farm and Garden Centre Well, 750 Tin Can Alley, Gabriola Island, B.C.	Section B - B'	Drawn:	Date Oct. 2023
		Approved:	Fig. 6



NOTES


- 1) See location of wells on Figs. 1 and 2
- 2) Water level trends based on 1-minute interval data logger record.
- 3) Daily rainfall based on Environment Canada's Nanaimo City Yard station.

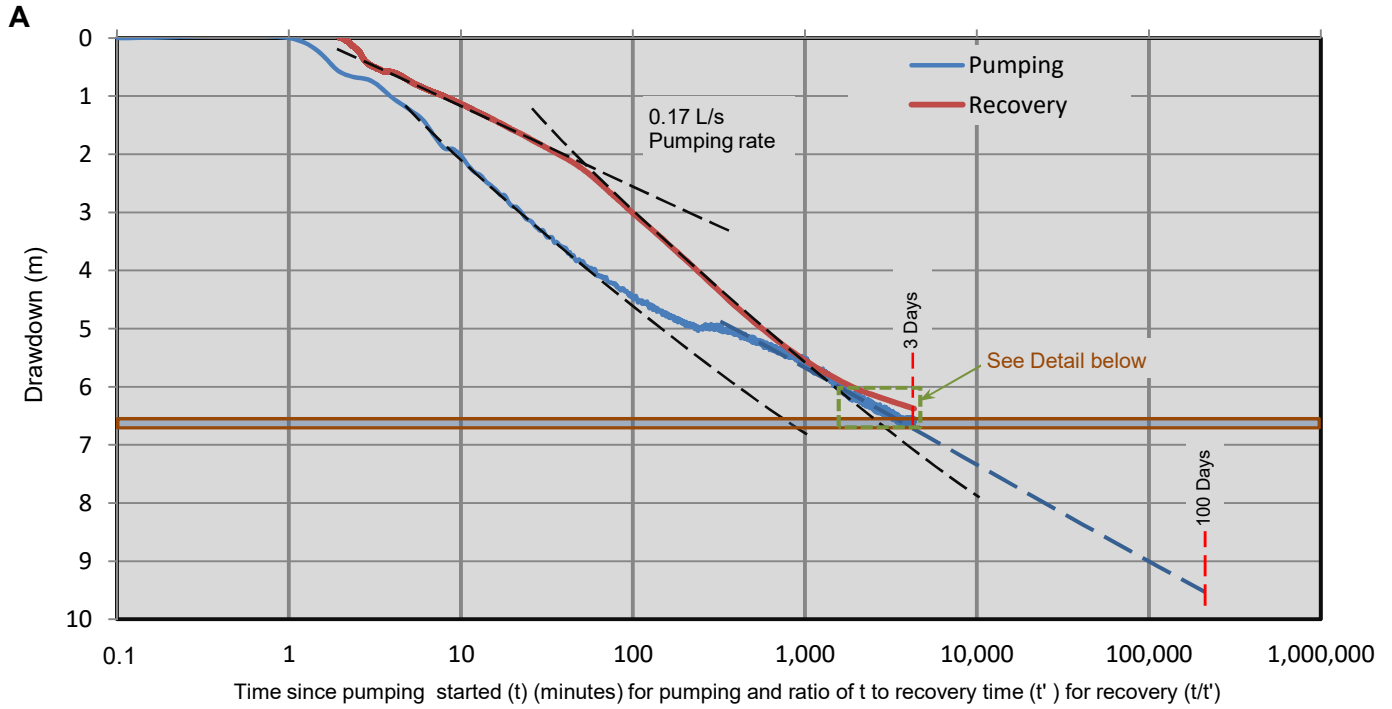
Alley Enterprises Ltd	ELANCO ENTERPRISES LTD. Victoria, B.C. (250 744-1357) Permit to Practice No: 1001505					
Assessment of Sustainable Yield from Wild Rose Farm and Garden Centre Well, 750 Tin Can Alley, Gabriola Island, B.C.	Water Level Elevation Trends	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">Drawn: </td> <td style="width: 50%; padding: 2px;">Date: Oct. 2023</td> </tr> <tr> <td style="padding: 2px;">Approved:</td> <td style="padding: 2px; text-align: center;">Fig. 7</td> </tr> </table>	Drawn:	Date: Oct. 2023	Approved:	Fig. 7
Drawn:	Date: Oct. 2023					
Approved:	Fig. 7					



NOTES

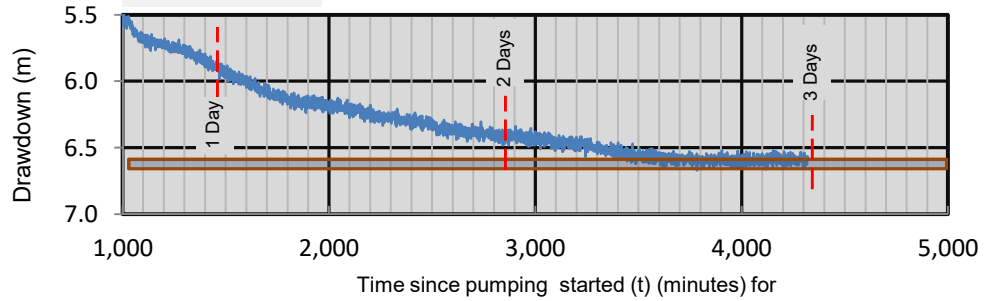
- 1) See location of well on Fig.2 and water level trends on Fig. 7.
- 2) Test was conducted on October 12, 2023
- 3) Data is based on 1minute data logger readings which was compared with manual depth to water measurements.

<p>Alley Enterprises Ltd</p>	<p>ELANCO ENTERPRISES LTD. Victoria, B.C. (250 744-1357) Permit to Practice No: 1001505</p>	
<p>Assessment of Sustainable Yield from Wild Rose Farm and Garden Centre Well, 750 Tin Can Alley, Gabriola Island, B.C.</p>	<p>Graphs of Step Pump Test Conducted on Well 73075</p>	<p>Drawn:  Date: Oct. 2023</p> <p>Approved: _____ Fig. 8</p>



Available drawdown (m) =

B Detail



Available drawdown (m) = 6.6 Upper fracture
 Available drawdown (m) = 38.2 Lower fracture

Transmissivity = $1.83 \times 10^{-4} \times Q / \Delta S$

First Leg Pumping
 Recovery
Second Leg Pumping
 Recovery

Q (L/s)	ΔS (m)	T (m ² /s)
0.07	2.5	5.1E-06
0.07	2.5	5.1E-06
0.07	1.7	7.5E-06
0.07	1.3	9.9E-06

6.0 m³/d

100 Day			
	Drawdown	Sp Cap L/s/m	L/s m ³ /d
Tested	9.5	0.007	0.07 6
Upper	5.0	0.007	0.04 3
Lower	28.6	0.007	0.21 18

Fracture Zone
 Upper Bottom

Sustainable Well Yield =	Upper	Bottom	L/s
	0.04	0.21	L/s
	0.48	2.8	lgpm
	3.2	18.2	m ³ /d

NOTE8

- 1) See location of well on Fig .2 and water level trends on Fig. 7.
- 2) Pump test was monitored by B. Strachan of Gabriola Waterworks.
- 3) Water levels based on data logger readings at 1 minute intervals.
- 4) Pumping rates were calculated from intermittent flow meter volume and time readings.

Alley Enterprises Ltd

ELANCO ENTERPRISES LTD.
 Victoria, B.C. (250 744-1357)

Assessment of Sustainable Yield from Wild Rose Farm and Garden Centre Well, 750 Tin Can Alley, Gabriola Island, B.C.

Graphs of Constant Rate Pump Test Conducted on Well 73075

Drawn: Date Oct. 2023

Approved: Fig. **9**

Appendix A

Laboratory Report on Well Water Quality



Your P.O. #: 03-P-23073
 Your Project #: ALLEY ENTERPRISES
 Your C.O.C. #: 08511715

Attention: Bryan Richardson

Andrew Sheret - Nanaimo
 2545 McCullough Rd
 Nanaimo, BC
 Canada V9S 4M9

Report Date: 2022/09/06
 Report #: R3227015
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C265290

Received: 2022/08/30, 09:00

Sample Matrix: Drinking Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity @25C (pp, total), CO3,HCO3,OH	1	N/A	2022/08/31	BBY6SOP-00026	SM 23 2320 B m
Chloride/Sulphate by Auto Colourimetry	1	N/A	2022/08/31	BBY6SOP-00011 / BBY6SOP-00017	SM23-4500-Cl/SO4-E m
Colour (True) by Kone Lab	1	N/A	2022/08/31	BBY6SOP-00057	SM 23 2120 C m
Conductivity @25C	1	N/A	2022/08/31	BBY6SOP-00026	SM 23 2510 B m
Fluoride	1	N/A	2022/08/31	BBY6SOP-00048	SM 23 4500-F C m
Hardness Total (calculated as CaCO3) (1)	1	N/A	2022/09/02	BBY WI-00033	Auto Calc
Mercury (Total) by CV	1	2022/09/01	2022/09/01	AB SOP-00084	BCMOE BCLM Oct2013 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2022/09/02	BBY WI-00033	Auto Calc
Elements by CRC ICPMS (total)	1	N/A	2022/09/01	BBY7SOP-00003 / BBY7SOP-00002	EPA 6020b R2 m
Nitrate + Nitrite (N)	1	N/A	2022/09/01	BBY6SOP-00010	SM 23 4500-NO3- I m
Nitrite (N) by CFA	1	N/A	2022/09/01	BBY6SOP-00010	SM 23 4500-NO3- I m
Nitrogen - Nitrate (as N)	1	N/A	2022/09/02	BBY WI-00033	Auto Calc
pH @25°C (2)	1	N/A	2022/08/31	BBY6SOP-00026	SM 23 4500-H+ B m
Total Dissolved Solids (Filt. Residue)	1	2022/09/02	2022/09/06	BBY6SOP-00033	SM 23 2540 C m
Tot Coliform/E.Coli by MF-Chromocult(PW)	1	N/A	2022/08/30	BBY4SOP-00143	Merck KGaA Version 1
Turbidity	1	N/A	2022/08/31	BBY6SOP-00027	SM 23 2130 B m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.



Your P.O. #: 03-P-23073
Your Project #: ALLEY ENTERPRISES
Your C.O.C. #: 08511715

Attention: Bryan Richardson

Andrew Sheret - Nanaimo
2545 McCullough Rd
Nanaimo , BC
Canada V9S 4M9

Report Date: 2022/09/06
Report #: R3227015
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C265290

Received: 2022/08/30, 09:00

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) "Total Hardness" was calculated from Total Ca and Mg concentrations and may be biased high (Hardness, or Dissolved Hardness, calculated from Dissolved Ca and Mg, should be used for compliance if available).

(2) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Customer Solutions, Western Canada Customer Experience Team

Email: customersolutionswest@bureauveritas.com

Phone# (604) 734 7276

=====

This report has been generated and distributed using a secure automated process.

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.

For Service Group specific validation please refer to the Validation Signature Page.



BUREAU
VERITAS

Bureau Veritas Job #: C265290
Report Date: 2022/09/06

Andrew Sheret - Nanaimo
Client Project #: ALLEY ENTERPRISES
Your P.O. #: 03-P-23073

DRINKING WATER PACKAGE (REGULATED)

Bureau Veritas ID					BAR842		
Sampling Date					2022/08/29 08:40		
COC Number					08511715		
	UNITS	MAC	AO	OG	PRE CISTERN	RDL	QC Batch
ANIONS							
Nitrite (N)	mg/L	1	-	-	<0.0050	0.0050	A703749
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	-	-	-	3.17	0.50	A699157
Nitrate (N)	mg/L	10	-	-	0.028	0.020	A699237
Misc. Inorganics							
Conductivity	uS/cm	-	-	-	370	2.0	A702188
pH	pH	-	-	7.0:10.5	7.96	N/A	A702185
Total Dissolved Solids	mg/L	-	500	-	220	10	A704214
Anions							
Alkalinity (PP as CaCO3)	mg/L	-	-	-	<1.0	1.0	A702193
Alkalinity (Total as CaCO3)	mg/L	-	-	-	150	1.0	A702193
Bicarbonate (HCO3)	mg/L	-	-	-	180	1.0	A702193
Carbonate (CO3)	mg/L	-	-	-	<1.0	1.0	A702193
Dissolved Fluoride (F)	mg/L	1.5	-	-	0.11	0.050	A700462
Hydroxide (OH)	mg/L	-	-	-	<1.0	1.0	A702193
Chloride (Cl)	mg/L	-	250	-	21	1.0	A701293
Sulphate (SO4)	mg/L	-	500	-	13	1.0	A701293
MISCELLANEOUS							
True Colour	Col. Unit	-	15	-	8.2	5.0	A701243
Nutrients							
Nitrate plus Nitrite (N)	mg/L	-	-	-	0.028	0.020	A703745
Physical Properties							
Turbidity	NTU	see remark	see remark	see remark	0.45	0.10	A700499
Elements							
Total Mercury (Hg)	ug/L	1	-	-	<0.0019	0.0019	A701694
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	2900	-	100	18.8	3.0	A700455
Total Antimony (Sb)	ug/L	6	-	-	<0.50	0.50	A700455
Total Arsenic (As)	ug/L	10	-	-	0.12	0.10	A700455
Total Barium (Ba)	ug/L	2000	-	-	<1.0	1.0	A700455
Total Boron (B)	ug/L	5000	-	-	182	50	A700455
No Fill	No Exceedance						
Grey	Exceeds 1 criteria policy/level						
Black	Exceeds both criteria/levels						
RDL = Reportable Detection Limit							
N/A = Not Applicable							



BUREAU
VERITAS

Bureau Veritas Job #: C265290
Report Date: 2022/09/06

Andrew Sheret - Nanaimo
Client Project #: ALLEY ENTERPRISES
Your P.O. #: 03-P-23073

DRINKING WATER PACKAGE (REGULATED)

Bureau Veritas ID					BAR842		
Sampling Date					2022/08/29 08:40		
COC Number					08511715		
	UNITS	MAC	AO	OG	PRE CISTERN	RDL	QC Batch
Total Cadmium (Cd)	ug/L	7	-	-	<0.010	0.010	A700455
Total Chromium (Cr)	ug/L	50	-	-	<1.0	1.0	A700455
Total Cobalt (Co)	ug/L	-	-	-	<0.20	0.20	A700455
Total Copper (Cu)	ug/L	2000	1000	-	3.00	0.20	A700455
Total Iron (Fe)	ug/L	-	300	-	19.7	5.0	A700455
Total Lead (Pb)	ug/L	5	-	-	<0.20	0.20	A700455
Total Manganese (Mn)	ug/L	120	20	-	2.4	1.0	A700455
Total Molybdenum (Mo)	ug/L	-	-	-	<1.0	1.0	A700455
Total Nickel (Ni)	ug/L	-	-	-	<1.0	1.0	A700455
Total Selenium (Se)	ug/L	50	-	-	<0.10	0.10	A700455
Total Silicon (Si)	ug/L	-	-	-	14000	100	A700455
Total Silver (Ag)	ug/L	-	-	-	<0.020	0.020	A700455
Total Strontium (Sr)	ug/L	7000	-	-	15.5	1.0	A700455
Total Uranium (U)	ug/L	20	-	-	<0.10	0.10	A700455
Total Vanadium (V)	ug/L	-	-	-	<5.0	5.0	A700455
Total Zinc (Zn)	ug/L	-	5000	-	<5.0	5.0	A700455
Total Calcium (Ca)	mg/L	-	-	-	1.05	0.050	A699236
Total Magnesium (Mg)	mg/L	-	-	-	0.133	0.050	A699236
Total Potassium (K)	mg/L	-	-	-	0.107	0.050	A699236
Total Sodium (Na)	mg/L	-	200	-	89.8	0.050	A699236
Total Sulphur (S)	mg/L	-	-	-	3.3	3.0	A699236
Microbiological Param.							
Total Coliforms	CFU/100mL	0	-	-	12	N/A	A699457
E. coli	CFU/100mL	0	-	-	0	N/A	A699457
No Fill	No Exceedance						
Grey	Exceeds 1 criteria policy/level						
Black	Exceeds both criteria/levels						
RDL = Reportable Detection Limit							
N/A = Not Applicable							



BUREAU
VERITAS

Bureau Veritas Job #: C265290

Report Date: 2022/09/06

Andrew Sheret - Nanaimo

Client Project #: ALLEY ENTERPRISES

Your P.O. #: 03-P-23073

GENERAL COMMENTS

MAC,AO,OG: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, September 2020.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG)
It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

Turbidity Guidelines:

1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.
4. To ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that water entering the distribution system have turbidity levels of 1.0 NTU or less.

Measurement of Uncertainty has not been accounted for when stating conformity to the selected criteria, where applicable.

Results relate only to the items tested.



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Bureau Veritas Job #: C265290
Report Date: 2022/09/06

Andrew Sheret - Nanaimo
Client Project #: ALLEY ENTERPRISES
Your P.O. #: 03-P-23073

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A700455	MYO	Matrix Spike	Total Aluminum (Al)	2022/09/01	110	%	80 - 120		
			Total Antimony (Sb)	2022/09/01	101	%	80 - 120		
			Total Arsenic (As)	2022/09/01	105	%	80 - 120		
			Total Barium (Ba)	2022/09/01	98	%	80 - 120		
			Total Boron (B)	2022/09/01	NC	%	80 - 120		
			Total Cadmium (Cd)	2022/09/01	99	%	80 - 120		
			Total Chromium (Cr)	2022/09/01	100	%	80 - 120		
			Total Cobalt (Co)	2022/09/01	94	%	80 - 120		
			Total Copper (Cu)	2022/09/01	95	%	80 - 120		
			Total Iron (Fe)	2022/09/01	NC	%	80 - 120		
			Total Lead (Pb)	2022/09/01	97	%	80 - 120		
			Total Manganese (Mn)	2022/09/01	102	%	80 - 120		
			Total Molybdenum (Mo)	2022/09/01	105	%	80 - 120		
			Total Nickel (Ni)	2022/09/01	96	%	80 - 120		
			Total Selenium (Se)	2022/09/01	104	%	80 - 120		
			Total Silicon (Si)	2022/09/01	NC	%	80 - 120		
			Total Silver (Ag)	2022/09/01	97	%	80 - 120		
			Total Strontium (Sr)	2022/09/01	101	%	80 - 120		
			Total Uranium (U)	2022/09/01	99	%	80 - 120		
			Total Vanadium (V)	2022/09/01	100	%	80 - 120		
			Total Zinc (Zn)	2022/09/01	96	%	80 - 120		
A700455	MYO	Spiked Blank	Total Aluminum (Al)	2022/09/01	101	%	80 - 120		
			Total Antimony (Sb)	2022/09/01	100	%	80 - 120		
			Total Arsenic (As)	2022/09/01	102	%	80 - 120		
			Total Barium (Ba)	2022/09/01	96	%	80 - 120		
			Total Boron (B)	2022/09/01	102	%	80 - 120		
			Total Cadmium (Cd)	2022/09/01	99	%	80 - 120		
			Total Chromium (Cr)	2022/09/01	99	%	80 - 120		
			Total Cobalt (Co)	2022/09/01	97	%	80 - 120		
			Total Copper (Cu)	2022/09/01	99	%	80 - 120		
			Total Iron (Fe)	2022/09/01	100	%	80 - 120		
			Total Lead (Pb)	2022/09/01	99	%	80 - 120		
			Total Manganese (Mn)	2022/09/01	98	%	80 - 120		
			Total Molybdenum (Mo)	2022/09/01	104	%	80 - 120		
			Total Nickel (Ni)	2022/09/01	99	%	80 - 120		
			Total Selenium (Se)	2022/09/01	107	%	80 - 120		
			Total Silicon (Si)	2022/09/01	113	%	80 - 120		
			Total Silver (Ag)	2022/09/01	98	%	80 - 120		
			Total Strontium (Sr)	2022/09/01	96	%	80 - 120		
			Total Uranium (U)	2022/09/01	97	%	80 - 120		
			Total Vanadium (V)	2022/09/01	99	%	80 - 120		
			Total Zinc (Zn)	2022/09/01	100	%	80 - 120		
A700455	MYO	Method Blank	Total Aluminum (Al)	2022/09/01	<3.0	ug/L			
			Total Antimony (Sb)	2022/09/01	<0.50	ug/L			
			Total Arsenic (As)	2022/09/01	<0.10	ug/L			
			Total Barium (Ba)	2022/09/01	<1.0	ug/L			
			Total Boron (B)	2022/09/01	<50	ug/L			
			Total Cadmium (Cd)	2022/09/01	<0.010	ug/L			
			Total Chromium (Cr)	2022/09/01	<1.0	ug/L			
			Total Cobalt (Co)	2022/09/01	<0.20	ug/L			
			Total Copper (Cu)	2022/09/01	<0.20	ug/L			
			Total Iron (Fe)	2022/09/01	<5.0	ug/L			
			Total Lead (Pb)	2022/09/01	<0.20	ug/L			
			Total Manganese (Mn)	2022/09/01	<1.0	ug/L			



BUREAU
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Bureau Veritas Job #: C265290
Report Date: 2022/09/06

Andrew Sheret - Nanaimo
Client Project #: ALLEY ENTERPRISES
Your P.O. #: 03-P-23073

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Molybdenum (Mo)	2022/09/01	<1.0		ug/L	
			Total Nickel (Ni)	2022/09/01	<1.0		ug/L	
			Total Selenium (Se)	2022/09/01	<0.10		ug/L	
			Total Silicon (Si)	2022/09/01	<100		ug/L	
			Total Silver (Ag)	2022/09/01	<0.020		ug/L	
			Total Strontium (Sr)	2022/09/01	<1.0		ug/L	
			Total Uranium (U)	2022/09/01	<0.10		ug/L	
			Total Vanadium (V)	2022/09/01	<5.0		ug/L	
			Total Zinc (Zn)	2022/09/01	<5.0		ug/L	
A700455	MYO	RPD	Total Aluminum (Al)	2022/09/01	1.4		%	20
			Total Antimony (Sb)	2022/09/01	NC		%	20
			Total Arsenic (As)	2022/09/01	4.3		%	20
			Total Barium (Ba)	2022/09/01	NC		%	20
			Total Boron (B)	2022/09/01	1.3		%	20
			Total Cadmium (Cd)	2022/09/01	NC		%	20
			Total Chromium (Cr)	2022/09/01	NC		%	20
			Total Cobalt (Co)	2022/09/01	NC		%	20
			Total Copper (Cu)	2022/09/01	0.65		%	20
			Total Iron (Fe)	2022/09/01	0.52		%	20
			Total Lead (Pb)	2022/09/01	NC		%	20
			Total Manganese (Mn)	2022/09/01	2.1		%	20
			Total Molybdenum (Mo)	2022/09/01	NC		%	20
			Total Nickel (Ni)	2022/09/01	NC		%	20
			Total Selenium (Se)	2022/09/01	NC		%	20
			Total Silicon (Si)	2022/09/01	0.69		%	20
			Total Silver (Ag)	2022/09/01	NC		%	20
			Total Strontium (Sr)	2022/09/01	0.67		%	20
			Total Uranium (U)	2022/09/01	NC		%	20
			Total Vanadium (V)	2022/09/01	NC		%	20
			Total Zinc (Zn)	2022/09/01	NC		%	20
A700462	DDE	Matrix Spike	Dissolved Fluoride (F)	2022/08/31		110	%	80 - 120
A700462	DDE	Spiked Blank	Dissolved Fluoride (F)	2022/08/31		108	%	80 - 120
A700462	DDE	Method Blank	Dissolved Fluoride (F)	2022/08/31	<0.050		mg/L	
A700462	DDE	RPD	Dissolved Fluoride (F)	2022/08/31	0		%	20
A700499	EYU	Spiked Blank	Turbidity	2022/08/31		102	%	80 - 120
A700499	EYU	Method Blank	Turbidity	2022/08/31	<0.10		NTU	
A700499	EYU	RPD	Turbidity	2022/08/31	0.58		%	20
A701243	JAV	Spiked Blank	True Colour	2022/08/31		104	%	80 - 120
A701243	JAV	Method Blank	True Colour	2022/08/31	<5.0		Col. Unit	
A701243	JAV	RPD	True Colour	2022/08/31	NC		%	20
A701293	SE5	Matrix Spike	Chloride (Cl)	2022/08/31		122 (1)	%	80 - 120
			Sulphate (SO4)	2022/08/31		112	%	80 - 120
A701293	SE5	Spiked Blank	Chloride (Cl)	2022/08/31		103	%	80 - 120
			Sulphate (SO4)	2022/08/31		106	%	80 - 120
A701293	SE5	Method Blank	Chloride (Cl)	2022/08/31	<1.0		mg/L	
			Sulphate (SO4)	2022/08/31	<1.0		mg/L	
A701293	SE5	RPD	Chloride (Cl)	2022/08/31	18		%	20
			Sulphate (SO4)	2022/08/31	NC		%	20
A701694	BAL	Matrix Spike	Total Mercury (Hg)	2022/09/01		101	%	80 - 120
A701694	BAL	Spiked Blank	Total Mercury (Hg)	2022/09/01		96	%	80 - 120
A701694	BAL	Method Blank	Total Mercury (Hg)	2022/09/01	<0.0019		ug/L	
A701694	BAL	RPD	Total Mercury (Hg)	2022/09/01	NC		%	20
A702185	TSO	Spiked Blank	pH	2022/08/31		101	%	97 - 103
A702185	TSO	RPD	pH	2022/08/31	0.14		%	N/A



BUREAU
VERITAS

Bureau Veritas Job #: C265290
Report Date: 2022/09/06

Andrew Sheret - Nanaimo
Client Project #: ALLEY ENTERPRISES
Your P.O. #: 03-P-23073

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A702188	TSO	Spiked Blank	Conductivity	2022/08/31		101	%	80 - 120
A702188	TSO	Method Blank	Conductivity	2022/08/31	<2.0		uS/cm	
A702193	TSO	Spiked Blank	Alkalinity (Total as CaCO3)	2022/08/31		96	%	80 - 120
A702193	TSO	Method Blank	Alkalinity (PP as CaCO3)	2022/08/31	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2022/08/31	<1.0		mg/L	
			Bicarbonate (HCO3)	2022/08/31	<1.0		mg/L	
			Carbonate (CO3)	2022/08/31	<1.0		mg/L	
			Hydroxide (OH)	2022/08/31	<1.0		mg/L	
A703745	YIL	Matrix Spike	Nitrate plus Nitrite (N)	2022/09/01		99	%	80 - 120
A703745	YIL	Spiked Blank	Nitrate plus Nitrite (N)	2022/09/01		104	%	80 - 120
A703745	YIL	Method Blank	Nitrate plus Nitrite (N)	2022/09/01	<0.020		mg/L	
A703745	YIL	RPD	Nitrate plus Nitrite (N)	2022/09/01	NC		%	25
A703749	YIL	Matrix Spike	Nitrite (N)	2022/09/01		97	%	80 - 120
A703749	YIL	Spiked Blank	Nitrite (N)	2022/09/01		98	%	80 - 120
A703749	YIL	Method Blank	Nitrite (N)	2022/09/01	<0.0050		mg/L	
A703749	YIL	RPD	Nitrite (N)	2022/09/01	NC		%	20
A704214	WZ1	Matrix Spike	Total Dissolved Solids	2022/09/06		NC	%	80 - 120
A704214	WZ1	Spiked Blank	Total Dissolved Solids	2022/09/06		93	%	80 - 120
A704214	WZ1	Method Blank	Total Dissolved Solids	2022/09/06	<10		mg/L	
A704214	WZ1	RPD	Total Dissolved Solids	2022/09/06	NC		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



BUREAU
VERITAS

Bureau Veritas Job #: C265290
Report Date: 2022/09/06

Andrew Sheret - Nanaimo
Client Project #: ALLEY ENTERPRISES
Your P.O. #: 03-P-23073

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature in black ink, appearing to read 'D. Huang', written over a horizontal line.

David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



wldrsgdn@telus.net



Victoria: 460 Fenwick Place, Unit 1, Victoria, BC V8Z 0S3 Ph: (250) 385-6113 Tel Fax: (250) 385-6113
Courtenay: 2755 D Moxy Ave, Courtenay, BC V9M 8J9 Ph: (250) 335-7798 Tel Fax: (250) 665-8568

DRINKING WATER SUBMISSION
CHAIN OF CUSTODY RECORD

BV Job #: _____

Company (Invoicing): ANDREW SHERET LIMITED

Company (Reporting): ANDREW SHERET LIMITED

Contact Name: BRYAN RICHARDSON

Mailing Address: 2545 MCCULLOUGH ROAD

HANAMMO, BC

Phone #: 250-758-7383

E-mail: bryan.richardson@sharet.com

VANCOUVER ISLAND HEALTH
AUTHORITY
Medical Health Officer: 1.800.204.6166
Drinking Water Officer: 250.755.6215

Please note your invoice may be
subject to a \$75 minimum bill.

Payment Received: Yes No

All information on this form must be completed before testing can commence.

If your drinking water service is two or more homes, we strongly recommend that you contact local health authorities to find out how the Drinking Water Protection Act applies to this system. Please be aware that, in this situation, we are legally obligated to report results directly to local health authorities.

Sample Collection

For determining drinking water quality, samples should be representative of the water that will be consumed. Therefore, we suggest sampling at the kitchen tap. However, other sampling locations may be used to determine pre-treatment water quality or for troubleshooting purposes.

1. Remove aerolith screen from faucet
2. Let the water run for 5 minutes
3. Label the bottle with your name, date and time you are taking the sample.
4. Fill all bottle(s) provided. Take care not to touch the inside of the bottle or underside of cap.
5. Cap the sample and place it in fridge or small cooler with icepack.

Remember: It is important that you do not contaminate the sample as you handle the container. Wash your hands before you start and be careful not to touch the rim of the bottle or the inside of the cap.

DON'T:

- Don't reuse or hold any bottles you receive from the lab
- Don't let the sample sit out overnight, please refrigerate.
- Don't freeze the sample.

Sample Transportation & Delivery

1. Samples should arrive at the laboratories (Courtenay or Victoria) within 24 hrs of sampling. Ship samples between Monday and Thursday to avoid lab scheduling conflicts.
2. The sample should be kept cooling during transit (<4°C - refrigerated or packed on ice).
3. Fill out the Chain of Custody (COC) form beside these instructions and submit with the sample. Incomplete or missing COCs will result in delays impacting turnaround time and the lab's ability to proceed with time sensitive tests.
4. Delivery Options:
 - Personally deliver samples to Courtenay or Victoria
 - Overnight shipping: If you ship a sample on the same day that it was collected you can use an overnight courier.
 - Same day shipping: Available in some areas. Please contact the lab for details.

After Hours Contact #: _____

Regular Turnaround Time (TAT) (5 days for most tests) RUSH Please contact the lab
Surcharges will be applied

Project Name: Alley Enterprises Data Required: _____

SPECIAL INSTRUCTIONS:

Return cooler Ship Sample Bottles (please specify)
LPO# 03-P-23073
INVOICE# 03-010242

Sample Identification (Sample Location &/or Description)	Sample Location (eg. Tap, Wellhead)	Date/Time Sampled (24hr)	PLEASE CIRCLE		ANALYSIS REQUESTED PLEASE SELECT BELOW								
			From a Drinking Water Source? Y/N	From multiple householders? Y/N	Are individuals drinking this water? Y/N	Are you on a bottled water delivery? Y/N	Drinking Water Scan	Home Safety Scan	Tap Water Scan including Hardness & pH	Tap Coliform and E. Coli	Report Drinking Water Chemical DWG17		
1 Pre Cistern		840	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Unless otherwise agreed to in writing, work performed on this Chain of Custody is subject to Boreal Ventures Laboratories' standard Terms and Conditions. Signing at the end of this Chain of Custody document is acknowledgment and acceptance of our terms available at <http://www.bvlab.com/terms-and-conditions>

Print name and sign			Print name and sign			Laboratory Use Only						
Relinquished By:	Date (yy/mm/dd):	Time (24 hr):	Received by:	Date (yy/mm/dd):	Time (24 hr):	Temp	Sensitive	Temperture on receipt (°C)	Custody Seal	Yes	No	N/A
Bryan Richardson	22/08/29	10:38	<i>[Signature]</i>	22/08/29	09:00	A) 13 B) 16 C) 15	<input type="checkbox"/>		Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
						Just sampled & not on line:	<input type="checkbox"/>	Contact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL DELAYS AND SAMPLE ANALYSIS RESULTS BEING UNAVAILABLE.

COC-1035

ice packs: yes, melted

BV FCO-02/27/15



SAVE-ON-SEPTIC SERVICES INC



Wild Rose Garden Centre
750 Tin Can Alley
Gabriola Island, B.C.

October 12, 2023

Project Reference: Feasibility study and Assessment of site conditions on Lot B, Plan 60373 for suitability for development of a wastewater treatment and dispersal system- 750 Tin Can Alley, Gabriola Island, B.C.

Attn: Kent Moen,

Background:

Mr. Kent Moen (owner) is proposing a residential/commercial mixed-use development for retail and food services on Lot B, located at 750 Tin Can Alley near the village. This report will provide information on the feasibility of providing an on-site wastewater treatment and dispersal system for this project. I will provide the soils testing data and a conceptual design of the wastewater treatment and dispersal system that will meet or exceed the requirements of the Standards of Practice Manual (SPM). I will outline our approach to minimize the environmental impact on the site.

Scope of Work:

The soil investigation involved digging 1.2m deep test pits with a machine to determine the soil characteristics and ability to renovate wastewater. I was also investigating the winter water table depths and surface features such as storm water run-off impact, proximity to a drinking water source and property boundaries. There appears to be a layer of solid rock at various depths that tends to slope in a southerly direction towards North Road. There is a drinking water well 100 meters south of the test area and we would need to minimize the impact on this potable water source. 10 test pits were dug and logged for characteristics and are included in this report. To test the permeability of the soils 4 test holes were dug and perk tests performed to document the suitability of the soil to renovate wastewater. The site conditions and soils will meet the strict guidelines set out in the SPM to minimize any environmental impact. This report also reviews the various options for pre-treatment and discuss the most appropriate level of treatment prior to dispersal.

Site Evaluation:

The property tends to slope towards the southwest corner at an overall slope of 7-8% and the upper half having a gentler slope about 5%. The site has had impact from tree removal and vehicle traffic from the garden centre. The soils in the test area located neat the northern boundary appears to be less impacted by development.

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Email: saveonseptic@shaw.ca

PO Box 4705
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V9B 6L2
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2...

I saw no evidence of stormwater erosion or impact from stormwater runoff and the site appears to be well drained. According to regional maps the principal soil type is a well drained Saturna soil. The location of the well was situated about 100 meters downslope along the eastern boundary. No other neighboring wells were encountered during this investigation. This well exceeds the setback distance (30m) and should pose no environmental impact from the dispersal area. There was a large outcrop of bedrock encountered in several locations that limit the area for dispersal, however the design shall take this into consideration to avoid discharging into these areas where thin soils are present. Both the dispersal area and the receiving area shall have sufficient depths of soil to adequately renovate the wastewater discharge to mitigate the environmental impact on the site. The northern neighbouring property has a pipe discharging stormwater onto the site and into a rock pit. This rock pit will be diverted to a new location that does not impact the dispersal site.

Test Pits:

There are a total of 10 test pits that were machine dug to a depth of about 1.2m or less if a limiting layer was encountered. There were 2 that were too shallow due to solid rock near the surface (see sketch) and were mapped as an area to avoid for development. The remaining 8 test pits revealing the stratified layer and soil types were documented. (See attached soil Logs) These test pits were then compared with the SPM requirements and other factors such as root penetration into the soils as well as soil mottling indicating the presence of the winter watertable. The results of this testing determined that there was 64cm-112cm of permeable soil overlaying a restrictive layer such as solid sandstone rock or winter watertable. The SPM requires a minimum separation of 60 cm for type 1,2&3 effluent discharges. We have sufficient depth for all 3 types with a sand filled bed design per the SPM. There is sufficient area to support a type 1 drain field design. Based on calculated daily flows of 9095L per day and soil permeability the required field length would need to be approximately 250m (820 feet) in total with a minimum length per run of 27.6m (90.6 feet) to meet the linear loading requirements of the SPM.

Percolation Testing:

There were 3 percolation tests performed on the site within the test area.(see attached test results) This test determines the ability of the soil to effectively move downward through the soil to renovate the wastewater prior to coming into contact with the under-laying ground water. The more porous the soils allow the wastewater to move quickly down through the soil. In our case the soils proved to be in the class of coarse sand and has a very high permeability. This class of soils allows the wastewater to move through the soil particles to quickly thus only partially treating the wastewater. In order to overcome this we need to pressure dose the field and limit the amount of effluent per dose (micro-dosing) using a timer in the control panel. This will allow the wastewater to be held between the soil particles by osmosis allowing it to come into contact with the micro-organisms for a longer duration thus providing better treatment of the wastewater prior to reaching the limiting layer. For coarse textured soils the hydraulic loading rate would be 40L/m²/ day.

Percolation Results:

PH #1- Average 1:50 mins. /inch
PH #2- Average 2:00 mins. /inch
PH #3- Average 1:15 mins. /inch

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Coarse Sandy Soils:

The soil log results indicate that the characteristics of the permeable layer encountered on site are predominantly coarse sand with 10-15% cobbles. This has a loading rate in the SPM of 40L/m²/day for Type 1 discharges. These soils are very well drained and with certain design considerations are capable of effectively removing contaminants from the wastewater. These design considerations are pressure dosing and timed dosing per the SPM.

Daily Design Peak Flows:

The estimated flows generated from the proposed development are as follows:

-60 Seat restaurant- 60X90L/person -5400L (Phase 2)
-Retail garden centre and 1 bedroom residential- Retail- 139m² x 5L= 695L
Apartment- 600L
-Coffee shop/Bakery 120persons x 20L= 2400L
TOTAL 9095L per day

Characteristics of the Wastewater:

The retail space and residential suite are both considered to be residential strength wastewater. The coffee shop and restaurant are considered to discharge high strength wastewater. This high strength component in the wastewater discharge would be required to be pre-treated to reduce both the FOG (Fats Oils & Grease) and the high BOD/TSS from the waste stream prior to discharging into the drain field (Must meet Type 1 treatment levels). This involves providing grease interceptor tanks and type 2 aeration and settling to reduce it to acceptable levels. An engineer is required to have oversight in the design of this high strength treatment system per the SPM.

Area for Drain Field:

The area of infiltrative surface requirements for Type 1 effluent discharge is as follows:

$$\text{AIS} = \frac{9095\text{L}}{40} = \underline{227.38 \text{ m}^2}$$

$$\text{Total Length of Field} = \frac{227.38\text{m}^2}{0.91\text{m}} = \underline{249.87 \text{ Lineal Metres (820 lineal feet)}}$$

0.91m (Maximum Width of Trench per SPM)

$$\text{Linear Loading Length} = \frac{9095\text{L}}{330} = \underline{27.56\text{m}} \text{ (This is the minimum length of trench per SPM)}$$

The drain field laterals would be 96 feet long and center fed from a central 2" Dia. manifold. There would be 9 laterals evenly spaced at 6 feet on centre. The area required for the drain field would need to be 100 feet long by 54 feet wide and be positioned perpendicular to the slope. The position of the drain field would have to meet all setback requirements of the SPM. The test area would be large enough to accommodate this field design. There is also an area eastern boundary that is large enough and could be developed for a 50% reserve area should problems arise.

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Local Area Water Wells:

There is only one well within close proximity of the wastewater system. This drilled well services our site (Lot B) and is located downslope approximately 100m away from the proposed drain field test site. The Lot above (Lot C) is served by a rainwater catchment system with a cistern tank. The location of the only well in the area exceeds the 30m setback requirements of the SPM.

Appropriate Design Considerations:

- All components of the wastewater system meet or exceed the requirements of the SPM.
- Providing the appropriate level of treatment for the high strength component the project and engaging an engineer to review the proposed design per the SPM.
- Provide redundancy in the system to reduce the risk of untreated wastewater discharges on the site.

Conclusion:

Lot B at 750 Tin Can Alley has sufficient potential to disperse pre-treated wastewater in the ground safely without any degradation of the local environment or contamination of the local drinking water source that under-lays the site. All of the setback and regulatory requirements within the SPM can be met by the designer. Since the high strength wastewater is being proposed for this development a review of the design is required and all documents must be stamped by a professional engineer prior to submission to Vancouver Island Health Authority.

Proposed Design Options:

The residential/ retail portion of the discharge can be Type 1 treatment prior to dispersal. The high strength portion of the discharge must undergo further treatment to reduce the wastewater strength to meet or exceed Type 1 treatment levels. This wastewater must have reductions of FOG (Fat, Oils & Grease) and BOD/TSS to 20mg/L FOG/ 300 BOD/ 250 TSS to be able to safely be dispersed in the drain field without degradation to the receiving environment.

Environmental Impact:

Once discharges start the pre-treatment tanks and treatment devices will provide a wastewater discharge suitable to be dispersed into the ground. Once dispersed into the soils natural processes will complete the full renovation of the wastewater. The risk to the environment shall be eliminated by choosing the most effective pre-treatment devices to reduce the wastewater to Type 1 treatment levels prior to discharge.

Operation & Maintenance:

The SPM dictates that on-going maintenance must be performed on all septic systems to ensure proper operating levels are met. The bi-annual maintenance must be performed by a qualified service provider (ROWP). To ensure proper levels of treatment are being met it would be recommended that testing of the wastewater be performed annually. An Operations and Maintenance manual will be provided to the owner by the designer per the SPM.

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If you have any questions, please contact me at 250-748-5676

Kind Regards,

Steve Brydges, ROWP
Save On Septic Services Inc.



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SEE SKETCH PLAN FOR LOCATIONS.

Observed Soil Conditions

Test Pit Logs

Date*: SEPT. 21/23		Site: 750 TIN CAN ALLEY		Logged by: MIKE SDB					
TP# 1		Pit Location: S.W. END OF D/FIELD SITE		Slope: 6-7%					
Soil Horizons (depths measured in cm / m (in / ft))									
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	1"	Brown	Topsoil	SG.	loose	1%	YES	NO	NO
1"	11"	Brown	S. Loam	SG	loose	5%	YES	Ø	Ø
11"	35"	Brown	C. Sand.	SG.	loose	10-15%	YES	Ø	Ø
35"	+	Tan	Clay/Silt	massive	hard	5%	NO	yes	Ø
				Roots to 35" / W/T @ 35"					
Notes									
TP # 2		Pit Location: EAST OF TH# 1		Slope: 7-8%					
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	5"	D. BROWN	TOPSOIL	SG.	LOOSE	2%	YES	NO	NO
5"	25"	TAN	S. LOAM	SG.	LOOSE	5%	YES	Ø	Ø
25"		SOLID SANDSTONE ROCK				N/A	YES	Ø	Ø
				Roots to 25" W/T not present					
Notes									

Based on USDA Field Book for Describing and Sampling Soils (2002).
 * Date water table measured



SEE SKETCH PLAN FOR LOCATIONS.

Observed Soil Conditions

Test Pit Logs

Date*: SEPT. 21/23 Site: 750 TIN CAN ALLEY. Logged by: Mike SDB

TP# 3 Pit Location: 50' W OF EAST BOUNDARY Slope: 8%

Soil Horizons (depths measured in cm / m (in) / ft)

Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	2"	Brown	Topsoil	S.G.	Loose	1%	yes	∅	∅
2"	26"	Tan	C. Sand.	S.G.	"	5-10%	yes	∅	∅
26" SOLID SANDSTONE ROCK @ 26"									
Roots to 26" No W/T.									
Notes									

TP # 4 Pit Location: W. of E. # 10' Slope: 6-7%

Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	3"	BROWN	Topsoil	SG.	Loose	2%	yes	∅	∅
3	44"	Brown	C. Sand	S.G.	Loose	2-4%	yes	∅	∅
Clayey Silt @ 44" w mottles									
Roots to 44"									
Notes									

Based on USDA Field Book for Describing and Sampling Soils (2002).
 * Date water table measured



SEE SKETCH FOR LOCATIONS

Observed Soil Conditions

Test Pit Logs

Date*: SEPT. 21/23		Site: 750 TIN CAN ALLEY				Logged by: Mike SDB			
TP# 5		Pit Location: 9' from E. P/L.				Slope: 6%			
Soil Horizons (depths measured in cm / m (in) / ft)									
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	2"	Brown	Topsoil	S.G.	Loose	1%	yes	∅	∅
2"	34"	Brown	C. Sand	SG	"	5%	yes	∅	∅
34"	49"	Tan	Silt Loam	SG.	"	10%	yes	yes	∅
			Roots to 44"						
			Mottles @ 45"						
Notes									
TP# 6		Pit Location: 13' from E. P				Slope: 6%			
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	29"	Brown	C. Sand	SG.	Loose	5%	yes	∅	∅
29"	37"	Tan	Silt Loam	SG.	Loose	5-10%	∅	yes	∅
37"	+	Solid	SANDSTONE ROCK						
			Roots to 29" / Mottles @ 29"						
Notes									

Based on USDA Field Book for Describing and Sampling Soils (2002).
 * Date water table measured



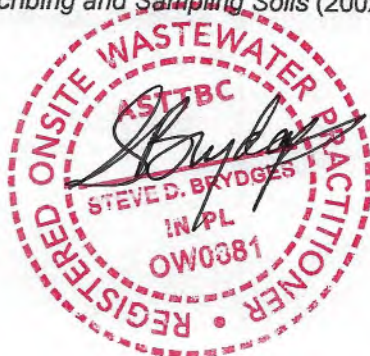
SEE SKETCH FOR LOCATIONS.

Observed Soil Conditions

Test Pit Logs

Date*: SEPT. 21/23		Site: 750 TIN CAN ALLEY		Logged by: Mike SDB					
TP# 7		Pit Location: 49' W of E.R.		Slope: 6-7%					
Soil Horizons (depths measured in cm / m (in / ft))									
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	14	Brown	C. Sand	S.G.	Loose	5%	yes	∅	∅
14"	+	Solid Sandstone Rock							
Hole is too shallow Roots to 14"									
Notes									
TP # 8		Pit Location: 98' W. of E.R.		Slope: 6%					
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	17"	Brown	C. Sand	S.G.	Loose	5%	yes	∅	∅
17"	+	Sandstone Rock							
Hole is too shallow Roots to 17"									
Notes									

Based on USDA Field Book for Describing and Sampling Soils (2002).
* Date water table measured



SEE SKETCH FOR LOCATIONS.

Observed Soil Conditions

Test Pit Logs

Date*: SEPT. 21/23		Site: 750 TIN CAN ALLEY		Logged by: Mike SDB					
TP# 9		Pit Location: 42' S of N P/L		Slope: 7-8%					
Soil Horizons (depths measured in cm / m (in) ft)									
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	2"	Brown	Topsoil	SG	Loose	2%	yes	∅	∅
2	29"	Brown	C. Sand	SG.	Loose	5%	yes	∅	∅
29	37"	Tan	F. Sand	SG.	Hard	5-10%	∅	yes	∅
37"	+	Solid Sandstone Roots to 29" / Mottles @ 29"							
Notes									
TP # 10		Pit Location: 43' S of N P/L		Slope: 6-8%					
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	1"	Brown	Topsoil	SG			yes	∅	∅
1	30"	Brown	C. Sand	SG			yes	∅	∅
30	35"	Tan	Silt	SG.			∅	yes	∅
35"	+	Solid sandstone rock Roots to 30" / Mottles @ 30"							
Notes									

Based on USDA Field Book for Describing and Sampling Soils (2002).

* Date water table measured



Observed Soil Conditions

Test Pit Logs

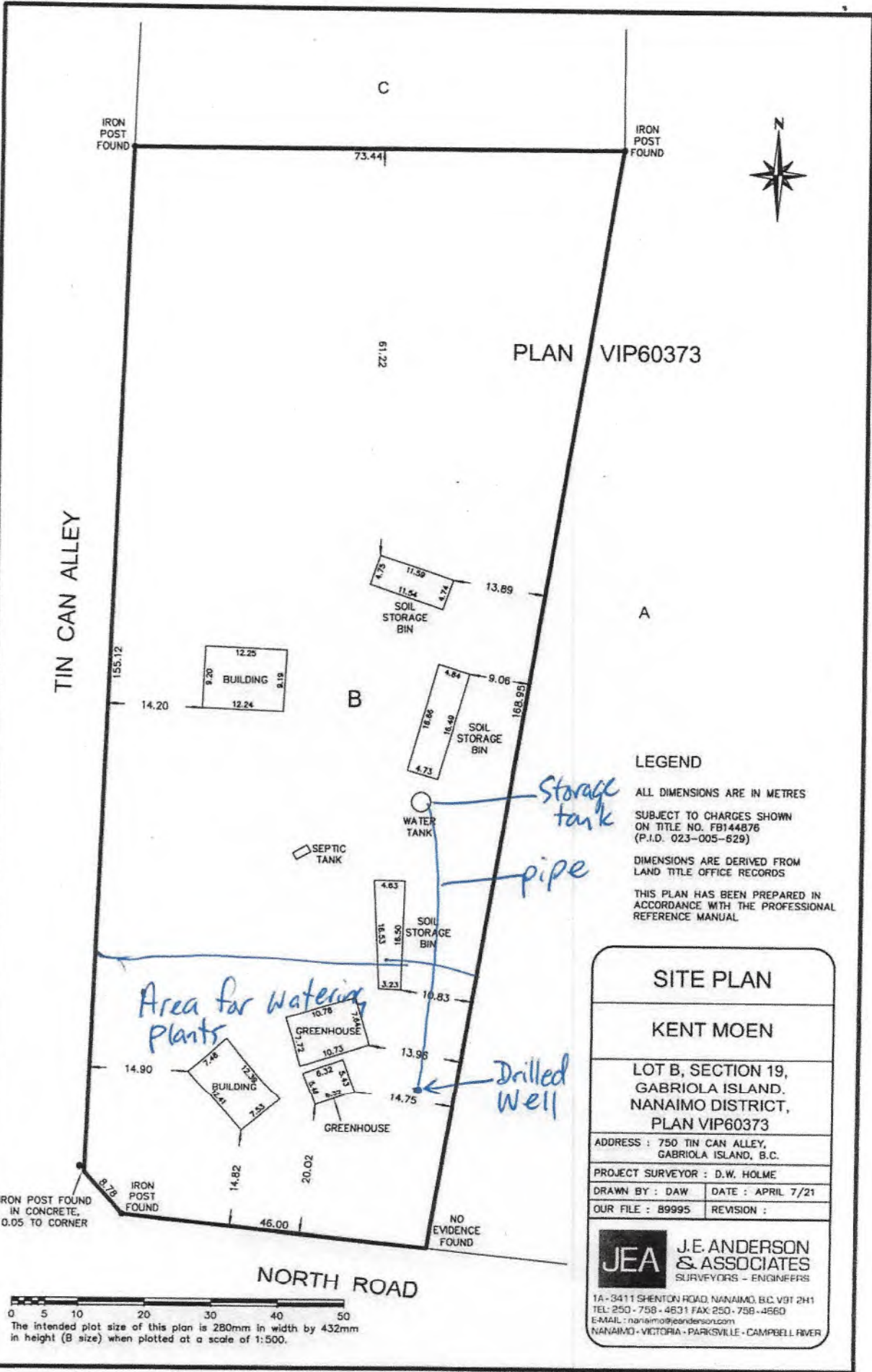
Date*: SEPT. 21/23		Site: 750 TIN CAN ALLEY				Logged by: Mike SDB			
TP# 11		Pit Location: 31' E. OF TH#9				Slope: 7-8%			
Soil Horizons (depths measured in cm / m (in / ft))									
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
0	2"	Brown	Topsoil	SG.	Loose	2%	yes	∅	∅
2"	27"	Brown	C. sand	SG.	Loose	10%	yes	∅	∅
27"	36"	Tan	F. Sand	SG.	Hard	5-10%	∅	yes	∅
solid sandstone @ 36" Roots to 27" w mottles @ 27"									
Notes									
TP # 2		Pit Location:				Slope:			
Depth		Colour	Texture	Structure	Rupture resistance (or density)	Coarse gravel (%)	Roots depth & quantity	Mottles depth & quantity	Moisture seepage
from	to								
Notes									

Based on USDA Field Book for Describing and Sampling Soils (2002).
 * Date water table measured

Percolation test

Location (address): 750 TIN CAN ALLEY, GABRIOLA		File #:						
Date: SEPT. 21/23		Tested by: SDB						
Weather: SUNNY								
Test number	Depth of base of hole from surface (cm)	Timings, mins per inch for water to drop from 6" to 5" from base of hole.						Lowest rate (min per inch)
		#1	#2	#3	#4	#5	#6	
1		1:40	1:45	1:45	1:50	1:50	1:50	
2		1:50	1:50	1:45	1:55	1:55	2:00	
3		1:05	1:10	1:10	1:05	1:10	1:15	
4		1:40	1:45	1:45	1:45	1:50	1:50	
5								
6								
7								
8								
Percolation rate for system sizing								
Notes:	HLR = 40L/m²/DAY.							





LEGEND

ALL DIMENSIONS ARE IN METRES

SUBJECT TO CHARGES SHOWN ON TITLE NO. FB144876 (P.I.D. 023-005-629)

DIMENSIONS ARE DERIVED FROM LAND TITLE OFFICE RECORDS

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROFESSIONAL REFERENCE MANUAL

SITE PLAN

KENT MOEN

LOT B, SECTION 19, GABRIOLA ISLAND, NANAIMO DISTRICT, PLAN VIP60373

ADDRESS : 750 TIN CAN ALLEY, GABRIOLA ISLAND, B.C.

PROJECT SURVEYOR : D.W. HOLME

DRAWN BY : DAW DATE : APRIL 7/21

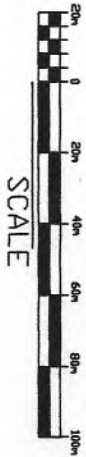
OUR FILE : 89995 REVISION :

JEA J.E. ANDERSON & ASSOCIATES
SURVEYORS - ENGINEERS

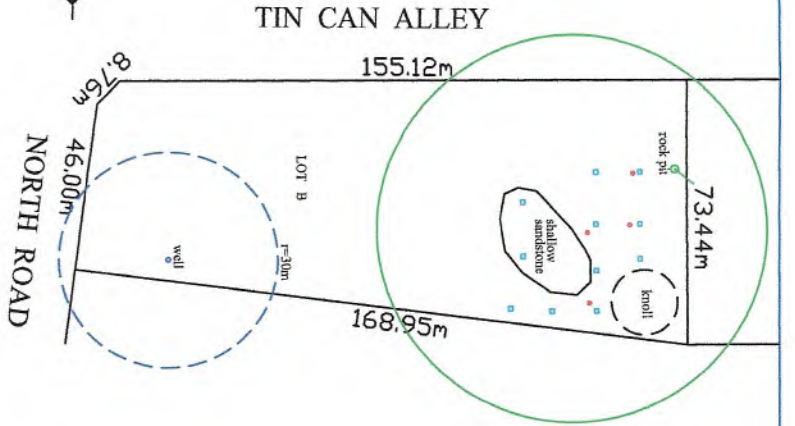
1A - 3411 SHENTON ROAD, NANAIMO, B.C. V9T 2H1
TEL: 250-758-4631 FAX: 250-758-4660
E-MAIL: nanaimo@jeanderson.com
NANAIMO - VICTORIA - PARKSVILLE - CAMPBELL RIVER

0 5 10 20 30 40 50

The intended plot size of this plan is 280mm in width by 432mm in height (B size) when plotted at a scale of 1:500.



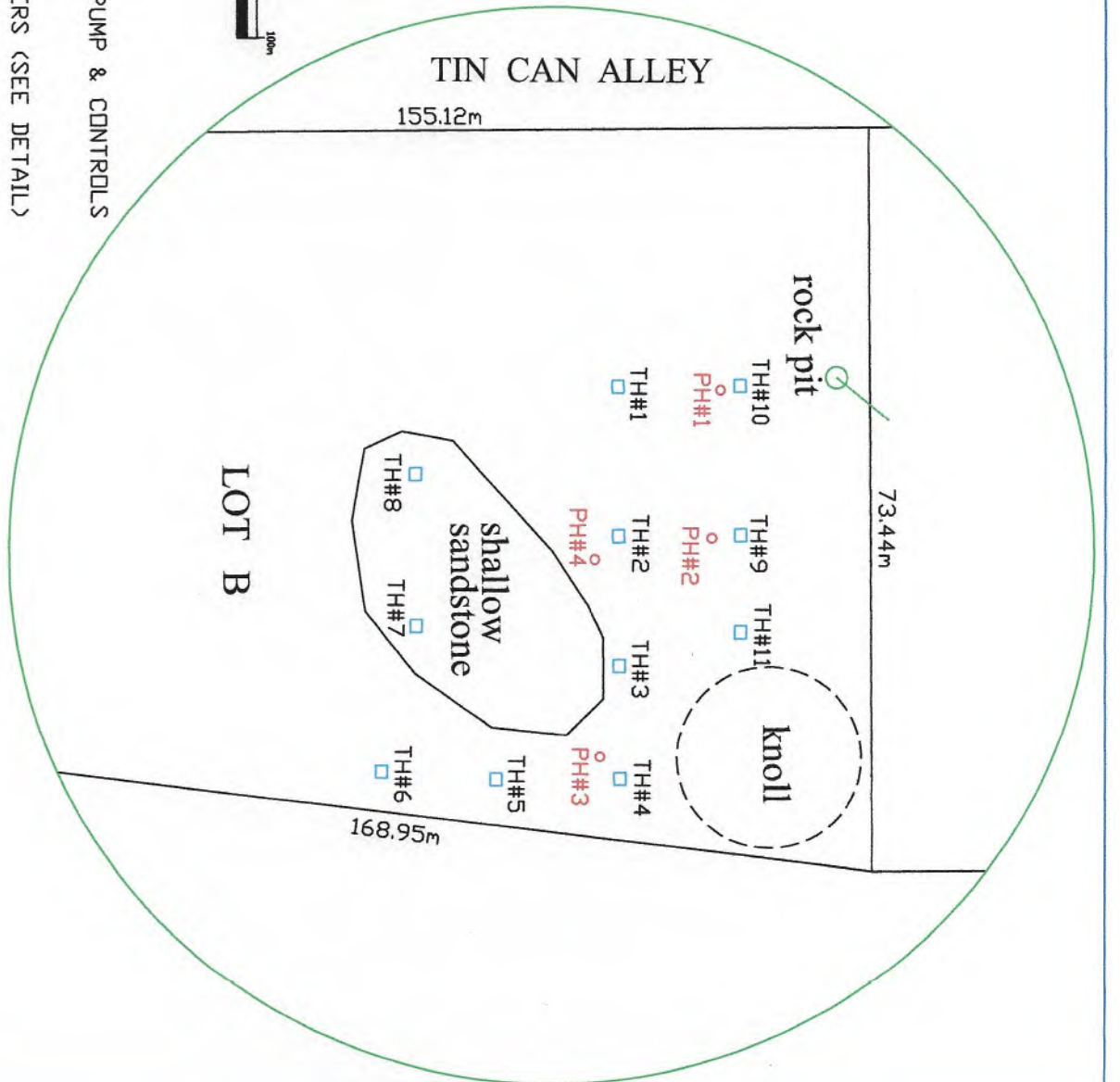
KEY PLAN



- LEGEND:**
- ① EXISTING 600 I.G., SEPTIC TANK-ADD RISERS
 - ② PROPOSED CANWEST 300 I.G. PUMP TANK W/ PUMP & CONTROLS
 - ③ 50mmØ PVC SCH 40 TRANSPORT LINE
 - ④ INSTALL 18.29m & 9.75m PRESSURIZED CHAMBERS (SEE DETAIL)
 - ⑤ PROPOSED FLUSH-DUTS AT DISTAL ENDS
 - ⑥ 100mmØ PVC SCH 40 TRANSPORT SEWER
- DENOTES 4' TEST HOLE LOCATION
 - DENOTES PERK TEST LOCATION



SITE PLAN



NOTE: ALL PIPE TO BE SCH. 40 PVC UNLESS OTHERWISE SHOWN



SAVE ON SEPTIC

430-2783 GABRIOLA ROAD, DUNCAN, B.C. V9L 5J2
TELEPHONE: 250-748-9878 CELL: 250-802-9852

PROJECT: PROPOSED SEPTIC FIELD-SITE PLAN OF 750 TIN CAN ALLEY, GABRIOLA

CLIENT: KENT MOEN

SCALE: AS SHOWN
DRAWING BY: SSB

DESIGN BY: SSB
DATE: NOV. 3/23

FILE No.: 00-243

DRG. No.: 1 OF 1