

Revised August 11, 2022 ~~March 16, 2022~~

Mr. Kristopher King  
Okanagan Gondola Ltd.  
3702 Finch Road  
Kelowna, B.C., V4V 1N4

**Re: Water Supply Feasibility Assessment, Okanagan Gondola Development, Vernon, BC**

Western Water Associates Ltd. (WWAL) has provided Okanagan Gondola Ltd. a letter report detailing the hydrogeological assessment at their development property (PID 013-561-235).

Our assessment concluded that the conditions for developing an onsite groundwater supply system to facilitate the proposed development at the site appears marginally feasible, with multiple supply wells likely required to meet the projects water demands. Any groundwater supply developed would be from the bedrock aquifer underlying the site (BC Aquifer 471), and specific yields are expected to be low, with a median well yield of 0.19 L/s (3 USgpm) reported for the aquifer. At relatively low well yields such as those predicted, interference between wells located onsite and those existing wells located offsite on adjacent properties is not anticipated.

Further, while the aquifer receives enough recharge to supply the proposed development, additional work (such as drilling and testing) will be required to determine the sustainable safe yield for the aquifer at the specific points of extraction.

We trust this is sufficient for your needs at this time. Please contact us if you have questions or concerns.

Sincerely,

**WESTERN WATER ASSOCIATES LTD.**  
(EGBC Permit to Practice No. 1001419)



**Christopher Homes, P.Geo.**  
**Senior Hydrogeologist**

March 15, 2022 **Revised August 11, 2022**

21-120-01VR

Mr. Kristopher King  
Okanagan Gondola Ltd.  
3702 Finch Road  
Kelowna, B.C., V4V 1N4

Via e-mail: [King@ridgenorthamerica.ca](mailto:King@ridgenorthamerica.ca)

Dear Mr. King:

**Re: WATER SUPPLY FEASIBILITY ASSESSMENT  
OKANAGAN GONDOLA DEVELOPMENT, VERNON, B.C.**

Western Water Associates Ltd. (WWAL) is pleased to provide this letter report detailing the hydrogeological assessment at the above noted property herein referred to as the “site” (Figure 1). This assessment pertains to the feasibility of developing an onsite water supply to service a proposed tourist attraction operation (a Gondola).

**Project Understanding**

We understand that you have acquired a large rural land parcel in Vernon, B.C., located west of Kekuli Bay Provincial Park, east of the Predator Ridge Golf Course area and north of and adjacent to the Predator Ridge Quarry. The parcel is bounded by Highway 97 to the east and Bailey Road to the north. The parcel is described in Table 1 as follows:

**Table 1: Site Description**

|                                 |  |
|---------------------------------|--|
| <b>Civic Address:</b>           | None (Highway 97)  |
| <b>Parcel Identifier (PID):</b> | 013-561-235  |
| <b>Legal Description:</b>       | Part N 1/2 , Section 36, Township 14, Osoyoos Division of Yale Land District, Except Plan B826, 37599, H823  |
| <b>Parcel Size:</b>             | 116.11 hectares (286.9 acres)  |
| <b>Zoning:</b>                  | Large Holdings (LH) Designation [103.31 ha] w/ some Agricultural (AG) Designation [12.8 ha], Area B, Vernon Rural [RDNO Zoning Bylaw No. 2650, 2013] |

The proposed development (as based on the 3–5-year time horizon) would include:

1. A base area with quick service café and public washroom facilities.
2. A mid-station activity centre with public washrooms.
3. A hilltop station, with viewing platform and public washrooms.
4. A 200-person capacity restaurant and event venue with dedicated washroom facility.

Visitors to the attraction would be largely seasonal, with peak season in the mid-late summer, early fall, and low season in the late fall, winter, and early spring.

Based on the proposed development items listed, an average daily water demand on the order of 21,000 L/day is expected. This is equivalent to approximately 3.85 USgpm continuously. However, to meet peak demand periods and to accommodate higher usage during open business hours, this demand is expected to be met by pumping from on-site storage (above-ground storage tanks) at each of the proposed building locations (Figure 1). In this way, a lower supply flow rate would be sufficient to continually pump to the storage, topping up the supply nightly.

From a review of the RDNO mapping for the property (Attachment A), it indicates two northern portions of the property (shown in red) are located in the Agricultural Land Reserve (ALR), consistent with the zoning described. As well, a statutory right-of way (Fortis Gas ROW, shown in purple) cuts north-south through the western half of the property.

Two provincially mapped streams (shown in blue) also cut across the property, draining the upland areas into Kalamalka Lake (the downstream receptor for runoff from this area). These streams are listed as fully recorded (FR), as they convey water within the Kalamalka Lake watershed. If not already complete, an environmental assessment should be completed prior to the initiation of land disturbance in these areas or working in or about any of the watercourses identified.

There are currently no water wells located on the property, nor any licensed points-of-diversion from either Kalamalka Lake or the watercourses on the property. As the property is undeveloped, there was no need for a water source historically.

### ***Site Physiography and Climate***

The site is located on an easterly sloped rural land parcel along the western side of Kalamalka Lake, about 11 km south of the city of Vernon, B.C. (Figure 1). The site has a parcel size of just under 300 acres of gently sloping to steeply sloping terrain, backing onto crown land toward the north and west. Further to the north is the Predator Ridge Golf Course and associated development. The site is bordered to the southeast by Kalamalka Lake, and directly to the east lies Kekuli Bay Provincial Park across Highway 97. Southwest of the site is the Predator Ridge Quarry, a current and active commercial enterprise (rock quarry).

The terrain is relatively steep and benched, with elevations at the site ranging from about 500 meters above sea level (masl) at the eastern property boundary adjacent to the highway to 785 masl up at the top station of the proposed gondola's upper landing and lookout area, with topographic relief ranging from steep bluffs of 30-40% from the escarpment in the upland portion levelling out to almost flat along the bench terraces before steepening again to about 30-40% as you approach the highway (Google Earth 2021).

The site is undeveloped with a main north-south oriented access road leading from Bailey Road to the north to the Predator Ridge Quarry, located adjacent to the south of the property (Figure 2). There is also one upper access road that winds its way uphill and across the site to access another off-site aggregate area. The remainder of the site is undeveloped, with steep slopes, bedrock outcrops, and coniferous trees scattered about the upland areas. The native ground cover is composed predominately of grassy rangelands. There were indications of recently used game trails and trail riding on horseback/ATV across the upper reaches during our site visit (page 8).

The closest climate station at a similar elevation to the site was located in the Coldstream Ranch area just east of Vernon (Canadian Climate Station 1128580), approximately 12 km away at an elevation of 482 m above sea level (along the valley bottom, east of the northern end of Kalamalka Lake). The station collected climate data for the

period 1981 through 1997, when climate record keeping at this station was discontinued. Table 2 summarizes the climate data from the Coldstream Ranch station.

**Table 2: Canadian Climate Normals Data (STN 1128580: 1981 - 1997)**

| Month                | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Yearly Avg. |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|-------------|
| <b>Temperature</b>   |      |      |      |      |      |      |      |      |      |      |      |      |             |
| Daily Average (°C)   | -3.9 | -1.7 | 3.9  | 8.7  | 13.1 | 16.6 | 19.1 | 18.8 | 13.8 | 7.2  | 0.6  | -4.4 | 7.7         |
| Standard Deviation   | 3.1  | 2.7  | 1.7  | 1.2  | 1.5  | 1.7  | 1.5  | 1.3  | 1.8  | 1.0  | 3.0  | 2.8  | 2.3         |
| <b>Precipitation</b> |      |      |      |      |      |      |      |      |      |      |      |      |             |
| Rainfall (mm)        | 8.9  | 13.9 | 20.8 | 33.5 | 47.8 | 59.1 | 45.6 | 42.3 | 40.8 | 34.3 | 28.7 | 7.8  | 383.5       |
| Snowfall (cm)        | 28.4 | 16.8 | 4.6  | 0.3  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.7  | 24.2 | 41.5 | 116.6       |
| Precipitation (mm)   | 37.4 | 30.7 | 25.4 | 33.7 | 47.8 | 59.1 | 45.6 | 42.3 | 40.8 | 35.0 | 52.9 | 49.4 | 500.0       |

Source: Canadian Climate Normals 1981 – 2010 (Environment Canada, 2021)

During this period, the recorded average annual temperature and total precipitation at the climate station were 7.7°C and 500.0 mm/year, respectively (Environment Canada, 2021). The recorded mean monthly temperatures ranged from -4.4°C in December to 19.1°C in July. The recorded mean monthly total precipitation ranged from 25.4 mm in March to 59.1 mm in June. However, past climate data are not necessarily indicative of future climate change.

Climate change is an ongoing process, and among the forecasted outcomes is that the duration and frequency of storm events has the potential to impact groundwater recharge in hillside areas. In general, the expected changes for this area include warmer annual temperatures with increased evaporative demand, wetter winters with less snow and more rain, wetter springs and falls and drier summers, combined with more frequent and severe extreme weather events. The smaller winter snowpacks that melt more rapidly will reduce late summer stream flow over most of the region, which has already begun to affect flows within the Kalamalka Lake watershed.

Particularly within the North Okanagan, domestic, commercial, and agricultural water use is substantial and is expected to grow. With a semi-arid climate, water levels are already below low-flow thresholds in some streams, (Vernon Creek for instance, pages 6-7 below). Competition for limited water resources will increase as seasonal water flow decreases; water allocation challenges will increase with climate change.

In terms of ongoing climate change and its potential effects on water supply and demand, there is a predicted overall increase in winter precipitation but a gradual hydraulic transition from a snowmelt-dominated system to a hybrid snow-rain driven system. This hybrid regime would tend to have greater frequency of flashy runoff events as well as mid-winter thaws (Ryan, M. and Hopkins, K. , 2016), which may affect infiltration patterns in gullied- or ravine-prone areas such as those surrounding the site. Climate change and its effects on this area should be monitored by water users and water managers as part of the overall monitoring completed for the region.

### Site Geology

Surficial geology mapping for the area (Paradis, 2009) lists the area as being surficial deposits interspersed with bedrock outcrops. The Surficial deposits include primarily glaciolacustrine and glacial sediments, with less coverage of glaciofluvial and post-glacial sediments. The thickness of unconsolidated material overlying the bedrock ranges from 0 to >200m (in places), but with a median of 6.1 m thick it is seen as a thin veneer. Observations made during

our site visit (Page 8) confirmed that surficial soils are organic silty sandy loam overtop coarse angular colluvium, grading to weathered bedrock at depth or where outcrop exposures are present.

The bedrock geology underlying the site is comprised of two different assemblages:

- 1) Toward the west of the site are older granodioritic intrusive rocks including granodiorite, quartz diorite, diorite, and quartz monzonite, formed during the Mesozoic to Middle Jurassic age (157-178 million years ago; ENV 2021).
- 2) Toward the east of the site are younger, early Tertiary granitic intrusive rocks including granite and alkali-feldspar granitic rocks of Eocene age (35.4-56.5 million years ago; ENV 2021).

Bedrock outcrop was observed in many places throughout the parcel, both along the escarpment to the east of the site by the Quarry access road, and in the mountainous terrain to the west up to the bedrock knob that comprises the upper landing area. Weathered friable bedrock was observed during our site visit in road cuts and along the face of material excavated/blasted to construct the access roads through the site (Page 8). Results including bedrock mapping for the site is included in Attachment B.

### ***Site Hydrology and Hydrogeology***

The site is located within the greater Vernon Creek watershed (ENV 2021); this large watershed extends from Ellison Lake to the south to Swan Lake to the north, and encompasses the municipal areas of Winfield, Oyama, Lake Country, Coldstream, Lavington, and Vernon. The most predominant waterbodies nearest the site are Kalamalka Lake to the east and MacKay Reservoir (a man-made or augmented lake) to the north. Several unnamed creeks are shown as flowing across or originating from within the site, and these are listed as fully recorded as they report directly to Kalamalka Lake. (Attachment B).

The site is located within the mapped boundaries of the west of Ellison and Wood Lakes aquifer, BC Ministry Aquifer No. 471 (Figure 1). This aquifer consists of fractured crystalline bedrock including granite and alkali-feldspar granite intrusive rocks. This bedrock aquifer extends from Ellison Lake in the south to just before Vernon city limits to the north.

A search of the BC Water Resources Atlas (WRA) identified only one well in the vicinity of the site (within 1 km), and only 11 wells in the upland area within 2 km of the site. Most of the wells along the western valley wall of the lake are shallow overburden wells that are hydraulically connected to the lake. Table 3 summarizes well details of several of the wells in the vicinity of the site, focusing on wells of similar elevation along the western valley wall.

**Table 3: Bedrock Wells within 2km N-S of the site**

| Well Tag No. | Water Use | Distance from Site (m) | Well Depth (ft) | Water Depth (ft) | Bedrock Depth (ft) | Well Yield (USgpm) |
|--------------|-----------|------------------------|-----------------|------------------|--------------------|--------------------|
| 17568        | UNK       | 1,175                  | 148             | -                | 24                 | DRY                |
| 17569        | IRR       | 1,175                  | 25              | 10               | ne                 | 60                 |
| 17622        | UNK       | 1,175                  | 32              | 0 (artesian)     | 32                 | 6                  |
| 20217        | UNK       | 1,650                  | 74              | nr               | 72                 | 0.5                |
| 62542        | DOM       | 1,400                  | 280             | 30               | 12                 | 3                  |
| 62543        | DOM       | 1,400                  | 260             | -                | 23                 | DRY                |
| 70266        | DOM       | 144                    | 200             | 33               | 48                 | 6                  |
| 117242       | COM/IND   | 1,160                  | -               | -                | -                  | -                  |
| 117243       | COM/IND   | 1,300                  | 540             | 14               | -                  | -                  |
| 119045       | COM/IND   | 930                    | 400             | -                | -                  | -                  |
| 120665       | COM/IND   | 1,650                  | 36              | -                | -                  | -                  |

Notes: UNK – unknown water use, COM/IND – commercial/industrial water use, DOM – domestic water use  
ne – bedrock not encountered, nr – not reported, DRY – well report indicated dry hole

Note that some of the boreholes drilled have been dry, indicating that the overlying sediments and near-surface weathered bedrock have not yielded sufficient quantities of water, and the productivity of the deeper bedrock can be very low. Expected depth of drilling should be greater than 300 ft in the lower reaches of the site (lower landing), and in the 600-800 ft range at high station to the west. Depth of a test well at mid-station could vary markedly (but is estimated at 450 ft for budgeting purposes). Anticipated well yields for wells such as these would be < 5 USgpm per well, and from the positioning relative to the three proposed landings, WWAL assumes the wells will be spaced far enough apart that well interference is not observed affecting each other (on-site wells) nor affecting neighbouring properties (existing surrounding users and their offsite wells).

Two Ministry observation wells (OBS wells 053 and 054) monitored water levels in Aquifer 471 over the period 1969-2008 in the Carrs Landing area further south of the site. Both of these wells displayed a marked decline in static water levels over the period 2000-2005. OBS Well 054 was observed to recover in 2008, but OBS well 053 did not, indicating that recharge to the bedrock aquifer in this area is not only slow, but variable. While the aquifer receives enough recharge to supply your proposed development, the amount available locally for you to sustainably extract will depend on the wells themselves and is best determined following a pumping test.

The conceptual model of groundwater flow beneath the site has water collected on the eastern face of the hillside flowing eastward toward the Kalamalka Lake, the ultimate receptor for surface and ground water in this area. The small hillside-fed ephemeral watercourses shown in the mapping divide the slope face into several small local-area catchments, but all creeks eventually lead to the lake. With the exception of some minor lateral east-west flow

components toward these ephemeral creeks across the hillside face, the assumed groundwater flow path is eastward as depicted in Figure 1.

### **Water Supply Options**

In this assessment, three water supply options were investigated:

- 1) Water supply be provided by the RDNO by a metered connection to the municipal water system servicing Predator Ridge;
- 2) Lake intake within Kalamalka Lake, with a lakeshore lift station to pump water up the hill and across the highway;
- 3) Distributed groundwater wells situated at each of the proposed buildings/landing where water is required, to service the local area under three independent small water systems.
- 4) For future irrigation, it may be possible to tie into existing City of Vernon Reclaimed Water infrastructure. There are two large parcels relatively nearby (City of Vernon, 2020) that are provided with reclaimed water for irrigation (outdoor, non-potable uses only).

Each of the first three options were assessed, and the findings are as follows:

#### RDNO Water Supply

WWAL contacted the building engineering and bylaw enforcement department at the Regional District of North Okanagan (RDNO) to get confirmation on the availability of water from the local municipal purveyor. We spoke with Mr. Michael Phillips (RDNO) about the project and the potential for a connection to their system.

The closest connection to a municipally provided water supply would come from the RDNO's Greater Vernon Water system. The Greater Vernon Water Subdivision and Development Servicing Bylaw No. 2650 is the municipal bylaw that governs connections to the GVW system. Under the Bylaws' *Section 112 - Servicing Requirements*, subsection 12 states:

*Notwithstanding any other provisions of this bylaw, connection to the GVW System is not permitted for the following parcels:*

- a) *In the case of Subdivision, parcels created by Subdivision where the average minimum lot size of the parcels to be created (to be determined in accordance with applicable zoning) is greater than 2.1 hectares; or*
- b) *In the case of Development, a parcel proposed to be developed which is not located within 500m of the terminus of the existing Waterworks system as measured along the road centerline to the closest point of the parcel,*

*And any Subdivision or Development of such parcel(s) shall be premised on the parcel(s) being serviced, in accordance with RDNO Bylaw No. 2600 (2013) with potable water from a source other than GVW.*

Put more plainly, if the terminus of the current water system is beyond **500 m** from the site, connection to GVW is not permitted. Depending on which "road centerline" the RDNO considers for measurement, the nearest connection point for the upper terminal is **800+ m** away from Commonage Road at its closest point. This would make this project ineligible for connection to the GVW system at this time.

As new homes/subdivisions continue to be built in the greater Predator Ridge area, the GVW system continues to expand. If not in time for the proposed construction, a connection to the municipal system may become possible in the future.

#### Connection to Kalamalka Lake Intake and Licensing

One feature of the site is a statutory right-of-way that connects the eastern side of the parcel to Kalamalka Lake via a thin, 15 ft wide easement. This easement was put in place specifically for future development potential of the parcel and includes provision for crossing underneath Highway 97.

Technically, this option is feasible, with directional drilling of a lake intake into Kalamalka Lake from the lakeshore (near the end of the easement) and installing a pressurized force main up to the lower landing. This would require a significant lift station at the base to create and maintain head pressures, but it could be done. However, obtaining a Ministry of Forests, Lands, Natural Resource Operations and Rural Development (MFLNRORD) licence to extract this surface water from Kalamalka Lake is another issue.

WWAL contacted the Water Stewardship Office who oversees water licences and applications for the region. We spoke with Mr. Jeff Nitychoruk, Senior Water Stewardship Officer with MFLNRORD, about the project and the potential to obtain a commercial surface water licence for Kalamalka Lake.

Kalamalka Lake is listed as **Fully Recorded**, indicating that no additional surface water allocations will be permitted. This listing is in place to be protective of the environmental flow needs of Vernon Creek; a fish-bearing waterbody that is fed by losses from Kalamalka Lake as it flows north through Vernon. With current difficulties in maintaining water levels at the outflow of the lake, and climate change increasing the uncertainty of both snowpack and runoff within the watershed, MFLNRORD have currently put a moratorium on new commercial surface water licences from the lake.

There is already one applicant that has had their commercial surface water licence application rejected, and an appeal is currently in front of the Environmental Review Board. Given this, there is considerable uncertainty in pursuing the lake intake option, as there would be significant engineering and construction costs associated with getting water up from the lake. If this option is to be considered, we strongly recommend early engagement with MFLNRORD to ensure that a licence can be obtained before significant engineering/construction costs are borne.

#### On-site Servicing by Distributed Groundwater Wells

While the first two options seemed able to technically provide ample water for the proposed development, each appear to have administrative barriers to accessing the water. Consequently, a more technically challenging option is still available: on-site water supply from groundwater wells.

The bedrock aquifer 471 is mapped as being located underneath the site; however, it is known that this area can be water-scarce area, with many dry boreholes drilled historically in the vicinity of the site. WWAL spoke to long-term resident and water well driller Mr. Max Schibli with regard to water scarcity for this area. He drilled several of the wells in the Predator Ridge area prior to the development of the Golf Course (specifically, WTNs 62542 and 62543 listed in Table 3).

The granitic rock in this area is **fairly tight**, with some fracture sets conveying appreciable water. However, in the absence of these fractures, the host bedrock is fairly competent, and does not yield appreciable groundwater on its own. Any water wells should look to take advantage of pre-existing fracture sets within the rock. These



may correlate with surface depressions, so a lineament assessment of detailed LIDAR imagery for the site could assist in targeting potential test well locations.

As well, there is a marked difference between water stored within a fractured bedrock aquifer, and the replenishment rate (or recharge) of those materials. Any water encountered during initial test well drilling should be tested for a significant amount of time (72-hours or more) to confirm well yield and that the well will recharge over time. This testing is often best done in the late summer or fall/winter months, away from the enhanced period of recharge during snowmelt and freshet expected in the March-July period.

### **Site Visit**

WWAL hydrogeologist Christopher Homes, P.Geo. attended a site visit and reconnaissance by UTV on December 1, 2021, accompanied by Mr. Rav Soomal (or Ridge North America). While on site Mr. Homes noted select site features including the proposed lower gondola landing area to the east, the stepped approach the gondola would be traversing, and the upper lookout at the top of the property to the northwest (Figure 2).

The long winding access road into the western part of the property is accessed off of Beal Road, which acts as the main access for the Quarry from the turnoff at Bailey Road (the nearest MOTI maintained road). The bedrock bluff along the southeast of the property can be viewed from these roadcuts, and surficial soils were observed as being a thin veneer of silts, sands and weathered colluvium overtop bedrock (Attachment C). Where present, surface vegetation was comprised of grasses, sedges and occasional sagebrush, indicative of the arid landscape of the region.

The lower landing is shown as the lowermost terminus of the proposed gondola (Figure 2). The landing area is fairly flat, and already has power/communication poles leading up to the landing area (Attachment C). This area has sufficient flat area to construct drill pads outside the proposed terminal building area, with minimal ground preparation required. The access road to the landing will need to be upgraded or capped with aggregate to permit the travel of road vehicles, but once onsite the drill equipment should be able to move unencumbered.

At the time of the site visit, plans did not indicate the need for water or washroom facilities at the landing at mid-station. Consequently, we did not assess the ground conditions of that area. However, if a washroom facility is planned for mid-station, a third water supply well can be drilled in the area. Access to this landing area will likely need to be enhanced from the upper access road, and across the Fortis Gas ROW (Figure 2). Once the footprint of the mid-station landing is surveyed, and access upgraded for travel by road vehicles, a suitable third well location can be found.

Once up on the upper landing area (Attachment C), the terrain is quite rugged, as the landform is bedrock controlled, and bedrock outcrop is observed scattered throughout this upper area. Current access to the proposed landing and viewing platform area is quite constrained by outcrop, but truck-mounted access is viable to a flatter, more open area located approximately 30 m southwest of the landing. Road improvements will be required to upgrade the road and trim trees to permit the movement of mobile machinery on site.

As we concluded our reconnaissance, we observed a few significant water impoundment areas toward the southwest of the property. Expressed as surficial boggy-marshy areas, these locations impound water at surface; however, these may or may not serve to directly supply water to the subsurface (as an area of enhanced infiltration) and are located a significant distance from proposed infrastructure. Any investigation into these “wetted areas” is only recommended should initial test well drilling in preferred locations prove ineffective.

It was discussed onsite that site regrading and levelling to facilitate the construction of the various landings and buildings would be required. Due to the presence of bedrock outcrop, this would be best completed by excavator and if the rip ability of the rock is found to be low, facilitated by the import of rock fill (possibly from as close as the adjacent quarry). Access to any test-well drilling targets could be established and drill pads could be built to facilitate a future drilling program using such machinery.

### **Conclusions**

There exists the potential to supply the proposed water demand via an onsite water supply system from wells; however, the system will likely require several water supply wells to make up the anticipated average water demand for the facilities, and daily or peak water demand will have to be met through on-site storage. This is mostly a function of the anticipated low aquifer yield from the bedrock underlying this area. Further, long-term testing at a low aquifer replenishment time of the year (August through February) is recommended to determine the sustainable well yields.

The cost of such an on-site water supply system would include the drilling and development of several test wells (minimum 3), pumping tests and water quality sampling on each of the wells, power to each of the test wells deemed viable for conversion to production wells, and on-site storage capacity. These would be classified as non-domestic wells and as such would need to be licensed under the *Water Sustainability Act* (see more detailed discussion on this below).

Approximate costs for a test well program in support of the proposed water demand is included in Table 4 below. There are some cost saving options available for the program, as outlined. One would be to avoid drilling near the identified streams, negating the need for the riparian/environmentally sensitive areas assessment (or if already completed by others). The other would be to conduct only preliminary (short-term) well flow tests on each of the test wells, as opposed to the more costly 72-hour tests. Note, however, that these 72-hour tests will likely be required in order to licence these wells under the B.C. *Water Sustainability Act*. See Groundwater Licensing discussion, below.

Depending on the initial findings of the test well program, a distributed water supply system could be designed to accommodate the apparent well yields. If a dry well were to be drilled, decisions regarding the costs of additional drilling versus altering the design concept would likely follow.

**Table 4: Cost Estimate for Test Well Program**

| Item  | Purveyor                      | Total Cost        |
|---|-------------------------------|-------------------|
| Project management and consulting services  | Western Water Associates Ltd. | \$ 5,000          |
| Riparian / environmentally sensitive areas assessment<br>(if needed for any drilling sites near watercourses) | Western Water Associates Ltd. | \$ 6,000          |
| Drilling and installing three test wells to 300, 450, 600 ft,<br>assumed lined with 4" PVC well liner         | Drilling Contractor - TBD     | \$ 85,000         |
| Pumping tests (72-hour) on three test wells, including<br>step-tests, and providing generator power           | Pumping Test Contractor - TBD | \$ 45,000         |
| Water quality samples for each well (3)   | CARO Analytical Services      | \$ 4,500          |
| Data analysis and reporting   | Western Water Associates Ltd. | \$ 7,000          |
| Taxes and disbursements (3% on WWAL fees and disbursements, 5% GST)   |                               | \$ 8,300          |
| Recommended Contingency (20% of Drilling and Testing)   |                               | \$ 26,000         |
| Estimated Cost for Test Well Program (three wells to 300, 450, and 600 ft)                                    |                               | <b>\$ 186,800</b> |

### Groundwater licensing

In addition to accessing water of sufficient quantity and quality, a provincial water-use licence would be required to access new water sources. Starting in 2016 with the introduction of the *Water Sustainability Act*, all non-domestic groundwater users must obtain a licence, and cannot legally use groundwater before obtaining a licence. The use of water for commercial enterprise is classified as a commercial water-use purpose (ENV 2016b).

The application process is fairly straightforward: an application is made online filling out the Ministry application form and paying the application fee of approximately \$1,000 for this requested water-use, whether it is provided by onsite servicing via groundwater wells or from a surface water licence on Kalamalka Lake (ENV 2016b). Documentation needed to support the file includes a legal description of the property, a map showing where the property is located in relation to surrounding properties and water uses, the proposed water-use (commercial enterprise – tourist attraction) and water demand estimates, and identification of the water source (in this instance, aquifer 471 underlying the site). Much of the required information is provided in this letter and supporting documents. New licence applications in the southern B.C. interior are currently taking a year or more from submittal of application to a licence decision. If the licence is approved, water rental costs would likely be minimal, on the order of \$200 per year.

In addition to Ministry licensing for the groundwater extraction, a permit from the regional Health Authority would be required to allow the water to be served to the public by way of public washrooms or food preparation facilities (i.e., restaurants, coffee bar, cafeterias). The Interior Health Authority (IH) has jurisdiction in this area, and an application for a new water source would be the first step in the permitting process. Further IH permits

could include a waterworks construction permit and a permit to operate. The permit application process involves the drinking water officer for this area, and the IH review includes looking into the sanitation and water quality aspects of the water supply. The application looks at the water source (bedrock wells), the raw water quality and quantity to be used, and any treatment facilities planned to ensure/maintain water potability for its intended use. Once an application is made, IH is typically faster to respond (weeks to months), but the overall length and cost of the permitting process would depend on the water-use required.

### ***Recommendations for further consideration***

From our assessment, the following recommendations are provided:

- R1. If not already completed for the project, prior to the commencement of earthworks complete a Riparian Areas Assessment to confirm the limits of approach for working in proximity to the mapped unnamed watercourses that exist within the land parcel itself (identified in Figure 2 and Attachment B). WWAL provides services in this regard;
- R2. Establish access to and construct level drilling pads at the three proposed landing areas (upper high-station, mid-station, and lower terminal landing areas) from the current upper site access road, coordinating with the neighbouring property owner to the southwest (Predator Ridge Quarry) to maintain access;
- R3. Complete a test well drilling program, drilling nominally 150mm (6”) diameter test holes at the three drilling targets identified in Figure 2 (in proximity to each of the proposed buildings, where water service is required).
- R4. Following well development, and knowing the static water level in each of the well(s), a pumping test program can be designed to test the wells and estimate a long-term capacity for each;
- R5. Preliminary costs have been provided for the test well program based on available information to date; this program can be modified in further discussions to suit your needs.  
**Note that more than 3 test wells may be required to meet the projected water demand for the project;**
- R6. Locations determined to have sufficient test yield to warrant further consideration may be considered for a) drilling of additional source wells and/or b) hydrofracturing of the bedrock at depth to increase the well yield;
- R7. Water from the supply wells at each location would be pumped to on-site storage (such as an aboveground storage tank) and fed to the local water system as needed. This will be required to optimize the use of water over the course of the day and during peak times, if suspected long-term sustainable well yields prove insufficient. This would create three small systems, one at each building, and each with its own dedicated source;
- R8. Access to power in the lower terminal area appears relatively straightforward (overhead lines and power poles already nearby). Access to power for the mid-station and high-station buildings should be subject to a cost-benefit analysis comparing hydro (overhead transmission lines) versus self-generated (wind/solar with a propane or diesel generator backup). This should be considered in detailed design of the facilities.

## Closure

Our assessment concludes that the conditions for developing an onsite groundwater supply system to facilitate the proposed development at the site appears marginally feasible, with multiple supply wells likely required to meet the project's water demand. Any groundwater supply developed would be from the bedrock aquifer underlying the site (Aquifer 471), and specific well yields should be expected to be low, with a median well yield of 0.19 L/s (3 USgpm) reported for the aquifer. Well interference effects between these proposed new onsite wells and existing offsite wells at these flow rates are not anticipated.

A test well program is encouraged to determine the presence or absence of a significant fracture zone or productive layer of bedrock at depth. Once a water supply is proven viable, additional supply wells can be drilled, or the wells can be hydrofractured to maximize the amount of flow from the bedrock into the wells. Ultimately, long-term sustainable well yield will depend more on the recharge rate to the aquifer in this area.

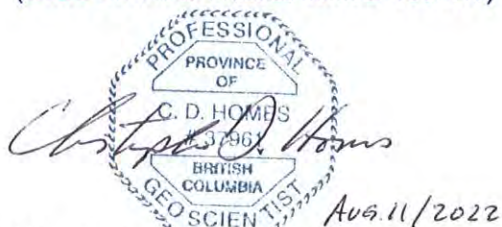
It is likely that multiple wells at different locations will be required to satisfy the projects' projected water demand for the development. It is likely that on-site storage will be required to facilitate operational demands as they vary throughout the day and over the tourist season.

We trust this report meets your needs at this time, if you have any questions or concerns, please contact the undersigned.

Yours truly,

### Western Water Associates Ltd.

(EGBC Permit to Practice number 1001419)



Christopher Homes, P.Geo.  
Senior Hydrogeologist

### Reviewed by:

A handwritten signature in black ink, which appears to read 'Douglas Geller'.

Douglas Geller, M.Sc., P.Geo.  
Principal Hydrogeologist

### Attachments:

- Figures 1 and 2
- Attachment A – RDNO Parcel Mapping
- Attachment B – WRA Mapping and Select Well Logs
- Attachment C – Photographic Documentation

## References

- British Columbia Ministry of Environment (ENV). 2021. *Water Resources Atlas (WRA)*.  
: <https://maps.gov.bc.ca/ess/hm/wrbc/>
- British Columbia Ministry of Environment (ENV). 2014. *Water Sustainability Act*. Act is current to November 24, 2021. <https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/14015#section9>
- British Columbia Ministry of Environment (ENV). 2016a. *Groundwater Protection Regulation*. Consolidation current to December 14, 2021. [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/39\\_2016](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/39_2016)
- British Columbia Ministry of Environment (ENV). 2016b. *Water Sustainability Regulation*. Consolidation current to December 14, 2021. [https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/36\\_2016#ScheduleA](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/36_2016#ScheduleA)
- British Columbia Ministry of Environment (ENV). 2016c. *Water Sustainability Fees, Rentals and Charges Tariff Regulation*. Consolidation current to December 14, 2021.  
[https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/37\\_2016#Schedule1](https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/37_2016#Schedule1)
- City of Vernon 2020. *Water Reclamation Centre Annual Report*.  
<https://www.vernon.ca/sites/default/files/docs/operations/Waste-Water/2020annrpt.pdf>
- Environment Canada, 2021. *Canadian Climate Normals 1981-2010, Vernon Coldstream Ranch* (Climate ID: 1128580). [https://climate.weather.gc.ca/climate\\_normals/index\\_e.html](https://climate.weather.gc.ca/climate_normals/index_e.html)
- Regional District of North Okanagan (RDNO). 2021. *North Okanagan Map Viewer*.  
<https://maps.vernon.ca/Html5Viewer/?viewer=NorthOkanaganMap>
- Ryan, M. and K. Hopkins. 2016. *Adapting natural resource management to climate change in the Thompson-Okanagan Region: Considerations for practitioners and Government staff*. Issued February 22, 2016 by MFLNRO.





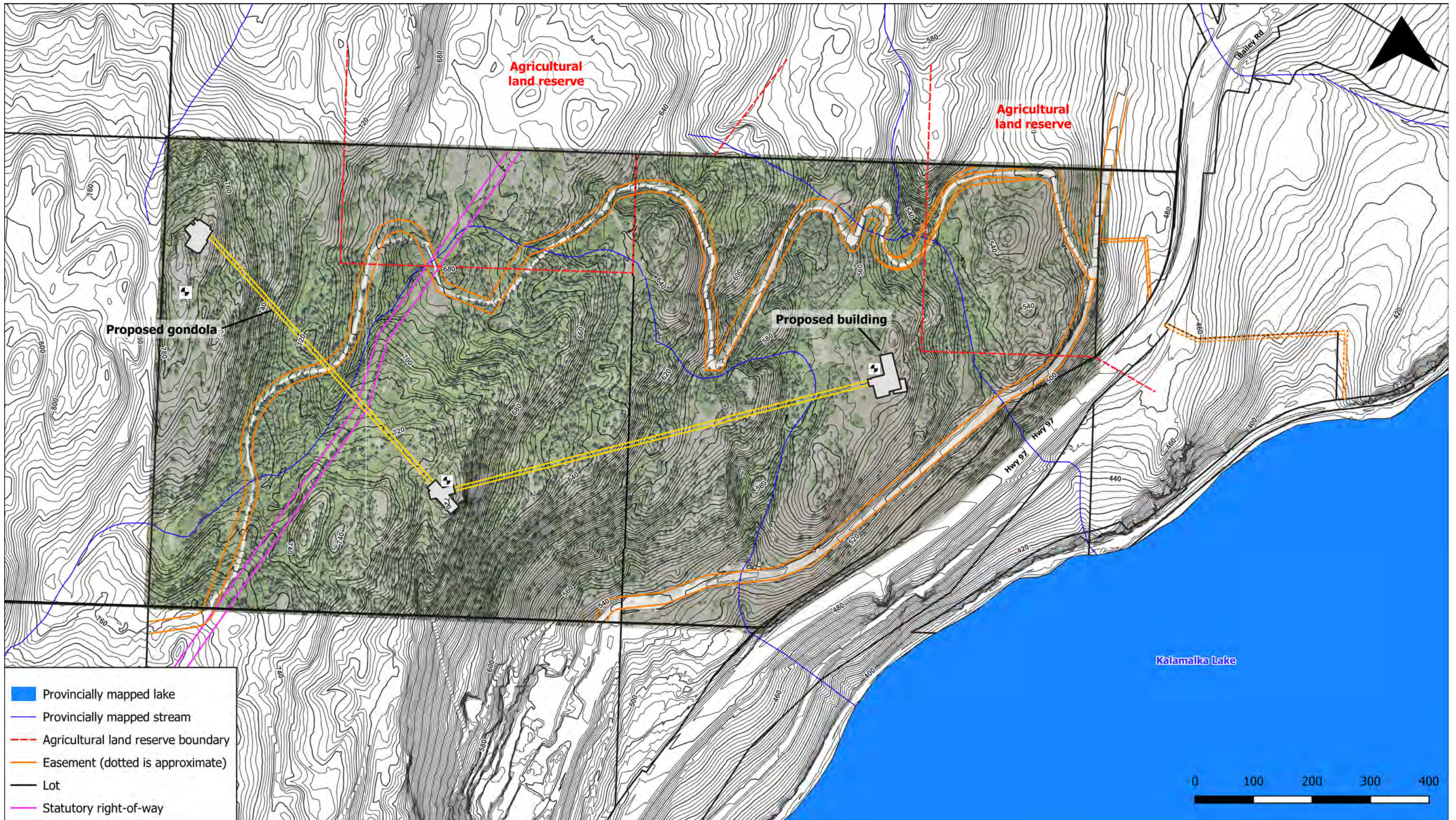
TITLE **Figure 1: Project Location**

**Okanagan Gondola Water Feasibility Assessment**



|          |     |          |                   |             |                             |
|----------|-----|----------|-------------------|-------------|-----------------------------|
| DRAWN    | CDH | DATE     | December 20, 2021 | PROJECT NO. | 21-120-01VR                 |
| CHECKED  | CDH | SCALE    | 1:50,000          | DWG. NO.    |                             |
| REVIEWED | DG  | FILE NO. | Figure 1          | SOURCE:     | Water Resources Atlas, 2021 |





**Okanagan Gondola Water Feasibility Assessment**

|          |                   |                                |                       |
|----------|-------------------|--------------------------------|-----------------------|
| TITLE    |                   | <b>Figure 2: Site overview</b> |                       |
| DRAWN    | Tim Sivak, P.Geo. | DATE                           | November 23, 2021     |
| REVIEWED |                   | PROJECT NO.                    | 21-120-01VR           |
|          |                   | CLIENT                         | Okanagan Gondola Ltd. |
|          |                   | REVISION NO.                   | B                     |

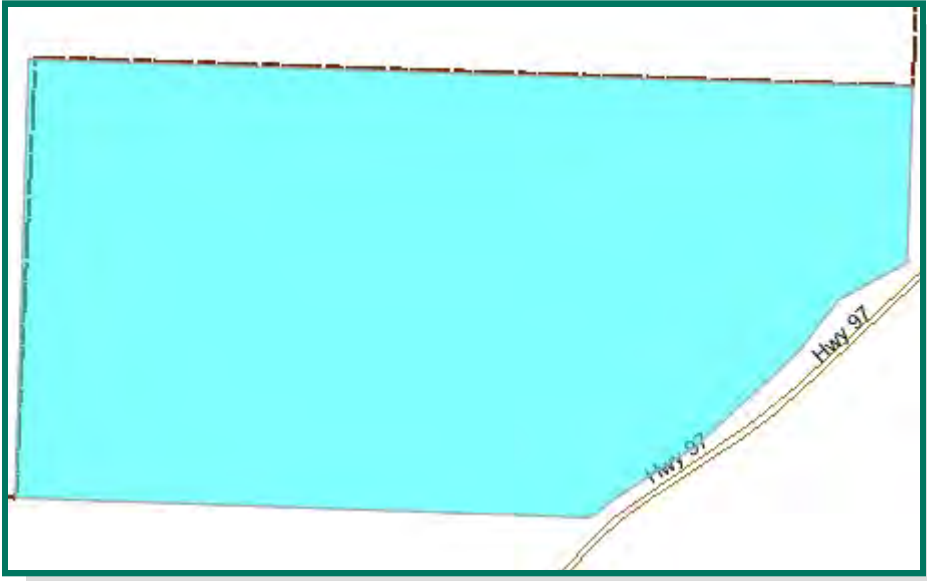
Data Sources: Base plan from Ridge Canada and public data sources

Contour interval: 10 m (major), 2 m (minor)  
 Map Projection: NAD83(CSRS) UTM Zone 11  
 Other notes: -





# Property Information Management System Report



Property highlighted in blue



### Legal Information:

Jurisdiction: Vernon Rural

Legal Type: OTHER

Site Address: HIGHWAY 97

Roll Number: 722.02090.000

Legal Description:

PART N1/2, SECTION 36, TOWNSHIP 14, OSOYOOS DIV OF YALE LAND DISTRICT, EXCEPT PLAN B826 37599 H823

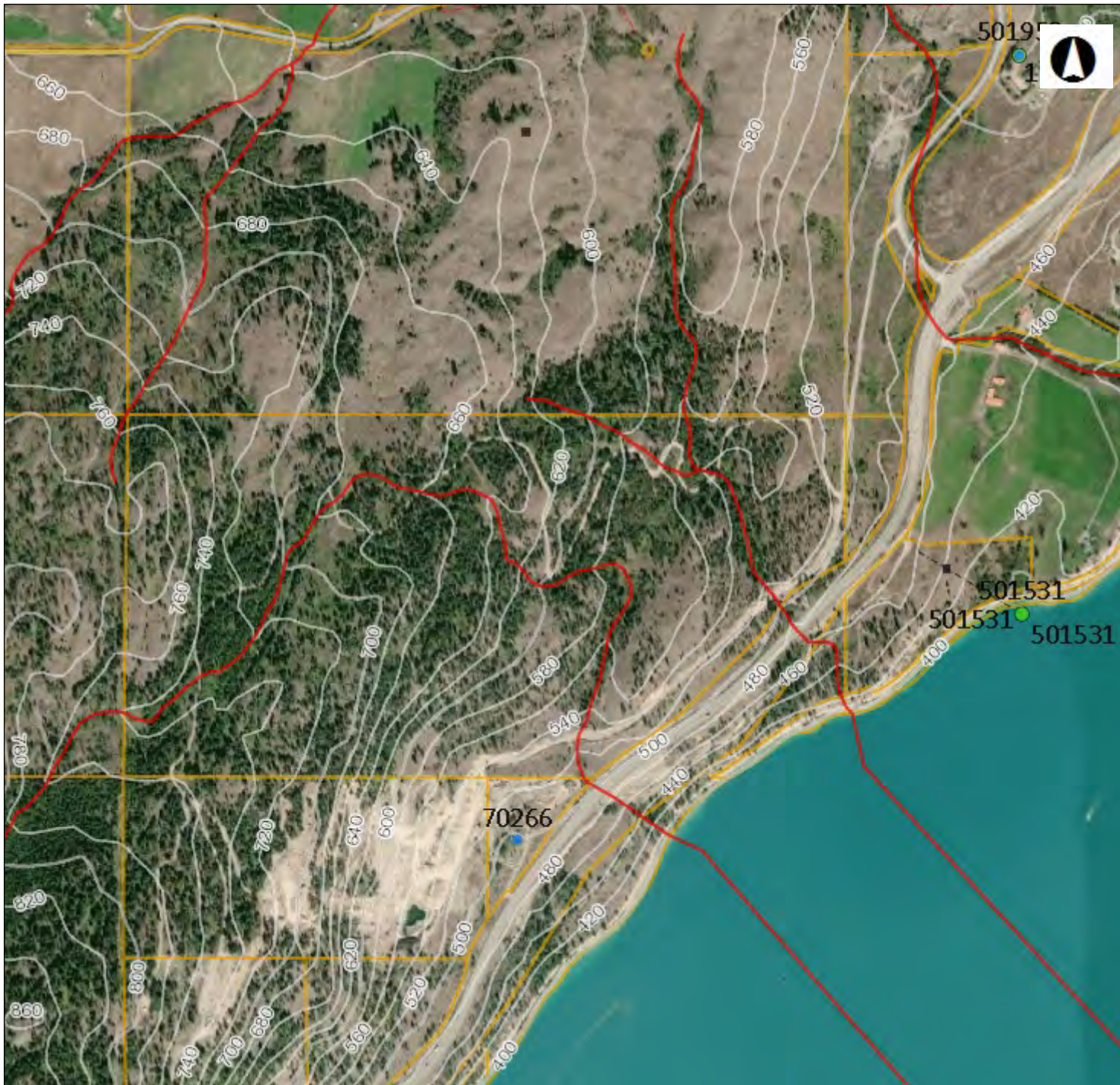
### Property ID:

013-561-235

### Land Use:

| Description                | Type | Size (ha) |
|----------------------------|------|-----------|
| ZONING DESIGNATION 1 (HA.) | LH   | 116.11    |
| O.C.P. DESIGNATION 1 (HA.) | AG   | 12.8      |
| O.C.P. DESIGNATION 2 (HA.) | LH   | 103.31    |
| O.C.P. DESIGNATION 3 (HA.) | CAH  |           |

This data is for general information only and is provided on a user beware basis. The Regional District North Okanagan makes no warranty or representation, expressed or implied, with the regard to the correctness, accuracy and/or reliability of the data supplied.



## Water Resources Atlas

### Legend

#### Groundwater Wells - All

ARTESIAN\_IND

- Reported Artesian Well
- Well

#### Provincial Observation Wells

OBSERVATION\_WELL\_STATL

- Active
- Inactive

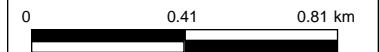
#### Water Rights - Licences

POD\_STATUS

- Active
- Inactive

#### Water Licence Points of Divi

STATUS



1: 20,000

### Copyright/Disclaimer

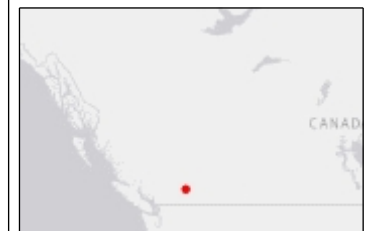
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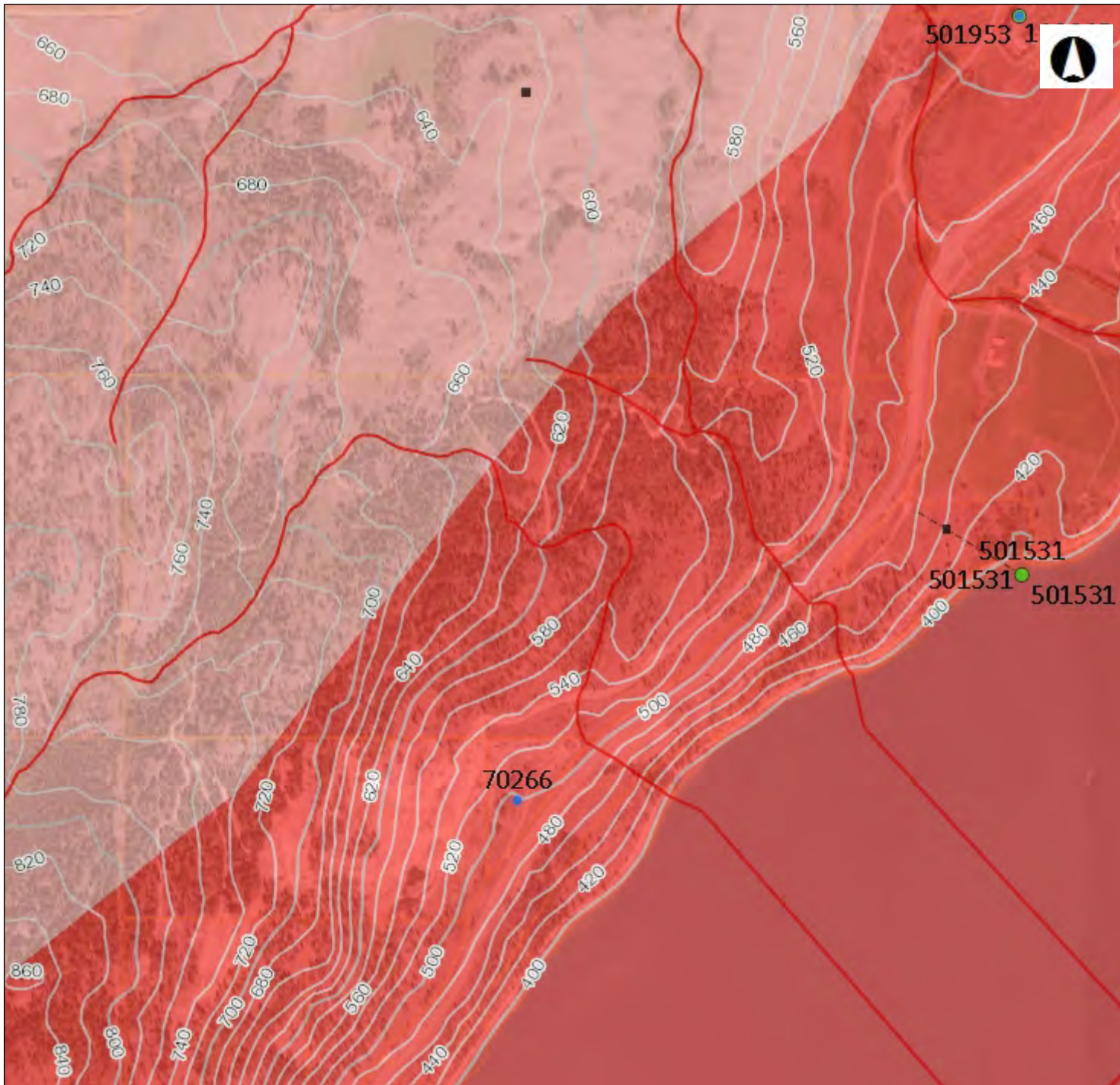
CAUTION: Maps obtained using this site are not designed to assist in navigation. These maps may be generalized and may not reflect current conditions. Uncharted hazards may exist. DO NOT USE THESE MAPS FOR NAVIGATIONAL PURPOSES.

Datum: NAD83

Projection: BC Albers

### Key Map of British Columbia





## Water Resources Atlas

### Legend

#### Groundwater Wells - All

ARTESIAN\_IND

- Reported Artesian Well
- Well

#### Provincial Observation Well:

OBSERVATION\_WELL\_STATL

- Active
- Inactive

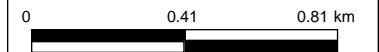
#### Water Rights - Licences

POD\_STATUS

- Active
- Inactive

#### Water Licence Points of Divi

STATUS



1: 20,000

### Copyright/Disclaimer

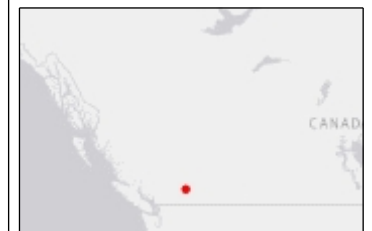
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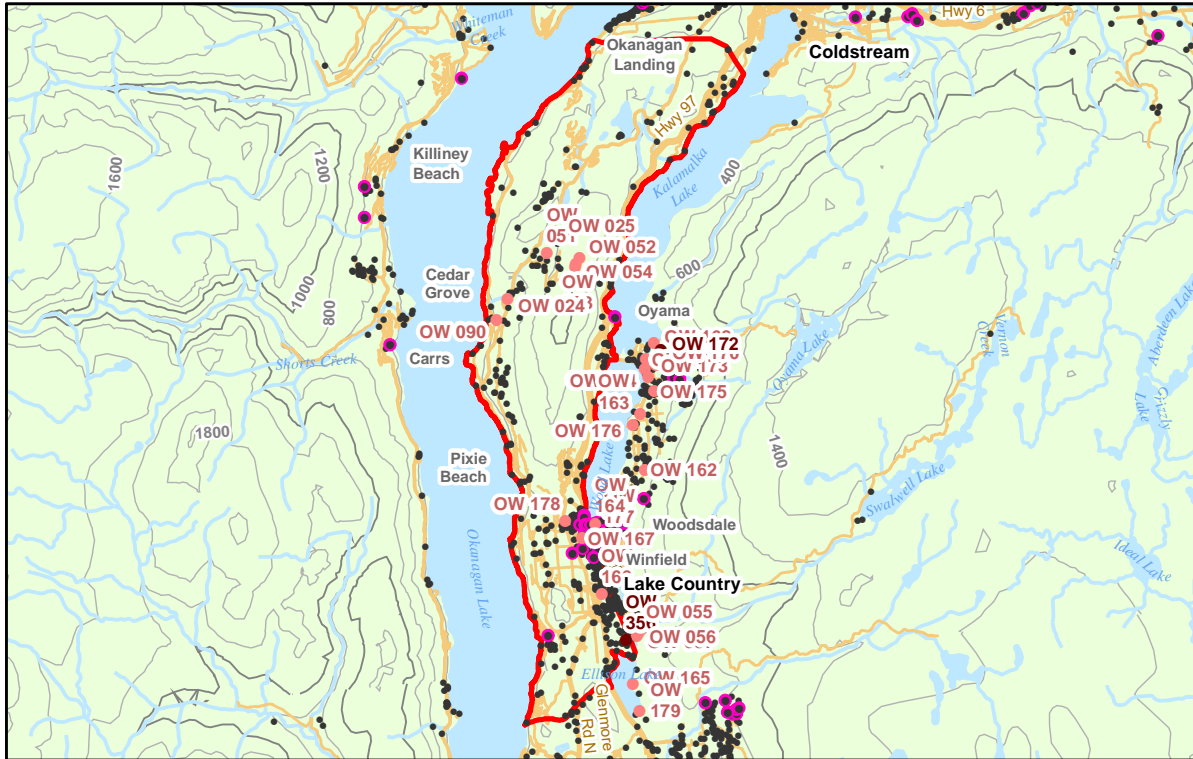
CAUTION: Maps obtained using this site are not designed to assist in navigation. These maps may be generalized and may not reflect current conditions. Uncharted hazards may exist. DO NOT USE THESE MAPS FOR NAVIGATIONAL PURPOSES.

Datum: NAD83

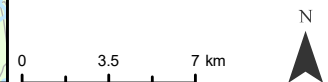
Projection: BC Albers

### Key Map of British Columbia




**Legend**

- Registered Water Well - Artesian
- Registered Water Well
- Active Observation Well
- Inactive Observation Well
- Aquifer Boundary

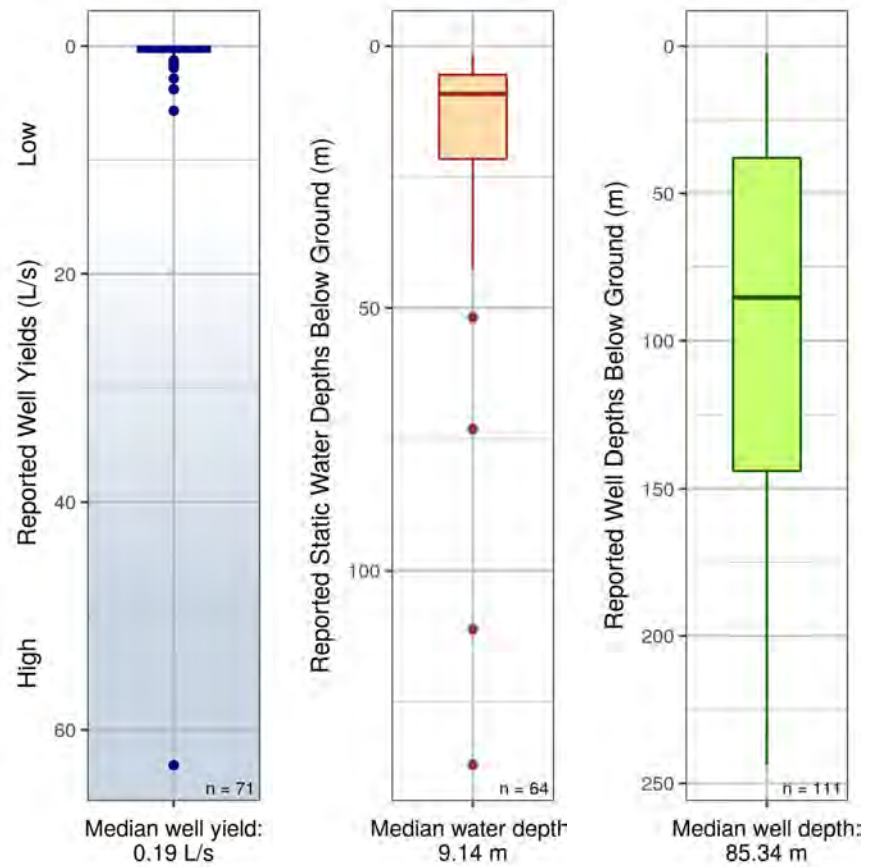

**Aquifer Description (Mapping Report - 2012):**

Fractured crystalline (igneous intrusive or metamorphic, meta-sedimentary, meta-volcanic, volcanic) rock aquifer (subtype = 6b).

**Aquifer Details**

|                                      |  |
|--------------------------------------|--|
| Region                               | Thompson-Okanagan                        |
| Water District                       | Vernon                                   |
| Aquifer Area                         | 127.6 km <sup>2</sup>                    |
| No. Wells Correlated to Aquifer      | 113                                      |
| Vulnerability to Contamination       | Moderate                                 |
| Productivity                         | Low                                      |
| Aquifer Classification               | IIIB                                     |
| Hydraulic Connectivity <sup>1</sup>  | Not Likely                               |
| Aquifer Stress Index                 | Method not applicable - confined aquifer |
| No. Water Licences Issued to Wells   | 3  |
| Observation Wells (Active, Inactive) | 24, 25, 54, 90, 178                      |

<sup>1</sup> Based on broad regional assessment



**Disclaimer:** Use of information from Aquifer factsheets (accessed by BC government website) is subject to limitation of liability provisions (further described on that website). That information is provided by the BC government as a public service on an "as is" basis, without warranty of any kind, whether express or implied, and its use is at your own risk. Under no circumstances will the BC government, or its staff, agents and contractors, be responsible or liable to any person or business entity, for any direct, indirect, special, incidental, consequential or any other loss or damages to any person or business entity based on this factsheet or any use of information from it.

Detailed methods for all figures are described in the companion document ([Aquifer Factsheet - Companion Document.pdf](#)).

Factsheet generated: 2020-08-06. Aquifers online: <https://apps.nrs.gov.bc.ca/gwells/aquifers>.

## **AQUIFER CLASSIFICATION WORKSHEET**

DATE: 21-Mar-12 (Updated 29-Jan-13)  
AQUIFER REFERENCE NUMBER: 471  
DESCRIPTIVE LOCATION OF AQUIFER: West of Ellison Lake and Wood Lake  
NTS MAP SHEET: 082E14 and 82L03  
BCGS MAP SHEET: 082e093, 082I003, 82I013, 82I014, and 82I028

**CLASSIFICATION: IIB**

**RANKING: 11**

Aquifer Size: 127.85 km<sup>2</sup>

### Aquifer Boundaries:

The western boundary follows the shoreline of Okanagan Lake. The northern and southern boundaries generally follow the extent of geological mapping for intrusive rocks. The eastern boundary coincides with Wood Lake, Kalamalka Lake, and a north/south trending fault through the valley bottom. Solid lines have been used for boundaries having a high degree of certainty while dash lines indicate a lesser degree of certainty.

Aquifer Sub-type: 6b

Characterized as fractured crystalline (igneous intrusive or metamorphic, meta-sedimentary, meta-volcanic, volcanic) rock aquifers.

Aquifer Priority Rating for Observation Wells: 42.62

### Geologic Formation (overlying materials):

Surficial deposits interspersed with bedrock outcrops. Surficial deposits include primarily glaciolacustrine and glacial sediments with less coverage of glaciofluvial and post-glacial sediments (Paradis, 2009). Glaciolacustrine sediments include littoral, sublittoral, and deep water sediments consisting of silt, clay, and sand deposits while glacial sediments include continuous and discontinuous till cover. The depth of unconsolidated material overlying the bedrock ranges from 0 to 210.5 m with a median of 6.10 m and an average of 18.76 m. The bedrock outcrops are estimated to cover approximately a third of the aquifer area.

Geologic Formation (aquifer):

Intrusive Rock

Primarily intrusive rock from the Mesozoic era. Rock types include granite and alkali feldspar granite. It is possible that this aquifer may be hydraulically connected to Aquifer No. 470.

Confined/Partially Confined/Unconfined:

Partially Confined

Vulnerability:

Moderate - B

Approximately 70 percent of the wells have a confining layer ranging in thickness from 0.46 to 89.91 m with a median of 3.66 m and an average of 6.40 m. The depth to the bottom of the primary confining layer ranges from 0.46 to 161.54 m with a median of 5.49 m and an average of 10.25 m. The confining materials generally include clay and till. The confining sediments have a low permeability; however, are interspersed with bedrock outcrops. Based on the above, the aquifer vulnerability is considered moderate.

Productivity:

Low – Geomean 0.12 L/s

Reported well yields range between 0.01 to 1.89 L/s with a median of 0.13 L/s and an average of 0.29 L/s based on 74 records. Productivity is considered low based on a geometric mean of 0.12 L/s.

Depth to Water:

Moderately Shallow – Average 19.97 m

The depth to static water level ranges from free flowing to 137.16 m with a median of 9.14m and an average of 19.97m based on 65 records. Artesian conditions were noted at two wells. The water level is above the bottom of the confining unit at a few wells, indicating the aquifer is under pressure at a few locations.

Direction of Groundwater Flow:

Groundwater likely flows west toward Okanagan Lake with some local flows to the east ignoring geologic complexities in the fractured bedrock and assuming groundwater will follow the topographic gradient from high elevation to low elevation.

Recharge:

Recharge likely occurs from direct infiltration of precipitation in the bedrock out crop areas, slow downward leakage, and/or from surface water features.

Domestic Well Density:

Low – 0.8 wells/km<sup>2</sup>

The level of density was calculated at 0.8 wells/km<sup>2</sup> using wells identified for domestic and unknown uses and is considered to be low.

Type of Water Use:

Multiple Uses

Groundwater is used for private domestic, water supply system, and potentially irrigation uses based on a review of well record information and aerial photography.

Reliance on Source:

Conjunctive. There are water licenses along local lakes, creeks, and springs that are used to meet local water demands. It is unknown if property owners are using private wells or if they are connected to a larger community system.

Conflicts between Users:

None documented.

Quantity Concerns:

Difficulties encountering a water bearing unit reported in several well reports.

Quality Concerns:

None documented.

Comments:

The following comments were included in the December 1, 2001 worksheet:

The two prime differences identified between this aquifer (# 0471) and the neighbouring bedrock aquifer (# 0470) is that the thickness of lower permeable materials found overlying aquifer # 0470 is less. The other difference is the lower average yield. There seems to be wells constructed in areas of exposed bedrock for both aquifers.

References:

Bernardinucci J. and K Ronneseth, 2002. Guide to Using the BC Aquifer Classification Maps for the Protection and Management of Groundwater. BC Ministry of Water, Land and Air Protection, Water Air and Climate Change Branch, Water Protection Section.

Paradis, S.J., 2009. Surficial Geology, Kelowna, British Columbia, Geological Survey of Canada, Open File 6146, scale 1:50 000.



## AQUIFER CLASSIFICATION AND RANKING

AQUIFER LOCATION: West of Ellison Lake and Wood Lake  
 AQUIFER REFERENCE NUMBER: 471  
 AQUIFER SUB-TYPE: 6b  
 AQUIFER PRIORITY RATING FOR OBSERVATION: 42.62

**CLASSIFICATION: IIB RANKING: 11**

Classification Component:

Level of Development: Aquifer productivity is considered low based on well yield. Demand is considered low (see below). There is a moderate level of development in relation to aquifer productivity.

Level of Vulnerability: Moderate level of vulnerability to surface contamination.

Ranking Component: Ranking Value:

|                |           |
|----------------|-----------|
| Productivity:  | 1         |
| Vulnerability: | 2         |
| Size:          | 3         |
| Demand*:       | 1         |
| Type Of Use:   | 3         |
| Quality:       |           |
| Quantity:      | 1         |
| <b>Total:</b>  | <b>11</b> |

*\* Demand has been assessed subjectively. Demand is based on domestic well density as well as general knowledge of well use and land use in the area. Demand assumes that the reported well capacity is the amount of water used, which can be misleading. The reported well capacity is often higher than actual use.*

### Statistical Summary of Well Data for Aquifer # 471

Total number of wells available for statistical analysis: 113

|                 | Depth to Bedrock<br>(m bgs) | Well Depth<br>(m bgs) | Depth to Water<br>(m bgs) | Reported Est. Well Yield<br>(L/s) | Est. Thickness of Confining Materials<br>(m) |
|-----------------|-----------------------------|-----------------------|---------------------------|-----------------------------------|--|
| Number of Wells | 110                         | 113                   | 65                        | 74                                | 76   |
| Minimum         | 0.00                        | 6.40                  | Artesian                  | 0.01                              | 0.46   |
| Maximum         | 210.46                      | 279.20                | 137.16                    | 1.89                              | 89.91  |
| Median          | 6.10                        | 85.34                 | 9.14                      | 0.13                              | 3.66   |
| Average         | 18.76                       | 97.02                 | 19.97                     | 0.29                              | 6.40   |
| Geometric Mean  | 7.38                        | 68.85                 | 11.54                     | 0.12                              | 3.85   |

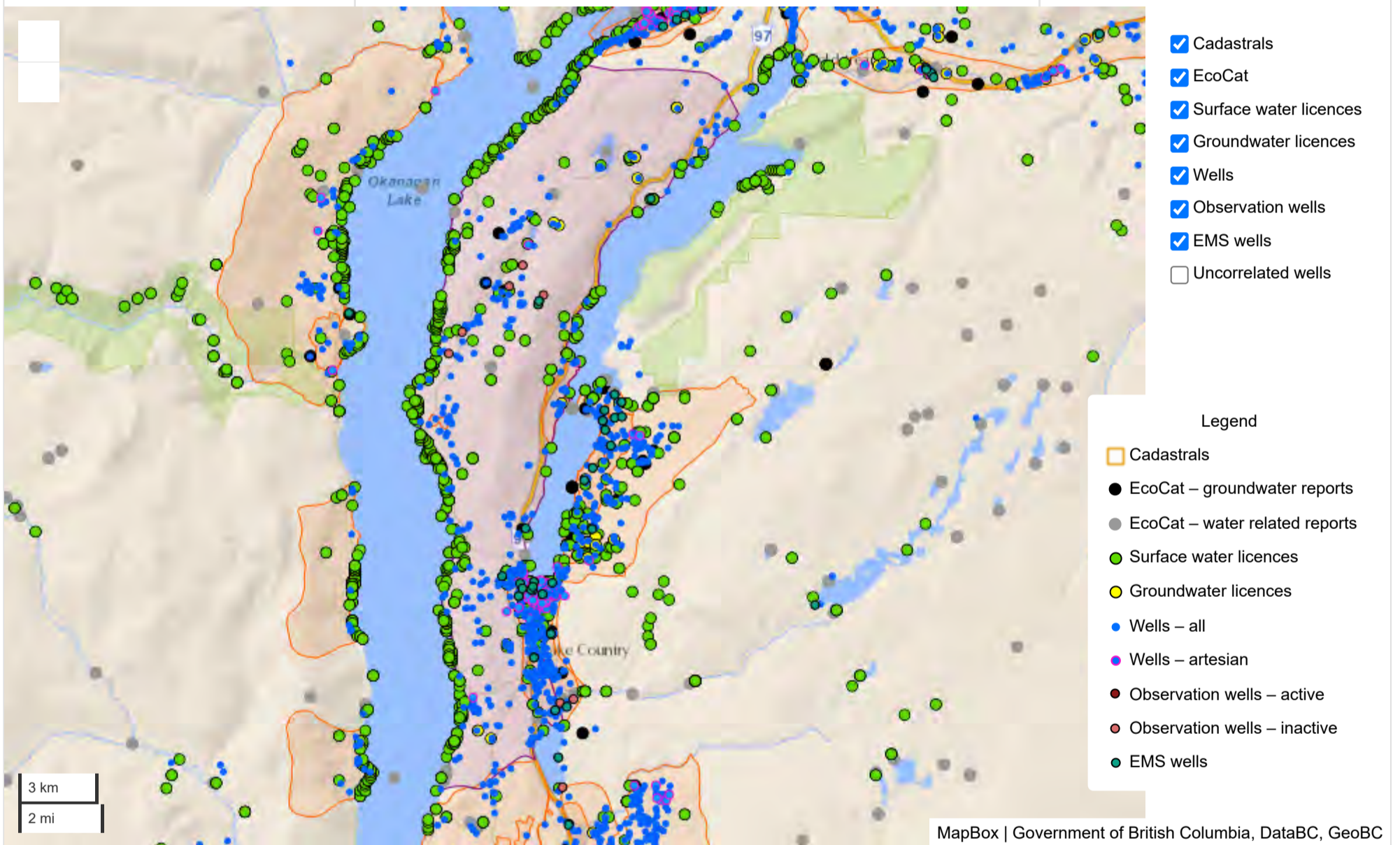


# Groundwater Wells and Aquifers

Aquifer Search / Aquifer Summary

## Aquifer 471 Summary

|                              |                      |                                 |  |
|------------------------------|----------------------|---------------------------------|--|
| <b>Aquifer number</b>        | 471                  | <b>Year of mapping</b>          | 2012   |
| <b>Aquifer name</b>          |                      | <b>Litho stratigraphic unit</b> | Intrusive rks; Mesozoic Era; Granite & Alkali feldspar granite |
| <b>Descriptive location</b>  | West of Ellison Lake | <b>Vulnerability</b>            | Moderate   |
| <b>Material type</b>         | Bedrock              | <b>Subtype</b>                  | Fractured crystalline bedrock                                  |
| <b>Quality concerns</b>      | None                 | <b>Productivity</b>             | Low  |
| <b>Size (km<sup>2</sup>)</b> | 127.6                | <b>Calculated well density</b>  | Low  |



## Well Information

|  |                             |
|--|-----------------------------|
| <b>Number of wells correlated to the aquifer</b>                 | 115                         |
| <b>Number of uncorrelated wells within mapped aquifer extent</b> | 328                         |
| <b>Artesian wells</b>  | 1 artesian wells in aquifer |

Well info last updated 10/8/2021

## Documentation

Factsheets

- AQ\_00471\_Aquifer\_Factsheet.pdf

Other Documents

- AQ\_00471\_Aquifer\_Mapping\_Report.pdf

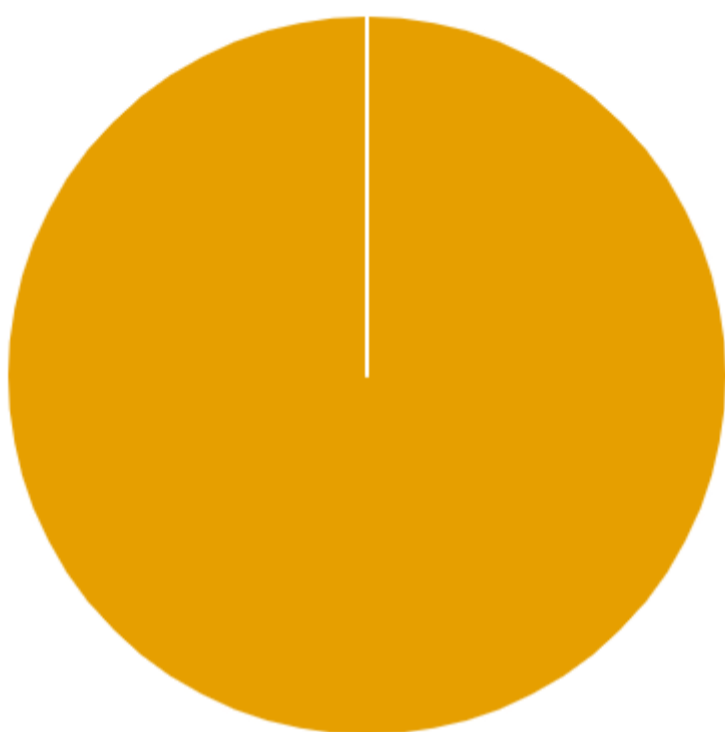
## Licensing Information

The licensing summaries should be considered estimates. Due to complexities in the structure of the licensing data, reported values should be confirmed through the [e-licensing portal \(https://j200.gov.bc.ca/pub/ams/Default.aspx?PossePresentation=AMSPublic&PosseObjectDef=o\\_ATIS\\_DocumentSearch&PosseMenuName=WS\\_Main\)](https://j200.gov.bc.ca/pub/ams/Default.aspx?PossePresentation=AMSPublic&PosseObjectDef=o_ATIS_DocumentSearch&PosseMenuName=WS_Main).

**Number of groundwater licences** 5  
**Water withdrawal volume (annual)** 7247 cubic metres

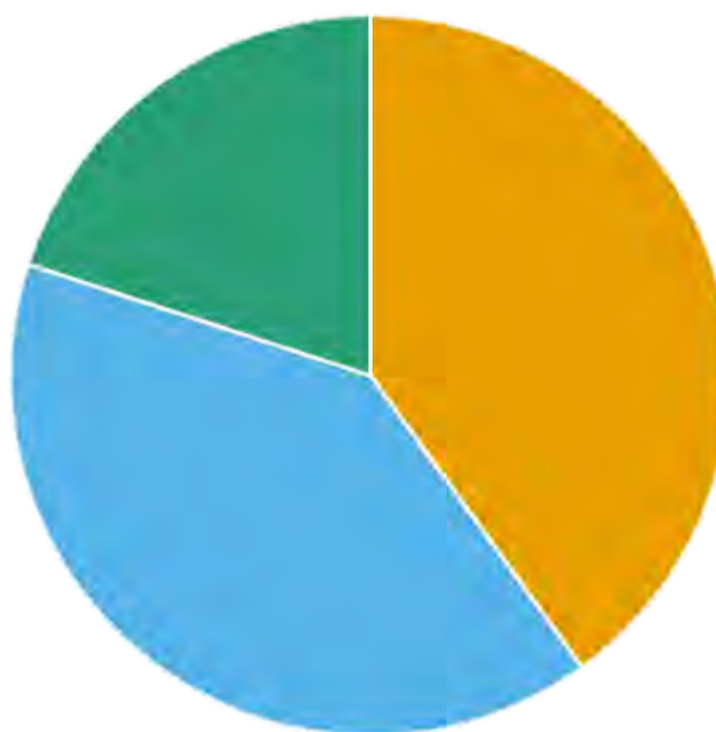
Licensed volume by purpose (millions of cubic meters)

Irrigation: Private 0.01 Livestock & Animal <0.01  
 Camps & Public Facilities <0.01



Number of licences by purpose

Irrigation: Private Livestock & Animal  
 Camps & Public Facilities



| Licence Number | Well Tag Numbers In Licence |
|----------------|-----------------------------|
| 501972         | 118183                      |
| 503171         | 120665                      |
| 501341         | 117242, 117243              |
| 501555         | 116196                      |
| 501953         | 119045                      |

Licence info last updated 10/30/2021

Licensing information is obtained from the [Water Rights Licence - Public data layer \(https://catalogue.data.gov.bc.ca/dataset/water-rights-licences-public\)](https://catalogue.data.gov.bc.ca/dataset/water-rights-licences-public).

Unique licenses are counted once for each aquifer that they are associated with.

The total licensed volume is counted once for each licence (the total volume may be shared between wells if there are multiple wells in a licence). In cases where specific volumes are licensed for multiple purposes, individual volumes are summed.

## Knowledge Indicators

**Advanced mapping** No information available.  
**Artesian advisory** No information available.

|  |  |
|--|--|
| <b>Observation wells</b>                         | Inactive<br>(data may not be available)  |
|  | <ul style="list-style-type: none"> <li>No Water Level Analysis: <a href="https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS%20WELL%20024">024 (https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS WELL 024)</a>, <a href="https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS%20WELL%20025">025 (https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS WELL 025)</a>, <a href="https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS%20WELL%20054">054 (https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS WELL 054)</a>, <a href="https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS%20WELL%20090">090 (https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS WELL 090)</a>, <a href="https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS%20WELL%20178">178 (https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=b53cb0bf3f6848e79d66ffd09b74f00d&amp;find=OBS WELL 178)</a></li> </ul> |
| <b>Numerical model</b>                           | No information available.  |
| <b>Pumping stress index</b>                      | <ul style="list-style-type: none"> <li><a href="https://services6.arcgis.com/ubm4tcTYICKBpist/arcgis/rest/services/Aquifer_180613_NA/FeatureServer/0/72/attachments/72">Stress Index Report (https://services6.arcgis.com/ubm4tcTYICKBpist/arcgis/rest/services/Aquifer_180613_NA/FeatureServer/0/72/attachments/72)</a></li> </ul>  |
| <b>Water budget</b>                              | No information available.  |
| <b>Water quality information</b>                 | 4 wells with an EMS ID   |
| <b>Hydraulically connected (screening level)</b> | Less likely  |
| <b>Groundwater Surface Water Interactions</b>    | No information available.  |
| <b>Other information</b>                         | No information available.  |



# Groundwater Wells and Aquifers

## Well Summary

**Well Tag Number:** 70266  
**Well Identification Plate Number:**  
**Owner Name:** VINCE MITTON  
**Intended Water Use:** Private Domestic  
**Artesian Condition:** No

**Well Status:** New  
**Well Class:** Water Supply  
**Well Subclass:** Not Applicable  
**Aquifer Number:** 471

**Observation Well Number:**  
**Observation Well Status:**  
**Environmental Monitoring System (EMS) ID:**  
**Alternative specs submitted:** No

## Licensing Information

**Licensed Status:** Unlicensed

**Licence Number:**

## Location Information

**Street Address:** 124 HWY 97N  
**Town/City:** OYAMA

**Legal Description:**

|   |           |
|---|-----------|
| Lot                                       |           |
| Plan                                      |           |
| District Lot                              |           |
| Block                                     |           |
| Section                                   | 36        |
| Township                                  | 14        |
| Range                                     |           |
| Land District                             | 41        |
| Property Identification Description (PID) | 013561286 |

**Description of Well Location:**



MapBox | Government of British Columbia, DataBC, GeoBC

**Geographic Coordinates - North American Datum of 1983 (NAD 83)**

**Latitude:** 50.17186      **Longitude:** -119.3637  
**UTM Easting:** 331214      **UTM Northing:** 5560414  
**Zone:** 11      **Coordinate Acquisition Code:** (100 m accuracy) Digitized from old Dept. of Lands, Forests and Water Resources maps

## Well Activity

| Activity      | Work Start Date | Work End Date | Drilling Company | Date Entered                |
|---------------|-----------------|---------------|------------------|-----------------------------|
| Legacy record | 1995-05-02      | 1995-05-04    | Capri Drilling   | August 13th 2003 at 9:17 AM |

## Well Work Dates

| Start Date of Construction | End Date of Construction | Start Date of Alteration | End Date of Alteration | Start Date of Decommission | End Date of Decommission |
|----------------------------|--------------------------|--------------------------|------------------------|----------------------------|--------------------------|
| 1995-05-02                 | 1995-05-04               |                          |                        |                            |                          |

## Well Completion Data

|  |   |  |
|--|---|--|
| <b>Total Depth Drilled:</b>            | <b>Estimated Well Yield:</b> 6 USgpm            | <b>Static Water Level (BTOC):</b> 33 feet btoc |
| <b>Finished Well Depth:</b> 200 ft bgl | <b>Well Cap:</b>                                | <b>Artesian Flow:</b>                          |
| <b>Final Casing Stick Up:</b>          | <b>Well Disinfected Status:</b> Not Disinfected | <b>Artesian Pressure (head):</b>               |
| <b>Depth to Bedrock:</b> 48 feet bgl   | <b>Drilling Method:</b> Air Rotary              | <b>Artesian Pressure (PSI):</b>                |
| <b>Ground elevation:</b>               | <b>Method of determining elevation:</b> Unknown | <b>Orientation of Well:</b> VERTICAL           |

## Lithology

| From (ft bgl) | To (ft bgl) | Raw Data                          | Description | Moisture | Colour | Hardness | Observations | Water Bearing Flow Estimate (USGPM) |
|---------------|-------------|-----------------------------------|-------------|----------|--------|----------|--------------|-------------------------------------|
| 0             | 3           | GRAVEL & DIRT                     |             |          |        |          |              |                                     |
| 3             | 12          | SAND; GRAVEL (WET)                |             | Wet      |        |          |              |                                     |
| 12            | 22          | WET STICKY CLAY; GRAVEL & COBBLES |             | Wet      |        |          |              |                                     |
| 22            | 26          | SAND GRAVEL & BOULDERS            |             |          |        |          |              |                                     |
| 26            | 32          | WET STICKY CLAY & BOULDERS        |             | Wet      |        |          |              |                                     |
| 32            | 46          | DRY GREY TILL                     |             | Dry      | grey   |          |              |                                     |
| 46            | 48          | BROKEN BEDROCK                    |             |          |        |          |              |                                     |
| 48            | 200         | BEDROCK                           |             |          |        |          |              |                                     |

## Casing Details

| From (ft bgl) | To (ft bgl) | Casing Type | Casing Material | Diameter (in) | Wall Thickness (in) | Drive Shoe |
|---------------|-------------|-------------|-----------------|---------------|---------------------|------------|
| 0             | 48          |             |                 | 6.63          |                     |            |

## Surface Seal and Backfill Details

|  |  |
|--|--|
| <b>Surface Seal Material:</b>            | <b>Backfill Material Above Surface Seal:</b> |
| <b>Surface Seal Installation Method:</b> | <b>Backfill Depth:</b>                       |
| <b>Surface Seal Thickness:</b>           |  |
| <b>Surface Seal Depth:</b>               |  |

## Liner Details

| <b>Liner Material:</b>       | <b>Liner Thickness:</b> | <b>Liner perforations</b>   |               |             |                              |  |
|------------------------------|-------------------------|---|---------------|-------------|------------------------------|--|
| <b>Liner Diameter:</b>       | <b>Liner to:</b>        | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl) | There are no records to show |  |
| From (ft bgl)                | To (ft bgl)             |   |               |             |                              |  |
| There are no records to show |                         |   |               |             |                              |  |
| <b>Liner from:</b>           |                         |   |               |             |                              |  |

## Screen Details

| <b>Intake Method:</b>        | <b>Installed Screens</b>   |               |               |               |               |           |                              |  |  |  |  |
|------------------------------|--|---------------|---------------|---------------|---------------|-----------|------------------------------|--|--|--|--|
| <b>Type:</b>                 | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> <th>Diameter (in)</th> <th>Assembly Type</th> <th>Slot Size</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl)   | Diameter (in) | Assembly Type | Slot Size | There are no records to show |  |  |  |  |
| From (ft bgl)                | To (ft bgl)  | Diameter (in) | Assembly Type | Slot Size     |               |           |                              |  |  |  |  |
| There are no records to show |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Material:</b>             |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Opening:</b>              |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Bottom:</b>               |  |               |               |               |               |           |                              |  |  |  |  |

## Well Development

|                      |                                    |
|----------------------|------------------------------------|
| <b>Developed by:</b> | <b>Development Total Duration:</b> |
|----------------------|------------------------------------|

## Well Yield

|   |  |                                     |
|---|--|-------------------------------------|
| <b>Estimation Method:</b>                           | <b>Estimation Rate:</b> 6 USgpm                  | <b>Estimation Duration:</b> 1 hours |
| <b>Static Water Level Before Test:</b> 33 ft (btoc) | <b>Drawdown:</b>                                 |                                     |
| <b>Hydrofracturing Performed:</b> No                | <b>Increase in Yield Due to Hydrofracturing:</b> |                                     |

## Well Decommission Information

|                                 |                                |
|---------------------------------|--------------------------------|
| <b>Reason for Decommission:</b> | <b>Method of Decommission:</b> |
| <b>Sealant Material:</b>        | <b>Backfill Material:</b>      |
| <b>Decommission Details:</b>    |                                |

## Comments

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DRILLER: WATER CLEAR MEASUREMENTS TAKEN AT GROUND LEVEL. SHALE TRAP SET ON LINER AT 60'.

**Alternative Specs Submitted:** Yes

## Documents

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- [WTN 70266 Well Record.pdf](#)

## Disclaimer

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The information provided should not be used as a basis for making financial or any other commitments. The Government of British Columbia accepts no liability for the accuracy, availability, suitability, reliability, usability, completeness or timeliness of the data or graphical depictions rendered from the data.

# WELL LOG



BOX 306, STN. A  
KELOWNA, B.C.  
V1Y 7N8

PHONE: (604) 769-3408  
(604) 762-1362

NO 2079

Be 'WELL' Satisfied

Name: VINCE MITTON  
Address: Hwy 97 N.  
Address: OYAMA, B.C.

DATE: Spudded MAY 2/95 Completed MAY 4/95  
Rig # TWO Other Equip. \_\_\_\_\_

WELL LOCATION: Lot \_\_\_\_\_ PL \_\_\_\_\_ DL \_\_\_\_\_

DEPTH:  
Overburden 48 ft. Tool Push \_\_\_\_\_  
Bedrock 152 ft. Driller DAVID KILBURN  
Total 200 ft. Roughneck MIKE BLANCHETTES

PROPOSED USE: Domestic  Industrial \_\_\_\_\_ Municipal \_\_\_\_\_  
Irrigation \_\_\_\_\_ Test Well \_\_\_\_\_ Other \_\_\_\_\_

TYPE OF WORK: Owner's number of well, (if more than one) \_\_\_\_\_  
New Well  Air Rotary   
Deepened \_\_\_\_\_ Rotary \_\_\_\_\_  
Reconditioned \_\_\_\_\_ Jetted \_\_\_\_\_  
Liner Installed \_\_\_\_\_ Pressure Fractured \_\_\_\_\_

**FORMATION**

**DEPTH**

| FROM         | TO  | FORMATION         |
|--------------|-----|-------------------|
| GROUND LEVEL | 3'  | gravel, dirt, wet |
| 3'           | 12' | sandy gravel, wet |
| 12'          | 22' | wet sticky clay   |
|              |     | gravel, & cobbles |
| 22'          | 26' | dry sand & gravel |
|              |     | boulders          |
| 26'          | 32' | wet sticky clay   |
|              |     | boulders          |
| 32'          | 46' | dry grey till     |
| 46'          | 48' | broken bedrock    |
| 48'          |     | bedrock           |

DIMENSIONS: Diameter of well 6 inches  
Drilled 200 ft. Depth of completed well 200 ft.

CONSTRUCTION DETAILS:  
CASING INSTALLED: \_\_\_\_\_ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Threaded \_\_\_\_\_ " Diam. from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Welded  6" B " Diam. from 0 ft. to 48 ft.

PREFORATIONS: Yes  No   
Type of perforator used 5 Kill saw  
SIZE of perforations 1/16 in. by 6 in.  
perforations from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
perforations from 140 ft. to 180 ft.

SCREENS: Yes  No   
Manufacturer \_\_\_\_\_  
Type \_\_\_\_\_ Model No. \_\_\_\_\_  
Diam. \_\_\_\_\_ Slot Size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.  
Diam. \_\_\_\_\_ Slot Size \_\_\_\_\_ from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

GRAVEL PACKED: Yes  No  Size of Gravel \_\_\_\_\_  
Gravel placed from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

SURFACE SEAL: Yes  No  Depth \_\_\_\_\_ ft.  
Material Used In Seal \_\_\_\_\_  
Method of Sealing strata off \_\_\_\_\_

PRODUCTION DATA AT TIME OF DRILLING:  
Static Level 33 ft.  
Measured from ground ft. With sounder  
Pumping level 198 ft. at 6 GPM  
Recommended Pump Setting 190 ft.  
If Flowing Well \_\_\_\_\_ GPM  
Recommended Max. Pump Output 360 GPH  
Water Clear  Coloured \_\_\_\_\_ Silty \_\_\_\_\_ Sandy \_\_\_\_\_  
Duration of test 1 Hrs.

WELL OWNER: V. Mitton Hereby Agree work has been completed in accordance with the contract and all material used has been of top quality.

CAPRI DRILLING (1985) LTD. \_\_\_\_\_

GENERAL REMARKS  
SHALE TRAP SET ON LINER AT 60

IT IS HEREBY AGREED THAT FORMATIONS, QUALITY, QUANTITY AND TYPE OF WATER, ALONG WITH ALL OTHER REMARKS, ARE TRUE ONLY TO THE BEST KNOWLEDGE OF THE PERSONNEL AND COMPANY, AND THEY CANNOT BE HELD RESPONSIBLE FOR A MISTAKE IN CALCULATION.

THE COMPANY WILL NOT BE HELD RESPONSIBLE FOR PUBLIC LIABILITY OR PROPERTY DAMAGE CAUSED BY FLOWING WELL WASH OUTS OR ANY OTHER MISHAPS.

ALL MATERIALS SHALL REMAIN PROPERTY OF CAPRI DRILLING UNTIL ACCOUNT IS PAID IN FULL.



Bens Master Backing

**BK A**

N1/2

G.N.R. R/W

KADANACKA LAKE

**36**

N1/2 OF SW1/4

H820

**082L.014.3.1.4**

**1.3**

SW1/4 OF SW1/4

HIGHWAY 97

NE1/4

SEC 30763  
PLAN  
A NATIONAL RAILWAY

BCGS

MAP

082L.014.3.1.4

WTN 70266

WELL NO. 001

WATER WELL RECORD PID: 013-561-286

MINISTRY OF ENVIRONMENT WATER MANAGEMENT DIVISION

VICTORIA, BRITISH COLUMBIA

LEGAL DESCRIPTION: LOT PART SE 1/4 SEC. 36 TP. 14 R. D.L. LAND DISTRICT ODYD PLAN EX PL 1382

DESCRIPTIVE LOCATION 124 HWY 97N, OYAMA LICENCE NO. DATE

OWNER'S NAME VINCE MITTON ADDRESS 124 HWY 97 OYAMA

DRILLER'S NAME CAPRI ADDRESS DATE COMPLETED 95/05/04

DEPTH 200' OF ESTIMATED SURVEYED CASING DIAM. LENGTH

METHOD OF CONSTRUCTION CASING DIAM. LENGTH

SCREEN LOCATION SCREEN SIZE LENGTH TYPE

SANITARY SEAL YES NO SCREEN SIZE LENGTH TYPE

PERFORATED CASING LENGTH PERFORATIONS FROM TO

GRAVEL PACK LENGTH DIAM. SIZE GRAVEL, ETC.

DISTANCE TO WATER 33' ESTIMATED WATER LEVEL

FROM MEASURED ELEVATION ARTESIAN PRESSURE

DATE OF WATER LEVEL MEASUREMENT WATER USE

Grid for Z, X, Y, NO. and NAT. TOPO. SHEET NO.

PRODUCTION TEST SUMMARY

Production Test Summary fields: DATE, TEST BY, BAIL TEST, PUMP TEST, DURATION OF TEST, RATE, DRAWDOWN, WATER LEVEL AT COMPLETION OF TEST, AVAILABLE DRAWDOWN, SPECIFIC CAPACITY, PERMEABILITY, STORAGE COEFF., TRANSMISSIVITY, ESTIMATED WELL YIELD 6 GPM, RECOMMENDED PUMPING RATE, RECOMMENDED PUMP SETTING

CHEMISTRY

Chemistry test fields: TEST BY, DATE, TOTAL DISSOLVED SOLIDS, TEMPERATURE, pH, SILICA (SiO2), CONDUCTANCE AT 25°C, TOTAL IRON (Fe), TOTAL HARDNESS (CaCO3), TOTAL ALKALINITY (CaCO3), PHEN. ALKALINITY (CaCO3), MANGANESE (Mn), COLOUR, ODOUR, TURBIDITY

Table for ANIONS (mg/l, e pm) and CATIONS (mg/l, e pm) including CARBONATE, BICARBONATE, SULPHATE, CHLORIDE, NO2+NO3, TKN, PHOSPHORUS, CALCIUM, MAGNESIUM, SODIUM, POTASSIUM, IRON(DISSOLVED)

CHEMISTRY FIELD TESTS: TEST BY, DATE, EQUIPMENT USED

CONTENTS OF FOLDER: DRILL LOG, PUMP TEST DATA, CHEMICAL ANALYSIS, SIEVE ANALYSIS, GEOPHYSICAL LOGS, REPORT, OTHER, SOURCES OF INFORMATION

LITHOLOGY

Lithology table with columns FROM, TO, DESCRIPTION

**REMARKS**

FEB '05

CANADA 411

-no relevant findings for "Mitton"

-reverse address search no relevant results

Legal confirmed through BC Assessment

Authority 05/02/04

WEST

NORTH

EAST

SOUTH

CARD BY \_\_\_\_\_ DATE \_\_\_\_\_  
ADDITIONAL DATA ADDED BY \_\_\_\_\_



Ministry of Environment

- Well Construction Report
- Well Closure Report
- Well Alteration Report

Stamp company name/address/ phone/fax/e-mail here, if desired.

Ministry Well ID Plate Number: 27106  
 Ministry Well Tag Number: 2193  
 Confirmation/alternative specs. attached  
 Original well construction report attached

Red lettering indicates minimum mandatory information.

See reverse for notes & definitions of abbreviations.

Owner name: Rae & Michael Thompson  
 Mailing address: 11930 OK Centre Rd W. Town Unionfield Prov. BC Postal Code V4V2H5

Well Location: Address: Street no. \_\_\_\_\_ Street name \_\_\_\_\_ Town \_\_\_\_\_  
 or Legal description: Lot \_\_\_\_\_ Plan B1187 D.L. \_\_\_\_\_ Block \_\_\_\_\_ Sec. 28 Twp. 14 Rg. \_\_\_\_\_ Land District ODY

or PID: 013559745 (and) Description of well location (attach sketch, if nec.):  
Except Plan KAP 45734.

NAD 83: Zone: 8311 UTM Easting: 4326560 E m Latitude (see note 3): \_\_\_\_\_  
 (see note 2) UTM Northing: 5558397 N m Longitude: \_\_\_\_\_

Method of drilling:  air rotary  cable tool  mud rotary  auger  driving  jetting  excavating  other (specify): \_\_\_\_\_

Orientation of well:  vertical  horizontal Ground elevation: \_\_\_\_\_ ft (asl) Method (see note 4): \_\_\_\_\_

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

Water supply wells: indicate intended water use:  private domestic  water supply system  irrigation  commercial or industrial  other (specify): \_\_\_\_\_

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

| From ft (bgl) | To ft (bgl) | Relative Hardness | Colour | Material Description (Use recommended terms on reverse. List in order of decreasing amount, if applicable) | Water-bearing Estimated Flow (USgpm) | Observations (e.g., fractured, weathered, well sorted, silty wash), closure details |
|---------------|-------------|-------------------|--------|--|--------------------------------------|---|
| 0             | 15          | soft              | Brown  | Silt (organics)  | —                                    |   |
| 15            | 30          | soft              | Brown  | Silt with clay   | Damp                                 |   |
| 30            | 35          | med               | Brown  | Silt, Gravel & sand  | wet                                  |   |
| 35            | 36          | soft              | orange | sand   | 1/3                                  | well sorted wash  |
| 36            | 48          | med               | Brown  | gravel silt  | wet                                  | poor sort.  |
| 48            | 60          | med               | Grey   | Bedrock with rust  |                                      | fractured   |
| 60            | 138         | med               | red    | Bedrock (120' water)   | 1/4                                  |   |
| 138           | 180         | med               | grey   | Bedrock  |                                      |   |
| 180           | 300         | med               | red    | Bedrock (200' water)   | 3/4                                  |   |
|               |             |                   |        | (201 water)  | 3 1/2                                | fractured   |
|               |             |                   |        | (260 water)  | 4                                    |   |

Casing details

| From ft (bgl) | To ft (bgl) | Dia in | Casing Material / Open Hole | Wall Thickness in | Drive Shoe |
|---------------|-------------|--------|-----------------------------|-------------------|------------|
| 0             | 48          | 6      | STEEL                       | 188               | ✓          |

Screen details

| From ft (bgl) | To ft (bgl) | Dia in | Type (see note 18) | Slot Size |
|---------------|-------------|--------|--------------------|-----------|
| /             |             |        |                    |           |

Surface seal: Type: Bentonite Depth: 18 ft  
 Method of installation:  Poured  Pumped Thickness: \_\_\_\_\_ in  
 Backfill: Type: \_\_\_\_\_ Depth: \_\_\_\_\_ ft  
 Liner:  PVC  Other (specify): \_\_\_\_\_  
 Diameter: \_\_\_\_\_ in Thickness: \_\_\_\_\_ in  
 From: \_\_\_\_\_ ft (bgl) To: \_\_\_\_\_ ft (bgl) Perforated: From: \_\_\_\_\_ ft (bgl) To: \_\_\_\_\_ ft (bgl)

Intake:  Screen  Open bottom  Uncased hole  
 Screen type:  Telescope  Pipe size  
 Screen material:  Stainless steel  Plastic  Other (specify): \_\_\_\_\_  
 Screen opening:  Continuous slot  Slotted  Perforated pipe  
 Screen bottom:  Bail  Plug  Plate  Other (specify): \_\_\_\_\_  
 Filter pack: From: \_\_\_\_\_ ft To: \_\_\_\_\_ ft Thickness: \_\_\_\_\_ in  
 Type and size of material: \_\_\_\_\_

Developed by:

Air lifting  Surging  Jetting  Pumping  Bailing  
 Other (specify): \_\_\_\_\_ Total duration: \_\_\_\_\_ hrs  
 Notes: \_\_\_\_\_

Well yield estimated by:

Pumping  Air lifting  Bailing  Other (specify): \_\_\_\_\_  
 Rate: 4 USgpm Duration: 2 hrs  
 SWL before test: 24 ft (btoc) Pumping water level: \_\_\_\_\_ ft (btoc)

Obvious water quality characteristics:

Fresh  Salty  Clear  Cloudy  Sediment  Gas  
 Colour/odour: none Water sample collected:

Well driller (print clearly):

Name (first, last) (see note 19): Walter Howe  
 Registration no. (see note 20): WD 05081001  
 Consultant (if applicable; name and company): \_\_\_\_\_

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

Signature of Driller Responsible: Jim Howe

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

Final well completion data:

Total depth drilled: 300 ft Finished well depth: 300 ft (bgl)  
 Final stick up: 24 in Depth to bedrock: 48 ft (bgl)  
 SWL: 24 ft (btoc) Estimated well yield: 4 USgpm  
 Artesian flow: \_\_\_\_\_ USgpm, or Artesian pressure: \_\_\_\_\_ ft

Type of well cap: Soni Well disinfected:  Yes  No  
 Where well ID plate is attached: on casing

Well closure information:

Reason for closure: \_\_\_\_\_  
 Method of closure:  Poured  Pumped  
 Sealant material: \_\_\_\_\_ Backfill material: \_\_\_\_\_  
 Details of closure (see note 17): \_\_\_\_\_

Date of work (YYYY/MM/DD):

Started: 2008 08 28 Completed: 2008 08 29  
 Comments: Hole was very stable.

0802.013.421



# Groundwater Wells and Aquifers

## Well Summary

**Well Tag Number:** 117242  
**Well Identification Plate Number:** 35147  
**Owner Name:** Lone Pine Ranch (2018) LTD.  
**Intended Water Use:** Commercial and Industrial  
**Artesian Condition:** No

**Well Status:** New  
**Well Class:** Water Supply  
**Well Subclass:** Not Applicable  
**Aquifer Number:** 471

**Observation Well Number:**  
**Observation Well Status:**  
**Environmental Monitoring System (EMS) ID:**  
**Alternative specs submitted:** No

## Licensing Information

**Licensed Status:** Licensed      **Licence Number:** 501341

## Location Information

**Street Address:**  
**Town/City:**

**Legal Description:**

|   |           |
|---|-----------|
| Lot                                       |           |
| Plan                                      |           |
| District Lot                              |           |
| Block                                     |           |
| Section                                   |           |
| Township                                  |           |
| Range                                     |           |
| Land District                             |           |
| Property Identification Description (PID) | 013560689 |

**Description of Well Location:** No description provided



**Geographic Coordinates - North American Datum of 1983 (NAD 83)**  
**Latitude:** 50.17162      **Longitude:** -119.39046  
**UTM Easting:** 329302      **UTM Northing:** 5560448  
**Zone:** 11      **Coordinate Acquisition Code:** (10 m accuracy) Handheld GPS with accuracy of +/- 10 metres

## Well Activity

| Activity      | Work Start Date | Work End Date | Drilling Company   | Date Entered              |
|---------------|-----------------|---------------|--------------------|---------------------------|
| Legacy record | 2013-04-16      | 2013-05-06    | Integrity Drilling | April 3rd 2019 at 8:37 AM |

## Well Work Dates

| Start Date of Construction | End Date of Construction | Start Date of Alteration | End Date of Alteration | Start Date of Decommission | End Date of Decommission |
|----------------------------|--------------------------|--------------------------|------------------------|----------------------------|--------------------------|
| 2013-04-16                 | 2013-05-06               |                          |                        |                            |                          |

## Well Completion Data

|                                    |   |                                      |
|------------------------------------|---|--------------------------------------|
| <b>Total Depth Drilled:</b>        | <b>Estimated Well Yield:</b>                    | <b>Static Water Level (BTOC):</b>    |
| <b>Finished Well Depth:</b>        | <b>Well Cap:</b> Not provided                   | <b>Artesian Flow:</b>                |
| <b>Final Casing Stick Up:</b>      | <b>Well Disinfected Status:</b> Not Disinfected | <b>Artesian Pressure (head):</b>     |
| <b>Depth to Bedrock:</b>           | <b>Drilling Method:</b>                         | <b>Artesian Pressure (PSI):</b>      |
| <b>Ground elevation:</b> 2562 feet | <b>Method of determining elevation:</b> Unknown | <b>Orientation of Well:</b> VERTICAL |

## Lithology

| From (ft bgl)                | To (ft bgl) | Raw Data | Description | Moisture | Colour | Hardness | Observations | Water Bearing Flow Estimate (USGPM) |
|------------------------------|-------------|----------|-------------|----------|--------|----------|--------------|-------------------------------------|
| There are no records to show |             |          |             |          |        |          |              |                                     |

## Casing Details

| From (ft bgl)                | To (ft bgl) | Casing Type | Casing Material | Diameter (in) | Wall Thickness (in) | Drive Shoe |
|------------------------------|-------------|-------------|-----------------|---------------|---------------------|------------|
| There are no records to show |             |             |                 |               |                     |            |

## Surface Seal and Backfill Details

|  |  |
|--|--|
| <b>Surface Seal Material:</b>            | <b>Backfill Material Above Surface Seal:</b> |
| <b>Surface Seal Installation Method:</b> | <b>Backfill Depth:</b>                       |
| <b>Surface Seal Thickness:</b>           |  |
| <b>Surface Seal Depth:</b>               |  |

## Liner Details

| <b>Liner Material:</b>       |                         | <b>Liner perforations</b>   |               |             |                              |  |
|------------------------------|-------------------------|---|---------------|-------------|------------------------------|--|
| <b>Liner Diameter:</b>       | <b>Liner Thickness:</b> | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl) | There are no records to show |  |
| From (ft bgl)                | To (ft bgl)             |   |               |             |                              |  |
| There are no records to show |                         |   |               |             |                              |  |
| <b>Liner from:</b>           | <b>Liner to:</b>        |   |               |             |                              |  |

## Screen Details

| <b>Intake Method:</b>        | <b>Installed Screens</b>   |               |               |               |               |           |                              |  |  |  |  |
|------------------------------|--|---------------|---------------|---------------|---------------|-----------|------------------------------|--|--|--|--|
| <b>Type:</b>                 | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> <th>Diameter (in)</th> <th>Assembly Type</th> <th>Slot Size</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl)   | Diameter (in) | Assembly Type | Slot Size | There are no records to show |  |  |  |  |
| From (ft bgl)                | To (ft bgl)  | Diameter (in) | Assembly Type | Slot Size     |               |           |                              |  |  |  |  |
| There are no records to show |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Material:</b>             |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Opening:</b>              |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Bottom:</b>               |  |               |               |               |               |           |                              |  |  |  |  |

## Well Development

|                      |                                    |
|----------------------|------------------------------------|
| <b>Developed by:</b> | <b>Development Total Duration:</b> |
|----------------------|------------------------------------|

## Well Yield

|  |  |                             |
|--|--|-----------------------------|
| <b>Estimation Method:</b>              | <b>Estimation Rate:</b>                          | <b>Estimation Duration:</b> |
| <b>Static Water Level Before Test:</b> | <b>Drawdown:</b>                                 |                             |
| <b>Hydrofracturing Performed:</b> No   | <b>Increase in Yield Due to Hydrofracturing:</b> |                             |

## Well Decommission Information

|                                 |                                |
|---------------------------------|--------------------------------|
| <b>Reason for Decommission:</b> | <b>Method of Decommission:</b> |
| <b>Sealant Material:</b>        | <b>Backfill Material:</b>      |
| <b>Decommission Details:</b>    |                                |

## Comments

Well x-ref'd and associated w/ GW licence app#100262449. Drilling = Pressure fracking. WELL USE=BACK UP WELL FOR CATTLE WATER, PRIMARILY USED FOR DOMESTIC PURPOSE.

**Alternative Specs Submitted:** Yes

## Documents

No additional documentation available for this well.

## Disclaimer

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# Groundwater Wells and Aquifers

## Well Summary

**Well Tag Number:** 117243  
**Well Identification Plate Number:** 35148  
**Owner Name:** Lone Pine Ranch (2018) LTD.  
**Intended Water Use:** Commercial and Industrial  
**Artesian Condition:** No

**Well Status:** New  
**Well Class:** Water Supply  
**Well Subclass:** Not Applicable  
**Aquifer Number:** 471

**Observation Well Number:**  
**Observation Well Status:**  
**Environmental Monitoring System (EMS) ID:**  
**Alternative specs submitted:** No

## Licensing Information

**Licensed Status:** Licensed      **Licence Number:** 501341

## Location Information

**Street Address:**  
**Town/City:**

**Legal Description:**

|   |           |
|---|-----------|
| Lot                                       |           |
| Plan                                      |           |
| District Lot                              |           |
| Block                                     |           |
| Section                                   |           |
| Township                                  |           |
| Range                                     |           |
| Land District                             |           |
| Property Identification Description (PID) | 013560689 |

**Description of Well Location:** No description provided



**Geographic Coordinates - North American Datum of 1983 (NAD 83)**

**Latitude:** 50.17213      **Longitude:** -119.39309  
**UTM Easting:** 329116      **UTM Northing:** 5560511  
**Zone:** 11      **Coordinate Acquisition Code:** (10 m accuracy) Handheld GPS with accuracy of +/- 10 metres

## Well Activity

| Activity      | Work Start Date | Work End Date | Drilling Company   | Date Entered              |
|---------------|-----------------|---------------|--------------------|---------------------------|
| Legacy record | 2013-05-22      | 2013-05-25    | Integrity Drilling | April 3rd 2019 at 9:04 AM |

## Well Work Dates

| Start Date of Construction | End Date of Construction | Start Date of Alteration | End Date of Alteration | Start Date of Decommission | End Date of Decommission |
|----------------------------|--------------------------|--------------------------|------------------------|----------------------------|--------------------------|
| 2013-05-22                 | 2013-05-25               |                          |                        |                            |                          |

## Well Completion Data

|  |   |  |
|--|---|--|
| <b>Total Depth Drilled:</b>            | <b>Estimated Well Yield:</b>                    | <b>Static Water Level (BTOC):</b> 14 feet btoc |
| <b>Finished Well Depth:</b> 540 ft bgl | <b>Well Cap:</b> Not provided                   | <b>Artesian Flow:</b>                          |
| <b>Final Casing Stick Up:</b>          | <b>Well Disinfected Status:</b> Not Disinfected | <b>Artesian Pressure (head):</b>               |
| <b>Depth to Bedrock:</b>               | <b>Drilling Method:</b>                         | <b>Artesian Pressure (PSI):</b>                |
| <b>Ground elevation:</b>               | <b>Method of determining elevation:</b> Unknown | <b>Orientation of Well:</b> VERTICAL           |

## Lithology

| From (ft bgl)                | To (ft bgl) | Raw Data | Description | Moisture | Colour | Hardness | Observations | Water Bearing Flow Estimate (USGPM) |
|------------------------------|-------------|----------|-------------|----------|--------|----------|--------------|-------------------------------------|
| There are no records to show |             |          |             |          |        |          |              |                                     |

## Casing Details

| From (ft bgl)                | To (ft bgl) | Casing Type | Casing Material | Diameter (in) | Wall Thickness (in) | Drive Shoe |
|------------------------------|-------------|-------------|-----------------|---------------|---------------------|------------|
| There are no records to show |             |             |                 |               |                     |            |

## Surface Seal and Backfill Details

|  |  |
|--|--|
| <b>Surface Seal Material:</b>            | <b>Backfill Material Above Surface Seal:</b> |
| <b>Surface Seal Installation Method:</b> | <b>Backfill Depth:</b>                       |
| <b>Surface Seal Thickness:</b>           |  |
| <b>Surface Seal Depth:</b>               |  |

## Liner Details

| <b>Liner Material:</b>       | <b>Liner Thickness:</b> | <b>Liner perforations</b>   |               |             |                              |  |
|------------------------------|-------------------------|---|---------------|-------------|------------------------------|--|
| <b>Liner Diameter:</b>       | <b>Liner to:</b>        | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl) | There are no records to show |  |
| From (ft bgl)                | To (ft bgl)             |   |               |             |                              |  |
| There are no records to show |                         |   |               |             |                              |  |
| <b>Liner from:</b>           |                         |   |               |             |                              |  |

## Screen Details

| <b>Intake Method:</b>        | <b>Installed Screens</b>   |               |               |               |               |           |                              |  |  |  |  |
|------------------------------|--|---------------|---------------|---------------|---------------|-----------|------------------------------|--|--|--|--|
| <b>Type:</b>                 | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> <th>Diameter (in)</th> <th>Assembly Type</th> <th>Slot Size</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl)   | Diameter (in) | Assembly Type | Slot Size | There are no records to show |  |  |  |  |
| From (ft bgl)                | To (ft bgl)  | Diameter (in) | Assembly Type | Slot Size     |               |           |                              |  |  |  |  |
| There are no records to show |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Material:</b>             |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Opening:</b>              |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Bottom:</b>               |  |               |               |               |               |           |                              |  |  |  |  |

## Well Development

|                      |                                    |
|----------------------|------------------------------------|
| <b>Developed by:</b> | <b>Development Total Duration:</b> |
|----------------------|------------------------------------|

## Well Yield

|  |  |                             |
|--|--|-----------------------------|
| <b>Estimation Method:</b>              | <b>Estimation Rate:</b>                          | <b>Estimation Duration:</b> |
| <b>Static Water Level Before Test:</b> | <b>Drawdown:</b>                                 |                             |
| <b>Hydrofracturing Performed:</b> No   | <b>Increase in Yield Due to Hydrofracturing:</b> |                             |

## Well Decommission Information

|                                 |                                |
|---------------------------------|--------------------------------|
| <b>Reason for Decommission:</b> | <b>Method of Decommission:</b> |
| <b>Sealant Material:</b>        | <b>Backfill Material:</b>      |
| <b>Decommission Details:</b>    |                                |

## Comments

Construction date estimated by owner and from drilling invoice. Drilling method = unknown. Well x-ref'd and associated w/ GW licence app #100262449; WELL 2, BARN WELL; WELL USE=LIVESTOCK & ANIMAL

**Alternative Specs Submitted:** Yes

## Documents

No additional documentation available for this well.

## Disclaimer

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# Groundwater Wells and Aquifers

## Well Summary

Well Tag Number: 19772  
 Well Identification Plate Number: 704  
 Owner Name: H L GIBBONS

Well Status: New  
 Well Class: Monitoring  
 Well Subclass: Permanent

Observation Well Number: 053  
 Observation Well Status: Inactive  
 Environmental Monitoring System (EMS) ID: 1401040

Intended Water Use: Not Applicable  
 Artesian Condition: No

Aquifer Number:

Alternative specs submitted: No

## Licensing Information

Licensed Status: Unlicensed

Licence Number:

## Location Information

Street Address:  
 Town/City: KELOWNA

Legal Description:

|   |    |
|---|----|
| Lot                                       |    |
| Plan                                      |    |
| District Lot                              |    |
| Block                                     |    |
| Section                                   | 22 |
| Township                                  | 14 |
| Range                                     |    |
| Land District                             | 41 |
| Property Identification Description (PID) |    |



Description of Well Location:

Geographic Coordinates - North American Datum of 1983 (NAD 83)

Latitude: 50.14622

Longitude: -119.40034

UTM Easting: 328506

UTM Northing: 5557647

Zone: 11

Coordinate Acquisition Code: (50 m accuracy) Digitized from 1:20,000 mapping

## Well Activity

| Activity      | Work Start Date | Work End Date | Drilling Company              | Date Entered                |
|---------------|-----------------|---------------|-------------------------------|-----------------------------|
| Legacy record | 1966-01-01      | 1966-01-01    | Okanagan Rotary Well Drilling | August 13th 2003 at 3:08 AM |

## Well Work Dates

| Start Date of Construction | End Date of Construction | Start Date of Alteration | End Date of Alteration | Start Date of Decommission | End Date of Decommission |
|----------------------------|--------------------------|--------------------------|------------------------|----------------------------|--------------------------|
| 1966-01-01                 | 1966-01-01               |                          |                        |                            |                          |

## Well Completion Data

|                                       |   |   |
|---------------------------------------|---|---|
| <b>Total Depth Drilled:</b>           | <b>Estimated Well Yield:</b> 0 USgpm            | <b>Static Water Level (BTOC):</b> 8 feet btoc |
| <b>Finished Well Depth:</b> 50 ft bgl | <b>Well Cap:</b>                                | <b>Artesian Flow:</b>                         |
| <b>Final Casing Stick Up:</b>         | <b>Well Disinfected Status:</b> Not Disinfected | <b>Artesian Pressure (head):</b>              |
| <b>Depth to Bedrock:</b>              | <b>Drilling Method:</b> Other                   | <b>Artesian Pressure (PSI):</b>               |
| <b>Ground elevation:</b>              | <b>Method of determining elevation:</b> Unknown | <b>Orientation of Well:</b> VERTICAL          |

## Lithology

| From (ft bgl)                | To (ft bgl) | Raw Data | Description | Moisture | Colour | Hardness | Observations | Water Bearing Flow Estimate (USGPM) |
|------------------------------|-------------|----------|-------------|----------|--------|----------|--------------|-------------------------------------|
| There are no records to show |             |          |             |          |        |          |              |                                     |

## Casing Details

| From (ft bgl)                | To (ft bgl) | Casing Type | Casing Material | Diameter (in) | Wall Thickness (in) | Drive Shoe |
|------------------------------|-------------|-------------|-----------------|---------------|---------------------|------------|
| There are no records to show |             |             |                 |               |                     |            |

## Surface Seal and Backfill Details

|  |  |
|--|--|
| <b>Surface Seal Material:</b>            | <b>Backfill Material Above Surface Seal:</b> |
| <b>Surface Seal Installation Method:</b> | <b>Backfill Depth:</b>                       |
| <b>Surface Seal Thickness:</b>           |  |
| <b>Surface Seal Depth:</b>               |  |

## Liner Details

| <b>Liner Material:</b>       |                         | <b>Liner perforations</b>   |               |             |                              |  |
|------------------------------|-------------------------|---|---------------|-------------|------------------------------|--|
| <b>Liner Diameter:</b>       | <b>Liner Thickness:</b> | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl) | There are no records to show |  |
| From (ft bgl)                | To (ft bgl)             |   |               |             |                              |  |
| There are no records to show |                         |   |               |             |                              |  |
| <b>Liner from:</b>           | <b>Liner to:</b>        |   |               |             |                              |  |

## Screen Details

| <b>Intake Method:</b>        | <b>Installed Screens</b>   |               |               |               |               |           |                              |  |  |  |  |
|------------------------------|--|---------------|---------------|---------------|---------------|-----------|------------------------------|--|--|--|--|
| <b>Type:</b>                 | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> <th>Diameter (in)</th> <th>Assembly Type</th> <th>Slot Size</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl)   | Diameter (in) | Assembly Type | Slot Size | There are no records to show |  |  |  |  |
| From (ft bgl)                | To (ft bgl)  | Diameter (in) | Assembly Type | Slot Size     |               |           |                              |  |  |  |  |
| There are no records to show |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Material:</b>             |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Opening:</b>              |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Bottom:</b>               |  |               |               |               |               |           |                              |  |  |  |  |

## Well Development

|                      |                                    |
|----------------------|------------------------------------|
| <b>Developed by:</b> | <b>Development Total Duration:</b> |
|----------------------|------------------------------------|

## Well Yield

|  |  |                             |
|--|--|-----------------------------|
| <b>Estimation Method:</b>              | <b>Estimation Rate:</b>                          | <b>Estimation Duration:</b> |
| <b>Static Water Level Before Test:</b> | <b>Drawdown:</b>                                 |                             |
| <b>Hydrofracturing Performed:</b> No   | <b>Increase in Yield Due to Hydrofracturing:</b> |                             |

## Well Decommission Information

|                                 |                                |
|---------------------------------|--------------------------------|
| <b>Reason for Decommission:</b> | <b>Method of Decommission:</b> |
| <b>Sealant Material:</b>        | <b>Backfill Material:</b>      |
| <b>Decommission Details:</b>    |                                |

## Comments

OLD OBS WELL # WR-46-66 ACTIVE. NO LOG. NO LITHOLOGIC INFORMATION AVAILABLE. METHOD OF DRILLING = DRILLED

**Alternative Specs Submitted:** Yes

## Documents

- [WTN 19772 Well Record.pdf](#)

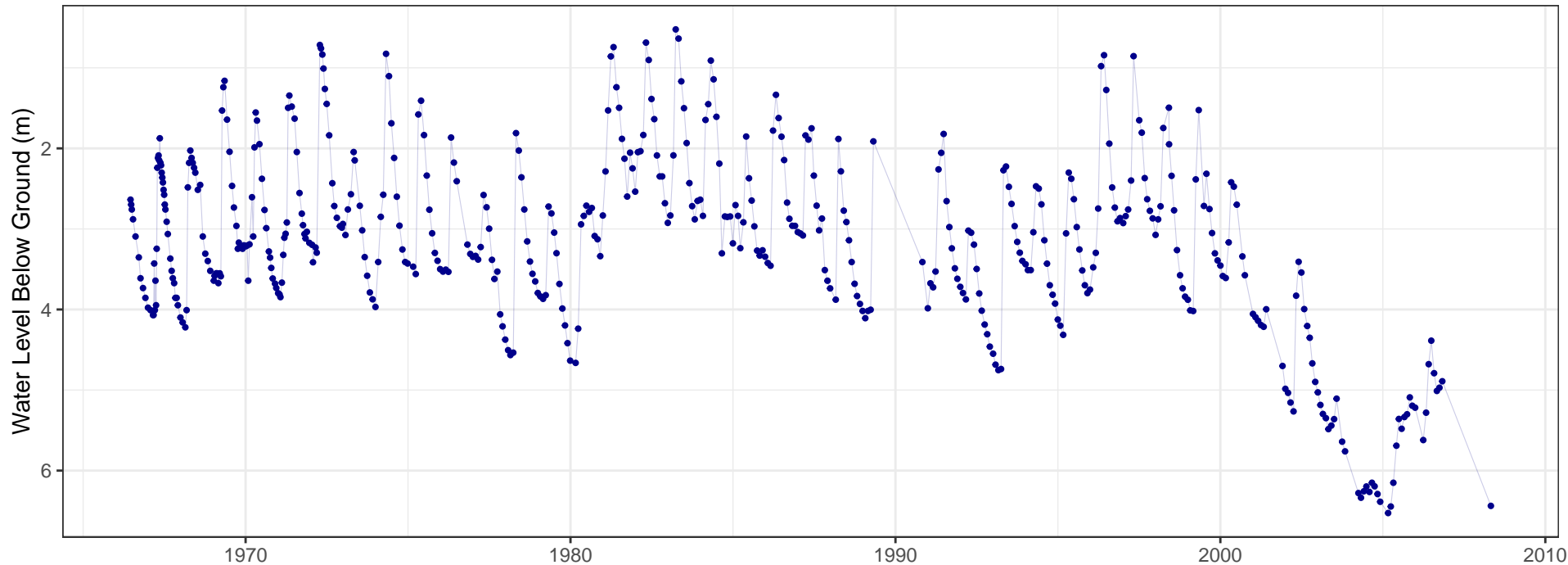
## Disclaimer

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# OBS WELL 053

## Water Level Snapshot



*Note: True data are marked with a dot, the thin line connecting points is a visual aid only and does not represent true observations.  
The full data set can be downloaded via the [BC Data Catalogue](#) or the [BC Real-time Water Data tool](#).*



# Groundwater Wells and Aquifers

## Well Summary

|  |                                   |  |
|--|-----------------------------------|--|
| <b>Well Tag Number:</b> 22692                  | <b>Well Status:</b> New           | <b>Observation Well Number:</b> <u>054</u>               |
| <b>Well Identification Plate Number:</b> 705   | <b>Well Class:</b> Monitoring     | <b>Observation Well Status:</b> Inactive                 |
| <b>Owner Name:</b> MoE Ministry of Environment | <b>Well Subclass:</b> Permanent   | <b>Environmental Monitoring System (EMS) ID:</b> 1401041 |
| <b>Intended Water Use:</b> Not Applicable      | <b>Aquifer Number:</b> <u>471</u> | <b>Alternative specs submitted:</b> No                   |
| <b>Artesian Condition:</b> No                  |                                   |  |

## Licensing Information

|                                    |                        |
|------------------------------------|------------------------|
| <b>Licensed Status:</b> Unlicensed | <b>Licence Number:</b> |
|------------------------------------|------------------------|

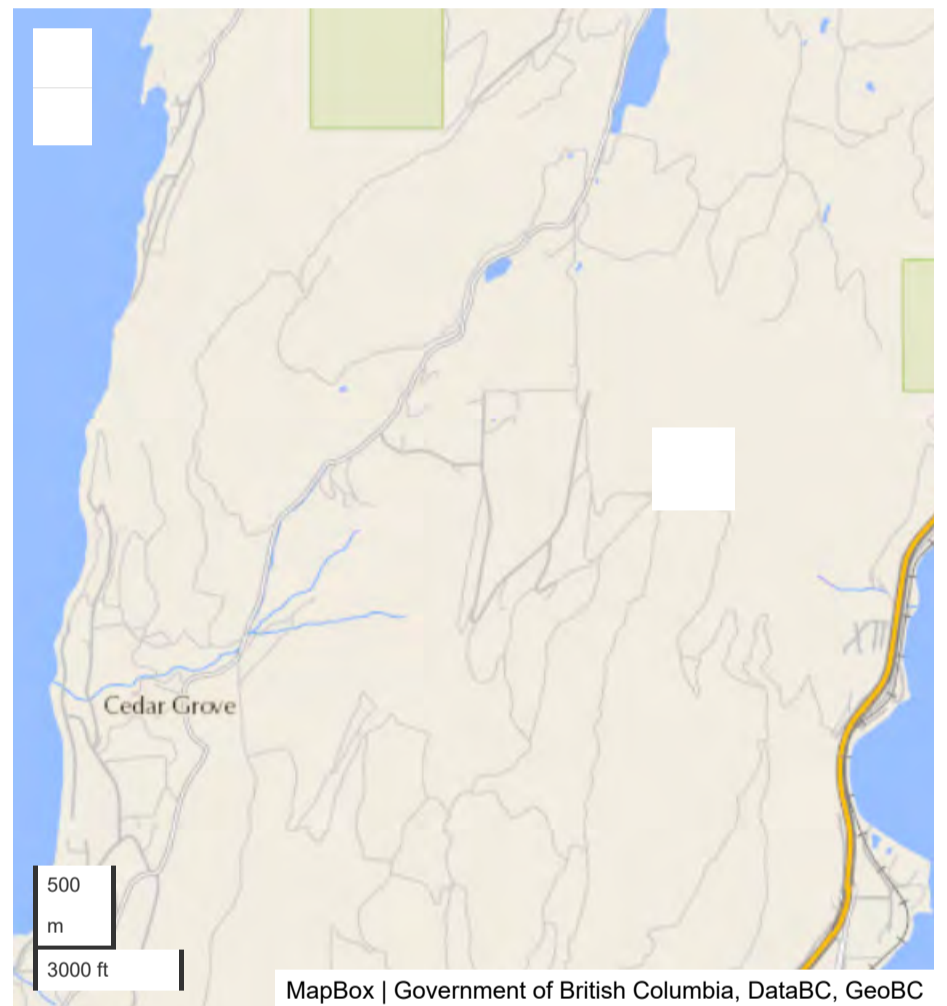
## Location Information

**Street Address:**  
**Town/City:** VICTORIA

**Legal Description:**

|   |    |
|---|----|
| Lot                                       |    |
| Plan                                      |    |
| District Lot                              |    |
| Block                                     |    |
| Section                                   | 22 |
| Township                                  | 14 |
| Range                                     |    |
| Land District                             | 41 |
| Property Identification Description (PID) |    |

**Description of Well Location:**



**Geographic Coordinates - North American Datum of 1983 (NAD 83)**

**Latitude:** 50.14502      **Longitude:** -119.40084  
**UTM Easting:** 328466      **UTM Northing:** 5557515  
**Zone:** 11      **Coordinate Acquisition Code:** (50 m accuracy) Digitized from 1:20,000 mapping

## Well Activity

| Activity      | Work Start Date | Work End Date | Drilling Company   | Date Entered                |
|---------------|-----------------|---------------|--------------------|-----------------------------|
| Legacy record | 1969-08-14      | 1969-08-14    | Osoyoos Tile Works | August 13th 2003 at 3:08 AM |

## Well Work Dates

| Start Date of Construction | End Date of Construction | Start Date of Alteration | End Date of Alteration | Start Date of Decommission | End Date of Decommission |
|----------------------------|--------------------------|--------------------------|------------------------|----------------------------|--------------------------|
| 1969-08-14                 | 1969-08-14               |                          |                        |                            |                          |



## Well Completion Data

|                                       |   |  |
|---------------------------------------|---|--|
| <b>Total Depth Drilled:</b>           | <b>Estimated Well Yield:</b> 0 USgpm            | <b>Static Water Level (BTOC):</b> 15 feet btoc |
| <b>Finished Well Depth:</b> 45 ft bgl | <b>Well Cap:</b>                                | <b>Artesian Flow:</b>                          |
| <b>Final Casing Stick Up:</b>         | <b>Well Disinfected Status:</b> Not Disinfected | <b>Artesian Pressure (head):</b>               |
| <b>Depth to Bedrock:</b> 15 feet bgl  | <b>Drilling Method:</b> Other                   | <b>Artesian Pressure (PSI):</b>                |
| <b>Ground elevation:</b>              | <b>Method of determining elevation:</b> Unknown | <b>Orientation of Well:</b> VERTICAL           |

## Lithology

| From (ft bgl) | To (ft bgl) | Raw Data          | Description | Moisture | Colour | Hardness | Observations | Water Bearing Flow Estimate (USGPM) |
|---------------|-------------|-------------------|-------------|----------|--------|----------|--------------|-------------------------------------|
| 0             | 15          | SAND,GRAVEL,ROCKS |             |          |        |          |              |                                     |
| 15            | 45          | BEDROCK           |             |          |        |          |              |                                     |

## Casing Details

| From (ft bgl)                | To (ft bgl) | Casing Type | Casing Material | Diameter (in) | Wall Thickness (in) | Drive Shoe |
|------------------------------|-------------|-------------|-----------------|---------------|---------------------|------------|
| There are no records to show |             |             |                 |               |                     |            |

## Surface Seal and Backfill Details

|  |  |
|--|--|
| <b>Surface Seal Material:</b>            | <b>Backfill Material Above Surface Seal:</b> |
| <b>Surface Seal Installation Method:</b> | <b>Backfill Depth:</b>                       |
| <b>Surface Seal Thickness:</b>           |  |
| <b>Surface Seal Depth:</b>               |  |

## Liner Details

| <b>Liner Material:</b>       | <b>Liner Thickness:</b> | <b>Liner perforations</b>   |               |             |                              |  |
|------------------------------|-------------------------|---|---------------|-------------|------------------------------|--|
| <b>Liner Diameter:</b>       | <b>Liner to:</b>        | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl) | There are no records to show |  |
| From (ft bgl)                | To (ft bgl)             |   |               |             |                              |  |
| There are no records to show |                         |   |               |             |                              |  |
| <b>Liner from:</b>           |                         |   |               |             |                              |  |

## Screen Details

| <b>Intake Method:</b>        | <b>Installed Screens</b>   |               |               |               |               |           |                              |  |  |  |  |
|------------------------------|--|---------------|---------------|---------------|---------------|-----------|------------------------------|--|--|--|--|
| <b>Type:</b>                 | <table border="1"> <thead> <tr> <th>From (ft bgl)</th> <th>To (ft bgl)</th> <th>Diameter (in)</th> <th>Assembly Type</th> <th>Slot Size</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="text-align: center;">There are no records to show</td> </tr> </tbody> </table> | From (ft bgl) | To (ft bgl)   | Diameter (in) | Assembly Type | Slot Size | There are no records to show |  |  |  |  |
| From (ft bgl)                | To (ft bgl)  | Diameter (in) | Assembly Type | Slot Size     |               |           |                              |  |  |  |  |
| There are no records to show |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Material:</b>             |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Opening:</b>              |  |               |               |               |               |           |                              |  |  |  |  |
| <b>Bottom:</b>               |  |               |               |               |               |           |                              |  |  |  |  |

## Well Development

|                      |                                    |
|----------------------|------------------------------------|
| <b>Developed by:</b> | <b>Development Total Duration:</b> |
|----------------------|------------------------------------|

## Well Yield

|  |  |                             |
|--|--|-----------------------------|
| <b>Estimation Method:</b>              | <b>Estimation Rate:</b>                          | <b>Estimation Duration:</b> |
| <b>Static Water Level Before Test:</b> | <b>Drawdown:</b>                                 |                             |
| <b>Hydrofracturing Performed:</b> No   | <b>Increase in Yield Due to Hydrofracturing:</b> |                             |

## Well Decommission Information

|                                 |                                |
|---------------------------------|--------------------------------|
| <b>Reason for Decommission:</b> | <b>Method of Decommission:</b> |
| <b>Sealant Material:</b>        | <b>Backfill Material:</b>      |
| <b>Decommission Details:</b>    |                                |

## Comments

OLD OBS WELL # WR-88-69 ACTIVE METHOD OF DRILLING = DRILLED

**Alternative Specs Submitted:** Yes

## Documents

- [WTN 22692 Well Record.pdf](#)

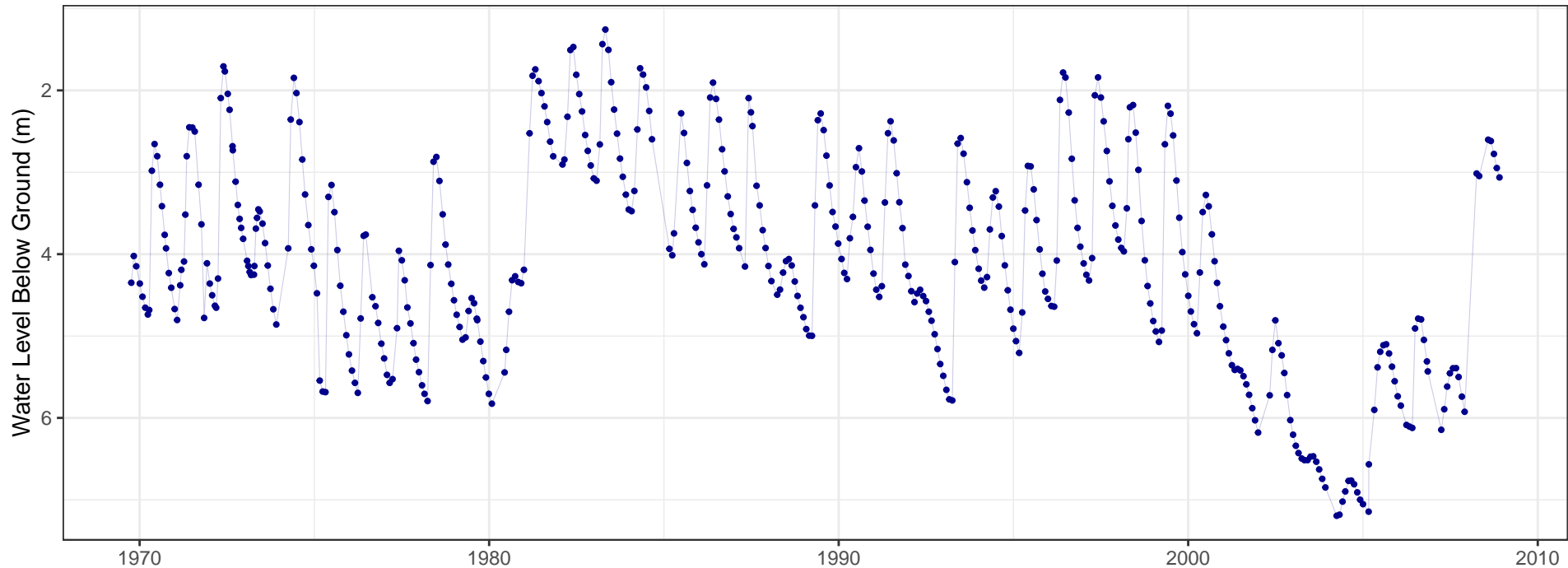
## Disclaimer

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The information provided should not be used as a basis for making financial or any other commitments. The Government of British Columbia accepts no liability for the accuracy, availability, suitability, reliability, usability, completeness or timeliness of the data or graphical depictions rendered from the data.

# OBS WELL 054

## Water Level Snapshot



*Note: True data are marked with a dot, the thin line connecting points is a visual aid only and does not represent true observations. The full data set can be downloaded via the [BC Data Catalogue](#) or the [BC Real-time Water Data tool](#).*

## Photographs 1-4. Site Visit, Dec. 1, 2021



1. View of lower terminal building location overlooking Kalamalka Lake. View looking northeast.



2. View of lower terminal building location and powerline running past to the west, showing vegetation and aspect. View looking south.



3. View of high station landing and terminal area showing rocky outcrop at elevation, with Kalamalka Lake in background. View looking northeast.



4. View of upper landing area south of high station area. Proposed test well drilling location approximately 50m south in more flat area. View looking south.