Associated Environmental

REPORT

Alto Utilities Ltd.

Source Assessment and Wellhead Protection Plan and GARP Assessment

MAY 2022

A Carbon Neutral Company

CANADA BEST MANAGED COMPANIES Platinum member

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1 INTRODUCTION

1.1 Background and Objectives

Alto Utilities Ltd. (Alto) owns and operates a medium-size water utility that provides potable water to the Clearwater subdivision under the Interior Health Authority (IHA) Operating Permit #13-122-0001 (the Permit). Clearwater subdivision includes 420 homes, one church, and one school. The water for the subdivision is sourced from two wells with the BC Well Tag Numbers (WTN) 83017 and 83230, located in Winfield, BC approximately 1.6 km south of Wood Lake (Figure 1-1). WTN 83017 is referred to as the "South Well" and WTN 83230 is referred to as the "North Well".

Alto retained Associated Environmental Consultants Inc. (Associated) to conduct a Source Assessment and Wellhead Protection Plan (SAPP) for the North and South Wells following Modules 1, 2, 7 and 8 of the BC Ministry of Healthy Living and Sport *Comprehensive Drinking Water Source-to-Tap Assessment Guideline* (the Source-to-Tap Guideline) (MOHLS 2010). Further, Alto has requested that Associated complete a Groundwater at Risk of Containing Pathogens (GARP) screening and assessment for the North and South Wells following the BC Ministry of Health *Guidance Document for Determining Groundwater at Risk of Containing Pathogens (GARP) Version 3* (MOH 2017).

We understand that as part of Alto's operating permit, both Kala Geoscience (Kala) and Golder Associates (Golder) completed work relating to groundwater protection planning for the system in 2008 and 2011, respectively. In February 2020, IHA reviewed Alto's compliance with the *Drinking Water Protection Regulation* (DWPR) (B.C. Reg 200/23) of the *Drinking Water Protection Act* (DWPA) (SBC 2001 Chapter 9) while considering the previous work completed by Kala and Golder and set out six conditions in the Operating Permit. These conditions include:

1. Provide a Source Water Assessment and Wellhead Protection Plan:
    - Required Actions:
        - Complete an updated source water assessment.
        - Develop and implement a wellhead protection plan.
2. Provide a Certified Operator to operate the system:
    - Required Actions:
        - Provide an appropriately certified operator for the water supply system.
        - Develop an Operations Plan that identifies how the water supplier will ensure that appropriately qualified operators are available for the water system and provide a copy to IHA by June 30, 2020.
3. Review and update the Emergency Response and Contingency Plan (ERCP), which will include a Drought Management Plan and a Wildfire Preparedness Plan:
    - Required Actions:
        - Review and update the ERCP, including alternate provision of potable water during emergencies.
        - Develop a Drought Management Plan and a Wildfire Preparedness Plan as part of the Alto Utility ERCP.
        - Provide a copy of the updated plan to IHA by November 30, 2020.
4. Operate according to the Water Quality Monitoring Plan:
    - Required Actions:
        - Update the existing Water Quality Monitoring Plan and provide a copy to IHA by June 30, 2020.

        - Continue to email the monthly report to IHA by the 10th day of the following month.
5. Provide a long-term plan for source, treatment, and distribution system improvements:
    - Required Actions:
        - Develop and implement an asset management process. The asset management process shall assess the state of the infrastructure, evaluate risk, and set priorities for investment in water assets, linked to financial plans that identify how these projects will be financed.
        - Determine whether water rates are sufficient to cover the full cost of service. Full cost recovery means that revenues should be sufficient to cover the cost to service and operate the system. The cost of service includes expenses to operate, administer, maintain, and repair the system, as well as replacement and renewal of infrastructure.
        - Provide an update on the long-term plans for source, treatment, and distribution system improvements, and a financial plan that supports these projects by November 30, 2020.
6. Develop a Cross Connection Control Program:
    - Required Action:
        - Develop a Cross Connection Control Program for the water system and provide a copy to IHA by November 30, 2020.

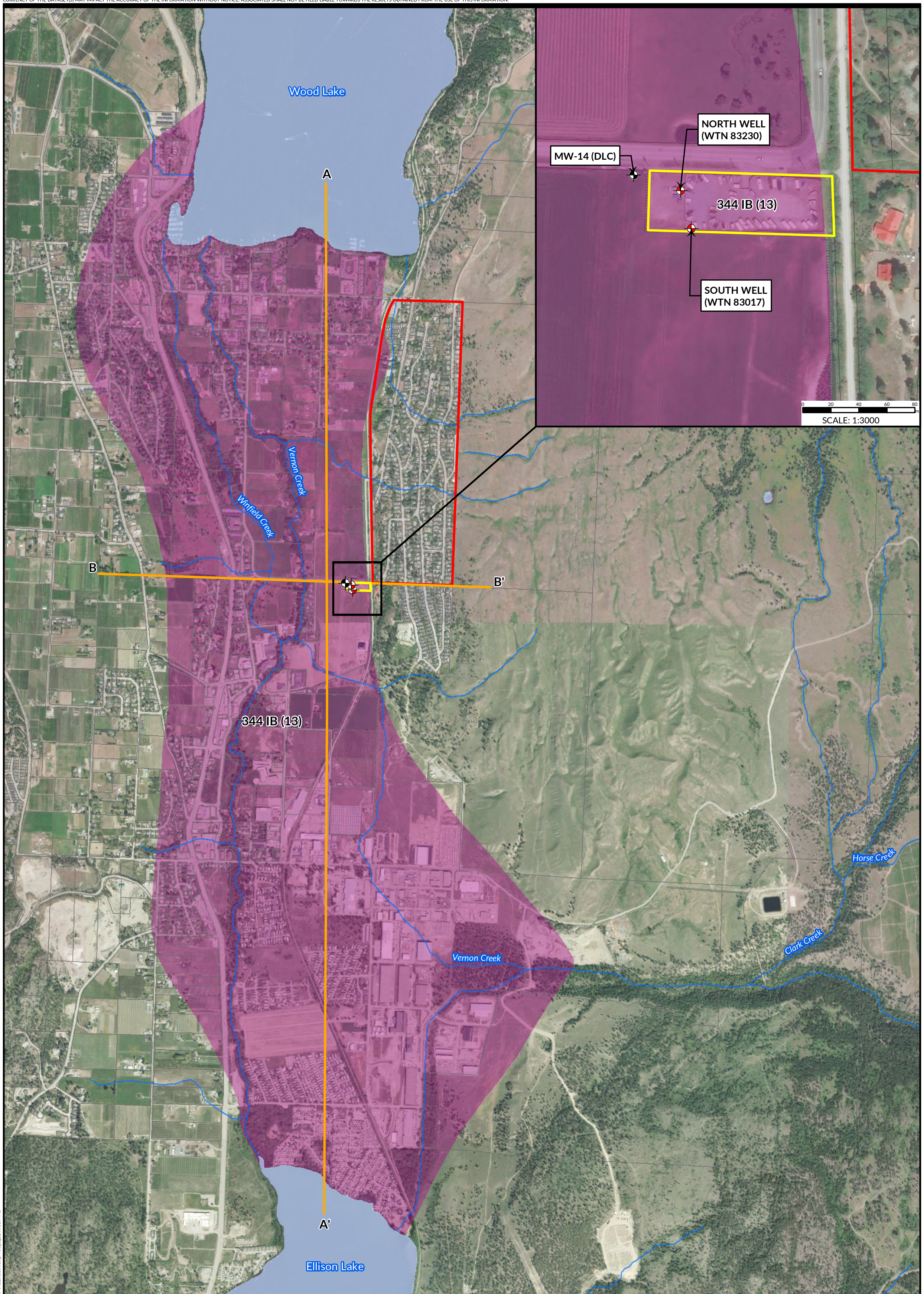
The goal of this report is to address Condition #1 (Source Water Assessment and Wellhead Protection Plan) in accordance with the *BC Comprehensive Drinking Water Source-to-Tap Assessment Guideline* (the Source-to-Tap Guideline) Modules 1, 2, 7, and 8 (MOHLS 2010).

1.2 Technical Advisory Committee

The Source-to-Tap Guideline recommends assembling a multi-disciplinary Technical Advisory Committee (TAC) to identify potential hazards to the drinking water system and assess the associated risks. In partnership with Alto, Associated facilitated the formation of a TAC whose members are listed in Table 1-1. The TAC meeting was held on October 12, 2021 and all persons noted in Table 1-1 were in attendance. The District of Lake Country (DLC) was invited to this meeting as they are considered an important stakeholder. They initially declined to attend but following the meeting they provided some comments on several hazards that were identified (Section 3 and 4 of this report). The record of meeting as well as comments from DLC are provided in Appendix A.

Table 1-1
Technical Advisory Committee Members

Organization	Name and Title
Alto Utilities Ltd	Keith Hanson, Owner/Operator
Interior Health Authority	Judi Ekkert, Specialist Environmental Health Officer
Associated Environmental Consultants Inc.	Tony Friesen, Hydrogeologist Mike Weldon, Hydrogeologist Marta Green, Senior Hydrogeologist
Ministry of Environment and Climate Change Strategy (ENV)	Mark Ecker, Water Stewardship Officer



LEGEND

- MONITORING WELL
- SUBJECT WELL
- CROSS SECTION
- ALTO UTILITIES SERVICE AREA
- PROPERTY BOUNDARY

BASE DATA

- WATERCOURSE
- AQUIFER 344
- DLC CADASTRAL
- WATERBODY

0 100 200 300 400 m

IMAGERY: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, USDA FSA, USGS, AEX, GETMAPPING; HYDROGRAPHY: NATURAL RESOURCES CANADA, 2017

AE PROJECT NO.	2021-8810.000
DATE	2022-03-14
SCALE	1:20000
COORD. SYSTEM	NAD 1983 UTM ZONE 11N
REV	00
DESCRIPTION	ISSUED FOR REPORT
DRAWN BY	KP
CHECKED BY	WL

FIGURE 1-1
SITE LOCATION AND SURROUNDING AREA

ALTO UTILITIES LTD.

SOURCE ASSESSMENT AND WELLHEAD PROTECTION PLAN

\\AE.CA\DATA\WORKING\VER\2021-8810-00\GIS\ARCMAP\AE20218810_FIG1_1_220311.MXD

1.3 Project Approach

The Source-to-Tap Guideline provides a structured and consistent approach to evaluating risks to drinking water (MOHLS 2010). It serves as a tool for water system owners and operators to: (a) develop a more comprehensive understanding of risks to drinking water safety and availability, (b) operate effectively, and (c) produce the best possible water quality. The four Source-to-Tap Guideline modules used for this assessment include:

- Module 1: Delineate and characterize the drinking water source.
- Module 2: Conduct contaminant source ('hazard') inventory.
- Module 7: Characterize risks.
- Module 8: Recommend actions to improve drinking water protection.

The scope of this SAPP is based on Modules 1, 2, 7, and 8. Modules 3, 4, 5, and 6 are related to engineering and governance, and are not required by the IHA at this time.

The general approach of the SAPP is summarized in Table 1-2. The methods used for each module, including details of the risk analysis procedure, are described in Sections 3 through 5.

Table 1-2
General Approach of the Source Assessment and Well Protection Plan (SAPP)

Source-to-Tap Module Number	Source-to-Tap Module Name	Section in this Report	Tasks
Module 1	Delineate and Characterize the Drinking Water Source	2	• Characterized the water source by collecting, reviewing, and summarizing available data including previous reports and other publicly available data. • Delineated the capture zone (i.e., the land area above or contributing to the aquifer supplying water to the production wells).

Module 2	Conduct Contaminant Source (Hazard) Inventory	3	• Developed a list of potential drinking water hazards through:
			  ○ Review of existing records
			  ○ Field survey
			  ○ Workshop with the TAC

Module 7	Characterize Risks from Source to Tap	4	• Lead a workshop with the TAC to assess and rank each hazard (following the Source-to-Tap Guideline) as low risk, moderate risk, high risk, or very high risk. • Completed a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis with the TAC.
Module 8	Recommend Actions to Improve Drinking Water Protection	5	• Developed recommendations for all identified moderate, high, and very high-risk hazards. • Prepared the SAPP (this document).

2 MODULE 1: DELINEATION AND CHARACTERIZATION OF WATER SOURCE

Module 1 involves characterizing the water source and delineating the capture zones. A key outcome of Module 1 is the definition of the capture zones for the North and South Wells during regular operating conditions. The capture zone is the area around a well that contributes water to the well. To determine this area, an understanding of the water source (including a description of the wells, well sites, and hydrogeological setting) is first required.

2.1 Description of Drinking Water Systems

Alto provides water sourced from two groundwater supply wells to approximately 420 domestic connections, 1 school, and 1 church (approximately 1,000 people). The source wells include the North Well (WTN 83230) and the South Well (WTN 83017). Details of the wells are summarized in Section 2.7. The distribution system consists of:

- A pump house located on Lodge Road,
- A booster station on Cheryl Road with two booster pumps (one 15-horsepower and one 7-horsepower),
- Approximately 8.5 km of 200 mm, 150 mm, and 100 mm diameter watermains,
- Twenty-six fire hydrants,
- Two pressure reducing valve stations, and
- Four reinforced concrete storage reservoirs with a total capacity of 1,780 m^3.

2.2 Location & Topography

The source wells are located at 10397 Lodge Road in Lake Country, BC (the Property) and are at an approximate elevation of 409 metres above mean sea level (mamsl). The Property is located on the east side of the south-north trending valley bounded by Ellison Lake (3.4 km to the south) and Wood Lake (1.9 km to the north), making up a portion of the Vernon Creek watershed. The valley bottom is an average of 1 km wide and has relatively low topographical relief. The valley sides are bounded by steep slopes comprising a combination of bedrock outcrops and bench material originating from glacial fluvial activity.

Wood Lake and Ellison Lake were formed from glacial fluvial damming of an ancient single-lake basin. Damming occurred as a result of fluvial deposition from the east, at the outflow of a tributary to the valley now occupied by Vernon Creek (Naismith 1962).

2.3 Land Use and Water Use within the Watershed

The primary land-uses surrounding the Property are agricultural, industrial/commercial and residential (Figure 1-1). Associated reviewed aerial photographs from 1938 to present to assess changes in land use over time, as summarized in Table 2-1. The aerial photos are provided in Appendix B.

Table 2-1
Historical Aerial Photograph Review

Photograph Year and Number	Site and Area Description
1938 BC122-54	The entire valley consists of either agricultural land use or undeveloped land. Vernon Creek has more meanders through the center of the valley. There is little in the way of residential or industrial development anywhere in the valley. The train track on the east side of the valley and Highway 97 both already exist in 1938.
1951 BC1247-46	Land use is still primarily agricultural although several of the parcels have been subdivided into smaller ones. Lodge Road and a few other small roads have been developed. Directly east of the Property there is new development that resembles a gravel pit on the hills that will eventually become a residential subdivision.
1956 BC2149-71	Much the same as in 1951, except for the new fruit packing plant to the south of the Property. In the southeast corner of the photo, there is evidence of significant flooding on the Vernon Creek fan resulting in the temporary change of flow direction to the north end of the fan rather than south to Ellison Lake.
1967 BC5238-178	Relatively unchanged since 1956 imagery. Increase in orchards.
1975 BC5659-220	Alto wells are now in place, along with the first phase of the Clearwater subdivision on the eastern bench of the valley. There is also the first evidence of the cattle dugout on the north side of Lodge Road across the street from the Property. West of the Property there are more residential lots that have been developed along the highway.
1980 15BC80070-186	The Clearwater subdivision continues to expand to the north. Several new subdivisions have been developed, and by 1980 several industrial buildings have been built. The BC Tree Fruits building has increased in size and there is now a larger building complex on the corner of Beaver Lake Road and Jim Bailey Road.
1985 30BCC362-36	By 1985, many of the mobile home parks have been developed along with several additional large industrial buildings along Jim Bailey Road. The road infrastructure for the second phase of the Alto subdivision is in place. There is evidence of a new golf course (Aspen Grove) located 1 km west of the well site.
1990 30BCB90004-146	Little has changed in the area immediately surrounding the Clearwater subdivision. Several new homes have been built in the Clearwater subdivision, and to the south there has been continued expansion of the industrial complex. One major change is the addition of the new wastewater treatment plant to the south of the subject wells.
1994 30BCC94152-98	Little change since 1990.
2001 15BCC01030-94	There has been expansion of several of the mobile home parks and some new industrial building built along Jim Bailey Road. Currently, those buildings house Tolko Industries, Versatile Fab & Machine, Sisco Kelowna, and Factors Laboratories.
2007 BCD07027-217-RGB-33-12b	Clearwater Subdivision is fully constructed with the last phase to the south completed. The industrial park is largely the same as it is currently. The agricultural area surrounding wells is still relatively unchanged.
2021 Ortho photo from Google Earth	Little change in the surrounding area. The Property is now fenced off with the east half of the property being used for boat and RV storage.

2.3.1 Agricultural

Much of the land immediately surrounding the Property comprises agricultural land that is used for livestock grazing and hay production. A review of historical air photos indicate much of the valley bottom has remained unchanged and within the Agricultural Land Reserve, with the exception of a few isolated residential developments and development of a large industrial complex approximately 1.5 km south of the Property.

2.3.2 Industrial and commercial

Beginning in about 1980, with the establishment of the BC Fruit Packers warehouse, the District of Lake Country (DLC) started to develop a portion of land into an industrial complex in Winfield, south of Highway 97. At the time of writing, the industrial complex encompasses approximately 105 ha of land and includes a variety of industrial and commercial activities including bulk fuel storage facilities, boat storage, lumber mills, hazardous waste storage facility, manufacturing plans, fruit packing plants, grocery stores, fast food restaurants, and gas stations.

2.3.3 Residential

Development over the last 80 years has also included several large single-family residential subdivisions and five large mobile home parks near Ellison Lake, to the south (Figure 1-1).

2.4 Climate

2.4.1 Climate Normals

The Property is located within the Ponderosa Pine biogeoclimatic zone, which is described as a very warm, dry climate (FLNRO 2018). The nearest climate station is the Winfield climate station (Climate ID 1128958), located 14.2 km south of the Property at an elevation of 506 mamsl. The data record for this station spans from 1971 to 2021. Table2-2 summarizes the climate data from the most recently available Climate Normal Period (1981 to 2010). During that period, average monthly temperatures ranged from −2.0°C in December to 20.3°C in July, with an average annual temperature of 8.9°C (Table 2-2). The average annual precipitation was 382.0 mm, with May and June experiencing the most rainfall (Environment and Climate Change Canada 2021).

Table 2-2
Climate Normals for Winfield Climate Station 1128958 (1981-2010)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature													
Average (°C)	-1.9	0.0	4.7	9.2	13.5	17.2	20.3	20.1	14.9	8.4	2.3	-2.0	8.9
Precipitation													
Total Rainfall (mm)	7.5	9.5	16.0	27.5	37.9	41.7	33.1	27.7	30.3	28.2	24.3	7.2	290.8
Total Snowfall (cm)	27.2	11.4	5.2	0.6	0.0	0.0	0.0	0.0	0.0	0.5	14.9	31.4	91.2
Total Precipitation (mm)	34.7	20.9	21.2	28.1	37.9	41.7	33.1	27.7	30.3	28.7	39.2	38.7	382.0

Source: Winfield climate station (Climate ID 1128958) (ECCC 2021).

2.4.2 Climate Change Considerations

Future climate conditions at the Property were considered using ClimateBC, an online application that allows users to estimate current and future climate data for locations within BC (Wang et al. 2016). In estimating future climate conditions, 15 General Circulation Model (GCM) with a Representative Concentration Pathway (RCP) of 8.5 was utilized. RCP 8.5 is seen as the worst-case scenario; however, current emissions records indicate that climate trends closely follow this model. Projected mean monthly temperatures and mean total monthly precipitation were extracted for the climate normal periods of 2010-2039, 2040-2069, and 2070-2100, hereafter referred to as the 2025, 2045, and 2085 climate periods, respectively (Table 2-3). In future climate forecasts, the mean monthly air temperature is expected to increase in all months, with mean annual temperature projected to increase by 6.9°C (i.e., to 16°C) by 2085, compared to the 1981-2010 average. Annual precipitation is projected to increase only slightly compared to 1981-2010. It is expected that an increasing proportion of winter precipitation will fall as rain rather than snow due to the increasing winter air temperatures.

The increase in air temperatures is likely to result in higher evaporation and evapotranspiration in the region, which may impact surface and vadose zone[1] water availability. Decreasing precipitation as snow may also result in a change in the groundwater recharge timing, as a smaller snowpack may be available to generate recharge through spring and summer at higher elevations.

[1] The vadose zone is the unsaturated zones of soil above the groundwater table.

Table 2-3
Projected Future Temperature and Precipitation Estimates for the Property for Three Climate Periods

Climate Period	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature														
Normal (1981-2010)	Average Temperature (°C)	-1.3	0.5	4.9	9.3	13.8	17.6	20.8	20.2	14.9	8.2	2.6	-1.7	9.1
2025		-1	2.4	6.5	10.5	15.6	20.2	23.8	23	17.3	9.6	3.9	-0.5	10.9
2045		1.3	4.6	8.5	12.4	17.6	22.9	27.6	26.1	20	11.6	6	1.8	13.4
2085		3.5	6.9	10.7	14.9	19.9	25.7	31.7	30.3	23.3	13.9	7.9	3.6	16.0
Precipitation														
Normal (1981-2010)	Total Precipitation (mm)	29	20	18	25	34	39	32	27	32	24	31	34	345
2025		35	24	18	28	33	26	26	28	34	21	28	45	347
2045		36	25	19	30	36	28	22	27	29	23	31	46	351
2085		38	26	19	30	41	29	19	22	26	24	34	42	351

Note: Climate normal periods: 2025 is from 2010 to 2039, 2045 is from 2040 to 2069, and 2085 is from 2070 to 2100.
Source: Wang et al. 2016

2.5 Hydrology

The North and South Wells are located within the Vernon Creek Watershed, which has an area of 84.5 km^2 and encompasses Swalwell Lake and surrounding tributaries. From its headwaters, Vernon Creek flows from the eastern plateau, down into the valley, and discharges to the north end of Ellison Lake. From Ellison Lake, there are two primary streams within the valley that flow north from Ellison Lake to Wood Lake (ENV 2021a) The official naming convention is unclear as it labels both streams on the east and west side of the valley as Vernon Creek. For the purposes of this report, we refer to the stream on the west side of the valley as Winfield Creek (as it is commonly referred to) and the stream on the east side of the valley as Vernon Creek.

Winfield Creek originates from valley-side runoff to the west. A search of available online resources indicates minimal hydrology data available for Winfield Creek.

Vernon Creek originates from the highlands to the east, enters the valley approximately 500 m north of Ellison Lake, and travels south discharging into Ellison Lake. From Ellison Lake, Vernon Creek drainage travels through the center of the valley before discharging into Wood Lake approximately 800 m west of the subject wells. Watershed runoff in Vernon Creek is closely controlled for water conservation associated with Swalwell Lake (aka Beaver Lake) located approximately 11 km east of the subject wells. A search of the Water Survey Canada database indicates no current hydrologic data available for Vernon Creek. However, historical data are available from 1919 to 1987 (Station 08NM009). During this time, the mean monthly discharge was 0.452 m^3/sec, with a maximum and minimum mean monthly discharge of 1.56 and 0.196 m^3/sec in May and January, respectively (WSC 2021).

2.6 Geology

2.6.1 Surficial Geology

Surficial geology in the area consists of a thin layer of alluvial[2] deposits of sand and gravel associated with Vernon Creek (ENV 2021a). Below this, the soil comprises glacio-fluvial deposits associated with the most recent glaciation and have been mapped as lacustrine deposits of silt, separated by units of coarse sand and gravel. This agrees with well logs provided by drillers for the area which typically describe the surficial materials as comprised of silt with fine sand and clay to 15 m below ground surface (m bgs) followed by loose sand, or sand-and-gravel from 15-25 m bgs, a dense clay and gravel from 25-40 m bgs, then water bearing sand and gravel from 40-53 m bgs before hitting bedrock at an estimated 53 m bgs in the vicinity of the Property.

2.6.2 Bedrock Geology

Bedrock comprises granodioritic intrusive rocks originally described as granodiorite, quartz diorite, diorite, quartz monzonite. It is part of the Middle Jurassic Assemblage, and was formed during the Mesozoic Era 157 - 178 million years ago (ENV 2021a).

[2] Alluvial – Sand and gravel deposits associated with running water.

2.7 Hydrogeology Setting

Provincial mapping indicates that there are two aquifers that underlie the subject wells: a confined, unconsolidated aquifer identified as Aquifer 344, and a deeper bedrock aquifer identified as Aquifer 1021 (ENV 2021b). The provincial well registry indicates that the North and South Wells are completed in Aquifer 344. The DLC has a monitoring well (MW-14) installed to 5.81 m below ground near their sewerage lift station on Lodge Road which suggests the presence of shallow aquifer above the confining unit for Aquifer 344 (the top of the confining unit at the North and South Wells is between 5.49 m bgl, and 13.11 m bgl, respectively [Appendix C]). This upper aquifer unit is not mapped by the Province and the extent of it is unknown. The well log for MW-14 was not provided by the DLC, but communications with DLC suggest the depth is 5.81 m (K. Wilkie, personal communication, 2021).

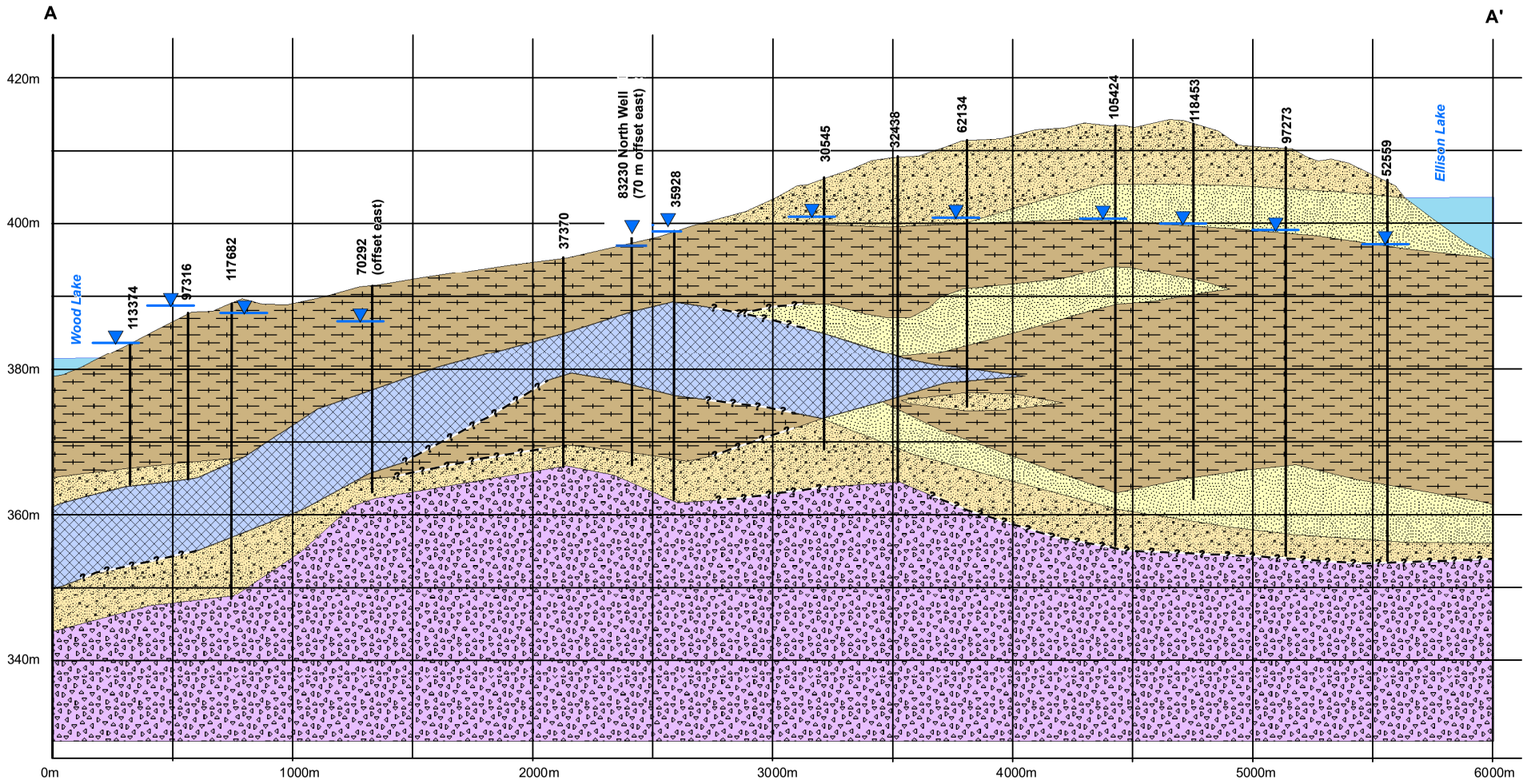
2.7.1 Aquifer 344

Aquifer 344 is a confined glacio-fluvial sand and gravel aquifer, which has high productivity, low demand, and moderate vulnerability to contamination. The mapped area of the aquifer is 8.7 km^2. It is 5 km long and extends from Wood Lake in the north, to Ellison Lake to the south. There are currently 26 registered wells correlated to the aquifer. Well records indicate a wide range of reported yields, ranging from 0.18 to 23.3 L/s (3 to 370 US gpm). The average recorded well completion depth is an estimated 30 m bgs. Flow direction of the aquifer is from south to north from the Vernon Creek alluvial fan, which is the primary recharge area along with mountain block recharge on the valley sides. Based on the elevation of the aquifer, the high hydraulic head noted very near the south end of Wood Lake, and the shallow nature of Wood Lake (30 m at its deepest), the aquifer is thought to run underneath Wood Lake and discharge into Kalamalka Lake 8 km to the north (LeBreton 1974).

We have developed a north-south cross-section (Figure 2-1) and a west-east cross-section (Figure 2-2) to show the extent of Aquifer 344 in the vicinity of the subject wells.

2.7.2 Aquifer 1021

Aquifer 1021 is a bedrock aquifer comprised primarily of metamorphic rocks from the Proterozoic era and some granodioritic intrusive rocks from the Mesozoic era (ENV 2021a). The aquifer is classified as having moderate productivity, low demand and low vulnerability to contamination. The mapped area of the aquifer is 25.5 km^2. It extends from Ellison Lake in the south to the south end of Wood Lake. There are currently eight registered wells correlated to the aquifer and no licensed wells. Well records indicate a wide range of reported yields with an average yield of 3.63 L/s (55.7 US gpm). The average recorded well completion depth is 40.7 m.



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? — ? — Uncertain_B_B

Average Water Depth (based on well logs)

Bedrock

Clay with Silt

Lake

Sand

Sand & Gravel

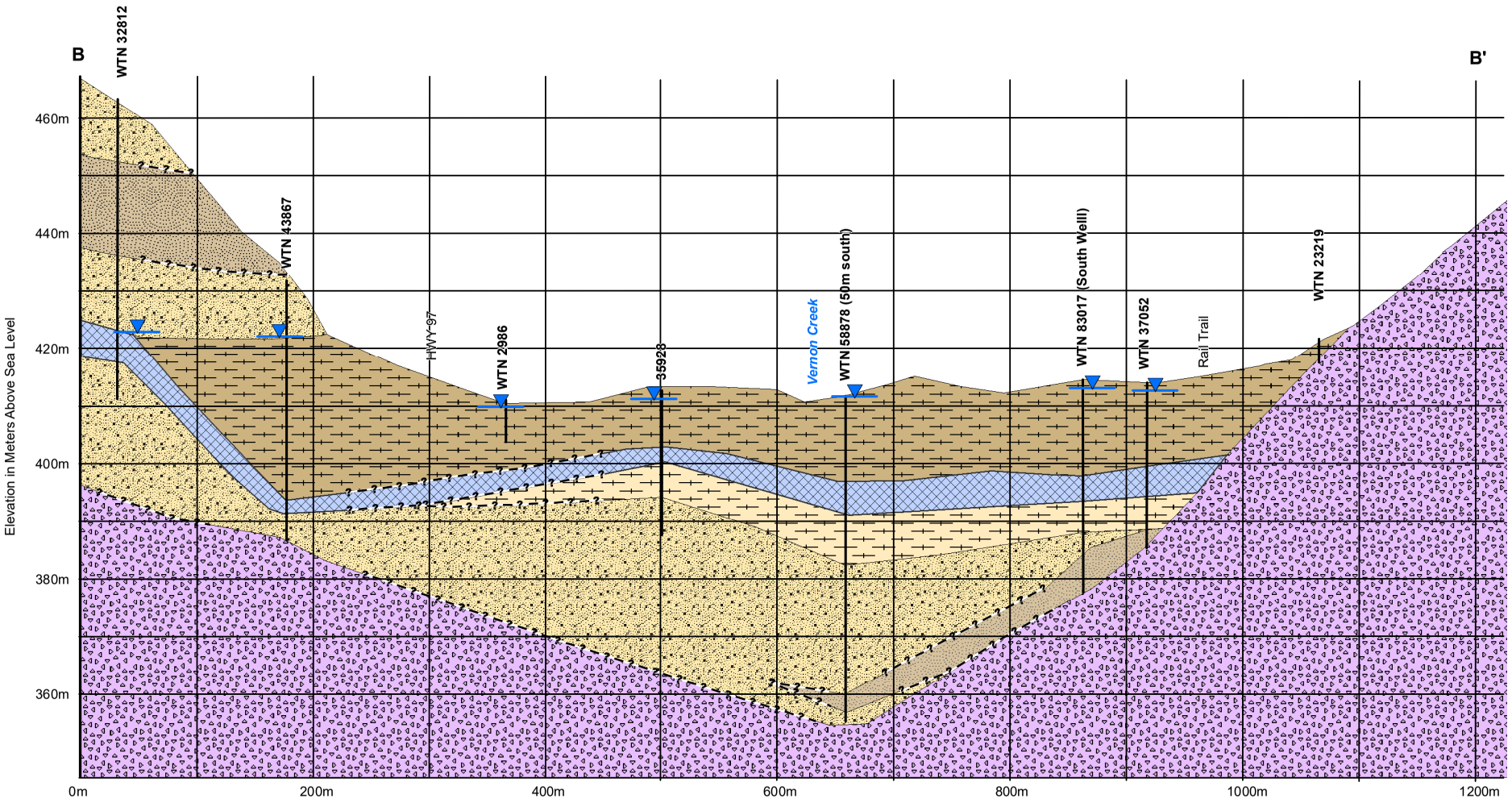
Silt

PROJECT NO.: 2021-8810.000
DATE: July 2021
DRAWN BY: DA

FIGURE 2-1: A-A' NORTH TO SOUTH AQUIFER CROSS SECTION

Alto Utilities

Alto Utilities Source Water Protection Plan



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Associated Environmental

? — ? — Uncertain

Average Water Depth (based on well logs)

Sand

Bedrock

Clay

Till

Sand and Gravel

Silt and gravel

Sand and Silt

PROJECT NO.: 2021-8810.000
DATE: July 2021
DRAWN BY: DA

FIGURE 2-2: CROSS SECTION B-B'

Alto Utilities

Alto Utilities Source Water Protection Plan

2.7.3 Existing Groundwater Wells

There are a total of five registered wells that are mapped on the Property, including Alto's source wells. A summary of the registered wells is presented in Table 2-4. Of the five wells, only the North and South Wells are remaining and are currently being used as production wells. Details of the two production wells are in Table 2-5 and well logs are provided in Appendix C.

Table 2-4
Alto Utility Water Supply Wells

WTN	WPID	Common ID	Date Drilled	Well Use	Well Depth (m bg)	Static Water level (m btoc)
83230	19071	North Well	April 26, 1977	Domestic Water Supply	26.2	1.1
83017	19072	South Well	May 1, 2002	Domestic Water Supply	30.78	2.0
104646	NA	NA	Sept 29, 2011	Decommissioned	16.15	NA
23636	NA	NA	June 3, 1970	NA	15.85	0.61
23433	NA	NA	April 5, 1970	NA	16.46	2.04

Notes:
WPID: Well Plate ID: This is the number located on a metal plate affixed to a well either voluntarily (pre-2016) or as required by well drillers when drilling a water supply well (March 1, 2016 or later).

WTN: Well Tag Number. This is the number assigned to a well construction report (or log) when a log is submitted BC Ministry of Environment either voluntarily (pre-2016) or as required by well drillers when drilling a water supply well (March 1, 2016 or later).

Table 2-5
North and South Well Construction Data

	North Well	South Well
Well Tag Number	WTN 83230	WTN 83017
Date of construction	April 26, 1977	May 1, 2002
Drilled depth (mbgl)	33.22	30.78
Completion depth (mbgl)	26.02	30.78
Completion diameter (mm)	250	305
Casing stick-up (magl)	0	0.65
Surface seal	Yes	Yes
Top of screen intake (mbgl)	19.8	Upper Screen - 20.9 Lower Screen - 27.0
Bottom of screen assembly (mbgl)	25.9	Upper Screen - 23.03 Lower Screen - 30.05

	North Well	South Well
Screen length and slot size	6 m at 0.100”	Upper Screen – 3 m at 0.060” Lower Screen – 3 m at 0.250”
Static water level (mbgl)	1.1	2.0
Well yield (L/s)	15	15
Description of aquifer lithology	Gravel with sand	Gravel with sand
Top of aquifer (mbgl)	14	14
Bottom of aquifer (mbgl)	28	28
Saturated aquifer thickness (m)	14	14
Aquifer type	Confined	Confined

Notes:
WTN – Well Tag Number; mbgl – metres below ground level; magl – metres above ground level

2.8 Groundwater Quality Review

Associated reviewed groundwater quality data uploaded to Wireless Water™, an online database for water quality, and from laboratory reports provided by Alto. Available data includes:

- Bacteriological – total coliform and *Escherichia coli* (*E. coli*);
- Turbidity; and
- Microscopic particulate analysis (MPA)[3].

Water quality data up to May 2021 was reviewed for this investigation.

2.8.1 Total Coliforms and E. coli

Alto’s Water Operators collect water samples from both wells and three additional locations within the distribution system. The samples are submitted to CARO Analytical Services for analysis of total coliforms and *E. coli*. Samples have been collected from the North and South Wells since they were installed in 1977 and 2003, respectively. In our review, we have collated the following sampling event results:

- Bi-monthly samples collected from March 2009 to October 2010 from the pumphouse (i.e., not specific to a well).
- Monthly samples collected between January 2016 and September 2019 from the pumphouse (i.e., not specific to a well).
- Unique samples from each well variably between 2011 and present. At the North Well, samples have been regularly collected (typically monthly) since September 2019. At the South Well, they have been collected monthly since September 2020.

None of the samples collected indicate the presence of *E. coli* or total coliforms originating from either of the wells (Appendix D; Table D-1).

[3] The US EPA Consensus Method (1992) for Determining Groundwaters Under the Direct Influence of Surface Water was utilized.

2.8.2 Turbidity

An inline turbidity meter at the pumphouse reports average, maximum, and minimum daily turbidity data for the system. Data from January 1, 2021 to May 31, 2021 were reviewed under the scope of this project. An average of 0.946 NTU was recorded on April 6, 2021, but typically the average daily turbidity was below 0.2 NTU for the data set. The turbidity data for each well (separate from the system average) is not available, but we compared the turbidity values recorded at the pumphouse to the daily extraction rates to determine a correlation (Figure 2-3). Higher turbidity values tend to occur during the change-over between wells. Daily maximum turbidity values have been reported as high as 5 NTU (likely the limit of the sensor), but these values need to be confirmed by manual testing to determine if they are accurate.

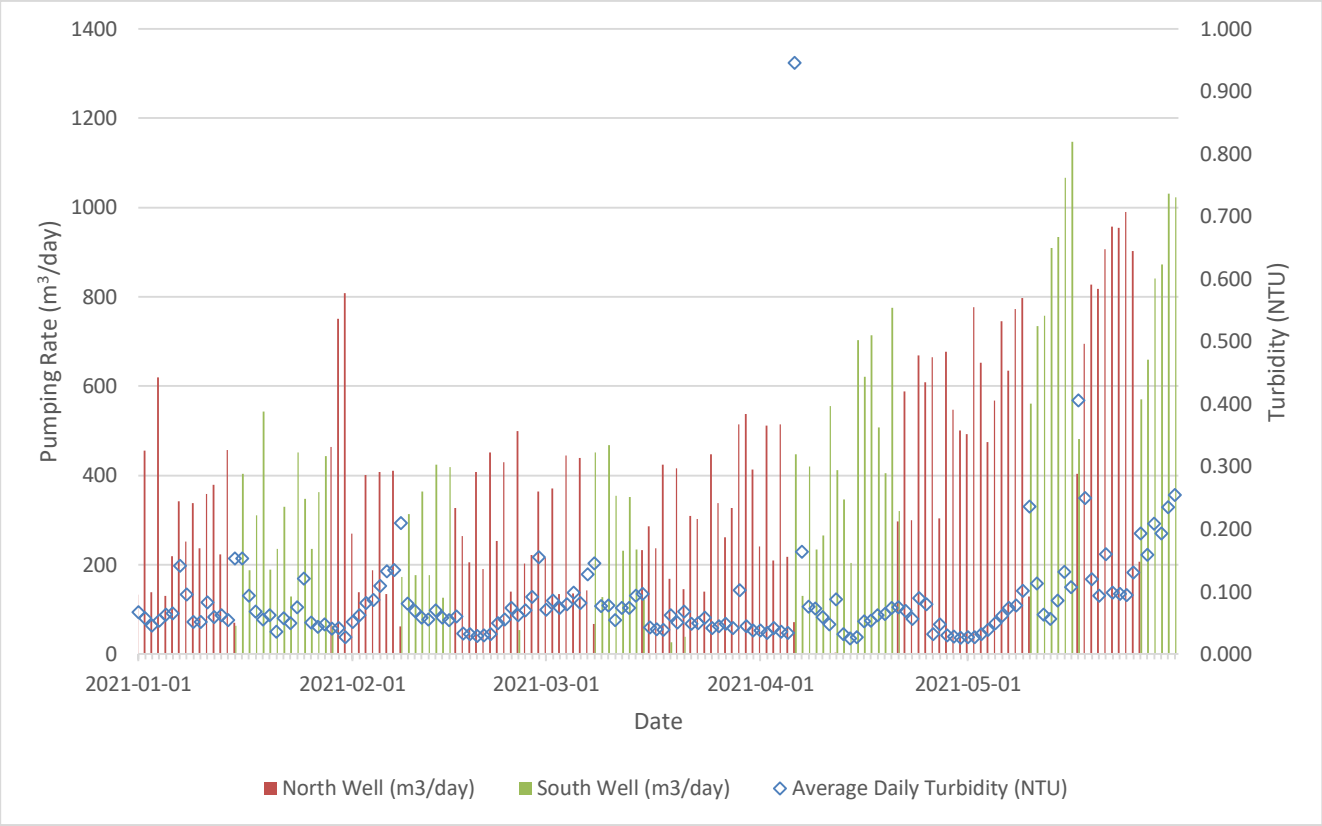


Figure 2-3
Daily Average Turbidity Compared with Daily Extraction Rates

2.8.3 Microscopic Particulate Analysis

Kala (2009) collected microscopic particulate analysis (MPA) samples from both wells on March 14, 2007, and indicated that both wells were considered at low risk of surface water contamination. The results of these analyses are attached in Appendix D.

2.8.4 Aerobic Spore Forming Samples

Aerobic spore-forming bacteria are ubiquitous bacteria primarily found in soil, similar to total coliforms. They are of similar size and shape to *Cryptosporidium* and can survive for years in the subsurface (as compared to weeks for total coliforms). Collecting aerobic spore-forming bacteria samples from both well water and the nearby river water can be used to assess the logarithmic removal between surface water and well water. However, limitations to this method are that if the surface water source naturally does not contain many aerobic spores (for example, rivers sourced by snowmelt from mountains will not have had sufficient time to collect the spores), the evidence of the amount of log removal will be limited. For example, if a well has 10 spores and the river has 100, there is only evidence to show 1 log removal result. However, for that same well sample with 10 spores, if the river has 10,000, then there is evidence to show 4 log removal.

For this assessment, on May 26, 2021, Associated collected three aerobic spore-forming bacteria samples: one sample from each of the source wells and one from the closest surface water body, a livestock watering lagoon located across Lodge Road. The samples were shipped to Hyperion Laboratories to analyze aerobic spore-forming bacteria. The results are presented in Table 2-6; locations are shown in Figure 3-2 in Section 3.

Table 2-6
Aerobic Spore Forming Bacteria Results

Location	Number of Aerobic Spore Forming Bacteria (CFU/L)[1]	Log Removal[2]
North Well	0	>4 – Log
South Well	40	4 - Log
Lagoon	68700	NA

Notes:
CFU/L = colony forming units per litre of water sampled.
Log removal observed in each well relative to the nearby lagoon.

2.8.5 Comprehensive Water Quality

Associated reviewed the results from five comprehensive raw water quality analyses collected from the wells between March 2020 and May 2021. Laboratory analyses were completed by Caro Analytical in Kelowna, BC and included major cations/anions, nutrients, and total metals. These data were uploaded to Wireless Water™ and compared to *Health Canada's Guidelines for Canadian Drinking Water Quality* (GCDWQ) Maximum Acceptable Concentrations (MAC) and Aesthetic Objectives (AO) (Health Canada 2019). The MAC are health-based guidelines, while the AO are parameters that may cause discolouration, odour, or undesirable taste. These results are attached in Appendix D, Table D-2.

Total dissolved solids (TDS) and manganese concentrations measured in both the North and South Well exceed the GCDWQ AO for all samples analyzed. The MAC for total manganese (0.12 mg/L) (was also consistently exceeded at the North Well. Manganese can be naturally occurring in sand and gravel aquifers and is commonly seen in the Okanagan Valley.

Nitrate (as N) concentrations can be of concern for production wells installed in agricultural areas. These data are available for both wells (Appendix D) and indicate concentrations are below the GCDWQ MAC (10 mg/L).

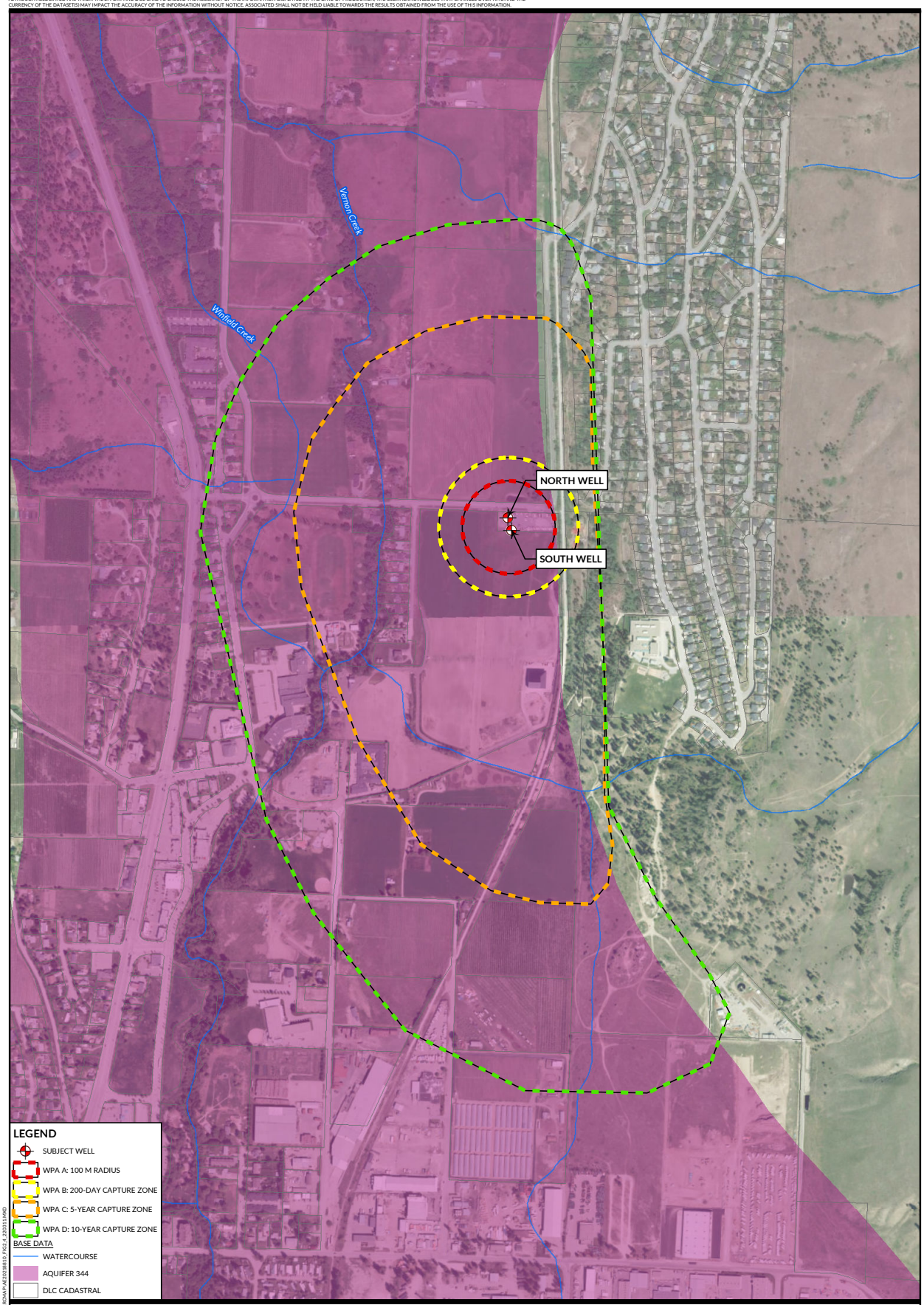
2.9 Delineation of Drinking Water Sources and Systems

Different types of contaminants can persist for various lengths of time in groundwater; therefore, four Well Protection Areas (WPAs) were mapped (100 m wellhead protection area, and 200-day, 5-year, and 10-year time of travel capture zones[4]) as follows:

- **Well Protection Area A**: a 100 m radius around each well. This is the area where the risk from direct contamination via the wellhead is highest.
- **Well Protection Area B**: a 200-day time of travel capture zone. The area within this boundary is used to protect against pathogenic contaminants (viruses, bacteria, and protozoa). This time of travel represents the survival time of pathogens and is consistent with the most recent version of the BC Ministry of Health's Guideline for Determining Groundwater at Risk of Containing Pathogens (MOH 2017).
- **Well Protection Area C**: a 5-year time of travel capture zone. The area within this boundary, but outside of the 200-day capture zone, is used to protect against chemical contaminants (e.g., petroleum contaminants, and persistent, mobile contaminants). This is the timeframe typically needed to allow for a remediation program of a hydrocarbon spill or leak to occur (Province of Ontario 2017).
- **Well Protection Area D**: a 10-year time of travel capture zone. The area within this boundary but outside of the 5-year capture zone boundary is used to protect against only the most persistent and mobile contaminants (e.g., chlorinated solvents and nitrates) (Province of Ontario 2017).

An overview of the delineated Well Protection Areas is shown on Figure 2-4, and Appendix E provides details on the methods and results for delineating the capture zones.

[4] The capture zones for 5- and 10-year are based on rationales from an Ontario Guideline. An Ontario Guideline was used because no similar rationale could be found from BC Guidelines.



IMAGERY: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, USDA FSA, USGS, AEX, GETMAPPING; HYDROGRAPHY: NATURAL RESOURCES CANADA, 2017

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FIGURE 2-4
WELL PROTECTION AREAS A,B,C AND D FOR THE NORTH AND SOUTH WELLS

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3 MODULE 2: CONTAMINANT SOURCE INVENTORY

Module 2 includes a contaminant source inventory that identifies potential hazards (relating to land use or human activities) that could affect source water quality within the WPAs. The term "contaminant source" is defined in the Source-to-Tap Guideline to mean both actual, existing, and potential sources of contamination.

Associated conducted the contaminant source inventory by completing the following steps:

1. Reviewed existing records, including:
   - BC Contaminated Site Registry (Government of Canada 2021).
   - Historical aerial photographs of the District of Lake Country (BC Geo Image Finder, 2021).
   - Zoning maps of the District of Lake Country (DLC 2021a).
   - Utility Maps available through the District of Lake Country (DLC 2021a).
   - Ministry of Environment and Climate Change Strategy (ENV) Authorization Management System (ENV 2021c).
   - iMAPBC to identify all registered wells (ENV 2021a).
   - Relevant past reports (including Kala 2003, Kala 2009, and Golder 2011).
2. Conducted a field survey to identify potential contaminant sources.
3. Hold a workshop (Workshop 1) with the TAC to identify potential contaminant sources based on their knowledge of the project area and water system. This workshop will occur after the submission of the draft report.

Hazards were identified (Table 3-1 and Figure 3-1) based on the records review, field survey, and input from the TAC (October 12, 2021). Section 3.1 describes the general types of contaminants and hazards. Section 3.2 describes the methods used to identify specific hazards for this SAPP and provides the list of identified hazards.

3.1 Types of Contaminants

Each hazard is associated with one or more contaminants of concern. Contaminants can enter groundwater via direct entry (e.g., improper wellhead construction), through runoff and preferred pathways along the outside of the well casing (e.g., overland flow from residential properties, commercial businesses, roads, or farms), or subsurface flow (e.g., leaking sanitary line flow through groundwater).

A summary of typies of contaminants is provided in Appendix F. The types of contaminants include:

- Physical contaminants (e.g., turbidity);
- Microbial contaminants (e.g., pathogens, including viruses, bacteria, and protozoa such as *Campylobacter*, *Cryptosporidium*, and *Giardia lamblia*);
- Inorganic contaminants, including nutrients like phosphorus and nitrogen, metals, and salts;
- Organic contaminants like pesticides, herbicides, and hydrocarbons; and
- Disinfection by-products (DBP), including those produced by chlorination in the presence of organic carbon[5].

[5] E.g. Trihalomethanes and haloacetic acids.

3.2 Registered Contaminated Sites

Associated completed a review of the BC Contaminated Sites Registry on May 2, 2021. At the time of the search, 30 registered sites were identified within 5 km of the North and South Wells. Appendix G presents a summary of the registered contaminated sites. Of the 30 registered sites, only one site is located within WPA's C and D, and a further 17 registered sites are located just outside, and upgradient of WPA D. Detailed reports of each of these 18 registered contaminated sites are provided in Appendix G, and their locations are shown in Figure 3-1.

The registered site within WPA's C and D is identified as Site 4597. Site 4597 is located approximately 680 m southwest of the Property and is described as an underground storage tank that was replaced with an above-ground storage tank. The last update for the site was in 1998 and is registered as no longer active. Based on the length of time since the report and the inactive status since this time, we believe that Site 4597 is likely a low risk to the North and South Well.

Of the remaining registered sites upgradient of the North and South Wells, they are listed as either inactive or have details indicating that remediation work has been completed and no further action is required.

3.3 Hazards Within the Wellhead Protection Areas

On May 26, 2021, Tony Friesen, P. Geo., of Associated, and Keith Hanson of Alto completed a site reconnaissance to identify any additional potential sources of contamination, focusing on the industrial complex to the south of the Property. During this site visit, several hazards were identified and are summarized in Table 3-1 below. These hazards are shown in Figure 3-2.

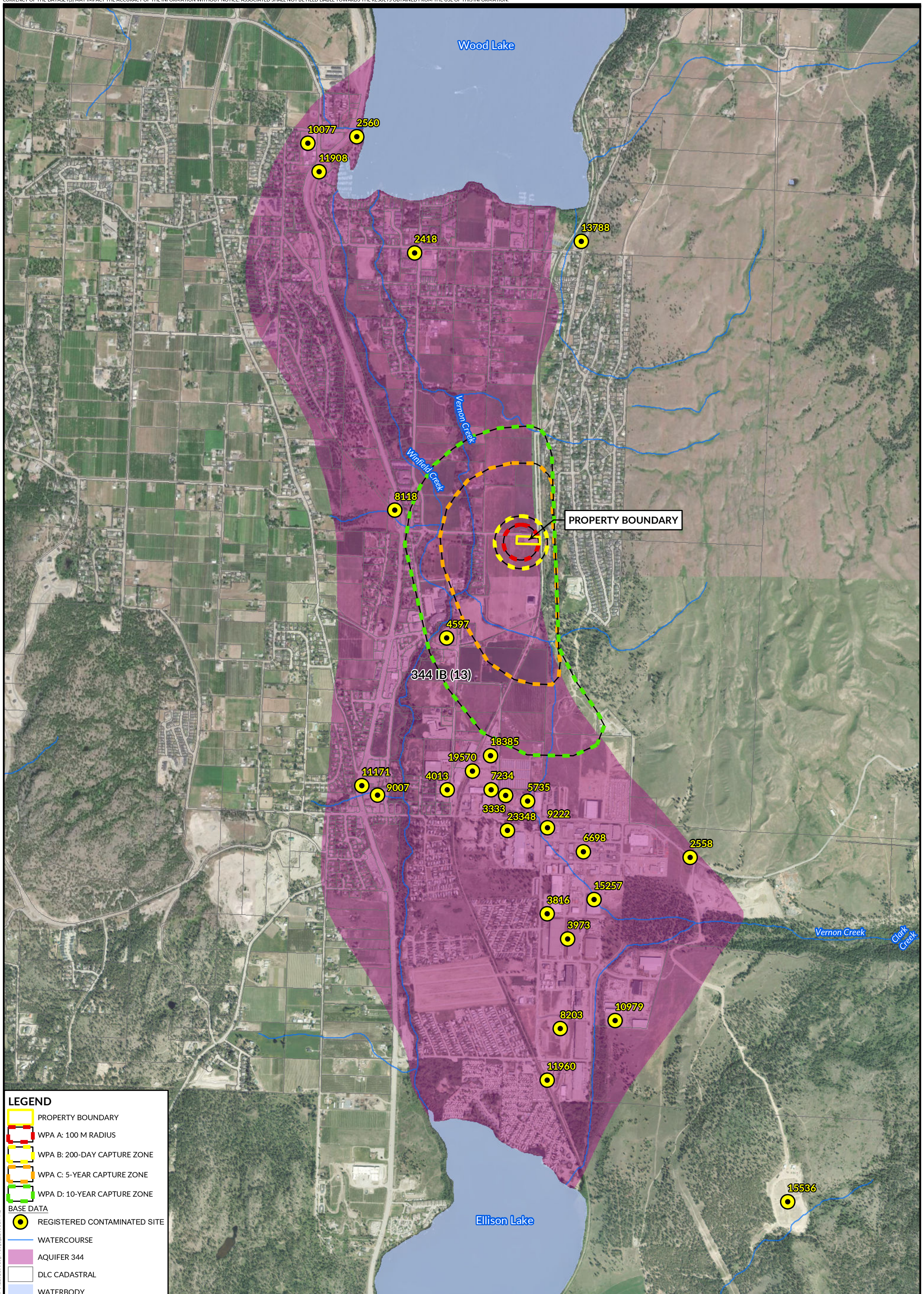

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FIGURE 3-1
LOCATION OF REGISTERED CONTAMINATED SITES

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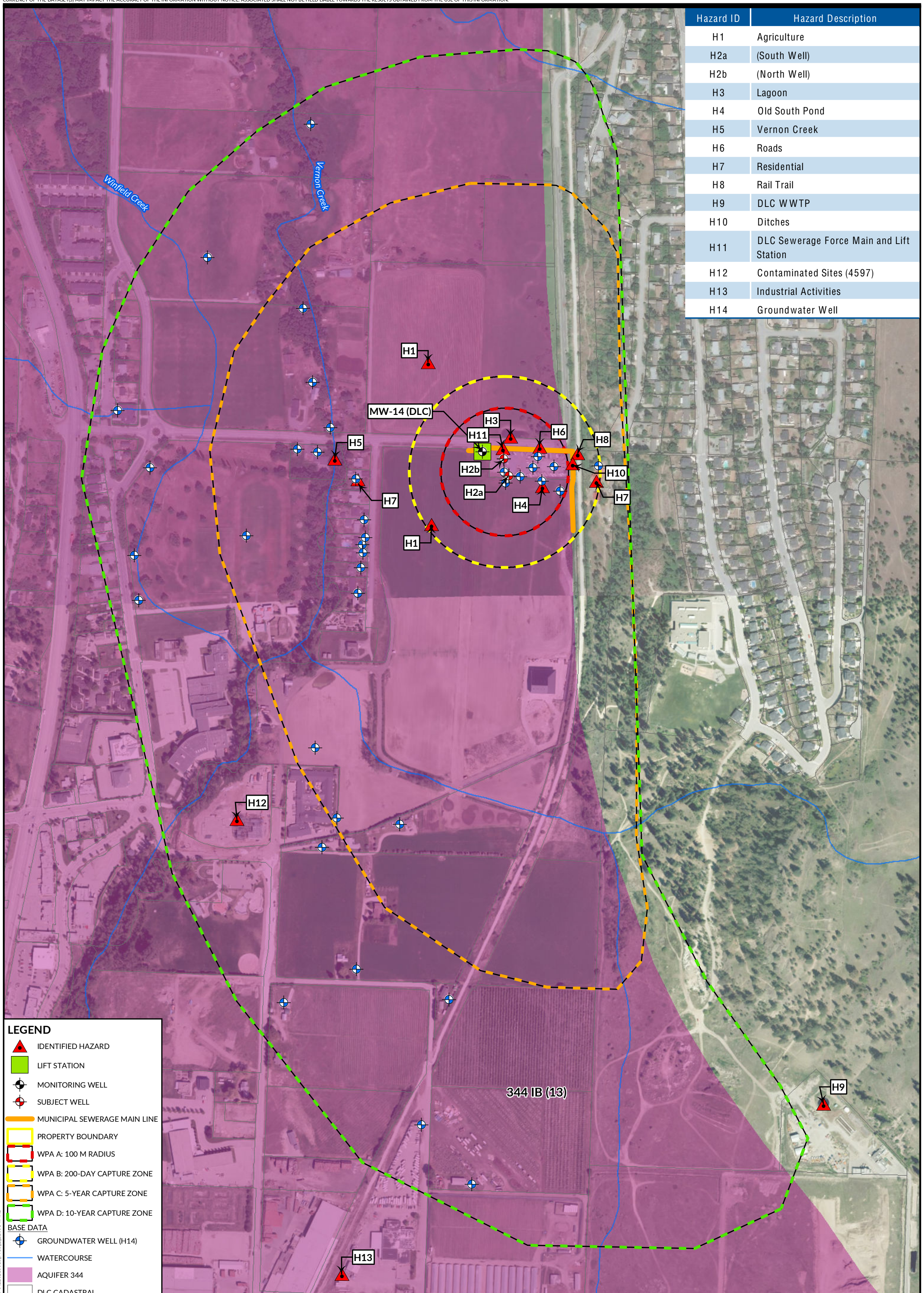
Table 3-1
Hazards Identified Within the Well Protection Areas

Hazard No.	Hazard	Hazard Description & Contaminants of Concern	Hazard Type	Well Protection Area[1]	Contaminant Transport Mechanism
H1	Agriculture	There is currently agricultural activity surrounding the Property on three sides. Agricultural activity includes livestock grazing and hay/alfalfa production. Contaminants of concern can include nutrients (mainly nitrate-N in groundwater), pesticides, and pathogens.	Agricultural	Areas A -D	Runoff and subsurface flow.
H2a	Direct and/or Near-Well Contamination – South Well	The South Well is located within a locked fenced compound that is not easily accessed. The well log indicates a proper well seal was installed when the well was constructed. Contaminants of concern resulting from direct entry (i.e., directly down the well casing) due to sabotage would vary. Contaminants of concern would typically be from nearby agricultural activities and can include nutrients, pesticides, and pathogens resulting from surface water ponding around the well.	Urban (sabotage) or Agricultural	Area A	Direct release into aquifer and then subsurface flow.
H2b	Direct and/or Near-Well Contamination – North Well	The North Well is located within the locked pump house within the fenced compound. The well log indicates a "mud seal" was installed, but it is unclear if this seal meets the requirements of the *Groundwater Protection Regulation*. Contaminants of concern resulting due to sabotage would vary. Contaminants of concern would typically be from nearby agricultural activities and can include nutrients (mainly nitrate-N in groundwater), pesticides, and pathogens. resulting from surface water ponding around the well.	Urban (sabotage) or Agricultural	Area A	Direct release into aquifer and then subsurface flow.
H3	Lagoon	There is a lagoon located approximately 30 m north of the North Well and 50 m north of the South Well, directly across Lodge Road. The lagoon is regularly used as a watering hole for cattle. The lagoon is approximately 11 m across and 40 m wide with an approximate depth of 1 m at the deepest point. The lagoon is fed by a small culvert that travels north under the road from east of the North and South Wells. Contaminants of concern can include nutrients, and pathogens including viruses.	Agricultural	Area A	Subsurface flow.
H4	Old South Pond	Historical air photos indicate a small pond located 15 m south of the South Well up until 2019. It is believed that at one time this pond drained through a culvert to the north into the lagoon across Lodge Road (H2). Since then, the pond has been filled with drain rock and a new 12-inch line has been installed draining to the south. It is not clear how far this drainage goes. Contaminants of concern would be similar to those affiliated with agricultural run-off; nutrients, pesticides, and pathogens.	Agricultural	Area A	Subsurface flow.
H5	Vernon Creek Flooding	Vernon Creek is about 220 m west of the Property. It flows from Ellison Lake (south) to Wood Lake (north). A stretch of Vernon Creek runs through the industrial park and agricultural land to south of the well site. Contaminants of concern can include industrial products such a petroleum or solvents, and potential agricultural contaminants including nutrients, pesticides, and pathogens.	Natural	Area C	Infiltration and then subsurface flow.
H6	Roads and Transportation Infrastructure	Lodge Road runs west to east approximately 15 m north of the North Well. There are currently no restrictions for dangerous goods that may be transported along Lodge Road. Contaminants of concern can include hydrocarbons and solvents from automotive spills, road salt, and stormwater runoff from adjacent agricultural fields (nutrients, pesticides, and pathogens).	Municipal	Area A	Infiltration and then subsurface flow.
H7	Residential Properties	The nearest residential property is 0.3 km to the east. Based on municipal mapping for the area, all homes within 300 m are currently connected to the District of Lake Country sewerage system and directed to the wastewater treatment plant. In the event that there are still some residences that opted out of connecting to the municipal sewer, we have included inadequate or improperly maintained septic systems as potential hazards. Some of the properties appear to have small-scale agricultural operations. Contaminants of concern can include nutrients, pesticides, and pathogens.	Residential	Area C	Infiltration and then subsurface flow.
H8	Railway	The old railway is located 115 meters east of the Property. The railway was originally built by CN Rail in 1925 and was in operation until 2013. At this time, the railway line is decommissioned, and the rails and ties removed. In 2016 the alignment was re-purposed into the "Rail Trail", a multi-use trail for pedestrians to bike/walk on. The Rail Trail was officially opened on September 27, 2018. Contaminants relating to the previous use of the trail are considered negligible since the rail and ties were removed (K. Wilkie, personal communication, 2022). There are likely no contaminants of concern from current use of the trail, but residual contamination from railway ties (i.e., hydrocarbons used in creosote) may still be present.	Transportation	Area B	Infiltration and then subsurface flow.
H9	Wastewater Treatment Plant (1 km south)	As per the DLC's Operational Certificate #14651 , the DLC is permitted to discharge up to 2,000 m^3/day of treated effluent to ground (ENV 2021c). The effluent is treated with tertiary treatment, so contaminants of concern associated with the wastewater treatment plant would be limited to nutrients such as nitrate. Unintentional spills occurring at the plant may include treatment chemicals. This hazard is outside of WPA Area D but has been identified for documentation purposes.	Commercial/Industrial	Outside Area D	Subsurface flow.

Hazard No.	Hazard	Hazard Description & Contaminants of Concern	Hazard Type	Well Protection Area[1]	Contaminant Transport Mechanism
H10	Nearby Ditches and Stormwater Discharges	There are ditches that run on either side of the Rail Trail. The ditch that runs on the west side of the rail trail flows into the ditch along Lodge Road before flowing into a culvert that runs north, into the Lagoon (Hazard H3). The water flowing in the ditches could potentially pick up contaminants from past railway use and any spills that have gone into the ditches along the road. Contaminants of concern can include hydrocarbons, solvents, nutrients, pathogens, pesticides, and sodium (from road salt).	Commercial/Industrial	Area A	Infiltration and then subsurface flow.
H11	Municipal Sewerage Force Main	There is a sewerage force main located along the south side of Lodge Road with a lift station 25 m northwest of the North Well. The sewerage line and lift station are within WPA A and B. The lift station is comprised of a pump and a standby diesel generator in the event of a power outage. The diesel generator has secondary containment for diesel fuel. The lift station has a flow meter, along with the flow meters at the wastewater treatment plant, which are used for comparison and leak detection. There is also a monitoring well (MW-14) located at the lift station that is 5.81 m deep. The well is installed above the confining layer of Aquifer 344 and is sampled quarterly for water quality to assess for changes that may be due to a leak in the lift station. As part of the DLC Capital Budget 2021, there is a plan to twin the force main with a new line that would run parallel to the existing line (DLC 2021b). The reasons for this are redundancy and to provide increased capacity. Furthermore, they intend to upgrade the standby diesel generator. In the event of a rupture, contents from the sewerage line could contaminate the aquifer with various untreated municipal wastewater contaminants. Contaminants of concern can include pathogens, nutrients (e.g., nitrate and phosphate), metals, as well as hydrocarbons and solvents.	Municipal	Area A	Infiltration and then subsurface flow.
H12	Contaminated Site Registry	A search of the BC Contaminated Site Registry indicates that there are 30 registered contaminated sites within 5 km of the wells. Of the 30 sites, only one is within the wellhead protection areas (WPA D, specifically), and is identified as Site 4597. Site 4597 is located approximately 680 m southwest of the Property and is described as an underground storage tank that has been replaced with an above-ground storage tank. The last update for the site was in 1998 and is registered as no longer active. On May 26, 2021, Tony Friesen of Associated and Keith Hanson of Alto completed a reconnaissance of each of the sites to get a better understanding of the current condition and land use at each location. During this time, none of the registered sites were noted to have any obvious additional concerns. Contaminants of concern can include hydrocarbons.	Commercial/Industrial	Area D	Infiltration and then subsurface flow.
H13	Industrial Activities	There are several industrial activities currently present upgradient of the North and South Wells, but outside of WPA D. Contaminants of concern are specific to each industrial operation, but the main ones are hydrocarbons, solvents, and possibly metals.	Commercial/Industrial	Outside Area D	Direct release into ground or runoff and infiltration, then subsurface flow.
H14	Groundwater Wells	Groundwater wells present hazards for aquifers since they provide direct conduits for contamination to the aquifer. In areas where confined aquifers exist, wells not constructed properly could pose a hazard since they may breach the confining layer. There are 39 registered wells within the wellhead protection areas. Contaminants of concern would be associated with agricultural, residential, or industrial land use, and can include hydrocarbons, solvents, metals, nutrients, and pathogens.	All	All	Infiltration and then subsurface flow.
H15	Future Development	Alto does not have control over development permits for the surrounding land. The current DLC Official Community Plan (OCP) (2018-2038) indicates that the land surrounding the subject wells is Agricultural and is used to graze cattle and grow forage (DLC 2019). Future land use is also expected to be agricultural. Contaminants of concern can be nutrients, pesticides, and pathogens.	Municipal	Areas A -D	Unknown.

Notes:

- Well Protection Area A: a 100 m area where the risk to the wellhead is highest.
- Well Protection Area B: a 200-day sub-surface time of travel capture zone used to protect against pathogenic contaminants (viruses, bacteria, and protozoa) and all chemical contaminants.
- Well Protection Area C: a 5-year sub-surface time of travel capture zone used to protect against all chemical contaminants (e.g., petroleum contaminants, and persistent, mobile contaminants).
- Well Protection Area D: a 10-year sub-surface time of travel capture zone used to protect against only the most persistent and mobile contaminants (e.g., chlorinated solvents and nitrates).



Hazard ID	Hazard Description
H1	Agriculture
H2a	(South Well)
H2b	(North Well)
H3	Lagoon
H4	Old South Pond
H5	Vernon Creek
H6	Roads
H7	Residential
H8	Rail Trail
H9	DLC WWTP
H10	Ditches
H11	DLC Sewerage Force Main and Lift Station
H12	Contaminated Sites (4597)
H13	Industrial Activities
H14	Groundwater Well

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0 50 100 150 200 m

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FIGURE 3-2
HAZARDS IDENTIFIED WITHIN THE WELLHEAD PROTECTION AREAS

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4 MODULE 7: CHARACTERIZE RISKS FROM SOURCE TO TAP

The purpose of Module 7 is to critically assess the adequacy of water protection barriers and assign risk levels to each hazard identified in Module 2. The TAC completed this step during a workshop held on October 12, 2021. The risk matrix provided in Module 7 of the Source-to-Tap Guideline was used to assign each hazard as low risk, medium risk, high risk, or very high risk (Section 4.1).

4.1 Risk-Ranking Framework

According to the Source-to-Tap Guideline, risk is defined as "the combination of the likelihood that a hazard will occur and cause harm, and the extent and degree of that harm" and can be quantitatively evaluated by multiplying the likelihood of a hazard occurring by the consequence of that hazard (MHLS 2010). Two ratings were applied to each hazard to determine potential risks:

1. The likelihood of occurrence (i.e., the probability the event occurs, and that if it occurs, will the contaminant migrate to the well intake); and
2. The magnitude of consequence if that event were to occur.

Tables 4-1 and 4-2 summarize how each level of risk is assigned using the likelihood of occurrence and magnitude of consequence matrices in MHLS (2010). Note the use of "and/or" in the definitions of the consequence levels (i.e., the occurrence of any one of the factors results in that specific level being assigned). Each hazard identified in Module 2 (Table 3-1) was assigned a likelihood of occurrence and magnitude of consequence score, and then risk was determined using the risk matrix (Table 4-3).

Table 4-1
Assignment of Risk Categories – Likelihood of Occurrence

Level	Description	Probability of Occurrence in Next 10 Years
A	Almost certain – is expected to occur in most circumstances	>90%
B	Likely – will probably occur in most circumstances	71–90%
C	Possible – will probably occur at some time	31–70%
D	Unlikely – could occur at some time	10–30%
E	Rare – may only occur in exceptional circumstances	<10%

Source: Source-to-Tap Guideline (MHLS 2010)

Table 4-2
Assignment of Risk Categories – Magnitude of Consequence

Level	Description
1	Insignificant – no illness, little disruption to normal operation, and/or little or no increase in normal operating costs
2	Minor – small population, mild illness moderately likely, some manageable operation disruption, and/or small increase in operating costs
3	Moderate – minor impact for large population, mild to moderate illness probable, significant moderation to normal operations but manageable, operating costs increased, and/or increased monitoring
4	Major – impact for small population, severe illness probable, systems significantly compromised and abnormal operation if at all, and/or high-level monitoring required
5	Catastrophic – major impact for large population, severe illness probable, and/or complete failure of system

Source: Source-to-Tap Guideline (MHLS 2010)

Table 4-3
Risk (Likelihood-Consequence) Matrix

Likelihood of Occurrence	Magnitude of Consequence				
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
A (almost certain)	Moderate	High	Very High	Very High	Very High
B (likely)	Moderate	High	High	Very High	Very High
C (possible)	Low	Moderate	High	Very High	Very High
D (unlikely)	Low	Low	Moderate	High	Very High
E (rare)	Low	Low	Moderate	High	High

Source: Source-to-Tap Guideline (MHLS 2010)

4.1.1 Sub-stage 2.5: Risk Ranking Results

Table 4-4 lists each hazard, the likelihood of occurrence and magnitude of consequence score, the risk rating based on that score, and the rationale behind each assigned risk. The purpose of the risk-ranking matrix is to provide a framework with which to identify the highest risks. Assigning scores is a qualitative and subjective process, and in many cases, it is difficult to accurately quantify the probability of an event occurring or the magnitude of the consequence. Furthermore, it is important to note that risks (as per Table 4-2) include those related to human health risk and/or risk of disruption to normal water system operations, increased maintenance, and increased monitoring (i.e., not all high risks necessarily present an immediate human health risk).

Table 4-4
Hazard and Risk Ranking

Hazard No.	Hazard Name	Likelihood Score	Consequence Score	Risk Ranking	Risk Ranking Rationale
H1	Agriculture	D (unlikely)	3 (moderate)	Moderate	Given the confined nature of the aquifer, the likelihood of occurrence would be **unlikely**. The contaminants of concern are nutrients (e.g., nitrate-N) and pathogens (e.g., bacteria and protozoa); however, the loading would be low, and as long as nitrates and *E. coli* and total coliforms are monitored in raw water quality regularly (e.g., once a quarter), the magnitude of consequence would be **moderate** (significant moderation to normal operations but manageable, operating costs increased, and/or increased monitoring).
H2a	Direct and Near-Well Contamination – South Well	E (rare)	4 (major)	High	The South Well has a locked well cap and is in a locked compound within a rural area. As a result, the likelihood of the well being sabotaged or vandalized is **rare**. The magnitude of consequence would largely depend on what was introduced into the aquifer. As such, the magnitude of consequence was ranked as **major**.
H2b	Direct and Near-Well Contamination – North Well	D (unlikely)	4 (major)	High	The North Well is in a locked pumphouse within a locked compound. The likelihood of the well being sabotaged or vandalized is lower than the South Well. However, the well log indicates that there is a 'mud seal' but there is no information on the thickness or depth of the seal. The material the concrete slab was poured over is also unclear. If the concrete was poured over gravel, any standing water, or spill material around the building could potentially migrate under the slab toward the well head. For these reasons, the likelihood of contamination is considered **unlikely**. Similar to the North Well, the magnitude of consequence would largely depend on what was introduced into the aquifer. As such, the magnitude of consequence was ranked as **major**.
H3	Lagoon	D (unlikely)	3 (moderate)	Moderate	Based on the review of aerial photos, the Lagoon has been present since before 1975 (Photo – 1975 -BC5659-220), and it is reasonable to assume that livestock have been using the Lagoon since then. As such, any contaminants from the Lagoon that could make it to the well intake would have been detected during existing water quality monitoring programs. In addition, there are several fine-textured layers that likely provide adequate protection from surface water influences (See GARP analysis in Section 6). As such, the likelihood of occurence is assessed as **unlikely**. If a contaminant (most likely a pathogen) arrived at the well, the magnitude of consequence would be **moderate** (significant moderation to normal operations but manageable, operating costs increased, and/or increased monitoring).
H4	Old South Pond	D (unlikely)	2 (minor)	Low	The south pond is very small and is hard to identify in the aerial photos. The likelihood of contaminants arriving at the well from this pond is **unlikely,** and the magnitude of consequence would be **minor** (some manageable operation disruption), most likely additional monitoring or improvements to the drainage system.
H5	Vernon Creek Flooding	D (unlikely)	2 (minor)	Low	Contamination from direct entry into the well was covered under Hazard 2. For this hazard, the focus is the risk of contaminants arriving at the well via groundwater flow. Based on the confined nature of the aquifer, the likelihood of occurrence is **unlikely**. The magnitude of consequence is **minor** because some additional (limited) monitoring may be required.
H6	Roads and Transport Infrastructure	D (unlikely)	4 (major)	High	Due to the thick confining layer and the small amount of commercial traffic on Lodge Road, the likelihood that contamination from this source would make it to the wells is **unlikely**. However, in the event of a hydrocarbon spill reaching the aquifer, the consequences would be **major** (systems significantly compromised or abnormal operation), because one well may need to be taken offline until the spill was remediated.
H7	Residential Properties	E (rare)	3 (moderate)	Moderate	The aquifer that the wells are completed into is confined, and the likelihood of contaminants reaching the well intake is considered **unlikely**. However, in the event this did occur, the consequence would be **moderate** (i.e., potential for illness and increased need for monitoring and treatment).
H8	Railway	E (rare)	2 (minor)	Low	There is a small possibility of persistent contaminants from past activity (e.g., creosote from railway ties). Since the railroad was built in 1925, the likelihood that a contaminant plume from this activity is still migrating towards the well would be **rare** (i.e., if creosote was a concern since 1925, it would have been noted in the wells by now). The consequence of contamination from creosote would be **minor** since the amount of creosote would be low. Risk from pedestrian use of the railway is also considered low.
H9	Wastewater Treatment Plant (1 km south)	E (rare)	3 (moderate)	Moderate	The treatment facility is upgradient and outside the 10-year travel time (WPA D), resulting in a **rare** likelihood of contamination occurring (only occurs in exceptional circumstances). If effluent was to migrate to the well, the consequence would be **moderate** since the effluent is treated with tertiary treatment and nutrient concentrations are reduced according to their Operational Certificate. Additional monitoring and/or treatment would still likely be needed.
H10	Nearby Ditches and Stormwater Discharges	D (unlikely)	3 (moderate)	Moderate	The likelihood of contaminants from the drainage ditches and stormwater discharges entering the aquifer is **unlikely** given the confined nature of the aquifer. The consequence from the potential contaminants would be **moderate** due to the short duration of contamination from point discharges.

Hazard No.	Hazard Name	Likelihood Score	Consequence Score	Risk Ranking	Risk Ranking Rationale
H11	Municipal Sewerage Force Main	D (unlikely)	5 (Catastrophic)	Very High	The likelihood of the sewerage force main leaking and causing contamination to Aquifer 344 is considered **possible** given the confined nature of the aquifer and the fact that the line is constructed from HPDE and was installed in 1998 (DLC 2021a). Furthermore, data provided by DLC indicates the presence of fecal coliforms at MW-14 in September 2021. DLC indicated that this result was a false positive, but further sampling should be done to confirm this (K. Wilkie, personal communication, 2021). Force mains can leak and can contain high viral loads as well as bacteria and pathogens that can cause severe illness to the population serviced by the utility. As a result, the magnitude of consequence is considered **catastrophic**.
H12	Contaminated Site Registry	E (rare)	4 (major)	High	The BC Contaminated Sites Registry identified one site within the wellhead protection areas, located approximately 680 m southwest of the Property. This site is registered as no longer active. The likelihood of an inactive contaminated site causing contamination to the source wells is **rare**, but the magnitude of consequence on an aquifer would be **major** given the long-term implications of certain contaminants (e.g., hydrocarbons) in groundwater.
H13	Industrial Activities	E (rare)	4 (major)	High	The majority of industrial activity is outside WPA D, and as a result, the likelihood of occurrence of notable contamination to the wells in the event of a spill is **rare**. For reasons similar to Hazard H12, contamination in aquifers from industrial land use could have long-term implications and would, therefore, have **major** consequences.
H14	Groundwater Wells	C (possible)	4 (major)	Very High	Groundwater wells are considered a risk due to the potential for improper construction and/or maintenance, leading to contaminants entering the aquifer through the conduit of a well or well annulus. There are 39 registered wells within the wellhead protection areas, so it is **possible** that one or more of them could contaminate the aquifer. The magnitude of consequence would vary from **minor** to **major**, depending on the land use surrounding the well (i.e., residential well would be minor while an industrial well would be major).
H15	Future Land Use	E (rare)	2 (minor)	Low	Future development would have to consider the presence of Alto Utilities and this SAPP, and as such, the likelihood of occurrence and magnitude of consequence would be **rare** and **minor**, respectively.

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5 MODULE 8: RECOMMENDED ACTIONS TO IMPROVE DRINKING WATER PROTECTION

The outcome of Module 8 is a series of recommendations for each moderate, high, and very high-risk hazard identified in Module 7. The recommended risk management actions follow the SMART (Specific, Measurable, Achievable, Realistic, Time-bound) principles outlined in Module 8 of the Source-to-Tap Guideline and are based on the **multiple barrier** framework[6] for source protection defined by the Canadian Council of Ministers of the Environment (CCME 2004), which considers practical and cost-effective methods to improve existing barriers or implementing new ones, where warranted. The suggested timeframes for risk management actions are presented in Table 5-1; however, the Source-To-Tap Guideline suggests that risk level is not the only factor to consider when prioritizing actions; ease of implementation can also be a factor to consider (MOHLS 2010).

Table 5-1
Suggested Time Categories for Risk Management Actions

Category	Timeframe	Type of Risk Management Action
Immediate	Within 3 months	Actions addressing regulatory violations, imminent public health threats, or water shortages.
Short Term	Within 1 year	Actions that are easy to implement or those addressing significant public health concerns or water quantity issues, enhancement, or weak barriers.
Medium Term	1 to 3 years	Actions addressing moderate water quality or quantity concerns, broad systemic issues.
Long Term	3 years +	Actions addressing hazards representing chronic health implications or long-term threats to water availability, broad systemic issues.

Source: MHLS 2010

5.1 Recommendations

Recommendations to specifically address the very high, high, and moderate risk hazards are provided in Table 5-2. Many of these recommendations will address more than one hazard, and the recommendations are grouped by implementation type. There are many ways in which source water protection can be strengthened, and recommendations should be reviewed periodically and be updated as new information becomes available.

An effective implementation strategy involves assigning roles and responsibilities, developing an implementation schedule, allocating resources, tracking progress, and regularly making improvements. The recommendations are categorized into the type of actions to assist with assigning roles and responsibilities, as summarized in Table 5-3.

[6] The multi-barrier approach is an integrated system of procedures, processes, and tools that collectively prevent or reduce the contamination of drinking water from source to tap, in order to reduce risks to public health.

Table 5-2
Implementation Description for the Different Types of Actions

Type of Action	Description	Lead Group	Example Partnerships
Engagement	Alto Utilities is a privately owned utility and does not have any direct control over the development of bylaws or policy regarding land use planning within the DLC. However, Alto can work with Provincial and DLC staff and local businesses to consider drinking water risks when making decisions.	Administration	District of Lake Country, IHA, FLNRORD
Public Awareness	Improving public awareness of the water source is a key recommendation of this SAPP, as everyone (e.g., regulators, residents, business owners, and tourists) has a role in source water protection.	Administration, Planning, and/or Communications	District of Lake Country, FLNRORD
Capital Works and Operations	Hazards can be addressed through infrastructure management, capital projects, and ongoing operations. For example, treatment for viruses would help reduce the magnitude of consequence of the forcemain hazard (with pathogens, including viruses, being the main contaminant of concern)	Operations	Associated
Source Water Monitoring Programs	Water quality monitoring programs to date indicate that well water quality is relatively good, but conditions may change in the future with increased development and climate change. Regular monitoring for bacteriological indicators, nutrients, and metals (for example) will help determine whether water quality is changing over time, and can provide early indicators of future issues.	Operations	Associated, District of Lake Country
Legislation, Policy, and Community Groups	The risk of some hazards can be addressed more broadly through legislation (e.g., bylaws), policy, or by supporting non-profit community groups. One key mechanism through which local governments can address and promote source water protection is through land use planning and development. Alto Utility can work with the DLC to develop the districts' Official Community Plan (OCP), which is a bylaw enacted by local government to outline community goals and objectives and develop policies to guide decisions on land use management and planning. Once adopted, any bylaws or works the Board of Directors (or Council) undertake must be consistent with the policies and objectives identified in the OCP. The Groundwater Bylaws toolkit developed by the OBWB is a valuable resource to help develop this framework: https://www.obwb.ca/library/groundwater-bylaws-toolkit/	Administration and/or Planning	District of Lake Country
Improve Emergency Preparedness	Many hazards cannot be prevented completely, such as a wildfire or major fuel spill in the well protection area. In these cases, risk is addressed through emergency preparedness and response planning	Administration	Local emergency services

Table 5-3
Risk Management Actions and Implementation Strategy for High and Moderate Risk Hazards

Hazard No.	Hazard	Risk to Drinking Water	Recommended Action	Recommended Timeframe
H1	Agriculture	Moderate	• Consider developing a technical memorandum outlining the risks that agricultural areas pose on water supply wells. Include best management practices, and make available for producers farming within the Aquifer Protection Area. The memorandum would provide some background on the local aquifers and the risks to aquifers from agricultural properties, identify the capture zones, and provide recommendations on best management practices (e.g., see BC Environmental Farm Plan and BMP Guides at http://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/programs/growing-forward-2/environmental-farm-plan). • Provide the tech memo to the surrounding landowners to increase awareness of the potential impacts they may be having.	1 to 3 years
H2a	Direct and Near-Well Contamination – South Well	High	• Develop a plan to carry out regular perimeter fence inspections and check the well caps and surface seal for evidence of tampering. • Conduct regular water quality monitoring (e.g., bacteriological indicators, nutrients, and metals). • Develop an emergency response plan to address the unlikely event that flooding impacts the Property. • During spring freshet, conduct frequent inspections of the South Well.	Within 3 months
H2b	Direct and Near-Well Contamination – North Well	High	• Develop a plan to carry out regular perimeter fence inspections and check the well caps and seal for evidence of tampering. • Develop an emergency response plan to address the unlikely event that flooding impacts the Property. • During spring freshet, conduct frequent inspections of the North Well. • Review the recommendations as laid out in the GARP Assessment for the well (Section 6 and 7) and develop an action plan.	Within 1 year
H3	Lagoon	Moderate	• Suggest the landowner of the lagoon erect a fence around the lagoon and set up a different system to water his livestock. • Work with the DLC to ensure they complete regular inspections of the ditches and culverts in the area and keep them free of debris to allow water to flow freely in and out of this pond area.	1 to 3 years
H5	Vernon Creek Flooding	Moderate	• Develop a plan to conduct regular groundwater quality monitoring (e.g., nutrients, anions/cations, general metals) to assess changes in water recharging the aquifer.	Within 1 year
H6	Roads and Transportation Infrastructure	High	• Share the SAPP with DLC. Continue to keep the access road gated and locked. Clearly post the well number and an emergency contact number on the well house. Discuss options with the DLC to update their Emergency Response Plan to include the Well Source Assessment and Protection Plan (which would include well logs for the North and South Wells in its appendix).	Within 1 year
H7	Residential Properties	Moderate	• Map out existing onsite septic systems and if they are in operation. For those upgradient and within 200 m of the Property, interview the homeowners and try and determine the level of treatment and condition of each system. If no septic systems exist, this hazard can be removed.	Within 1 year
H9	Wastewater Treatment Plant (1 km south)	Moderate	• Continue to monitor the water quality in the North and South Wells (e.g., nutrients) and have this data reviewed on an annual basis. • Request that the DLC alert Alto Utilities if there is a problem. • Share this SAPP with the DLC and increase awareness of policy makers of the Utility and the protection measures that are in place.	Within 1 year
H11	Municipal Sewerage Force Main	Very High	• Request DLC provide the well construction log for MW-14. Have a qualified professional review the log to confirm it is installed above Aquifer 344. • Request the DLC completes monthly sampling (as opposed to quarterly) to better understand the changes in water quality and provide for earlier detection of a leak, based on the presence of total and fecal coliforms at MW-14. Water sampling should focus on bacteriological indicators since there is no commercially viable way to sample for viruses at this time. • Alternatively, Alto could install a pair of monitoring wells at the northwestern corner of the Property (i.e., between the production wells and the lift station). The wells would be installed above and below the confining layer with exceptional care to ensure the confining layer is re-established once installation of the deeper well has been completed. These wells would be sampled monthly for bacteriological indicators to compare water quality of the upper and lower aquifers. • Consider treatment of the North and South Wells for bacteria and pathogens (including viruses).	Within 3 months to 1 to 3 years
H12	Contaminated Site Registry	High	• Complete a yearly review of the contaminated site registry and identify any new site added or changes to existing sites that may have resulted in an increase risk to the subject wells.	Within 1 year
H13	Industrial Activities	High	• Request that DLC make Alto aware of any new plan or permit that may result in an increase risk to Aquifer 344.	Within 3 months
H14	Groundwater Wells	Very High	• Continue water quality monitoring as recommended in other hazards above (i.e., H2, H4, H10). Unfortunately, every groundwater well within the WPA cannot reasonably be inspected.	Within 3 months

6 GROUNDWATER AT RISK OF PATHOGENS - SCREENING AND ASSESSMENT

6.1 Methods

Associated used the BC Ministry of Health *Guidance Document for Determining Groundwater at Risk of Pathogens (GARP)* (the GARP Guideline) (Ministry of Health 2017). The GARP Guideline outlines four stages for developing a GARP determination:

Stage 1 - Hazard Screening and Assessment
Stage 2 - GARP Determination
Stage 3 - Risk Mitigation
Stage 4 - Long-term Monitoring

In Stage 1, the water source is screened for 13 hazards. Hazards identified as being present are then considered individually and assessed as to whether the hazard makes the source potentially GARP. In Stage 2, the hazards that are deemed to potentially make the source GARP are reviewed to make an overall determination if the source is GARP or at low risk of containing pathogens. If determined to be GARP, the guideline transitions to Stage 3 and mitigation measures put in place, either through water treatment or by addressing the specific hazard. All water systems move to Stage 4: Long-term Monitoring.

To complete the GARP determination, an understanding of the water source is required. Depending on the complexity of the water source, up to three levels of investigation are completed:

Level 1 – Existing records and field inspection
Level 2 – Preliminary hydrogeological investigation
Level 3 – Detailed hydrogeological investigation

This study involves a Level 3 investigation, and comprises the following tasks:

1) Review geology maps, soil maps, well logs, topographic maps, and aquifer mapping data to understand the aquifer setting (presented in Sections 2.6 and 2.7).
2) Review previously summarised water quality data and well protection areas for the wells (presented in Sections 2.8 and 2.9).
3) Use information gathered during prior investigations to assess the condition of the wellheads and identify potential GARP sources such as: septic systems, animal enclosures, and hydraulically connected surface water (Section 3).
4) Prepare a revised GARP Screening and Assessment Field Form based on results of tasks 1, 2, and 3 above, and complete a GARP Determination.
5) Make recommendations to mitigate risks and develop long-term monitoring.

6.2 GARP Screening

Hazard screening involves a review of the well's water quality, source type and location, construction, and aquifer properties to assess if any site-specific properties meet the GARP Screening Criteria provided in the GARP Guideline. The GARP Determination Field Form, which summarises the revised Stage 1 screening and assessment for all of the hazards, is provided in Appendix G. Hazards that are considered "present" are summarized in Table 6-1.

Table 6-1
GARP Screening Summary for North and South Well

Hazard	North Well	South Well
Hazard B4: Well is located within 300 m of a source of probable enteric viral contamination without a barrier to viral transport	Present	Present
Hazard C1: Well does not meet the *Groundwater Protection Regulation* (B.C. Reg. 39/216) for surface sealing	Present[1]	Not Present

Note:
Well log for the North Well indicated "Mud seal" is present, however the well was drilled in the 70's, prior to the time when the GWPR required a surface seal and it is not known how deep the seal goes.

Each of these hazards that were screened as present were further assessed during the hazard assessment (Section 6.3).

6.3 GARP Hazard Assessment

To aid in the assessment portion of Stage 1 for several hazards, a limited subsurface filtration capacity study was completed, which is based on Section A3.1 of "Part B:6 Drinking Water Treatment Objectives (Microbiological) for Ground Water Supplies in British Columbia" of the "Drinking Water Officers' Guide" (MOH 2017). Tasks included:

- Reviewing the water quality, including turbidity and MPA results (Section 2.8);
- Reviewing capture zones completed as part of SAPP (Section 2.9);
- Reviewing well logs; and
- Collecting aerobic spore forming bacteria samples from the pond north of the Property from both North and South Wells.

Capture Zone Summary

For the purposes of the GARP discussion, only hazards related to pathogens were considered. The GARP Guideline recommends a capture zone distance equal to 200 days when assessing risk from pathogens (MOH 2017). For these wells, the 200-day capture zone involves a radius of approximately 150 m from each wellhead. The hazards related to pathogens identified within this zone are contaminants from nearby livestock and agricultural land, from the lagoon to the north of Lodge Road, and the municipal sewerage force main that runs east-west on the south side of Lodge Road.

Water Quality Review

Water quality is discussed in detail in Section 2.8. The findings are summarized as follows:

- All groundwater data reviewed between 2009 and May 2021 indicate that total coliforms and *E. coli* are not present (Appendix D; Table D-1).
- Average daily turbidity recorded via an inline turbidity meter reviewed between January 1, 2021 and May 31, 2021 is typically below 0.2 NTU, although one spike (daily average of 0.946 NTU) was recorded on April 6, 2021. Increases in turbidity tend to occur when the system switches between pumps. Manual turbidity readings should also be collected to confirm the results of the in-line turbidity meter.
- Microscopic particulate analysis (MPA) completed in March 2007 (Kala 2009) indicate both of the wells are at low risk for surface water contamination.

- Aerobic spore results indicated that there is a minimum of a 4-Log removal of bacteria occurring between the nearest surface water body and the well intakes.
- Both North and South Wells typically exceed the GCDWQ AO for TDS and manganese. The North Well also consistently exceeds the health-based GCDWQ MAC for manganese. Manganese can be naturally occurring and variable in sand and gravel aquifers, which is likely why there is some variability in concentrations between the North and South Well.
- Nitrate (as N) concentrations in both wells are below the GCDWQ MAC (10 mg/L) for samples collected between March 31, 2020 and June 14, 2021.

Well Log Review

Both wells are installed in provincially-mapped Aquifer 344; a confined sand and gravel aquifer. The North Well has a substantial confining layer, with 7.62 m of silt and clay between 5.49 and 13.11 m bg and clay with gravel from 13.11 m to 18.90 m bg, for a total of 13.41 m of confining material. The South Well has silty clay, silty sand, and firm clay from surface to 16.15 m bg. While the confining unit is thick at these two locations, there is some variability in the lithology at the Property.

6.4 GARP Determination

At the GARP screening stage of the GARP assessment, two hazards were identified that could indicate that the wells were 'at-risk' for pathogens. Based on the results of the GARP Screening and Assessment, we determined that both wells were at low risk for pathogens, but there is insufficient data to conclude that they are not at risk for viruses until further information is gathered. Therefore, we propose to classify both wells as "**At Risk (GARP-viruses only)**". The following sections summarize the results of the assessment, and recommendations for mitigation for each hazard that was screened as "present" at the screening stage.

6.4.1 South Well

Hazard B4: *Located within 300 m of a source of probable enteric viral contamination without a barrier to viral transport.*

This hazard refers to the lagoon and muncipal sewererage force main located north of the Property. The lagoon is used for livestock watering, is likely to contain enteric viruses originating from this use, and is located approximately 50 m from the South Well, within the 200-day capture zone. The well log indicates approximately 16.15 m of confining material, with 3.04 m of firm clay above the aquifer. The well log, in conjunction with the acceptable water quality results over the years (*E. coli*, total coliform, MPA, and aerobic spore forming bacteria), indicate that the well is at "low risk" to bacteria and protozoa.

However, a low risk to bacteria and protozoa does not indicate a low risk to viruses, as viruses can travel much further in the subsurface than *E. coli*, *Giardia*, and *Cryptosporidium* (Borchardt et al. 2007). The variability in the confining layer (13.41 m in the North Well and 16.15 m in the South Well) suggest that it may not homogenous and could be thinning to the north.

Further investigation could be conducted to re-assess this GARP classification, including:

1. Seasonal viral testing of the South Well four times in one year. This would assess the existence of viruses originating from the north lagoon, as we predict that if there are viruses from this source, they would be present in the aquifer already, given its proximity. This investigation does not rule out the high risk posed by the municipal sewerage force main.

2. Drilling three monitoring wells around the Property to confirm the thickness of the aquifer in the vicinity. If the confining layer thickness is not compromised within the 200-day capture zone, there would be better evidence to suggest a barrier to viral transport exists. Prior to completing this investigation, we'd need to understand the depth of the municipal sewerage force main. If the sewer main were installed below the confining unit, it would always remain a high risk.

6.4.2 North Well

***Hazard B4**: Located within 300 m of a source of probable enteric viral contamination without a barrier to viral transport.*

This hazard refers to the lagoon located 30 m to the north of North Well and the municipal sewerage force main. The lagoon is used for livestock watering and therefore likely contains pathogens. The well log for the North Well indicates approximately 13.41 m of confining material above the aquifer. The well log, in conjunction with the acceptable water quality results over the years (*E. coli*, total coliform, MPA, and aerobic spore forming bacteria), indicate that the well is at 'low risk' to this hazard. However, as stated above, a low risk to pathogens does not indicate a low risk to viruses.

A similar work plan as that outlined in Section 6.4.1 could be completed to re-assess the GARP classification for the North Well.

***Hazard C1**: Does not meet the Groundwater Protection Regulation for surface sealing.*

The *Groundwater Protection* Regulation requires that wells installed by drilling and driving casing must have surface seals that are at least 1 m in length to reduce the likelihood of surface water contaminating the aquifer. The well log for the North Well (Appendix C) indicates that a 'mud seal' was installed, but it does not indicate the length. However, the acceptable water quality observed at the well over a long period of record and the fact that the well is situated inside of a building with a roof suggests that no surface water could reasonably enter through the annulus of the casing, or along the outside of the casing and then in through the screen. Therefore, the well is considered at 'low risk' to this hazard.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Source Assessment and Wellhead Protection Plan

A Source Assessment and Wellhead Protection Plan was completed for Alto Utilities, focusing on the North and South Wells (WTN 83230 and WTN 83017, respectively). The assessment followed Modules 1, 2, 7, and 8 of the Ministry of Health Source-To-Tap Guideline (MOHLS 2010). The other modules related to financial and governance aspects of the water system are being managed by Alto.

Potential sources of water contamination (hazards) were identified by reviewing available reports, conducting interviews, and by completion of a site visit by Tony Friesen, P.Geo. A meeting was held with the Technical Advisory Committee on October 12, 2021. During this meeting, each hazard was discussed and hazard ratings were developed based on likelihood of occurrence and magnitude of consequence. Associated reviewed these hazards after the meeting to confirm the hazard risk ratings and develop recommendations for hazards listed as moderate, high, or very high (Table 5-2). The recommendations from these risks are summarized in Table 7-1 below.

Table 7-1
Recommendations for Key Hazards Identified

Timeframe	Recommendation	Hazard(s) Addressed
Within 3 months	Request that the DLC sample MW-14 immediately to determine if the September 2021 fecal coliform results are accurate. If they will not, request they allow Alto's qualified professional to sample.	H11 – Municipal Sewerage Force Main
Within 3 months	Develop a plan to conduct regular inspections of the North and South Well (e.g., well cap, perimiter fence).	H2a/b – Direct and Near-Well Contamination (North and South Well) H4 – Vernon Creek Flooding
Within 3 months	Develop a plan to conduct regular sampling of the North and South well for bacteriological indicators, nutrients, metals, and cations/anions.	H2a/b – Direct and Near-Well Contamination (North and South Well) H4 – Vernon Creek Flooding H9 – DLC Wastewater Treatment Plant H11 – Municipal Sewerage Force Main H14 – Groundwater Wells
Within 3 months	Share the SAPP with DLC and recommend they consider it for land use planning, wastewater treatment plant, and sewerage forcemain/lift station. Further, work with the DLC to ensure ditches around the Property remain free of debris to allow water to flow readily and not pond.	H6 – Roads and Transportation Infrastructure H9 – DLC Wastewater Treatment Plant H11 – Municipal Sewerage Force Main
Within 1 year	Develop an Emergency Response Plan.	H2a/b – Direct and Near-Well Contamination (North and South Well)
Within 1 year	Complete yearly reviews of the BC Contaminated Sites registry to identify new sites within the WPAs.	H12 – Contaminated Sites Registry H13 – Industrial Activities

Timeframe	Recommendation	Hazard(s) Addressed
Within 1 year	Retain a qualified professional to develop a treatment plan for the North and South Wells for bacteria and pathogens (including viruses) as well as for manganese.	H2a/b – Direct and Near-Well Contamination (North and South Well) H3 – Lagoon H5 – Vernon Creek Flooding H7 – Residential Properties H11 – Municipal Sewerage Force Main H14 – Groundwater Wells
Within 1 year	Install a pair of monitoring wells (one above Aquifer 344, and one within) at the northwest corner of the Property to assess for influences resulting from the sewerage force main/lift station.	H11 – Municipal Sewerage Force Main
1 to 3 years	Develop a technical memorandum outlining risks that land uses pose on the aquifer and distribute to agricultural landowners.	H1 – Agriculture H14 – Groundwater Wells
1 to 3 years	Request that the landowner north of the Property erect a fence around the livestock watering hole and set up a different method for livestock watering.	H3 - Lagoon
1 to 3 years	Determine if septic systems exist within 200 m of the Property. If none do, this hazard can be removed.	H7 – Residential Properties

7.2 GARP

The GARP Guideline allows for wells to be assessed either as:

- At-risk (GARP) to both viruses and protozoa
- At risk (GARP-viruses only)
- At low risk (to both viruses and protozoa)

Based on this GARP Screening and Assessment, the South Well was determined to at risk (GARP-viruses only). This determination is supported by the following evidence:

- The south well has consistently had low levels of turbidity (<1 NTU) when tested.
- The MPA results indicate a low risk rating for the south well.
- The well log indicates that the well was constructed to meet all GWPR which includes a surface seal.
- If the municipal sewerage force main leaks (Hazard H11), it could result in contamination of the upper aquifer, which may result in contamination of Aquifer 344 if the confining unit is at all compromised (e.g. by the potential lack of well seal at the North Well).

Based on this GARP Screening and Assessment, the North Well was determined to be at risk (GARP-viruses only). This determination is supported by the following evidence:

- The installation of a clay surface seal was not regulated when the North Well was drilled and the well log is unclear as to the depth of the 'mud seal'.

- If the municipal sewerage force main leaks (Hazard H12), it could result in contamination of the upper aquifer, which could then migrate to the wellhead and make its way down to the lower confined aquifer if the well seal isn't adequate.

Options to address the GARP determinations presented in this report include:

1. Drill a new well following the GWPR to replace the North Well. There is no guarantee that this new well will be free from manganese or virus concerns, and treatment may still be required.
2. Complete a multi-year water quality monitoring program and detailed sanitary survey to gain more information about the risk to Aquifer 344 from viruses. However, the GARP determination following this additional information may still yield an "at risk for viruses" determination.
3. Hire a qualified well driller to excavate around the well casing of the North Well to install an adequate surface seal. However, this is not likely reasonable to do so given access and costs.
4. Retain a qualified professional to design a treatment plant to provide 4-log removal of viruses.

Given the information we have reviewed to date and the hazards present, both wells have been assessed as "groundwater at risk of pathogens – viruses only". We recommend that these water sources be treated to provide 4-log removal of viruses. As such, we recommend Alto retains a qualified professional (e.g., Professional Engineer with expertise in water treatment) to design a treatment plant that meets the BC treatment objectives for supplies that are "at risk of containing pathogens - viruses only" (MOH 2015).

Furthermore, treatment to address the elevated manganese in the North Well should be implemented. Alto should consult with a qualified professional to determine treatment options to address these concerns.

A successful treatment plant can provide a multi-barrier approach which can address the GARP determination as well as reduce the risks associated with several hazards identified in Table 7-1, including: H2a/b (Direct and Near-Well Contamination), H3 (Lagoon), H5 (Vernon Creek Flooding), H7 (Residential Properties), H11 (Municipal Sewerage Force Main), and H14 (Groundwater Wells).

CLOSURE

This report was prepared for the Alto Utilities Ltd. The report presents the results of the Alto Utilities Source Water Assessment and Wellhead Protection Plan, following Modules 1, 2, 7, and 8 of the BC *Comprehensive Drinking Water Source-to-Tap Assessment Guideline*. Further, this report presents the result of the Groundwater at Risk of containing Pathogens determination for the North and South Wells.

The services provided by Associated Environmental Consultants Inc. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,
Associated Environmental Consultants Inc.

12-MAY-2022

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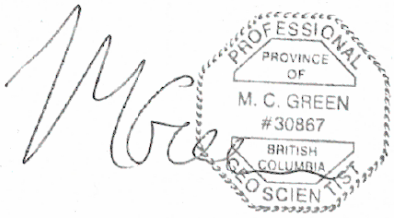
Hydrogeologist

Responsible for:
Source Assessment and Wellhead Protection Plan



2022-05-12

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Responsible for:
GARP Assessment and Determination

PERMIT TO PRACTICE
1001754

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Wilkie, K. Utilities Manager, District of Lake Country. November 22, 2021. Personal communication (email) with Keith Hanson of Alto Utilities.

Wilkie, K. Utilities Manager, District of Lake Country. January 5, 2022. Personal communication (email) with Tony Friesen of Associated Environmental Consultants.

APPENDIX A - TAC RECORD OF MEETING AND COMMENT FROM DISTRICT OF LAKE COUNTRY

Associated Environmental | AN ASSOCIATED ENGINEERING COMPANY

RECORD OF MEETING

Date:	October 12, 2021	**File No.:**	2021-8810
Time:	09:00 – 12:00	**Location:**	Teams Meeting (Online)
Client:	Alto Utilities Ltd.	**Project Name:**	Alto Utilities Source Water Assessment and Wellhead Protection Plan
Subject:	Technical Advisory Committee Workshop: Identify Drinking Water Hazards and Characterize Risks		
Attendees:	Keith Hansen (Alto Utilities) Mark Ecker (FLNRORD) Judi Ekkert (IHA)	Tony Friesen (AE) Mike Weldon (AE) Marta Green (AE)	
Distribution:	Those Present		

This Record of Meeting is considered to be complete and correct.

Action by	Discussion:
Tony Friesen	**1 WELCOME AND INTRODUCTIONS**

- Keith: owns and operates the utility. Judi has started Keith on this process. Keith explained it's been great to get to know Tony, but also to learn about the aquifer, know where the water source is coming from, plan long-term for Alto's financial well-being.
- Mark: work with FLNRORD. Water allocation. Deal with licensing, surface and groundwater. Recalls working with Alto so probably granted a licence.
- Judi: last name spelt Ekkert. Judi explained she works with large water systems, down to border and out to Princeton. Great opportunity for Keith to learn more about the wells at Alto. Judi explained she knows it's been a long drawn out process in a way, but it's always about bringing the pieces together, and there's been three owner changes. Also great timing to do this project with respect to licensing and proposed development, and getting to know more about the system so we can make decisions about more treatment or improved monitoring. Great to have Mark Ecker here, to speak to improved monitoring for this aquifer.
- Mike Weldon – hydrogeologist, worked on many Source protection plans when I was in BC, been in Calgary three years. Worked lots with Marta and Tony.
- Marta – Senior Hydrogeologist, add value around transport of pathogens, particularly viruses, and also help with brainstorming some actions.

Tony Friesen
Mike Weldon

2 PROJECT RECAP

- Tony went through the Alto utility. Judy asked about 400 people or 400 connections. Tony answered: 400 connections.
- Tony went over the Source to Tap method. Judy added that IHA usually explain Modules 1,2,7,8. It's not that the others aren't important. We often work with water suppliers on the other components. The overall goal, is to put it all together. This will help to gather information about treatment objectives, or operator training. So just because we don't say you don't need to do the other sections. If there's an issue, I do ask for other sections to be done. As information becomes available, I use that to highlight if something might have been overlooked. So it's not just doing these, but the water supplier can collect information on the other modules, we just request these four modules to meet schedule and budgeting

Action by **Discussion:**

constraints, get the ball rolling.

- Mike then went over a brief summary of the aquifer in question, 344.
- Confined aquifer, sand and gravel, located just above the bedrock in the valley bottom. Fairly thick succession of clays. Wells North well: 26m, South well: 30m. North well 1977. South Well 2002 with Kala's oversight. Groundwater flow in the aquifer is understood to flow from South to North towards Wood Lake. Some discussion in literature aquifer flows under Wood Lake and discharges to Kalamalka Lake. For our purposes looking for contaminants from South.
- Followed Ceric and Hatjema method: it suggests whether to use circular method, an ellipsoid (flattened circle elongating in direction of travel), or Boat method. Anything beyond bow of that boat is too far to cause flow back towards the well. When we plotted it up, the Northern section 40m downgradient, and that the lateral extents only went 100 to 120m east-west. But we know from the pumping tests, well interference exists 400m away. So used the circular method. As cone of depression expands during pumping, once it reaches the bedrock it'll be a "no flow zone" and will take water from the other directions. The figure shows the elongated capture zones. Eastern extent goes to end of aquifer boundary, and then all the way to the south. Each of these capture zones, show a time of travel. Aquifer Protection Area A: 100m, most important, and around every well-head. 200-day: yellow circle, a radius of 150m, and then 5-year (red) and 10-year (green) extent substantially further.
- Tony went through methods for identifying hazards, and went through the hazards.
- Hazard H2a Ponds: Keith talked about the sewage being old. Still run-off form the hill, still does feed the North Pond. Slows down in summertime, but running right now. Judi suggested for Keith to take notes on that. What is the infill to that pond. One of the questions Marta had: what happened during the 2017-2018 flooding, if you have any information during that worst case scenario. If you didn't have flooding, that's good to know. If you did have flooding, that's good to know too. If you are having flow now after one of the driest summers, that'll be useful for our monitoring planning that we are doing now. ***AI: Tony to add Flooding as a hazard.*** Keith explained just a bit more about the mechanisms: ditch on both sides of rail lines. The water coming through the culvert underneath the railway exists a small ditch on west and then flows North and South. Seems to split. Flows North into that pond, North of Alto's well site. Some of it that also flows south, and will be captured by this new capture reservoir that's been put in. I've never seen it at creek levels, something at peak at 10 gpm. Tony says that would be interesting: integrated sample of the railway ditches.
- Hazard H3: Roads and transportation: Lodge Road. Mike asked if dangerous goods are allowed on that road. Judy asked where that road goes. Tony explained it goes east-west to the north of the Property and then heads north along the western edge of the valley bottom. Not sure if still called Lodge Road. Changes to Oyama Road. Does act as a thorough fare road. Definitely sees it's traffic and lots of residents of Alto use that road if coming from Kelowna. Judy asked, how are the residents of the new development? Keith said from Lake Country proper. Bottom Lake Road and northwards. The access to that is separated by lodge road by about a kilometer.
- H5: residential properties. Tony explained these can sometimes have backyard garages. Tony explained he also reached out to District of Lake Country to be part of this process. They didn't

Action by **Discussion:**

seem interested. Tony still wants to talk to their engineers. Judy agreed, make sure that you copy me when you email them with the questions. We can bring them in at a later date, and also for them to fact check those gaps now. And I will also ask them to provide that info. Identify the gaps that you'd like them to fill. Also try later on to have them to participate in the source protection planning. Tony said he would appreciate that. Keith asked if Judy knew who to contact. Judy said Tony has contacted the right people. She knows there are lots of people busy, but hopefully if we give them more opportunities they can add their comments to fill the gaps. ***AI: Tony to work with Judy on reaching out to Lake Country.***

- H8: discharge a lot of treated effluent to ground. Some are persistent. Within 10-year capture zone. Something that definitely needs to be a part of this discussion.
- H9: Septic systems from residential. Not too many left. Something I want to learn more from DLC. ***AI: Tony to ask DLC about how many septic fields were connected to the sanitary and when.*** Judy also suggested adding if there was a requirement for septic tanks to be removed or if that was left to the home owner.
- H7: forestry. Nothing happening in immediate surrounding area but the watershed that feeds Ellison has forestry. The whole industrial area is on an alluvial fan that is a losing stream, which means recharging the aquifer.
- H11: High pressure sewer main that runs along Lodge Road. Ties into a lift station at the border of Alto's property and a farmer's property. So all the sewage that comes from Alto Utilities subdivision comes down as a gravity feed, and then comes to this lift station and then gets pumped. Is within the 100m, so it is crucial to understand. Big concern, not treated, raw sewage. A question that will be presented to DLC: what are the engineering details, any fail safes, how quickly would you know if there's a leak, and if there's a leak what does that response look like? Contaminants of concern are quite widely including hydrocarbons. Mike added that there's a monitoring well that DLC owns. Keith thinks it's a shallow well. Judi suggested to confirm that, and also, with their new plans (going for a discharge permit), do they foresee any changes? ***AI: Tony to get more details on well and the pipe, and any changes planned from DLC.***
- H12: CS Registry. Only only one in the 5 and 10 year capture zones. Closest one was registered in 1998.
- H13: other groundwater wells. Can act as conduits: along outside of casing, or inside the well. Deep wells can in particular be a problem. A lot of wells in the area.
- H14: Industrial activities. Just on the cusp of the capture zones. A big enough area with enough activity that we felt it's important to include. A lot of these contaminants can be quite persistent in groundwater.
- H15: potential contaminants from future development. Tony explained that Keith mentioned his neighbour is developing large structures, what does DLC have with respect to residential, commercial, industrial development. To the west: that golf course, looks like it's in transition. Don't know what that looks like. Hopefully turning into a park and then less fertilizers will be used.

October 12, 2021

Alto Utilities Ltd.

Action by	Discussion:
Tony Friesen	**3 HAZARD INVENTORY AND RISK RANKING (MODULE 2 AND 7)**
All to participate	• Tony introduced some of the potential hazards to the drinking water system and we had discussions during ranking of the risk (See Tables 4 and 5 in Supporting Documents #2) • Tony explained that his interpretation for likelihood is that the hazard arrives at the well. Judy agreed with this interpretation. • Tony looked at the agricultural hazard and explained the rationale. Keith explained this could be broken down further. For example, for a farmer that is spreading fertilizer or manure on surface, the likelihood of that getting down to the aquifer and the well is extremely low. Keith wondered if that would be catastrophic, compared to, a very different situation where if you had a well that the cows could poo next to or into. Keith felt like those things needed to be categorized separately. ***AI: Tony to break down further.*** Judi explained that with the testing, 30 years is an exaggeration of the results. IHA have really good results for five years., but before that the sampling location is debatable. There is no chlorine here so that is not clouding things and sampling is getting better. Judi explained that she worked on that with the previous owner, and with Keith too. So now we know what sample was taken and where. Judi explained it's important to note that bacterial samples are not indicative of protozoa or viruses; the absence of bacteria is a great thing but it doesn't tell you if the other pathogens are also absent. Judy asked Tony if we looked at the nitrate levels and would that help your ranking here? Tony said, yes, we did look at nitrates, but we didn't compare to background. Tony wondered if there are other wells that are showing lower nitrates, which would show a localised impact, but explained generally speaking, nitrate concentrations in this lower aquifer are low. Judy suggested adding that as part of your rationale. ***AI: Tony to add some text around evidence of low nitrate concentrations into this rationale.*** Keith talked about adding nitrate to quarterly monitoring and then added that what's something is that interaction between the upper and lower aquifer. Keith suggested that we sort of need to add that before we assign any risk rankings. He explained that the Golder report suggested doing a 72-hour pumping test. Until we know how that upper aquifer moves and interacts with the lower aquifer, it's tough to assign this magnitude to any of these hazards. Tony explained: that's part of Module 8, to make recommendations to improve our dataset, but it's tricky to do so with permitting. Mark had no comment at this time. • Tony went over the E-5 (High) risk ranking for DLC's sanitary line. Marta explained the multiple-barrier approach, that the point of this is to get a list of the priorities and that'll help us understand our priorities around for example, the Emergency Response Plan. Tony offered a table format, and Judy liked that approach, with questions right in there. Put your rationale but say "uncertain, we need this information to support this".
All	**4 ACTIONS, MITIGATIVE MEASURES AND IMPLEMENTATION STRATEGY (MODULE 8)**
	• Marta reviewed the different types of **SMART**[1] actions and implementation strategies, explaining which ones the Water Supplier has control over, and which ones they would act as a

[1] Specific, Measurable, Achievable, Realistic, Time-bound

Action by	Discussion:
	partner with, for example DLC and the wastewater infrastructure. • Judy suggested posting Alto's plans [on their website], and then explaining them, making yourself available to be notified for referrals when new
All	**5 STRENGTHS, WEAKNESS, OPPORTUNITIES AND THREATS (SWOT)** See supporting document #1 that start on next page for meeting minutes. This was a brainstorming session to support development of actions (Module 8).
Tony Friesen	**6 CLOSURE** • Tony thanked everyone for their contribution. • Judi left at 11:31 • Keith asked Mark about groundwater licensing, and water level trends. Discussion. • Keith talked about a comment that was made that North well water levels are declining. Keith isn't sure about that. They put in a different pump. Keith asked Mark about the steps if they are putting in a new well. Mark explained if you aren't changing the volume, it's just a change of works. The second you add more houses or the area you are serving and the volume goes up, that becomes a new application. • Keith asked about the neighbour's water use: Mark suggested using the RAPP line, explained it gets triaged to the conservation officer. Mark explained if you think there is unauthorized use it'll get looked at. Can do it anonymously.

October 12, 2021

Alto Utilities Ltd.

Supporting document #1: SWOT Guidance (extracted from Module 7 of the Comprehensive Source to Tap Guideline https://www2.gov.bc.ca/assets/gov/environment/air-land-water/cs2ta-mod7.pdf)

Identify the major factors (strengths, weaknesses, opportunities and threats) with the greatest potential to influence drinking water quality and availability both at present and into the future.

Strengths are the major assets of the water supply system, the areas where the water supply system is doing well. Highlighting strengths serves to recognize and encourage the positive aspects of the water supply system. Recommendations for supporting areas of strength in the water supply system will be included in Module 8.

Meeting minutes:

- One operator been with Alto for two years is an EOCP Level 2, just writing his EOCP Level 3, and Keith working on Level 1 EOCP.
- Keith, as the Owner, is very invested in this utility, and has shown a lot of interest in how to make it better. Keith has always wanted to work towards making it as safe as possible for the customer.
- Keith is a self-starter, not waiting for IHA.
- Judi has been a great source of information, is gracious, no-nonsense. A real source (lamented COVID, missing face to face time, and Judi has a lot more work), feel like Judi's given a clear perspective of expectations. A real asset to the owner/operator.
- Judi elaborated that a lot of the information that she'd asked for by previous owners wasn't being down. Now with the data, we will have more support decision making. Starting to fill the data gaps, in particular around trends with water quality. Improving monitoring, reporting, and taking the next steps in this plan.
- Physically confined aquifer
- Redundancy with two wells

Weaknesses are fundamental deficiencies in the protective and preventative measures in the water supply system. They are areas where significant vulnerabilities exist and more attention is required. Recommendations on addressing these weaknesses will be made in Module 8.

Meeting minutes:

- Some analyte problems: high in manganese, iron, hard water. Problems that have to be addressed and rectified. Just North well high in manganese. Which goes to show how complex hydrogeology is, with wells 30 m apart. Opportunities for blending? Understanding this might help choosing the next well location.
- Finances. Limited finances. Part of what we are doing this for is to use this for future forecasting for projects, get a sense of the types of capital that are being required. In a private utility, finances are sourced right now for future projects, rather than borrowing.
- Completed into an aquifer with a lot of wells, other land uses, complex aquifer, a lot going on, a lot of different water users. Lots of infrastructure that's been installed that's reduced the use/demand of the aquifer. Conduits might still be there. Liabilities.
- Large industrial complex up-gradient.

- Don't know much about that upper aquifer. Shallow, only used for some domestic wells. Some parts are "leaky", so some interactions between the two. But some other areas are clearly different. 2003 Kala report pretty much assumed fair bit of leakage which helped the water quality at Alto. Understanding the confining layer (consistency of it), and important recharge areas, and where potential for contaminants can come in.

Opportunities are prospects for improvements to the safety or sustainability of the water supply. These opportunities will be capitalized on when developing recommended risk management strategies in Module 8.

Meeting minutes:

- Multiple barrier approach. Don't have to solve everything in one day.
- Lots of monitoring options with the old wells in the area. Protective cap will give us time to notice any changes in land use that might impact water quality.
- District of Lake Country. Both a threat and an opportunity.
- Can address manganese and pathogen treatment side at once.
- Alto is at planning stage so lots of opportunity to bring in ideas at this stage. Doing two things right now:
    - Source Protection Plan
    - Wanting to get a long term plan for treatment. It's a good direction to remove manganese, and at the same time can solve the concerns with the pathogens.

Threats are major hazards to the safety or sustainability of the drinking water supply. Strategies for minimizing and mitigating these threats are included in the recommendations in Module 8.

Meeting minutes:

- District of Lake Country. Marta explained that Health Canada's approach right now is the allow for source protection, and monitoring to mitigate for viruses. But at some point you may prefer not relying on DLC for that, and might want to consider UV at a later date.
- Judy will only be focusing on MACs, for example if you meet MACs, IHA will say you are good to go. But for aesthetic: those are things that might benefit you and your consumers over time.
- Water Use and Drought.
    - Some people in the area (not Alto) using a lot of water. Potentially unsanctioned water use nearby. Neighbour's well was drilled in 2017. Worried about quantity if not well managed. Mark: if flowing into Kal, Kal hit record lows this area.
    - With new agriculture coming online, having some of this information available is beneficial. A water conservation plan is an option for drought years. Something for everyone in the Okanagan to pay attention to. Collecting that information: monitoring groundwater levels, see draw down, compare to your demand. Helps to support whether we need to be concerned about this. Middle Vernon Creek was very dry this year.
    - Judy sent out specific temperature and precipitation observations, and usage observations. July 20: put in Stage 2 restrictions. Just try to follow Lake Country's drought response plan because Alto's customer's tend to look at DLC's website. Did see at 20% usage in August (also did cool off a bit, so hard to say what from). Judy suggested adding temperature to monthly summaries, as a way to start monitoring, when you ask for these reductions, do you get a reduction, and how long does it last? City Penticton lasted 10 days.

Mike Weldon

From: Shaw <alto.utilities@shaw.ca>
Sent: March 9, 2022 11:18 AM
To: Mike Weldon
Subject: Fwd: Alto Utilities Source Water Protection Plan

Mike,

Below is Kiel Wilkes response to Tony's questions.

Regards,
Keith Hanson
Alto Utilities

Sent from my iPhone

Begin forwarded message:

> From: Kiel Wilkie <kwilkie@lakecountry.bc.ca>
> Date: January 5, 2022 at 10:32:06 AM PST
> To: friesent@ae.ca
> Cc: Greg Buchholz <gbuchholz@lakecountry.bc.ca>, Matt Vader <mvader@lakecountry.bc.ca>, Scott Unser <sunser@lakecountry.bc.ca>, alto.utilities@shaw.ca, Judi.ekkert@interiorhealth.ca
> Subject: FW: Alto Utilities Source Water Protection Plan
>
> Hi Toney-
>
> See my comments in red below.
>
> ---
>
> From: Tony Friesen <friesent@ae.ca>
> Sent: Friday, December 10, 2021 3:38 PM
> To: Kiel Wilkie <kwilkie@lakecountry.bc.ca>
> Cc: Alto <alto.utilities@shaw.ca>; judi.ekkert@interiorhealth.ca
> Subject: Alto Utilities Source Water Protection Plan
>
> Hello Kiel,
>
> I hope this finds you well. Associated has been retained by Alto Utilities to complete a Source Water Assessment and Protection Plan (SWPP). As part of the process, we hosted a Technical Advisory Committee (TAC) meeting in October which included representatives from Alto, Interior Health Authority, and FLNRORD. From this meeting, we identified potential hazards that will form part of Alto's SWPP. Several of those hazards relate to DLC infrastructure and we're hoping that you may be able to provide some comment/information on them:
>
> 1. There is a high-pressure sewerage main and lift station on Lodge Road, adjacent to Alto's production wells. We are hoping you can provide us with some as-built drawings of the main and provide some comment around leak detection and pro-active maintenance that may be in place for the line. We also understand that there is a monitoring well nearby the lift-station; are

you able to provide a well log for this and some comment around monitoring activities that take place?
I ask that you not use the terminology "high-pressure sewerage main". This is a standard wastewater force main, operating at standard pressures, using standard pumps. My understanding is that much of the record drawings have been provided, and I recently provided Alto with the information on the monitoring well adjacent to the lift station. Our lift station has a flow meter, along with the flow meters at the wastewater treatment plant which are used for comparison and leak detection. Furthermore the maximum wastewater level in the Lodge Road lift stations wetwell is below the ground water table in that area. This would cause any leakage in the wetwell to leak in, and not out.

2. We understand that there may be a plan to upgrade (twin) the sewerage main on Lodge Road (Capital Item 2021-41), can you please provide some comment on this new line and proposed leak detection/maintenance? Will there be/has there been community engagement associated with this upgrade?
   Yes our intention is to construct a parallel force main. This is for redundancy and capacity purposes. Leak detection will be the same as above. The engagement conducted to date has been through our Liquid Waste Management Plan.
3. We also understand there is a plan to upgrade the generator at the Lodge Road (Capital Item 2021-43), can you provide some comment on how much fuel will be stored with this generator and what secondary containment measures will be in effect?
   Yes the generator needs replacement. The fuel containment tank is, and will be, double-wall constructed to protects against fuel leaks or ruptures.
4. The subdivision on the East Hill above Lodge Road is currently serviced entirely by DLC sewage lines. Do you know when these were put in service and if there was a time when the subdivision was on septic?
   I assume you mean the Clearwater Subdivision? Which is basically the older homes serviced by Alto. Sewer was installed to that area in the early 2000's, not all homes are connected, and homes use septic prior to connecting. The Copper Hills subdivision, which is on the newer area south of Clearwater, is all connected to sewer and were never on septic.
5. The CN rail line was discontinued in 2013 and the rail trail opened in 2018. Was DLC involved in the construction of the rail trail? Is so, are you aware of what was involved in the construction and if all of the old railway ties specifically were removed from the trail?
   Yes we were involved in the constructing the rail trail, and prior to takeover CN removed an disposed of the railway ties.
6. Do you know if there are any restrictions on the transportation of dangerous goods on Lodge Road?
   There are no restrictions regarding the transportation of dangerous goods on Lodge Rd in effect from the District of Lake Country. Transportation of Dangerous goods is regulated through federal and provincial legislation, all pertinent sections of that regulation would apply to this location.

Thank you for your time. Please do not hesitate to reach out to me if you have any questions or if you would like to discuss. Note that we intend to extend you and invitation to the next TAC meeting (time TBD) to allow you to provide some comment and discussion on these items as well.

Regards,

Tony Friesen, M.Sc. P.Geo.
Hydrogeologist
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APPENDIX B - HISTORIC AERIAL PHOTOS

1938 – BC122-54

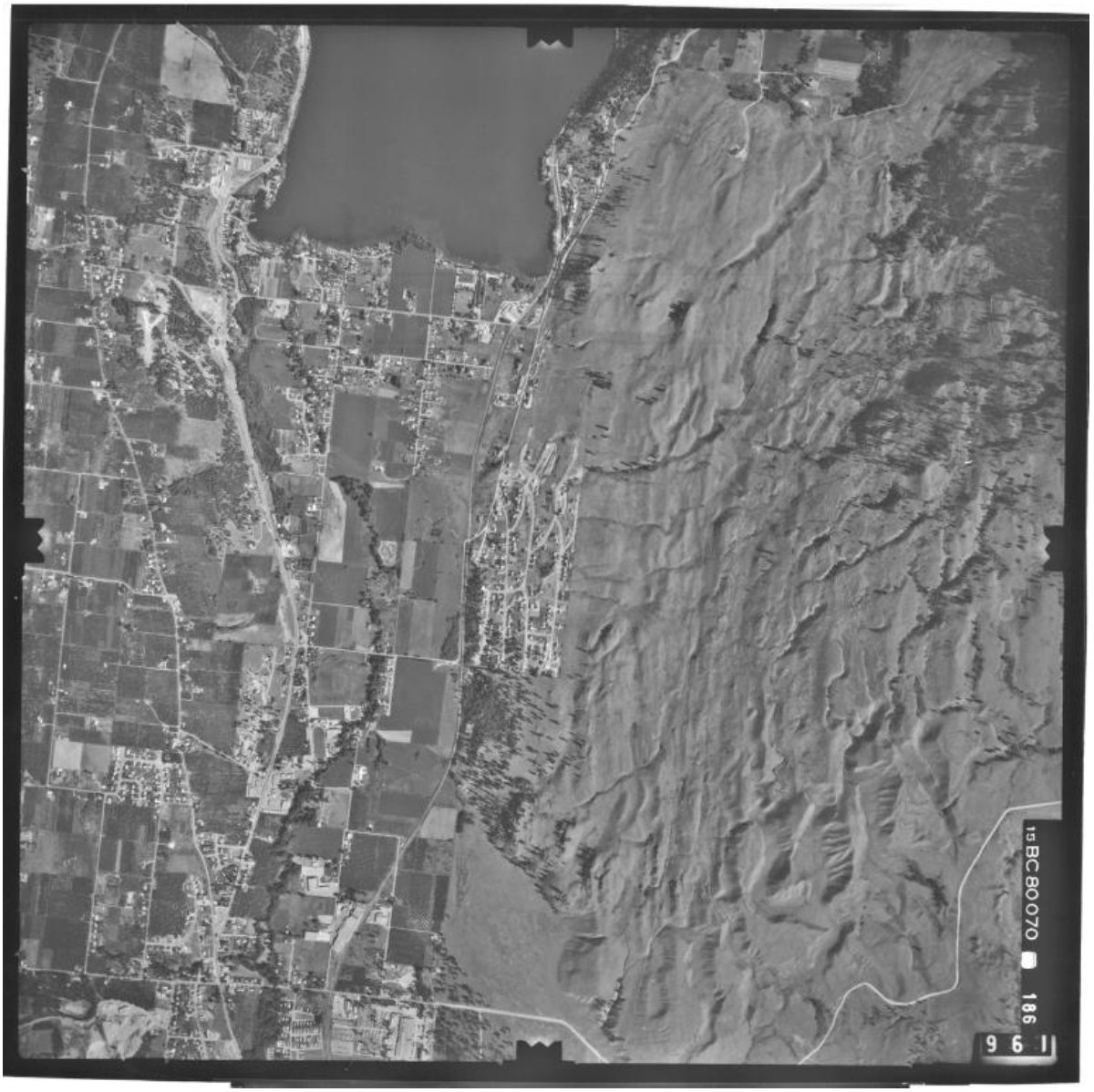
1951 – BC12478-46

1956 – BC2149-714

1963 – BC4197-21

1967 – BC5238-178

1975 -BC5659-220

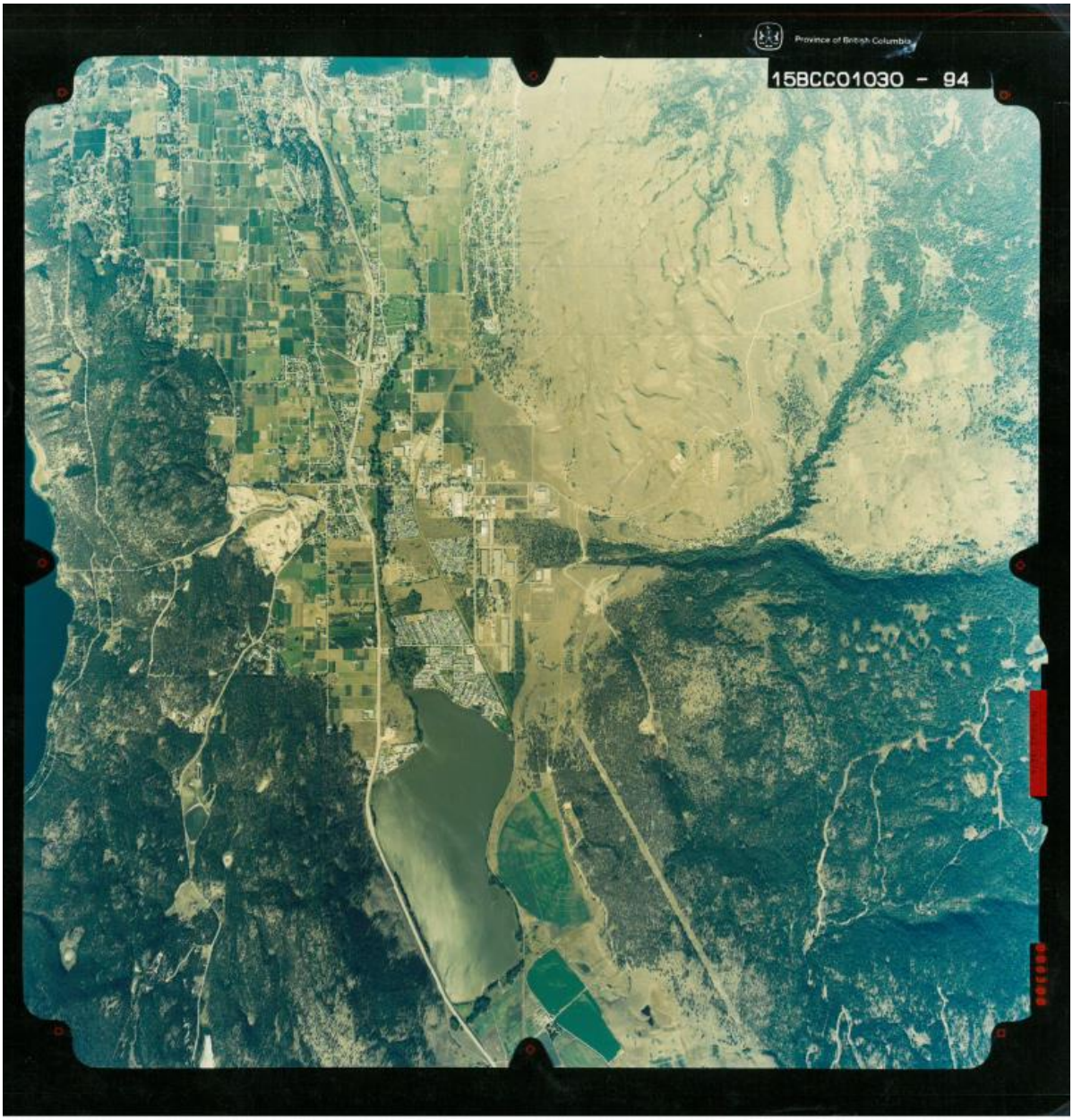


1980 – 15BC80070 – 186

1985 – 30BCC362-36

1990 – 30BCB90004-146

1994 – 30BCC94152-98



2001 – 15BCC01030-94

BCD07027_217_RGB_33_12b

2007 - BCD07027-217-RGB-33-12b

APPENDIX C - WELL LOGS

WELL LOG CONSTRUCTION RECORD

OWNER TOOVEY ENTERRISES

Address R.R.#5 TOOVEY ROAD KELOWNA B.C.

Well Location EAST END LODGE ROAD BY RAILWAY WINFIELD

Date Started _____ Date Completed APR. 24/77

A.C.
DRILLERS LTD.
RR#1 KEREMEOS
B.C.

Drilling Method CABLE

Driller G. MONKMAN Helper _____

File _____ Folio _____

Signed By _____

LOG OF FORMATIONS

Depth	Descriptions
0 to 2	GRAVEL FILL
2 to 12	ORGANIC SILT
12 to 18	SILTY COARSE
_____ to _____	GRAVEL ORGANIC
18 to 29	SANDY GREY SILT
29 to 43	SOFT GREY CLAY
43 to 45	INTERBEDDED CLAY
_____ to _____	GRAVEL
45 to 62	TAN CLAY WITH
_____ to _____	PEBBLES
62 to 83	SANDY COARSE GRAVEL
83 to 84	GREY CLAY
84 to 92	GREY SAND WITH
_____ to _____	STONES
92 to 107	SILTY ANGULAR
_____ to _____	GRAVELS
107 to 109	SILTY GREY SAND
_____ to _____	WITH PEBBLES

GENERAL REMARKS

Well log for WTN 83230/
WTN 14071
AKA. North Well

CASING RECORD

Dia. 10 ins. Wt. 42 #/ft. From 0 to 107

Dia. _____ ins. Wt _____ #/ft. From _____ to _____

Dia. _____ ins. Wt. _____ #/ft. From _____ to _____

Shoe ✓ Welded ✓ Cemented MUD SEAL

SCREEN RECORD

Make JOHNSTON Material SS

Slot opening 100 Length 20 FT.

Top 65 ft. Bottom 86 ft.

Fittings Top TYPE K Fittings Bottom BAIL

Gravel Pack _____ Natural ✓

Development Method SURGE SWAB

ROCK WELL DATA

Open Bore Hole _____ Dia. _____ ins.

From _____ ft. to _____ ft.

PRODUCTION DATA

Static Level 3.62 ft.

Measured from TOP OF CASING

Pumping Level _____ ft. at _____ GPM

27.27 ft. at 685 GPM

Bail Test _____ ft. at _____ GPH

_____ ft. at _____ GPH

Recommended Pump Setting 60 ft.

Recommended Max. Pump Output _____ GPM GPH

Duration of Test 24 HOURS Hrs.

PUMP DATA

Make _____ Type _____

Model _____ Serial No. _____

Size _____ HP _____ Drop Pipe _____ ins.

GPM _____ Head _____ ft. _____ RPM

Motor _____ Volts _____ PH _____

Well Seal _____

Water Analysis — Hardness _____ PPM

PH _____ Iron _____ PPM

Groundwater Wells and Aquifers

South Well

Well Summary

Well Tag Number: 83017
Well Identification Plate Number: 19072
Owner Name: ALTO UTILITIES LTD

Intended Water Use: Water Supply System
Artesian Condition: No

Well Status: New
Well Class: Water Supply
Well Subclass: Not Applicable

Aquifer Number: 344

Observation Well Number:
Observation Well Status:
Environmental Monitoring System (EMS) ID: E258719
Alternative specs submitted: No

Licensing Information

Licensed Status: Licensed
Licence Number: 501667

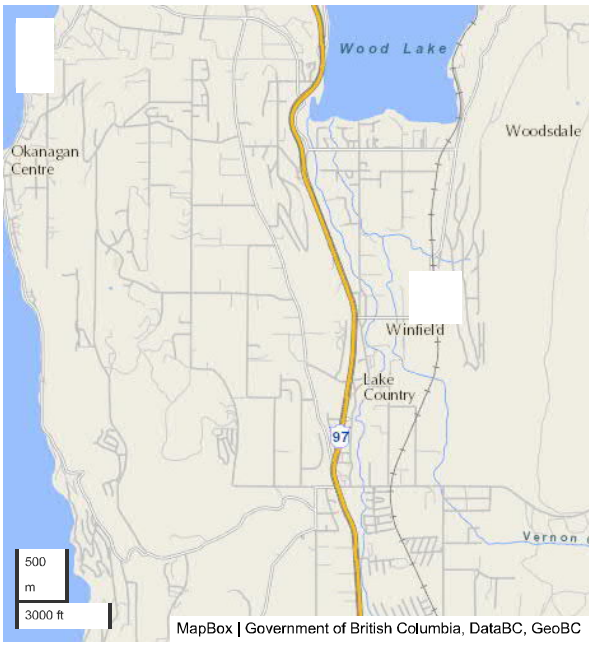
Location Information

Street Address: 10397 LODGE ROAD
Town/City: IAKE COUNTRY

Legal Description:

Lot	A
Plan	20771
District Lot	118
Block	
Section	
Township	
Range	
Land District	41
Property Identification Description (PID)	007733020

Description of Well Location:



Geographic Coordinates - North American Datum of 1983 (NAD 83)
Latitude: 50.03426
Longitude: -119.39412
UTM Easting: 328551
UTM Northing: 5545186
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	2002-05-01	2002-10-10	Field Drilling Contractors	June 13th 2005 at 10:00 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
2002-05-01	2002-10-10				

Well Completion Data

Total Depth Drilled:
Finished Well Depth: 111.7 ft bgl
Final Casing Stick Up:
Depth to Bedrock:
Ground elevation: 1335.3 feet

Estimated Well Yield: 619.74 USgpm
Well Cap:
Well Disinfected Status: Not Disinfected
Drilling Method: Cable Tool
Method of determining elevation: Unknown

Static Water Level (BTOC): 6 feet btoc
Artesian Flow:
Artesian Pressure (head):
Artesian Pressure (PSI):
Orientation of Well: VERTICAL

Lithology

From (ft bgl)	To (ft bgl)	Raw Data	Description	Moisture	Colour	Hardness	Water Bearing Flow Observations	Water Bearing Flow Estimate (USGPM)
101	114	BEDROCK	0 nothing entered		0 nothing entered			
53	101	GRAVEL WITH FINE BROWN SAND	0 nothing entered		0 nothing entered			
43	53	VERY FIRM TAN COLORED CLAY	0 nothing entered		0 nothing entered			
15	43	VERY SOFT SILTY SAND TRACES OF CLAY AND GRAVEL	0 nothing entered		0 nothing entered			
0	15	SILTY CLAY SLIGHTLY SANDY	0 nothing entered		0 nothing entered			

Casing Details

From (ft bgl)	To (ft bgl)	Casing Type	Casing Material	Diameter (in)	Wall Thickness (in)	Drive Shoe
					0.35	

Surface Seal and Backfill Details

Surface Seal Material:
Surface Seal Installation Method:
Surface Seal Thickness:
Surface Seal Depth:

Backfill Material Above Surface Seal:
Backfill Depth:

Liner Details

Liner Material:
Liner Diameter:
Liner from:

Liner Thickness:
Liner to:

Liner perforations

From (ft bgl)	To (ft bgl)
There are no records to show	

Screen Details

Intake Method:
Type: Telescope
Material: Stainless Steel
Opening:
Bottom:

Installed Screens

From (ft bgl)	To (ft bgl)	Diameter (in)	Assembly Type	Slot Size
68.70	75.80	12.00		60.00
88.60	98.80	12.00		250.00

Well Development

Developed by:

Development Total Duration:

Well Yield

Estimation Method:
Static Water Level Before Test:
Hydrofracturing Performed: No

Estimation Rate:
Drawdown:
Increase in Yield Due to Hydrofracturing:

Estimation Duration: 17.7 hours

Well Decommission Information

Reason for Decommission:
Sealant Material:
Decommission Details:

Method of Decommission:
Backfill Material:

Comments

WELL X-REF'D AND ASSOCIATED W/EGW LICENCE APP# 100187637. SOUTH WELL. ORIGINAL ESTIMATED WELL YIELD PROVIDED AS 39.1 LPS

Alternative Specs Submitted: Yes

Documents

- WTN 83017_Well Record.pdf

Disclaimer

Groundwater Wells and Aquifers

Well Summary

Well Tag Number: 104646
Well Identification Plate Number:
Owner Name: ALTO UTILITIES LTD
Intended Water Use: Not Applicable

Well Status: Closure
Well Class: Unknown
Well Subclass:
Aquifer Number:

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: 10490 LODGE ROAD
Town/City: WINFIELD

Legal Description:

Lot	A
Plan	20771
District Lot	118
Block	
Section	
Township	
Range	
Land District	59
Property Identification Description (PID)	007733020

Description of Well Location: WELL WAS LOCATED APPROX HALF WAY ALONG WEST FENCE OF PROPERTY APPROX 20FT IN FROM FENCE (LEFT SIDE WHEN DRIVING THROUGH GATE)

Geographic Coordinates - North American Datum of 1983 (NAD 83)
Latitude: 50.034543
Longitude: -119.393493
UTM Easting: 328597
UTM Northing: 5545216
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			Cyclone Drilling Ltd.	September 29th 2011 at 7:50 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
				2009-04-09	2009-04-09

Well Completion Data

Total Depth Drilled:
Finished Well Depth: 53 ft bgl
Final Casing Stick Up:
Depth to Bedrock:
Ground elevation: 1329 feet

Static Water Level:
Estimated Well Yield:
Artesian Flow:
Artesian Pressure:
Method of determining elevation: GPS

Well Cap: PVC CAP
Well Disinfected Status: Not Disinfected
Drilling Method:
Orientation of Well: 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

Surface Seal Material:
Surface Seal Installation Method:
Surface Seal Thickness:
Surface Seal Depth:

Backfill Material Above Surface Seal:
Backfill Depth:

Liner Details

Liner Material:
Liner Diameter:
Liner from:

Liner Thickness:
Liner to:

Liner perforations

From (ft bgl)	To (ft bgl)
There are no records to show	

Screen Details

Intake Method: Screen
Type:
Material:
Opening:
Bottom:

Installed Screens

From (ft bgl)	To (ft bgl)	Diameter (in)	Assembly Type	Slot Size
There are no records to show				

Well Development

Developed by:

Development Total Duration:

Well Yield

Estimation Method:
Static Water Level Before Test:
Hydrofracturing Performed: No

Estimation Rate:
Drawdown:
Increase in Yield Due to Hydrofracturing:

Estimation Duration:

Well Decommission Information

Reason for Decommission: UNUSED WELL
Sealant Material: BENTONITE
Decommission Details: WELL CLOSURE DONE WTIH 15' BIRDS EYE GRAVEL INSDIE SCREENS 2FT BENTONITE PELLETS ON TOP OF SCREENS THEN 29TH BENTONITE CHIPS TO TOP OF CASING & 5 BAGS PLACED ON TOP OF CAP ON CASING. HOLE BACK FILLED TO GROUND LEVEL.

Method of Decommission: POURED
Backfill Material: BENTONITE CHIPS AND PELLETS

Comments

ORIGINAL WELL CONSTRUCTION FROM NOT RECIEVED. DATA FROM WELL CLOSURE FORM

Alternative Specs Submitted: No

Documents

No additional documentation available for this well.

Disclaimer

Groundwater Wells and Aquifers

Well Summary

Well Tag Number: 23636
Well Identification Plate Number:
Owner Name: ALTO UTILITIES
Intended Water Use: Unknown Well Use
Artesian Condition: No

Well Status: New
Well Class: Unknown
Well Subclass:
Aquifer Number: 344

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

Licensing Information

Licensed Status: Unlicensed

Licence Number:

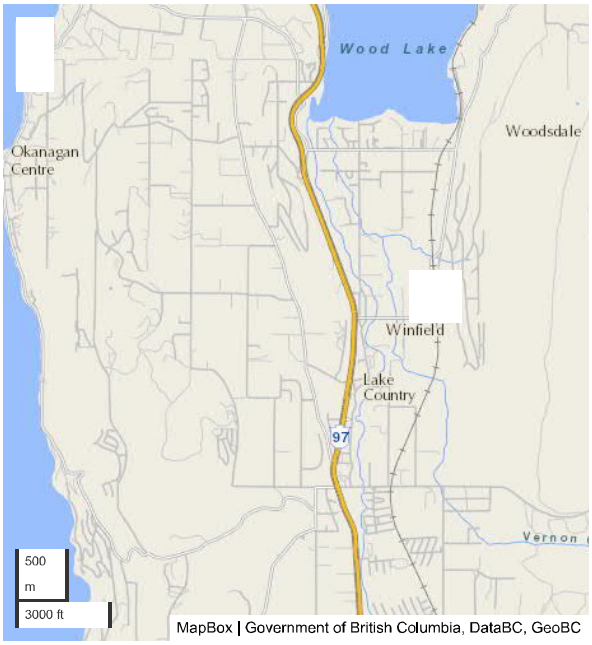
Location Information

Street Address:
Town/City: WINFIELD

Legal Description:

Lot	
Plan	
District Lot	
Block	
Section	
Township	
Range	
Land District	41
Property Identification Description (PID)	

Description of Well Location:



Geographic Coordinates - North American Datum of 1983 (NAD 83)
Latitude: 50.034312
Longitude: -119.394221
UTM Easting: 328544
UTM Northing: 5545192
Zone: 11
Coordinate Acquisition Code: (20 m accuracy) Digitized from 1:5,000 mapping

Well Activity

Activity	Work Start Date	Work End Date	Drilling Company	Date Entered
Legacy record	1970-06-03	1970-06-03	Stewart Drilling	August 13th 2003 at 4:07 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
1970-06-03	1970-06-03				

Well Completion Data

Total Depth Drilled:
Finished Well Depth: 62 ft bgl
Final Casing Stick Up:
Depth to Bedrock:
Ground elevation:

Estimated Well Yield: 450 USgpm
Well Cap:
Well Disinfected Status: Not Disinfected
Drilling Method:
Method of determining elevation: Unknown

Static Water Level (BTOC): 2 feet btoc
Artesian Flow:
Artesian Pressure (head):
Artesian Pressure (PSI):
Orientation of Well: VERTICAL

Lithology

From (ft bgl)	To (ft bgl)	Raw Data	Description	Moisture	Colour	Hardness	Observations	Water Bearing Flow Estimate (USGPM)
0	3	HUMUS						
3	8	GRAVEL & SAND						
8	37	BLUE VARVED SILTS						
37	44	FINE SAND & GRAVEL,WATER-BEARING						
44	62	COARSE SANDS & GRAVEL SOME COBBLES						

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

Surface Seal Material:
Surface Seal Installation Method:
Surface Seal Thickness:
Surface Seal Depth:

Backfill Material Above Surface Seal:
Backfill Depth:

Liner Details

Liner Material:
Liner Diameter:
Liner from:

Liner Thickness:
Liner to:

Liner perforations

From (ft bgl)	To (ft bgl)
There are no records to show	

Screen Details

Intake Method:
Type:
Material:
Opening:
Bottom:

Installed Screens

From (ft bgl)	To (ft bgl)	Diameter (in)	Assembly Type	Slot Size
There are no records to show				

Well Development

Developed by:

Development Total Duration:

Well Yield

Estimation Method:
Static Water Level Before Test:
Hydrofracturing Performed: No

Estimation Rate:
Drawdown:
Increase in Yield Due to Hydrofracturing:

Estimation Duration:

Well Decommission Information

Reason for Decommission:
Sealant Material:
Decommission Details:

Method of Decommission:
Backfill Material:

Comments

No comments submitted

Alternative Specs Submitted: Yes

Documents

- WTN 23636_Well Record.pdf

Disclaimer

Groundwater Wells and Aquifers

Well Summary

Well Tag Number: 23433
Well Identification Plate Number:
Owner Name: ALTO UTILITIES
Intended Water Use: Unknown Well Use
Artesian Condition: No

Well Status: New
Well Class: Unknown
Well Subclass:
Aquifer Number:

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

Licensing Information

Licensed Status: Unlicensed

Licence Number:

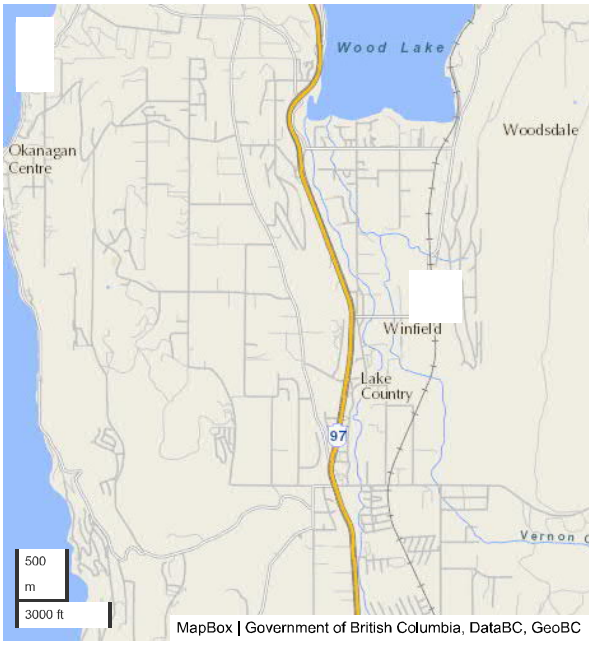
Location Information

Street Address:
Town/City: RUTLAND

Legal Description:

Lot	A
Plan	20771
District Lot	118
Block	
Section	
Township	
Range	
Land District	41
Property Identification Description (PID)	

Description of Well Location:



Geographic Coordinates - North American Datum of 1983 (NAD 83)
Latitude: 50.034256
Longitude: -119.393869
UTM Easting: 328569
UTM Northing: 5545185
Zone: 11
Coordinate Acquisition Code: (20 m accuracy) Digitized from 1:5,000 mapping

Well Activity

Activity	Work Start Date	Work End Date	Drilling Company	Date Entered
Legacy record	1970-04-05	1970-04-05	Oasis Drilling	August 13th 2003 at 4:07 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
1970-04-05	1970-04-05				

Well Completion Data

Total Depth Drilled:
Finished Well Depth: 54 ft bgl
Final Casing Stick Up:
Depth to Bedrock:
Ground elevation:
Estimated Well Yield: 100 USgpm
Well Cap:
Well Disinfected Status: Not Disinfected
Drilling Method: Other
Method of determining elevation: Unknown
Static Water Level (BTOC): 8 feet btoc
Artesian Flow:
Artesian Pressure (head):
Artesian Pressure (PSI):
Orientation of Well: 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

Surface Seal Material:
Surface Seal Installation Method:
Surface Seal Thickness:
Surface Seal Depth:
Backfill Material Above Surface Seal:
Backfill Depth:

Liner Details

Liner Material:
Liner Diameter:
Liner from:
Liner Thickness:
Liner to:

Liner perforations

From (ft bgl)	To (ft bgl)
There are no records to show	

Screen Details

Intake Method:
Type:
Material:
Opening:
Bottom:

Installed Screens

From (ft bgl)	To (ft bgl)	Diameter (in)	Assembly Type	Slot Size
There are no records to show				

Well Development

Developed by:
Development Total Duration:

Well Yield

Estimation Method:
Static Water Level Before Test:
Hydrofracturing Performed: No
Estimation Rate:
Drawdown:
Increase in Yield Due to Hydrofracturing:
Estimation Duration:

Well Decommission Information

Reason for Decommission:
Sealant Material:
Decommission Details:
Method of Decommission:
Backfill Material:

Comments

NO DATA. NO LOG. NO LITHOLOGIC INFORMATION AVAILABLE. METHOD OF DRILLING = DRILLED

Alternative Specs Submitted: Yes

Documents

- WTN 23433_Well Record.pdf

Disclaimer

APPENDIX D - HISTORIC WATER QUALITY DATA (TO MAY 2021)

Table D-1
Summary of Bacteriological Data Reviewed (2009-2021)

Date	Lab ID	Sample ID	Sample Location (inferred)	Coliforms, Total (CFU, 100 mL)	E. Coli (CFU/100 mL)
1-Mar-11	K1C0037-01	Lodge Sampling station - North Well	North Well	<1	<1
18-Nov-14	4110909-01	Lodge Sampling station - North Well	North Well	<1	<1
26-Sep-18	8092385-02	Lodge Sampling station - North Well	North Well	<1	<1
25-Jan-19	9011891-01	Lodge Rd 60 Pump	North Well	<1	<1
27-Mar-19	9032148-01	Lodge Rd 60 Pump	North Well	<1	<1
26-Jun-19	9062817-01	Lodge Rd 60 Pump	North Well	<1	<1
31-Jul-19	9080007-01	Lodge Rd 60 Pump	North Well	<1	<1
9-Sep-19	9090718-02	Lodge Sampling station - North Well	North Well	<1	<1
22-Oct-19	9102073-01	Lodge Sampling station - North Well	North Well	<1	<1
27-Nov-19	9111047-01	Lodge Sampling station - North Well	North Well	<1	<1
23-Dec-19	9122016-01	Lodge Sampling station - North Well	North Well	<1	<1
21-Jan-20	0011229-01	Lodge Sampling station - North Well	North Well	<1	<1
25-Feb-20	0021957-01	Lodge Sampling station - North Well	North Well	<1	<1
31-Mar-20	0040055-01	Lodge Sampling station - North Well	North Well	<1	<1
5-May-20	0050321-01	Lodge Sampling station - North Well	North Well	<1	<1
12-May-20	0050994-03	Lodge Sampling station - North Well	North Well	<1	<1
23-Jun-20	0062233-01	Lodge Sampling station - North Well	North Well	<1	<1
28-Jul-20	0072750-01	Lodge Sampling station - North Well	North Well	<1	<1
18-Aug-20	0081726-01	Lodge Sampling station - North Well	North Well	<1	<1
27-Oct-20	20J2582-01	Lodge Sampling station - North Well	North Well	<1	<1
9-Nov-20	20K1047-01	Lodge Sampling station - North Well	North Well	<1	<1
14-Dec-20	20L1485-01	Lodge Sampling station - North Well	North Well	<1	<1
11-Jan-21	21A0657-01	Lodge Sampling station - North Well	North Well	<1	<1
8-Feb-21	21B0884-01	Lodge Sampling station - North Well	North Well	<1	<1
8-Mar-21	21C1068-01	Lodge Sampling station - North Well	North Well	<1	<1
6-Apr-21	21D0342-01	Lodge Sampling station - North Well	North Well	<1	<1
10-May-21	21E0903-01	Lodge Sampling station - North Well	North Well	<1	<1
29-Aug-18	8082719-01	Lodge Sampling station - South Well	South Well	<1	<1
24-Oct-18	8102259-01	Lodge Rd East Well	South Well	<1	<1
28-Nov-18	8112211-01	Lodge Rd Southwell	South Well	<1	<1
27-Feb-19	9021901-01	Lodge Rd Pumphouse 30 Pump	South Well	<1	<1
23-Apr-19	9042016-01	Lodge Rd Pumphouse 30 Pump	South Well	<1	<1
22-May-19	9052034-01	Lodge Road 30 Pump	South Well	<1	<1
28-Aug-19	9082637-01	Lodge Road 30 Pump	South Well	<1	<1
30-Sep-20	0109138-01	Lodge Sampling station - South Well	South Well	<1	<1
23-Nov-20	20K2395-01	Lodge Sampling station - South Well	South Well	<1	<1
29-Dec-20	20L2708-01	Lodge Sampling station - South Well	South Well	<1	<1
25-Jan-21	21A2167-01	Lodge Sampling station - South Well	South Well	<1	<1

Table D-1
Summary of Bacteriological Data Reviewed (2009-2021)

Date	Lab ID	Sample ID	Sample Location (inferred)	Coliforms, Total (CFU, 100 mL)	E. Coli (CFU/100 mL)
16-Feb-21	21B1490-01	Lodge Sampling station - South Well	South Well	<1	<1
15-Mar-21	21C2018-01	Lodge Sampling station - South Well	South Well	<1	<1
19-Apr-21	21D1902-01	Lodge Sampling station - South Well	South Well	<1	<1
5-Mar-09	K9C0159-03	Lodge Rd, Pump House	Pumphouse (undifferentiated)	<1	<1
2-Apr-09	K9D0067-01	11397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
29-Apr-09	K9D0839-01	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
1-Jun-09	K9F0005-03	Lodge Rd, Pump House	Pumphouse (undifferentiated)	<1	<1
26-Jun-09	K9F0995-01	Lodge Rd, Pump House	Pumphouse (undifferentiated)	<1	<1
30-Jul-09	K9G1022-04	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
31-Aug-09	K9H1019-02	10490 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
28-Sep-09	K9I0932-01	Lodge Rd, Pump House	Pumphouse (undifferentiated)	<1	<1
27-Oct-09	K9J0819-05	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
26-Nov-09	K9K0883-01	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
4-Jan-10	K0A0003-01	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
28-Jan-10	K0A0750-01	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
26-Feb-10	K0B0819-05	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
30-Mar-10	K0C0923-03	10490 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
29-Apr-10	K0D0902-01	Lodge Rd, Pump House	Pumphouse (undifferentiated)	<1	<1
27-May-10	K0E0937-05	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
24-Jun-10	K0F1082-01	Lodge Rd, Pump House	Pumphouse (undifferentiated)	<1	<1
29-Jul-10	K0G1077-03	Lodge Rd, Pump House	Pumphouse (undifferentiated)	<1	<1
30-Aug-10	K0H1159-01	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
28-Sep-10	K0I1058-01	10397 Lodge Rd - Pumphouse	Pumphouse (undifferentiated)	<1	<1
28-Oct-10	K0J1061-01	Lodge Rd, Pump House	Pumphouse (undifferentiated)	<1	<1
29-Jan-16	6011506-05	Lodge Rd Pump (Source)	Pumphouse (undifferentiated)	<1	<1
24-Feb-16	6021388-01	10397 Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
29-Mar-16	6031867-01	Pumphouse (10397 Lodge Rd)	Pumphouse (undifferentiated)	<1	<1
26-Apr-16	6041782-05	Pumphouse (10397 Lodge Rd)	Pumphouse (undifferentiated)	<1	<1
30-May-16	6052223-01	10397 Lodge Rd	Pumphouse (undifferentiated)	<1	<1
28-Jun-16	6062371-01	10397 Lodge Rd	Pumphouse (undifferentiated)	<1	<1
28-Jul-16	6072096-04	10397 Lodge Rd	Pumphouse (undifferentiated)	<1	<1
31-Aug-16	6082326-05	10397 Lodge Rd	Pumphouse (undifferentiated)	<1	<1
28-Sep-16	6092058-01	10397 Lodge Rd	Pumphouse (undifferentiated)	<1	<1
27-Oct-16	6101924-01	10397 Lodge Rd	Pumphouse (undifferentiated)	<1	<1
25-Nov-16	6111828-05	10397 Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
3-Jan-17	7010034-01	10397 Lodge Rd (Pumphouse)	Pumphouse (undifferentiated)	<1	<1
27-Jan-17	7011699-05	10397 Lodge Rd (Pumphouse)	Pumphouse (undifferentiated)	<1	<1
28-Feb-17	7021648-01	10397 Lode Rd. (Wells)	Pumphouse (undifferentiated)	<1	<1

Table D-1
Summary of Bacteriological Data Reviewed (2009-2021)

Date	Lab ID	Sample ID	Sample Location (inferred)	Coliforms, Total (CFU, 100 mL)	E. Coli (CFU/100 mL)
3-Apr-17	7040067-01	10397 Lodge Rd - Source	Pumphouse (undifferentiated)	<1	<1
24-Apr-17	7041596-01	10397 Lodge Rd - Source	Pumphouse (undifferentiated)	<1	<1
26-May-17	7052189-05	10397 Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
28-Jun-17	7062658-01	10397 Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
31-Jul-17	7072560-03	10397 Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
31-Aug-17	7082818-05	10397 Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
28-Sep-17	7092713-03	10397 Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
30-Oct-17	7102637-01	Lodge Pumphouse	Pumphouse (undifferentiated)	<1	<1
30-Nov-17	7120017-01	Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
3-Jan-18	8010153-04	Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
31-Jan-18	8020074-01	Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
2-Mar-18	8030159-01	Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
4-Apr-18	8040375-01	Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
3-May-18	8050477-01	Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
30-May-18	8052918-01	Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
27-Jun-18	8062724-05	Lodge Rd Pumphouse	Pumphouse (undifferentiated)	<1	<1
2-Aug-18	8080303-04	Lodge Road	Pumphouse (undifferentiated)	<1	<1

Notes:
Assumed East Well (sample 8102259-01) referred to South Well
Assumed "50 Pump" and "60 Pump" referred to North Well
Assumed "30 Pump" referred to South Well

Table D-2
Comprehensive Water Quality Data (2020-2021)

Analyte	Unit	Guideline		Lodge Sampling station - North Well	Lodge Sampling station - North Well	Lodge Sampling station - North Well	Lodge Sampling station - North Well	Lodge Sampling station - North Well	Lodge Sampling station - North Well	Lodge Sampling station - North Well	Lodge Sampling station - South Well	Lodge Sampling station - South Well	Lodge Sampling station - South Well	Lodge Sampling station - South Well	Lodge Sampling station - South Well	Lodge Sampling station - South Well	Lodge Sampling station - South Well
				31-Mar-20	12-May-20	11-Jan-21	08-Feb-21	08-Mar-21	06-Apr-21	10-May-21	30-Sep-20	25-Jan-21	16-Feb-21	15-Mar-21	19-Apr-21	17-May-21	14-Jun-21
				0040055-01	0050994-03	21A0657-01	21B0884-01	21C1068-01	21D0342-01	21E0903-01	0109138-01	21A2167-01	21B1490-01	21C2018-01	21D1902-01	21E1785-01	21F1871-01
		GCDWQ AO	**GCDWQ MAC**														
Lab Results																	
General																	
Alkalinity (bicarbonate, as CaCO3)	mg/L	NG	NG	299	324					317	286				339		
Alkalinity (carbonate, as CaCO3)	mg/L	NG	NG	<1.0	<1.0					<1.0	<1.0				<1.0		
Alkalinity (hydroxide, as CaCO3)	mg/L	NG	NG	<1.0	<1.0					<1.0	<1.0				<1.0		
Alkalinity (phenolphthalein, as CaCO3)	mg/L	NG	NG	<1.0	<1.0					<1.0	<1.0				<1.0		
Alkalinity (total, as CaCO3)	mg/L	NG	NG	299	324					317	286				339		
Chloride	mg/L	250	NG	75.1	81.3					72.8	76.4				91.1		81.6
Conductivity	µS/cm	NG	NG	875	934					893	872				938		
Total cyanide	mg/L	NG	0.2 [2.1]	<0.0020	<0.0020					<0.0020	<0.0020				0.0022		
Fluoride	mg/L	NG	1.5	0.18	0.31					0.19	0.38				0.31		
Hardness, Total (total as CaCO3)	mg/L	NG	NG	348	391					371	350				386		
Nitrate (as N)	mg/L	NG	10	0.330	0.818					0.565	0.722				0.823		1.13
Nitrate + Nitrite (as N)	mg/L	NG	10 [2.2]														1.13
Nitrate + Nitrite (as N) (calculated)	mg/L	NG	10 [2.3]	0.330	0.818					0.565	0.722				0.823		1.13
Nitrite (as N)	mg/L	NG	1	<0.010	<0.010					<0.010	<0.010				<0.010		<0.010
pH		7.0 - 10.5 [1.1]	NG	8.06	8.06					8.11	8.09				7.91		
Sulphate	mg/L	500 [1.2]	NG	69.5	72.4					66.7	70.2				74.5		76.3
Total dissolved solids (computed)	mg/L	500	NG	504	553					520	502				585		
Turbidity	NTU	NG	N [2.4]	0.89	1.34					0.77	1.09				0.96		
Metals																	
Aluminum (total)	mg/L	0.100 [1.3]	2.9 [2.5]	<0.0050	<0.0050					<0.0050	<0.0050				<0.0050		
Antimony (total)	mg/L	NG	0.006	<0.00020	<0.00020					0.00020	<0.00020				<0.00020		
Arsenic (total)	mg/L	NG	0.010 [2.6]	0.00092	0.00107					0.00089	<0.00050				<0.00050		
Barium (total)	mg/L	NG	2.0 [2.7]	0.0645	0.0671					0.0622	0.0466				0.0572		
Boron (total)	mg/L	NG	5	0.0549	0.0680					<0.0500	<0.0500				0.0625		
Cadmium (total)	mg/L	NG	0.007 [2.8]	0.000023	0.000034					0.000028	0.000026				0.000043		
Calcium (total)	mg/L	NG	NG	87.1	98.2					93.9	84.8				92.5		
Chromium (total)	mg/L	NG	0.05	<0.00050	<0.00050					0.00155	<0.00050				<0.00050		
Copper (total)	mg/L	1 [1.4]	2 [2.9]	0.00102	0.00091					0.00102	0.00127				0.00185		
Iron (total)	mg/L	0.3	NG	0.218	0.258					0.139	0.160				0.228		
Lead (total)	mg/L	NG	0.005 [2.10]	<0.00020	<0.00020					0.00404	<0.00020				<0.00020		
Magnesium (total)	mg/L	NG	NG	31.6	35.4					33.1	33.5				37.6		
Manganese (total)	mg/L	0.02 [1.5]	0.12 [2.11]	**0.129**	**0.127**	**0.147**	**0.138**	**0.130**	**0.136**	**0.137**	0.0258	0.0497	0.0546	0.0573	0.0591	0.0408	0.0313
Potassium (total)	mg/L	NG	NG	5.46	5.75					5.74	5.45				5.81		
Selenium (total)	mg/L	NG	0.05	0.00168	0.00238					0.00196	0.00217				0.00228		
Sodium (total)	mg/L	200	NG	51.6	58.7					52.0	54.4				73.2		
Strontium (total)	mg/L	NG	7.0 [2.12]							0.669	0.737				0.748		
Uranium (total)	mg/L	NG	0.02	0.0126	0.0165					0.0118	0.0138				0.0143		
Zinc (total)	mg/L	5.0	NG	<0.0040	<0.0040					0.0056	0.0059				0.0159		
Microbiological																	
E. coli (counts)	CFU/100 mL	NG	0 [2.13]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total coliforms (counts)	CFU/100 mL	NG	0 [2.14]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Table D-2

Legend

<	Less than reported detection limit
>	Greater than reported upper detection limit
>=	Greater than or equal to
A	Absent
Calc	Calculated guideline or standard. The guideline or standard is dependent on the value of one or more other analytes, and is calculated from a formula or table.
GCDWQ AO	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives
GCDWQ MAC	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations
GCDWQ Screening Level	Guidelines for Canadian Drinking Water Quality - Screening Level
L	Laboratory reading type (Lab result)
m asl	metres above sea level
N	Narrative type of guideline or standard, or Result Note.
ND	Non-detect. Result is less than lower detection limit.
NG	No Guideline
NR	No Result
NS	No Standard
NT	Not Tested
OG	Overgrown
P	Present
PR	Presumptive
TK	Test kit reading type (Field result)
TNTC	Too numerous to count
	Highlighted value has a lower detection limit that is greater than the guideline/standard maximum and/or the guideline/standard minimum, or has an upper detection limit that is less than the guideline/standard maximum and/or the guideline/standard minimum.
	The maximum guideline/standard value cannot be determined because a result for a dependent analyte is not available for the sample.
GCDWQ AO	Highlighted value exceeds GCDWQ AO
GCDWQ MAC	Highlighted value exceeds GCDWQ MAC
GCDWQ Screening Level	Highlighted value exceeds GCDWQ Screening Level
SL Criteria Override	Highlighted value exceeds sampling location criteria override

Table D-2

Guideline Notes

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

Note 1.1 for pH:

The operational guideline for pH is a range of 7.0 to 10.5 in finished drinking water.

Note 1.2 for Sulphate:

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

Note 1.3 for Aluminum (total):

The operational guidance (OG) value for total aluminum in drinking water is 0.100 mg/L (100 µg/L) to optimize water treatment and distribution system operations. This value is based on a locational running annual average. The sampling frequency required to calculate the locational running annual average will vary based on the type of treatment facility and the sampling location. (Update March 5, 2021)

Note 1.4 for Copper (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on Copper, June 2019.

Note 1.5 for Manganese (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

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

Note 2.1 for Total cyanide:

The MAC for free cyanide is 0.2 mg/L. A maximum of 0.2 mg/L was used, in this report, to identify exceedances for total cyanide as a means for determining the potential for exceeding the free cyanide guideline.

Note 2.2 for Nitrate + Nitrite (as N):

The MAC for Nitrate (as N) is 10 mg/L

Note 2.3 for Nitrate + Nitrite (as N) (calculated):

The MAC for Nitrate (as N) is 10 mg/L

Note 2.4 for Turbidity:

Waterworks systems that use a surface water source or a groundwater source under the direct influence of surface water should filter the source water to meet health-based turbidity limits, as defined for specific treatment technologies. Where possible, filtration systems should be designed and operated to reduce turbidity levels as low as possible, with a treated water turbidity target of less than 0.1 NTU at all times. Where this is not achievable, the treated water turbidity levels from individual filters should meet the requirements described in GCDWQ.

For systems that use groundwater that is not under the direct influence of surface water, which are considered less vulnerable to faecal contamination, turbidity should generally be below 1.0 NTU.

For effective operation of the distribution system, it is good practice to ensure that water entering the distribution system has turbidity levels below 1.0 NTU.

Note 2.5 for Aluminum (total):

The maximum acceptable concentration (MAC) for total aluminum in drinking water is 2.9 mg/L (2 900 µg/L) based on a locational running annual average of a minimum of quarterly samples taken in the distribution system. (Update March 5, 2021)

Note 2.6 for Arsenic (total):

Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 2.7 for Barium (total):

Update January 24, 2020. The MAC was revised from 1.0 mg/L to 2.0 mg/L.

Note 2.8 for Cadmium (total):

A maximum acceptable concentration (MAC) of 0.007 mg/L (7 µg/L) is established for total cadmium in drinking water, based on a sample of water taken at the tap. (Update July 14, 2020)

Note 2.9 for Copper (total):

A maximum acceptable concentration (MAC) of 2 mg/L is established for total copper in drinking water, based on a sample of water taken at the tap. Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on Copper, June 2019.

Note 2.10 for Lead (total):

The maximum acceptable concentration (MAC) for total lead in drinking water is 0.005 mg/L (5 µg/L), based on a sample of water taken at the tap and using the appropriate protocol for the type of building being sampled. Every effort should be made to maintain lead levels in drinking water as low as reasonably achievable (or ALARA). (GCDWQ: Guideline Technical Document; March, 2019)

Note 2.11 for Manganese (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on manganese, May 2019.

Note 2.12 for Strontium (total):

Guidelines for Canadian Drinking Water Quality - Guideline Technical Document on strontium, May 2019.

Note 2.13 for E. coli (counts):

MAC is none detectable per 100 mL

Note 2.14 for Total coliforms (counts):

Table D-2

Guideline Notes

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

Client/Code

KALA Groundwater
1314 McGill Road
Kamloops, BC
V2C 6N6

TEL: (250) 372-9194
FAX: (250) 372-9398
kalagroundwater@telus.net

Date 15Mar07 11:48a No. W72834
Source FWS
Type of Sample water
No. of Samples 3

Comments Arrival temp.: 4.0C
Kala Project No: 07003

Samlpes: Alto Utilities Winfield BC

	Sample		lactose fermentors	Coliforms Total	Coliforms Fecal	Yeast/Fungi	TPC*
1	Kala South Well	14Mar07 02:25p	ND	ND	ND	ND / 784	797
2	West Well	14Mar07 08:35a	ND	ND	ND	ND / ND	2.08
3	Surface Water	14Mar07 01:30p	34.0	0.26	0.16	ND / ND	1008

* all counts are colony forming units per milli-litre

ND = none detected
TPC = total plate count- spread plate method - 35C/48hr TGEA
FDA/BAM 8th ed, 1995 + Revision A, 1998

- see following page for micro ID & chemistry results -

K. Hooper
Microbiologist

W. Riggs
Sr. Microbiologist

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Date 15Mar0 11:48a
Source FWS
Type of Sample water
No. of Samples 3

Comments Arrival temp.: 4.0C
Kala Project No: 07003

Samples: Alto Utilities Winfield BC

MICROBIAL IDENTIFICATION

Sample	CFU/mL	Organisms Identified	Likely Habitat/Comments
1 Kala South Well	784	Scopulariopsis koningii (Oud.)Vuillemin	F -associated with mammals; grows @ 18-37C
14Mar07 02:25p	10.0	Acidovorax delafieldii	B -widespread; environment
	2.72	Acetobacter pasteurianus	B -plant pathogen; food spoilage
2 West Well	2.00	Pseudomonas putida	B -soil, water
14Mar07 08:35a	0.06	Arcanobacterium sp	B -potential pathogen
	0.02	Micrococcus varians	B -environment, water, skin

B = bacterium
Y = yeast
F = fungus

CFU = colony forming units

Sample		less than 10um	greater than 10um	Total *
1 Kala South Well	14Mar07 02:25p	1.80×10^4	1.00×10^4	2.80×10^4
2 West Well	14Mar07 08:35a	9.20×10^4	1.60×10^4	1.08×10^5

* all counts are particle/mL

- see following page for chemistry results -

K. Hooper
Microbiologist

W. Riggs
Sr. Microbiologist

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Date 15Mar0 11:48a
Source FWS
Type of Sample water
No. of Samples 3

No. W72834 pg3

Comments Arrival temp.: 4.0C
Kala Project No: 07003

Samples: Alto Utilities Winfield BC

SAMPLE	DATE	TIME	Alkalinity (mg/L)	HCO_3 (mg/L)	BOD_5 (mg/L)	D.Ca (mg/L)	Cl^- (mg/L)
Kala South Well	14Mar07	02:25p	---	---	ND	---	---
West Well	14Mar07	08:35a	---	---	ND	---	---
Surface Water	14Mar07	01:30p	85.0	85.0	---	30.9	13.6
Lab Blank			ND	ND	ND	ND	ND
S_o			0.100	0.100	0.300	0.030	0.015
REF. VALUE			200	200	19.8	50.0	10.0
STD ± 2SD			199 ± 13.7	201 ± 10.8	19.7 ± 1.96	50.2 ± 4.22	9.90 ± 0.956

SAMPLE	DATE	TIME	COD (mg/L)	D.Mg (mg/L)	D.Na (mg/L)	SO_4^{2-} (mg/L)	T.O.C. (mg/L)
Kala South Well	14Mar07	02:25p	ND	---	---	---	ND
West Well	14Mar07	08:35a	ND	---	---	---	ND
Surface Water	14Mar07	01:30p	---	11.9	142	9.67	---
Lab Blank			ND	ND	ND	ND	ND
S_o			1.50	0.030	0.0300	0.700	0.300
REF. VALUE			50.0	10.0	10.0	10.0	10.0
STD ± 2SD			50.2 ± 4.99	10.1 ± 1.05	9.98 ± 0.880	10.2 ± 1.02	9.93 ± 0.881

SAMPLE	DATE	TIME	Turbidity (NTU)	UVT (%)
Kala South Well	14Mar07	02:25p	---	97.6
West Well	14Mar07	08:35a	---	96.8
Surface Water	14Mar07	01:30p	1.36	---
Lab Blank			ND	ND
S_o			0.015	0.100
REF. VALUE			5.00	90.0
STD ± 2SD			5.00 ± 0.361	89.0

SD = standard deviation
STD = secondary standard calibrated to primary standard reference material
S_o = standard deviation at zero analyte concentration; method detection limit is generally considered to be 3x S_o value
ND = none detected n/a = not applicable

R. Bilodeau
Analytical Chemist

H. Hartmann
Sr. Analytical Chemist

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Date 15Mar0 11:48a No.
Source FWS
Type of Sample water
No. of Samples 3
Comments Arrival temp.: 4.0C
Kala Project No: 07003

Samples: Alto Utilities Winfield BC

TRIHALOMETHANES FORMATION POTENTIAL

	SAMPLE	DATE	TIME	$CHCl_3$ ug/L	$CHBr_3$ ug/L	$BrCl_2CH$ ug/L	$ClBr_2CH$ ug/L	Start 7 Days Cl_2 @ 21C	
1	Kala South Well	14Mar07	02:25p	8.42	<0.10	3.58	1.39	4.90	3.95 mg/L
2	West Well	14Mar07	08:35a	7.60	<0.10	2.44	2.44		
	Lab Blank			<0.10	<0.10	<0.10	<0.10		

Reference Standard		% Recovery
$CHCl_3$	Chloroform	104
$CHBr_3$	Bromoform	98.2
$BrCl_2CH$	Bromodichloromethane	108
$ClBr_2CH$	Chlorodibromomethane	104

ND = not detected
ug/L = micrograms per liter
< = less than

R. Bilodeau
Analytical Chemist

H. Hartmann
Sr.Analytical Chemist

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TEL: (250) 372-9194
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Date 15Marv/ 12:15p No. W72835
Source FWS
Type of Sample 1um wound filter
No. of Samples 2

Comments Arrival temp.: 7.0C
Project: 07003

Samples: Alto Utilities - Winfield, BC South Well

MICROSCOPIC PARTICULATE ANALYSIS *

Processing Information:

Date & Time of Sample: 14Mar07 02:25p

Total volume filtered 640 gal
Filter sediment collected 4.51gm
Vol. sucrose sediment 0.3 mL
Vol. float. pellet/100gal 0.14mL

Laboratory Examination

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

Indicator Elements	Count/100 gal	Table #1 Range Rating**	Table #2 Relative Risk***
Giardia	ND	NS	0
Cryptosporidium	ND	NS	0
Diatoms	ND	NS	0
Algae (chlorophyll +)	ND	NS	0
Insects (or parts)	ND	NS	0
Rotifers	ND	NS	0
Plant Debris	ND	NS	0

ND = none detected
n/a = not applicable

EH = extremely heavy
H = heavy
M = moderate
R = rare
NS = not significant

Risk of surface water contamination: 0 = LOW RISK

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

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

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

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W. Riggs
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TEL: (250) 372-9194
FAX: (250) 372-9398
kalagroundwater@telus.net

Date 15Mar07 12:15p No. W72835 pg2
Source FWS
Type of Sample 1um wound filter
No. of Samples 2

Comments Arrival temp.: 7.0C
Project: 07003

Samples: Alto Utilities - Winfield, BC West Well

MICROSCOPIC PARTICULATE ANALYSIS *

Processing Information:

Date & Time of Sample: 14Mar07 08:35a

Total volume filtered 1230 gal
Filter sediment collected 6.82gm
Vol. sucrose sediment 0.2 mL
Vol. float. pellet/100gal 0.17mL

Laboratory Examination

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

Indicator Elements	Count/100 gal	Table #1 Range Rating**	Table #2 Relative Risk***
Giardia	ND	NS	0
Cryptosporidium	ND	NS	0
Diatoms	ND	NS	0
Algae (chlorophyll +)	ND	NS	0
Insects (or parts)	ND	NS	0
Rotifers	ND	NS	0
Plant Debris	65	M	1

ND = none detected
n/a = not applicable

EH = extremely heavy
H = heavy
M = moderate
R = rare
NS = not significant

Risk of surface water contamination: 1 = LOW RISK

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

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

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

K. Hooper
Microbiologist

W. Riggs
Sr. Microbiologist

APPENDIX E - CAPTURE ZONE DELINEATION METHODS

Methods

Table 1-4 in Module 1 of the Source-to-Tap Guideline summarizes the different capture zone delineation methods that range from simple to more complex and recommends which one to follow depending on the size of the water system and the hydrogeologic setting (MOHLS 2010). For water systems with 100 to 10,000 connections, the Source-to-Tap Guideline recommends using analytical equations and hydrogeological mapping to delineate the capture zones. The North and South Wells service 430 connections; therefore, the assessment involved a combination of desktop-based hydrogeological mapping and analytical equations outlined by Ceric and Haitjema (2005). This involved a mathematical approach to justify the method selection between the circular, eccentric circular, and boat-shaped capture zone analytical equations that are presented in the BC Well Protection Toolkit (MOE 2000). The analytical equations require inputting the aquifer's hydraulic conductivity (m/s), thickness (m), hydraulic gradient (unitless), and porosity (unitless) as well as the pumping rate of the well and the timeframe of interest (Table C-1).

The proximity of the two wells (25 m) allows us to treat the wells as a single source for the purpose of determining the capture zones. The capture zones are based on the combined licenced extraction rate from the North and South Well (473,000 m^3/year under Licence 501667). For the purposes of this assessment, we have assumed that this is equivalent to an average year-round pumping rate of 15 L/s.

Table E-1
Capture Zone Delineation Parameters for the North Well and South Well

Parameter	Value
Aquifer description	Aquifer 344 – Confined sand and gravel
Hydraulic conductivity (m/s)[1]	7.21×10^{-4}
Aquifer thickness (m)[2]	14
Porosity[3]	0.25
Hydraulic gradient and direction[4]	0.006 m/m to the North
Pumping rate (L/s)[5]	15

Notes:
[1] The hydraulic conductivity was determined by Golder (2011).
[2] Based on the well logs of the North and South Wells.
[3] Typical porosity for sand and gravel (from BC Well Protection Toolkit).
[4] The hydraulic gradient was calculated from the groundwater elevations measured at the South Well, WPID 38650, and WTN 117682 on May 27, 2021 (0.0067) and the gradient reported for Aquifer 344 by Lebreton (1974) (0.0055). Lebreton (1974) indicated a groundwater flow direction to the North and this was affirmed by the measurements we recorded on May 27, 2021.
[5] Based on the licenced groundwater extraction rate for the water supply system (Licence 501667).

Results

The Ceric and Haitjema (2005) methodology suggested using a boat-shaped capture zone, predominantly because the hydraulic gradient is 0.006 m/m (i.e., 6 mm of head drop per every meter of distance). The "bow" of the boat in this instance is estimated to be 40 m down-gradient of the North and South Wells, which is to say that nothing further down-gradient than that would be included in the capture zone. Further, the eastern and western limits of the boat extend ~120 m from the wells. Kala (2003) has indicated that groundwater levels in wells located 440 m and 600 m west (cross-gradient) of the production wells were impacted by pumping at the North and South Well. Therefore, it is reasonable to assume that the capture zones could extend beyond 120 m west from this water supply system. To remain conservative, we have elected to use the CFR method to ensure and adequate down-gradient and cross-gradient area is considered in the SWPP. We have modified the 5-year and 10-year capture zones based on the hydrogeologic mapping and the groundwater gradient.

The 200-day capture zone was determined to have a radius of 150 m and extended slightly into the bedrock wall. This capture zone was not altered as it is reasonable to assume that some recharge to the aquifer could originate from the bedrock.

The 5-year capture zone was determined to have a radius of 460 m and extend approximately 360 m beyond the mapped extent of Aquifer 344, into the bedrock. While some flow is anticipated from the bedrock, we expect that the higher transmissivity of the confined aquifer would provide substantially more flow. Given that the groundwater gradient is to the north, this capture zone would reasonably elongate to the south. The area of the capture zone in Figure 2-3 is 0.66 km^2, which is equivalent to the area of a circle with radius 460 m.

The 10-year capture zone was determined to have a radius of 660 m and extend approximately 560 m beyond the mapped extend of Aquifer 344, into the bedrock. For the reasons laid out above, we have fitted the capture zone according to the hydrogeological mapping and our understanding groundwater flow. The area of this capture zone is 1.37 km^2, which is equivalent to the area of a circle with radius 660 m.

Figure 2-4 in the report illustrates the captures zones as Well Protection Areas, A, B, C and D as follows:

- Well Protection Area A –100 m protection area around well,
- Well Protection Area B – 200-day capture zone,
- Well Protection Area C – 5-year capture zone, and
- Well Protection Area D – 10-year capture zone.

APPENDIX F - SUMMARY OF CONTAMINANT TYPES AND CONTAMINATED SITES REGISTRY OUTPUTS

Hazards by Land Use (Point Source and Non-point Sources)
The term "hazards" in the Source-to-Tap Guideline encompasses actual/existing hazards and potential hazards. Hazards are typically categorized as point source or non-point source. Point sources of contamination arise from a single, identifiable location (e.g., a wastewater treatment plant discharge). Non-point sources arise from multiple sources over an area (e.g., fertilizer use on agricultural land, private on-site wastewater treatment systems).

Seven main types of land uses can cause a point source or non-point source hazard (AANDC 2014). Examples of hazards from each type of land use are as follows:

- **Naturally occurring:** pathogens from wildlife, organic matter, sedimentation/turbidity from flooding events or increased runoff after wildfire events, metals.
- **Agricultural:** nitrates and phosphates from fertilizers, pesticides/herbicides, increased sedimentation, pathogens from livestock, accidental fluid releases from machinery.
- **Construction (residential, commercial, or industrial transportation):** various possible contaminants (turbidity, hydrocarbons).
- **Forestry:** sedimentation and turbidity, nutrients and pathogens (due to increased runoff from logged areas), motor fuel from vehicle access and logging roads, leachate from decomposing wood waste.
- **Industrial:** varied, depending on the type of industrial enterprises, but could include storage tanks, landfills, pipelines, and brownfield sites (former industrial sites).
- **Mining:** legacy mine sites and stockpiles.
- **Urban (commercial, residential, and municipal):** varied, depending on the type of commercial enterprises (e.g., solvents and machinery waste from auto repair shops, dry cleaners, campgrounds, gas stations with storage tanks, cemeteries and graveyards); pathogens and nutrients from septic systems; fertilizers and herbicides from fields/parks; stormwater runoff, road salt for de-icing, sewage lagoons, unused or abandoned wells.

Table F-1
Contaminated Sites Registry Outputs

Site ID	Distance from Site (m)	Gradient (up/down)	200m 5-year or 10-year capture zone	Longitude	Latitude	Last Updated	Notes
4597	676	Upgradient	5 - year	119° 23' 59.64"	50° 1' 45.46"	22-Jun-98	Inactive (Under ground storage tank, replaced with Above ground storage tank)
8118	741	Cross Gradient	10 - year	119° 24' 15.73"	50° 2' 8.78"	25-May-06	Inactive
18385	1238	Upgradient	> 10 - year	119° 23' 46.00"	50° 1' 24.00"	04-Nov-15	NA
19570	1331	Upgradient	> 10 - year	119° 23' 51.00"	50° 1' 21.00"	14-Oct-16	NA
3333	1435	Upgradient	>10 - year	119° 23' 41.26"	50° 1' 16.73"	15-Aug-01	Active
7234	1441	Upgradient	>10 - year	119° 23' 45.49"	50° 1' 17.71"	17-Sep-07	Inactive
5735	1455	Upgradient	> 10 - year	119° 23' 34.90"	50° 1' 15.80"	19-Jun-19	Inactive
4013	1463	Upgradient	>10 - year	119° 23' 58.08"	50° 1' 17.41"	10-Oct-03	Inactive
9222	1628	Upgradient	>10 - year	119° 23' 29.00"	50° 1' 11.00"	17-Mar-05	Inactive (Nothing in Report)
9007	1642	Upgradient	>10 - year	119° 24' 18.00"	50° 1' 16.00"	17-Mar-05	Active, (Above ground storage tank removal and associated contaminants)
23348	1642	Upgradient	> 10 - year	119° 23' 40.46"	50° 1' 10.28"	05-Jun-20	NA
11171	1687	Upgradient	> 10 - year	119° 24' 22.60"	50° 1' 17.70"	17-Apr-09	NA
13788	1692	Downgradient	>10 - year	119° 23' 24.70"	50° 2' 59.50"	23-Sep-15	NA
2418	1750	Downgradient	>10 - year	119° 24' 12.40"	50° 2' 56.40"	NA	Active
6698	1795	Upgradient	>10 - year	119° 23' 18.50"	50° 1' 6.80"	12-Apr-05	Inactive
2558	2048	Upgradient	>10 - year	119° 22' 47.79"	50° 1' 6.36"	NA	Inactive
3816	2102	Upgradient	>10 - year	119° 23' 28.26"	50° 0' 55.09"	01-Jun-01	Inactive
15257	2127	Upgradient	> 10 - year	119° 23' 15.00"	50° 0' 58.00"	09-Nov-13	NA

Site ID	Distance from Site (m)	Gradient (up/down)	200m 5-year or 10-year capture zone	Longitude	Latitude	Last Updated	Notes
3973	2295	Upgradient	>10 - year	119° 23' 22.14"	50° 0' 50.61"	08-Nov-06	Inactive
2560	2466	Downgradient	>10 - year	119° 24' 30.06"	50° 3' 17.48"	04-Jun-04	Unknown
11908	2491	Downgradient	> 10 - year	119° 24' 40.50"	50° 3' 10.80"	14-Sep-12	NA
10077	2500	Downgradient	>10 - year	119° 24' 44.00"	50° 3' 16.00"	NA	Active,
10979	2762	Upgradient	> 10 - year	119° 23' 7.80"	50° 0' 35.80"	NA	NA
8203	2780	Upgradient	> 10 - year	119° 23' 23.50"	50° 0' 34.00"	12-Aug-11	NA
11960	3055	Upgradient	> 10 - year	119° 23' 26.72"	50° 0' 24.40"	26-Mar-10	NA
15536	4095	Upgradient	> 10 - year	119° 22' 16.70"	50° 0' 3.32"	25-Mar-21	NA
20652	4234	Downgradient	>10 - year	119° 20' 31.80"	50° 3' 9.30"	NA	NA (located in a different watershed)
12291	4577	Downgradient	>10 - year	119° 24' 30.10"	50° 4' 29.10"	NA	NA
16970	4631	Downgradient	>10 - year	119° 24' 37.18"	50° 3' 58.33"	18-Nov-14	NA

30 records selected for 5.0 km from latitude 50 deg, 02 min, 4.28 sec
and Longitude 119 deg, 23 min, 39 sec

Site Id	Lastupd	Address / City
0002418		3191 WOODSDALE ROAD WINFIELD
0002558		BEAVER LAKE ROAD WINFIELD
0002560	04JUN04	11891 HIGHWAY 97 NORTH WINFIELD
0003258	01DEC19	11449 OKANAGAN CENTRE ROAD OKANAGAN CENTRE
0003333	01AUG15	9595 MCCARTHY ROAD KELOWNA
0003816	01JUN20	8999 JIM BAILEY ROAD WINFIELD
0003973	06NOV08	8999 JIM BAILEY ROAD WINFIELD
0004013	03OCT10	9618 BOTTOM WOOD LAKE ROAD WINFIELD
0004597	98JUN22	10241 BOTTOM WOOD LAKE ROAD WINFIELD
0005735	19JUN19	400 BEAVER LAKE ROAD KELOWNA
0006698	05APR12	JIM BAILEY ROAD WINFIELD
0007234	07SEP17	9590 MCCARTHY ROAD KELOWNA
0008118	06MAY25	10550 HIGHWAY 97 WINFIELD
0008203	11AUG12	8999 JIM BAILEY ROAD WINFIELD
0009007	05MAR17	9558 GLENMORE ROAD WINFIELD
0009222	05MAR17	350 CARION ROAD KELOWNA
0010077		11850 OCEOLA ROAD LAKE COUNTRY
0010979		8850 GRIGG ROAD KELOWNA
0011171	09APR17	9611 HIGHWAY 97 NORTH WINFIELD
0011908	12SEP14	9531 HIGHWAY 97 N LAKE COUNTRY
0011960	10MAR26	8717 JIM BAILEY CRESCENT KELOWNA
0012291		13150 OLD MISSION ROAD LAKE COUNTRY
0013788	15SEP23	3774 WOODSDALE ROAD LAKE COUNTRY
0015257	13NOV09	200 POTTERTON ROAD KELOWNA
0015536	21MAR25	ELLISON LAKE ROAD EAST WINFIELD

As Of: MAY 02, 2021 BC Online: Site Registry 21/05/06
For: PN57542 ASSOCIATED ENVIRONMENTAL CONSULTANT 12:58:05

30 records selected for 5.0 km from latitude 50 deg, 02 min, 4.28 sec
and Longitude 119 deg, 23 min, 39 sec

Site Id	Lastupd	Address / City
0016970	14NOV18	LOT A, SECTION 27 (EAST PORTION) LAKE COUNTRY
0018385	15NOV04	9750 MCCARTHY ROAD KELOWNA
0019570	16OCT14	MCCARTHY ROAD LAKE COUNTRY
0020652		2.5 KM NORTH OF BEAVER LAKE ROAD WINFIELD
0023348	20JUN05	9500 JIM BAILEY ROAD (SW CORNER OF BEAVER LAKE RD KELOWNA

```
 As of: MAR 06, 2022       BC Online: Site Registry                    22-03-10
                      For: PN57542  ASSOCIATED ENVIRONMENTAL CONSULTAN 08:44:33
 Folio: 2021-8810                                                      Page   1
                                 Detail Report
SITE LOCATION
       Site ID:       4597                            Latitude:  50d 01m 45.5s
 Victoria File:                                      Longitude: 119d 23m 59.6s
 Regional File: 26100-20/4597
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: 10241 BOTTOM WOOD LAKE ROAD
         City: WINFIELD                       Prov/State: BC
  Postal Code: V4X 1Y7

 Registered: JAN 14, 1998  Updated: JUN 22, 1998  Detail Removed: JUN 05, 1998

 Notations:   2   Participants:   4    Associated Sites:   0
 Documents:   0 Susp. Land Use:   3 Parcel Descriptions:   4

Location Description: LONG/LAT DERIVED BY BC ENVIRONMENT REFERENCING DIGITAL
 TRIM MAP COVERAGES, NAD83 - 1:20000 SCALE.

Record Status: NOT ASSIGNED
 Fee category: NOT APPLICABLE

 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
NOTATIONS

  Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE
                 MINISTRY
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
      Initiated: NOV 20, 1997                        Approved:

 Ministry Contact: VERGAMINI, DON (PENTICTON)

 Notation Participants                               Notation Roles
 JARMAN, PETER                                       ISSUED BY

 Note: LETTER RE:  SITE PROFILE FOR 10241 BOTTOM WOOD LAKE ROAD, LAKE COUNTRY,
 BC.  THE MINISTRY OF ENVIRONMENT, LANDS AND PARKS DOES NOT INTEND TO REQUIRE
 OR ORDER A PRELIMINARY OR DETAILED SITE INVESTIGATION AT THIS TIME.
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE RECEIVED
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
      Initiated: NOV 18, 1997                        Approved:

 Ministry Contact: JARMAN, PETER

 Notation Participants                               Notation Roles
 SCHOOL DISTRICT 23 (CENTRAL OKANAGAN)               SUBMITTED BY

 Note: SITE PROFILE TRIGGERED UPON APPLICATION FOR A DEVELOPMENT PERMIT
 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
SITE PARTICIPANTS

   Participant: JARMAN, PETER
```

```
 As of: MAR 06, 2022       BC Online: Site Registry                    22-03-10
                      For: PN57542  ASSOCIATED ENVIRONMENTAL CONSULTAN 08:44:33
 Folio: 2021-8810                                                      Page   2
SITE PARTICIPANTS

       Role(s): ALTERNATE MINISTRY CONTACT
    Start Date: NOV 18, 1997                           End Date:
         Notes: ASSISTANT REGIONAL WASTE MANAGER
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   Participant: SCHOOL DISTRICT 23 (CENTRAL OKANAGAN)
       Role(s): PROPERTY OWNER
    Start Date: NOV 18, 1997                           End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   Participant: SHOEMAKER, JUDY
       Role(s): SITE PROFILE COMPLETOR
                SITE PROFILE CONTACT
    Start Date: NOV 18, 1997                           End Date:
         Notes: SCHOOL DISTRICT #23 CONTACT
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   Participant: VERGAMINI, DON (PENTICTON)
       Role(s): MAIN MINISTRY CONTACT
    Start Date: NOV 18, 1997                           End Date:
         Notes: CONTAMINATED SITES TECHNICIAN
 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
SUSPECTED LAND USE

 Description: APPLIANCE/EQUIP OR ENGINE REPAIR/RECONDIT/CLEAN/SALVAGE
       Notes: SECONDARY SCHOOL INDUSTRIAL ARTS SHOP(described on Site Profile
              dated 97-11-06)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Description: PETROL PROD., /PRODUCE WATER STRG ABVEGRND/UNDERGRND TANK
       Notes: 100 GALLON UNDERGROUND WASTE OIL TANK REPLACED WITH AN ABOVE
              GROUND TANK
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Description: SEPTIC TANK PUMPAGE STORAGE OR DISPOSAL
       Notes:
 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
PARCEL DESCRIPTIONS

  Date Added: NOV 06, 1997                  Crown Land PIN#:
    LTO PID#: 005242100                    Crown Land File#:
   Land Desc: LOT A SECTION 10 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
              26148
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Date Added: NOV 06, 1997                  Crown Land PIN#:
    LTO PID#: 010586750                    Crown Land File#:
   Land Desc: LOT 1 SECTION 10 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
              4073EXCEPT PLAN 36673
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Date Added: NOV 06, 1997                  Crown Land PIN#:
    LTO PID#: 011510536                    Crown Land File#:
   Land Desc: LOT B DISTRICT LOT 118 OSOYOOS DIVISION YALE DISTRICT PLAN 1630
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Date Added: NOV 06, 1997                  Crown Land PIN#:
    LTO PID#: 018085814                    Crown Land File#:
   Land Desc: LOT A DISTRICT LOT 118 OSOYOOS DIVISION YALE DISTRICT PLAN
```

```
 As of: MAR 06, 2022       BC Online: Site Registry                    22-03-10
                         For: PN57542  ASSOCIATED ENVIRONMENTAL CONSULTAN 08:44:33
 Folio: 2021-8810                                                      Page   3
PARCEL DESCRIPTIONS

              KAP48997
 = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = = =
CURRENT SITE PROFILE INFORMATION (Sec. III to X)
                                   Site Profile Completion Date: NOV 06, 1997

Local Authority         Received:

Ministry Regional Manager Received: NOV 18, 1997        Decision: NOV 20, 1997
   Decision: INVESTIGATION NOT REQUIRED

Site Registrar       Received:                         Entry Date:

III  COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE
       Schedule 2
    Reference           Description
         E1       APPLIANCE/EQUIP OR ENGINE REPAIR/RECONDIT/CLEAN/SALVAGE
         H18      SEPTIC TANK PUMPAGE STORAGE OR DISPOSAL

AREAS OF POTENTIAL CONCERN
 Petroleum, solvent or other polluting substance spills to the environment
    greater than 100 litres?.............................................NO
 Residue left after removal of piled materials such as chemicals, coal,
    ore, smelter slag, air quality control system baghouse dust?...........NO
 Discarded barrels, drums or tanks?.........................................NO

FILL MATERIALS
 Fill dirt, soil, gravel, sand or like materials from a contaminated site
    or from a source used for any of the activiities listed under Schedule
    2?...................................................................NO
 Discarded or waste granular materials such as sand blasting grit, asphalt
    paving or roofing material, spent foundry casting sands, mine ore,
    waste rock or float?.................................................NO
 Dredged sediments, or sediments and debris materials originating from
    locations adjacent to foreshore industrial activities, or municipal
    sanitary or stormwater discharges?...................................NO

WASTE DISPOSAL
 Materials such as household garbage, mixed municipal refuse, or demolition
    debris?..............................................................NO
 Waste or byproducts such as tank bottoms, residues, sludge, or
    flocculation precipitates from industrial processes or wastewater
    treatment?...........................................................NO
 Waste products from smelting or mining activities, such as smelter slag,
    mine tailings, or cull materials from coal processing?.................NO
 Waste products from natural gas and oil well drilling activities, such as
    drilling fluids and muds?............................................NO
 Waste products from photographic developing or finishing laboratories;
    asphalt tar manufacturing; boilers, incinerators or other thermal
    facilities (eg. ash); appliance, small equipment or engine repair or
    salvage; dry cleaning operations (eg. solvents); or automobile and
    truck parts cleaning or repair?........................................NO
```

TANKS OR CONTAINERS USED OR STORED
Underground fuel or chemical storage tanks?.....NO
Above ground fuel or chemical storage tanks?.....NO

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES
PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO
Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO
Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS
Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....YES
Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO
Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 5735 Latitude: 50d 01m 15.8s
Victoria File: 26250-20/5735 Longitude: 119d 23m 34.9s
Regional File: 26250-20/5735
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 400 BEAVER LAKE ROAD
City: KELOWNA Prov/State: BC
Postal Code: V4V 1S5

Registered: MAR 11, 1999 Updated: JUN 19, 2019 Detail Removed: JUN 18, 2019

Notations: 3 Participants: 4 Associated Sites: 0
Documents: 0 Susp. Land Use: 0 Parcel Descriptions: 6

Location Description: LAT/LONG CONFIRMED USING PARCELMAP BC ON 10 JUNE, 2019

Record Status: NOT ASSIGNED
Fee category: NOT APPLICABLE

= =

NOTATIONS

Notation Type: NOTICE OF INDEPENDENT REMEDIATION COMPLETION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: JUN 18, 2019 Approved: JUN 18, 2019

Ministry Contact: FREDERICK, PABLO

Notation Participants	Notation Roles
GD ASSESSMENTS INC.	SUBMITTED BY

Note: COMPLETED: 2019-05-10 INDUSTRIAL MOTOR VEHICLE ACCIDENT: (DGIR) # 183893

- -

Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAR 03, 1999 Approved:

Ministry Contact: WARD, JOHN E H

- -

```
 Notation Type: SITE PROFILE RECEIVED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
     Initiated: FEB 03, 1999                        Approved:

Ministry Contact: WARD, JOHN E H

Notation Participants                               Notation Roles
RIVERSIDE FOREST PRODUCTS LTD. (KELOWNA, B.C.)      SITE PROFILE SUBMITTED
                                                    BY
```

= =

SITE PARTICIPANTS

```
  Participant: FREDERICK, PABLO
      Role(s): MINISTRY CONTACT
   Start Date: JUN 18, 2019                           End Date:
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: GD ASSESSMENTS INC.
      Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
   Start Date: JUN 18, 2019                           End Date:
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: RIVERSIDE FOREST PRODUCTS LTD. (KELOWNA, B.C.)
      Role(s): PROPERTY OWNER
               SITE PROFILE COMPLETOR
               SITE PROFILE CONTACT
   Start Date: FEB 03, 1999                           End Date:
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: WARD, JOHN E H
      Role(s): MAIN MINISTRY CONTACT
   Start Date: FEB 03, 1999                           End Date:
```

= =

PARCEL DESCRIPTIONS

```
 Date Added: JAN 22, 1999                 Crown Land PIN#:
   LTO PID#: 003785297                   Crown Land File#:
  Land Desc: LOT 12 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
             PLAN 6040
```

- -
Date Added: JAN 22, 1999 Crown Land PIN#:
LTO PID#: 003785319 Crown Land File#:
Land Desc: LOT 13 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 6040

- -
Date Added: JAN 22, 1999 Crown Land PIN#:
LTO PID#: 003785335 Crown Land File#:
Land Desc: LOT 14 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 6040

- -
Date Added: JAN 22, 1999 Crown Land PIN#:
LTO PID#: 010233571 Crown Land File#:
Land Desc: LOT 5 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 6040

- -
Date Added: MAR 06, 1999 Crown Land PIN#:
LTO PID#: 024384488 Crown Land File#:
Land Desc: LOT A SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP63756

- -
Date Added: MAR 06, 1999 Crown Land PIN#:
LTO PID#: 024384496 Crown Land File#:
Land Desc: LOT B SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP63756

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CURRENT SITE PROFILE INFORMATION (Sec. III to X)

Site Profile Completion Date: JAN 22, 1999

Local Authority Received: JAN 26, 1999

Ministry Regional Manager Received: FEB 03, 1999 Decision: MAR 03, 1999
Decision: INVESTIGATION NOT REQUIRED

Site Registrar Received: FEB 03, 1999 Entry Date: MAR 03, 1999

AREAS OF POTENTIAL CONCERN

Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?.....NO
Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?.....NO
Discarded barrels, drums or tanks?.....NO

FILL MATERIALS

Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activiities listed under Schedule 2?.....NO
Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?.....NO
Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?.....NO

WASTE DISPOSAL

Materials such as household garbage, mixed municipal refuse, or demolition debris?.....NO
Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?.....NO
Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.....NO
Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO
Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); or automobile and truck parts cleaning or repair?.....NO

TANKS OR CONTAINERS USED OR STORED

Underground fuel or chemical storage tanks?.....NO
Above ground fuel or chemical storage tanks?.....NO

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES

PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO
Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO
Paints, solvents, mineral spirits or waste pest control products or pest

control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS

Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO

Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO

Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 8203 Latitude: 50d 00m 34.0s
Victoria File: 26250-20/8203 Longitude: 119d 23m 23.5s
Regional File: 26250-20/8203
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 8999 JIM BAILEY ROAD
City: WINFIELD Prov/State: BC
Postal Code: V4V 2K9

Registered: APR 02, 2003 Updated: AUG 12, 2011 Detail Removed: AUG 04, 2011

Notations: 9 Participants: 10 Associated Sites: 1
Documents: 7 Susp. Land Use: 0 Parcel Descriptions: 9

Location Description: THIS IS A PORTION OF THE HISTORICAL PROPERTY SITE 3973

Record Status: NOT ASSIGNED
Fee category: UNRANKED

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NOTATIONS

Notation Type: SITE RISK CLASSIFIED - SITE IS NON-HIGH RISK
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: AUG 09, 2011 Approved: AUG 09, 2011

Ministry Contact: O'GRADY, TYLER

Notation Participants	Notation Roles
EBA ENGINEERING CONSULTANTS LTD	SUBMITTED BY

Note: SITE RISK CLASSIFICATION REPORT IS FOR PORTION OF SITE WITHIN 8877 JIM BAILEY ROAD. PID 024-779-768

- -

Notation Type: NOTICE OF INDEPENDENT REMEDIATION COMPLETION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: AUG 02, 2011 Approved: AUG 02, 2011

Ministry Contact: SAMWAYS, JENNIFER

Notation Participants	Notation Roles
EBA ENGINEERING CONSULTANTS LTD	SUBMITTED BY

Note: INDEPENDENT REMEDIATION IS BEING CONDUCTED WITHIN 8877 JIM BAILEY ROAD. PID 024-779-768

- -

Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: AUG 02, 2011 Approved: AUG 02, 2011

Ministry Contact: SAMWAYS, JENNIFER

NOTATIONS

Notation Participants	Notation Roles
EBA ENGINEERING CONSULTANTS LTD	SUBMITTED BY

Note: INDEPENDENT REMEDIATION IS BEING CONDUCTED WITHIN 8877 JIM BAILEY ROAD. PID 024-779-768

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Notation Type: CERTIFICATE OF COMPLIANCE ISSUED (WMA 27.6(2))
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: APR 02, 2003 Approved: APR 02, 2003

Ministry Contact: WARD, JOHN E H

Notation Participants	Notation Roles
PATRICK, GUY	ROSTERED EXPERT UNDER PROTOCOL SIX
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	RECEIVED BY
WARD, JOHN E H	ISSUED BY

Note: ISSUED ON THE ADVICE OF A ROSTERED PROFESSIONAL EXPERT (GUY PATRICK) UNDER PROTOCOL 6 OF THE CONTAMINATED SITES REGULATION.

- -

Notation Type: CERTIFICATE OF COMPLIANCE REQUESTED WITHOUT INSPECTION

Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: NOV 14, 2002 Approved: JAN 21, 2003

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants	Notation Roles
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	REQUESTED BY

Note: CERTIFICATE OF COMPLIANCE REQUESTED

Required Actions: 2003-01-21 - CERTIFICATE OF COMPLIANCE NO LONGER REQUESTED AS THEY ARE GOING TO PROCEED THROUGH THE ROSTERED PROFESSIONAL OPTION

- -

Notation Type: REMEDIATION COMPLETION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: OCT 24, 2002 Approved: OCT 24, 2002

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants	Notation Roles
GOLDER ASSOCIATES LTD (KELOWNA)	SUBMITTED BY

Note: TWO REPORTS SUBMITTED TITLED VOLUME 1 (& 2) SITE REMEDIATION AND CLOSURE HYDROCARBON CONTAMINATED SOIL AND GROUNDWATER FORMER HIRAM WALKER PLANT, 8877 JIM BAILEY ROAD, KELOWNA, BRITISH COLUMBIA

- -

NOTATIONS

Notation Type: REMEDIAL PLAN SUBMITTED WITHOUT RISK ASSESSMENT: INTERNAL REVIEW REQUESTED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: JUL 19, 2002 Approved: JUL 19, 2002

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants	Notation Roles

GOLDER ASSOCIATES LTD (KELOWNA)   SUBMITTED BY

Note: TWO REPORTS SUBMITTED: "REMEDIAL DESIGN INVESTIGATION ABOVEGROUND AND UNDERGROUND STORAGE TANK AREAS FORMER HIRAM WALKER PLANT 8877 JIM BAILEY ROAD, KELOWNA, BRITISH COLUMBIA" AND "AMENDMENT TO REMEDIAL ACTION PLAN FORMER HIRAM WALKER PLANT, 8777 JIM BAILEY ROAD, KELOWNA, BC, BCE SITE NO. 3973"

- -

Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED (WMA 28(2))
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAY 30, 2000   Approved: MAY 30, 2000

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants   Notation Roles
EBA ENGINEERING CONSULTANTS LTD   SUBMITTED BY

Required Actions: 2000-06-09 - LETTER SUBMITTED BY EBA NOTIFYING THAT THEIR REMEDIATION PLAN WILL BE IMPLEMENTED STARTING JUNE 12, 2000

- -

Notation Type: SITE INVESTIGATION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: MAR 01, 1998   Approved: MAR 01, 1998

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants   Notation Roles
EBA ENGINEERING CONSULTANTS LTD   SUBMITTED BY

Note: REPORT TITLED "DETAILED SITE INVESTIGATION, 8999 JIM BAILEY ROAD, KELOWNA, BC, EBA FILE NO. 0808-97-89533". THIS IS A COPY OF THE DSI FOR SITE 3973.

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SITE PARTICIPANTS

Participant: EBA ENGINEERING CONSULTANTS LTD
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: MAR 01, 1998   End Date:

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Participant: GOLDER ASSOCIATES LTD (KELOWNA)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: JUL 16, 2002   End Date:

SITE PARTICIPANTS

Participant: J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)
Role(s): PROPERTY OWNER
Start Date: MAR 30, 1998 End Date:

Participant: JARMAN, PETER
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: JUL 29, 1998 End Date:

Participant: O'GRADY, TYLER
Role(s): MINISTRY CONTACT
Start Date: AUG 09, 2011 End Date:

Participant: PATRICK, GUY
Role(s): ROSTERED EXPERT UNDER PROTOCOL SIX
Start Date: APR 02, 2003 End Date:

Participant: SAMWAYS, JENNIFER
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: AUG 02, 2011 End Date:

Participant: VERGAMINI, DON (KAMLOOPS) E
Role(s): MAIN MINISTRY CONTACT
Start Date: MAR 01, 1998 End Date:

Participant: WARD, JOHN E H
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: APR 02, 2003 End Date:

Participant: 4224973 CANADA INC (INC NO. 422497)
Role(s): PROPERTY OWNER
Start Date: AUG 02, 2011 End Date:

DOCUMENTS

Title: VOLUME 2 SITE REMEDIATION AND CLOSURE HYDROCARBON CONTAMINATED SOIL AND GROUNDWATER, FORMER HIRAM WALKER PLANT 8877 JIM BAILEY ROAD, KELOWNA, BRITISH

Authored: OCT 24, 2002 Submitted: OCT 24, 2002

Participants	Role
GOLDER ASSOCIATES LTD (KELOWNA)	AUTHOR

Title: VOLUME 1 SITE REMEDIATION AND CLOSURE HYDROCARBON CONTAMINATED SOIL AND GROUNDWATER FORMER HIRAM WALKER PLANT 8877 JIM BAILEY ROAD, KELOWNA, BRITISH C

Authored: OCT 24, 2002 Submitted: OCT 24, 2002

Participants	Role
GOLDER ASSOCIATES LTD (KELOWNA)	AUTHOR
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	COMMISSIONER

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DOCUMENTS

Title: VOLUME 2 SITE REMEDIATION AND CLOSURE HYDROCARBON CONTAMINATED SOIL AND GROUNDWATER, FORMER HIRAM WALKER PLANT 8877 JIM BAILEY ROAD, KELOWNA, BRITISH

Authored: OCT 24, 2002 Submitted: OCT 24, 2002

Participants	Role
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	COMMISSIONER

- -

Title: AMENDMENT TO REMEDIAL ACTION PLAN FORMER HIRAM WALKER PLANT, 8777 JIM BAILEY ROAD, KELOWNA, BRITISH COLUMBIA, BCE SITE NO. 3973

Authored: JUL 16, 2002 Submitted: JUL 19, 2002

Participants	Role
GOLDER ASSOCIATES LTD (KELOWNA)	AUTHOR
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	COMMISSIONER

- -

Title: REMEDIAL DESIGN INVESTIGATION ABOVEGROUND AND UNDERGROUND STORAGE TANK AREAS, FORMER HIRAM WALKER PLANT, 8877 JIM BAILEY ROAD, KELOWNA, BRITISH COLUM

Authored: MAY 06, 2002 Submitted: MAY 06, 2002

Participants	Role
GOLDER ASSOCIATES LTD (KELOWNA)	AUTHOR
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	COMMISSIONER

- -

Title: SOILS REMEDIATION REPORT

Authored: JUN 01, 2001 Submitted: JUN 01, 2001

Participants Role

EBA ENGINEERING CONSULTANTS LTD AUTHOR

- -

Title: APPROVAL IN PRINCIPLE FOR BCE SITE NO 3973 (PREPARED BY PETER JARMIN, MWALP, SOUTHERN INTERIOR REGION)

Authored: JUL 29, 1998 Submitted: JUL 29, 1998

Participants Role

JARMAN, PETER AUTHOR

- -

Title: DETAILED SITE INVESTIGATION, 8999 JIM BAILEY ROAD, KELOWNA, BC

Authored: MAR 30, 1998 Submitted: MAR 30, 1998

Participants Role

EBA ENGINEERING CONSULTANTS LTD AUTHOR

J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER) COMMISSIONER

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ASSOCIATED SITES

Site id: 3973 Date: MAR 25, 2003

Notes: SITE 8203 IS ONLY A PORTION OF THE FORMER DISTILLERY PROPERTY.

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PARCEL DESCRIPTIONS

Date Added: MAY 20, 2000 Crown Land PIN#:

PARCEL DESCRIPTIONS

LTO PID#: 024779768 Crown Land File#:

Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP66761EXCEPT PLAN KAP71932 AND EPP98124

- -

Date Added: OCT 05, 2002 Crown Land PIN#:

LTO PID#: 025493345 Crown Land File#:

Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP71932

- -

Date Added: JAN 12, 2021 Crown Land PIN#:

LTO PID#: 031077749 Crown Land File#:
Land Desc: LOT 2 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP98124

- -

Date Added: JAN 12, 2021 Crown Land PIN#:
LTO PID#: 031077757 Crown Land File#:
Land Desc: LOT 3 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP98124

- -

Date Added: JAN 12, 2021 Crown Land PIN#:
LTO PID#: 031077765 Crown Land File#:
Land Desc: LOT 4 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP98124

- -

Date Added: JAN 12, 2021 Crown Land PIN#:
LTO PID#: 031077773 Crown Land File#:
Land Desc: LOT 5 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP98124

- -

Date Added: JAN 12, 2021 Crown Land PIN#:
LTO PID#: 031077781 Crown Land File#:
Land Desc: LOT 6 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP98124

- -

Date Added: JAN 12, 2021 Crown Land PIN#:
LTO PID#: 031077790 Crown Land File#:
Land Desc: LOT 7 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP98124

- -

Date Added: JAN 12, 2021 Crown Land PIN#:
LTO PID#: 031077803 Crown Land File#:
Land Desc: LOT 8 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP98124

No activities were reported for this site

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 10979 Latitude: 50d 00m 35.8s
Victoria File: 26250-20/10979 Longitude: 119d 23m 07.8s
Regional File:
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 8850 GRIGG ROAD
City: KELOWNA Prov/State: BC
Postal Code:

Registered: JUN 06, 2008 Updated: Detail Removed:

Notations: 2 Participants: 3 Associated Sites: 0
Documents: 0 Susp. Land Use: 0 Parcel Descriptions: 1

Location Description: LAT & LONG COORDINATES FROM (2008-04-15) NOTICE OF INDEPENDENT REMEDIATION

Record Status: NOT ASSIGNED
Fee category: UNRANKED

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NOTATIONS

Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: APR 15, 2008 Approved: APR 15, 2008

Ministry Contact: ROSSER, CRAIG L

Notation Participants	Notation Roles
EBA ENGINEERING CONSULTANTS LTD	SUBMITTED BY

Note: STARTED: 2008-04-15

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Notation Type: NOTICE OF INDEPENDENT REMEDIATION COMPLETION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: APR 15, 2008 Approved: APR 15, 2008

Ministry Contact: ROSSER, CRAIG L

Notation Participants   Notation Roles
EBA ENGINEERING CONSULTANTS LTD   SUBMITTED BY

Note: COMPLETED: 2008-04-15

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SITE PARTICIPANTS

Participant: EBA ENGINEERING CONSULTANTS LTD
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: APR 15, 2008   End Date:

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SITE PARTICIPANTS

Participant: FORTISBC INC
Role(s): PROPERTY OWNER
Start Date: APR 15, 2008   End Date:

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Participant: ROSSER, CRAIG L
Role(s): MAIN MINISTRY CONTACT
Start Date: APR 15, 2008   End Date:

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PARCEL DESCRIPTIONS

Date Added: NOV 26, 2005   Crown Land PIN#:
LTO PID#: 026493951   Crown Land File#:
Land Desc: LOT 7 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

No activities were reported for this site

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 15257 Latitude: 50d 00m 58.0s
Victoria File: 26250-20/15257 Longitude: 119d 23m 15.0s
Regional File:
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 200 POTTERTON ROAD
City: KELOWNA Prov/State: BC
Postal Code: V4V 2K9

Registered: MAY 14, 2013 Updated: NOV 09, 2013 Detail Removed: NOV 09, 2013

Notations: 4 Participants: 8 Associated Sites: 0
Documents: 2 Susp. Land Use: 0 Parcel Descriptions: 10

Location Description: LATS/LONGS CONFIRMED ICIS APRIL 24, 2013

Record Status: NOT ASSIGNED
Fee category: UNRANKED

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NOTATIONS

Notation Type: FINAL DETERMINATION OF CONTAMINATED SITE ISSUED - SITE NOT CONTAMINATED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: SEP 24, 2013 Approved: SEP 24, 2013

Ministry Contact: LOCKHART, DAVE

Notation Participants	Notation Roles
MINISTRY OF CITIZENS' SERVICES AND OPEN GOVERNMENT (MOCS)	RECEIVED BY
WARD, JOHN E H	ISSUED BY
HEMMERA	APPROVED PROFESSIONAL

Note: ISSUED ON THE RECOMMENDATION OF AN APPROVED PROFESSIONAL (GABRIEL VIEHWEGER) UNDER PROTOCOL 6 OF THE CONTAMINATED SITES REGULATION.

- -

Notation Type: PRELIMINARY DETERMINATION OF CONTAMINATED SITE ISSUED - SITE NOT CONTAMINATED

Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: JUL 03, 2013 Approved: JUL 03, 2013

Ministry Contact: LOCKHART, DAVE

Notation Participants	Notation Roles
LOCKHART, DAVE	RECEIVED BY
CONDON, COLM	ISSUED BY
HEMMERA	APPROVED PROFESSIONAL

Note: ISSUED ON THE RECOMMENDATION OF AN APPROVED PROFESSIONAL (GABRIEL

VIEHWEGER) UNDER PROTOCOL 6 OF THE CONTAMINATED SITES REGULATION

- -

Notation Type: SITE RISK CLASSIFIED - SITE IS NON-HIGH RISK
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: MAY 23, 2013 Approved: MAY 23, 2013

Ministry Contact: O'GRADY, TYLER

Notation Participants	Notation Roles
HEMMERA	SUBMITTED BY

- -

Notation Type: DETERMINATION OF CONTAMINATED SITE REQUESTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: MAY 01, 2013 Approved: MAY 01, 2013

Ministry Contact: SAMWAYS, JENNIFER

Notation Participants	Notation Roles
MINISTRY OF CITIZENS' SERVICES AND OPEN GOVERNMENT (MOCS)	REQUESTED BY
HEMMERA	APPROVED PROFESSIONAL

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SITE PARTICIPANTS

Participant: CONDON, COLM
Role(s): MINISTRY CONTACT
Start Date: JUL 03, 2013 End Date:

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Participant: HEMMERA
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: APR 18, 2013 End Date:

- -

Participant: HEMMERA (VANCOUVER)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: APR 01, 2013 End Date:

- -

Participant: LOCKHART, DAVE
Role(s): MINISTRY CONTACT
Start Date: JUL 03, 2013 End Date:

- -

Participant: MINISTRY OF CITIZENS' SERVICES AND OPEN GOVERNMENT (MOCS)
Role(s): PROPERTY OWNER
Start Date: MAY 01, 2013 End Date:

- -

Participant: O'GRADY, TYLER
Role(s): MINISTRY CONTACT
Start Date: MAY 23, 2013 End Date:

- -

Participant: SAMWAYS, JENNIFER
Role(s): MINISTRY CONTACT
Start Date: MAY 01, 2013 End Date:

- -

Participant: WARD, JOHN E H
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: SEP 24, 2013 End Date:

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DOCUMENTS

Title: SUMMARY OF SITE CONDITION

Authored: APR 18, 2013 Submitted: APR 18, 2013

Participants	Role
HEMMERA	AUTHOR

- -

Title: STAGE 1 AND 2 PRELIMINARY SITE INVESTIGATION. 200 POTTERTON ROAD, KELOWNA, BC

Authored: APR 01, 2013 Submitted: APR 01, 2013

Participants	Role
HEMMERA (VANCOUVER)	AUTHOR

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PARCEL DESCRIPTIONS

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839147 Crown Land File#:
Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

- -

Date Added: JUL 13, 2017 Crown Land PIN#:
LTO PID#: 030164982 Crown Land File#:
Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN EPP66963

- -

Date Added: JUL 13, 2017 Crown Land PIN#:
LTO PID#: 030164991 Crown Land File#:
Land Desc: LOT 2 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN EPP66963

- -

Date Added: JUL 13, 2017 Crown Land PIN#:
LTO PID#: 030165008 Crown Land File#:
Land Desc: LOT 3 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN EPP66963

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Date Added: JUL 13, 2017 Crown Land PIN#:
LTO PID#: 030165016 Crown Land File#:
Land Desc: LOT 4 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN EPP66963

- -

Date Added: JUL 13, 2017 Crown Land PIN#:
LTO PID#: 030165024 Crown Land File#:
Land Desc: LOT 5 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN EPP66963

- -

Date Added: JUL 13, 2017 Crown Land PIN#:

PARCEL DESCRIPTIONS

LTO PID#: 030165032 Crown Land File#:
Land Desc: LOT 6 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP66963

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Date Added: JUL 13, 2017 Crown Land PIN#:
LTO PID#: 030165041 Crown Land File#:
Land Desc: LOT 7 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP66963

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Date Added: JUL 13, 2017 Crown Land PIN#:
LTO PID#: 030165059 Crown Land File#:
Land Desc: LOT 8 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP66963

- -

Date Added: AUG 19, 2017 Crown Land PIN#:
LTO PID#: 030223814 Crown Land File#:
Land Desc: PARCEL A (BEING A CONSOLIDATION OF LOTS 3 AND 4, SEE
CA6205642)SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN EPP66963

No activities were reported for this site

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 18385
Latitude: 50d 01m 24.0s
Victoria File: 26250-20/18385
Longitude: 119d 23m 46.0s
Regional File:
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 9750 MCCARTHY ROAD
City: KELOWNA
Prov/State: BC
Postal Code: V4V 1S5

Registered: SEP 23, 2015 Updated: NOV 04, 2015 Detail Removed: NOV 03, 2015

Notations: 2   Participants: 3   Associated Sites: 0
Documents: 0 Susp. Land Use: 1 Parcel Descriptions: 1

Location Description: LAT/LONG VERIFIED USING GOOGLE EARTH ON SEPTEMBER 17, 2015.

Record Status: NOT ASSIGNED
Fee category: NOT APPLICABLE

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NOTATIONS

Notation Type: SITE PROFILE REVIEWED - FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: SEP 17, 2015
Approved:

Ministry Contact: LARSEN, KELLI

Note: NOVEMBER 3, 2015: RELEASE OF DEMOLITION PERMIT GRANTED UNDER SCENARIO 1.

Required Actions: PRELIMINARY SITE INVESTIGATION

- -

Notation Type: SITE PROFILE RECEIVED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: SEP 04, 2015
Approved:

Ministry Contact: LARSEN, KELLI

Notation Participants   Notation Roles
ASHLAND CHEMICAL   SITE PROFILE SUBMITTED
                                                         BY

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SITE PARTICIPANTS

Participant: ASHLAND CANADA CORP.
Role(s): PROPERTY OWNER
Start Date: SEP 04, 2015   End Date:

- -

SITE PARTICIPANTS

Participant: ASHLAND CHEMICAL
Role(s): SITE PROFILE COMPLETOR
SITE PROFILE CONTACT
Start Date: SEP 04, 2015   End Date:

- -

Participant: LARSEN, KELLI
Role(s): MAIN MINISTRY CONTACT
Start Date: SEP 04, 2015   End Date:

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SUSPECTED LAND USE

Description: RESIN/PLASTIC MONOMER MANU/FORMULATE/WHOLESALE BULK STORAGE
Notes: INSERTED FOR SITE PROFILE DATED 2015-09-01(described on Site
Profile dated 15-09-01)

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PARCEL DESCRIPTIONS

Date Added: SEP 01, 2015   Crown Land PIN#:
LTO PID#: 019138741   Crown Land File#:
Land Desc: LOT 1 SECTION 11 TOWNSHIP 20 AND DISTRICT LOT 118 OSOYOOS
DIVISION YALEDISTRICT PLAN KAP54110

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CURRENT SITE PROFILE INFORMATION (Sec. III to X)
Site Profile Completion Date: SEP 01, 2015

Local Authority Received: SEP 04, 2015

Ministry Regional Manager Received: SEP 04, 2015 Decision: SEP 17, 2015
Decision: INVESTIGATION REQUIRED

Site Registrar Received: Entry Date:

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE
Schedule 2

Reference	Description
A13	RESIN/PLASTIC MONOMER MANU/FORMULATE/WHOLESALE BULK STORAGE

AREAS OF POTENTIAL CONCERN
Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?.....NO
Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?.....NO
Discarded barrels, drums or tanks?.....NO
Contamination resulting from migration of substances from other properties?.....NO

FILL MATERIALS
Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activiities listed under Schedule 2?.....NO
Discarded or waste granular materials such as sand blasting grit, asphalt

paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?.....NO
Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?.....NO

WASTE DISPOSAL (QUESTIONS AS OF JANUARY 1 2009)
Materials such as household garbage, mixed municipal refuse, or demolition debris?.....NO
Waste or byproducts such as tank bottoms, residues, sludge, or

flocculation precipitates from industrial processes or wastewater treatment?.....NO

Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.....NO

Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO

Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); for from the cleaning or repair of parts of boats, ships, barges, automobiles or trucks, including sandblasting grit or paint scrapings?.....NO

TANKS OR CONTAINERS USED OR STORED, OTHER THAN TANKS USED FOR RESIDENTIAL HEATING FUEL

Underground fuel or chemical storage tanks other than storage tanks for compressed gases?.....YES

Above ground fuel or chemical storage tanks other than storage tanks for compressed gases?.....YES

HAZARDOUS WASTES OR HAZARDOUS SUBSTANCES

PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO

Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO

Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS

Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO

Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO

Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 19570 Latitude: 50d 01m 21.0s
Victoria File: 26250-20/19570 Longitude: 119d 23m 51.0s
Regional File:
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: MCCARTHY ROAD
City: LAKE COUNTRY Prov/State: BC
Postal Code: V4V 1R2

Registered: SEP 30, 2016 Updated: OCT 14, 2016 Detail Removed: OCT 06, 2016

Notations: 3 Participants: 3 Associated Sites: 0
Documents: 0 Susp. Land Use: 0 Parcel Descriptions: 2

Location Description: LATS/LONGS CONFIRMED USING GOOGLE EARTH AND ICIS SEPT 29, 2016

Record Status: NOT ASSIGNED
Fee category: UNRANKED

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NOTATIONS

Notation Type: NOTICE OF INDEPENDENT REMEDIATION COMPLETION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: SEP 28, 2016 Approved: SEP 28, 2016

Ministry Contact: SAMWAYS, JENNIFER

Notation Participants	Notation Roles
GOLDER ASSOCIATES LTD	SUBMITTED BY

Note: COMPLETED: 2016-09-22

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Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: SEP 28, 2016 Approved: SEP 28, 2016

Ministry Contact: SAMWAYS, JENNIFER

Notation Participants | Notation Roles
GOLDER ASSOCIATES LTD | SUBMITTED BY

Note: START: 2016-09-07

Notation Type: SITE RISK CLASSIFIED - SITE IS NON-HIGH RISK
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: SEP 27, 2016 | Approved: SEP 27, 2016

Ministry Contact: YAN, PETER

NOTATIONS

Notation Participants | Notation Roles
GOLDER ASSOCIATES LTD | SUBMITTED BY

SITE PARTICIPANTS

Participant: CANADIAN NATIONAL RAILWAY COMPANY
Role(s): PROPERTY OWNER
Start Date: SEP 28, 2016 End Date:

Participant: GOLDER ASSOCIATES LTD
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: SEP 27, 2016 End Date:

Participant: SAMWAYS, JENNIFER
Role(s): MINISTRY CONTACT
Start Date: SEP 28, 2016 End Date:

PARCEL DESCRIPTIONS

Date Added: SEP 29, 2016 Crown Land PIN#:
LTO PID#: 001914475 Crown Land File#:
Land Desc:

Date Added: SEP 29, 2016 Crown Land PIN#:

LTO PID#: 012323969 Crown Land File#:
Land Desc: THAT PART OF LOT 46 DISTRICT LOT 118 OSOYOOS DIVISION YALE DISTRICT PLAN 457 SHOWN RED ON PLAN 939F
No activities were reported for this site

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 23348 Latitude: 50d 01m 10.3s
Victoria File: 26250-20/23348 Longitude: 119d 23m 40.5s
Regional File:
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 9500 JIM BAILEY ROAD (SW CORNER OF BEAVER LAKE RD
AND JIM BAILEY ROAD)
City: KELOWNA Prov/State: BC
Postal Code: V4V1S5

Registered: MAR 19, 2020 Updated: JUN 05, 2020 Detail Removed: JUN 02, 2020

Notations: 2 Participants: 3 Associated Sites: 0
Documents: 0 Susp. Land Use: 0 Parcel Descriptions: 0

Location Description: LOCATION CONFIRMED USING GOOGLE EARTH

Record Status: NOT ASSIGNED
Fee category: NOT APPLICABLE

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NOTATIONS

Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: MAR 16, 2020 Approved: MAR 16, 2020

Ministry Contact: FREDERICK, PABLO

Notation Participants	Notation Roles
TETRA TECH CANADA INC.	SUBMITTED BY

Note: START: 2020-03-12 RESIDENTIAL: SMALL DIESEL ABOVE GROUND STORAGE TANK (APPROXIMATELY 250 L)

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Notation Type: SITE RISK CLASSIFIED - SITE IS NON-HIGH RISK
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: MAR 16, 2020 Approved: MAR 16, 2020

Ministry Contact: YAN, PETER

Notation Participants | Notation Roles
TETRA TECH CANADA INC. | SUBMITTED BY

SITE PARTICIPANTS

Participant: FREDERICK, PABLO
Role(s): MINISTRY CONTACT
Start Date: MAR 16, 2020 | End Date:

Participant: SRI HOMES

SITE PARTICIPANTS

Role(s): PROPERTY OWNER
Start Date: MAR 16, 2020 | End Date:

Participant: TETRA TECH CANADA INC.
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: MAR 16, 2020 | End Date:

No activities were reported for this site

End of Detail Report

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 As of: APR 20, 2008       BC Online: Site Registry                     08-04-21
                     For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:09:10
 Folio:                                                                Page   1
                                   Detail Report
SITE LOCATION
       Site ID:       3258                             Latitude:  50d 02m 57.7s
 Victoria File:                                       Longitude: 119d 26m 57.7s
 Regional File: 26250-20/3258
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: 11449 OKANAGAN CENTRE ROAD
         City: OKANAGAN CENTRE                 Prov/State: BC
  Postal Code:

 Registered: JAN 26, 2001  Updated: DEC 19, 2001  Detail Removed: DEC 06, 2001

 Notations:   0   Participants:   0    Associated Sites:   1
 Documents:   0 Susp. Land Use:   0 Parcel Descriptions:   3

Location Description: * TOMBSTONE DATA ONLY FOR SITE REGISTRY * - FEDERAL
 LAND.  APPROX 30M E OF OKANAGAN LAKE.  LAT/LONG DERIVED BY BC ENVIRONMENT
 REFERENCING DIGITAL TRIM MAP COVERAGES, NAD83 - 1:20000 SCALE.

Record Status: INACTIVE - NO FURTHER ACTION
 Fee category: UNRANKED

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ASSOCIATED SITES

     Site id:       3554                                  Date: DEC 17, 1996
       Notes: COMMON PID
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PARCEL DESCRIPTIONS

  Date Added: MAY 30, 1996                    Crown Land PIN#:
    LTO PID#: 012373761                      Crown Land File#:
   Land Desc: LOT 18 BLOCK B SECTIONS 17 AND 20 TOWNSHIP 20 OSOYOOS DIVISION
              YALE DISTRICT PLAN 454
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Date Added: DEC 30, 1996                    Crown Land PIN#:
    LTO PID#: 012373788                      Crown Land File#:
   Land Desc: LOT 19 BLOCK B SECTIONS 17 AND 20 TOWNSHIP 20 OSOYOOS DIVISION
              YALE DISTRICT PLAN 454
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Date Added: OCT 26, 2002                    Crown Land PIN#:
    LTO PID#: 025502492                      Crown Land File#:
   Land Desc: PARCEL "B" (DD KT113200) BLOCK B SECTION 17 TOWNSHIP 20 OSOYOOS
              DIVISION     YALE DISTRICT PLAN 454
No activities were reported for this site

                              End of Detail Report
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 As of: APR 20, 2008       BC Online: Site Registry                     08-04-21
                     For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:14:15
 Folio:                                                                Page   1
                                    Detail Report
SITE LOCATION
       Site ID:      10077                          Latitude:  50d 03m 16.0s
 Victoria File: 26250-20/10077                     Longitude: 119d 24m 44.0s
 Regional File:
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: 11850 OCEOLA ROAD
         City: LAKE COUNTRY                   Prov/State: BC
  Postal Code: V4V 1H1

 Registered: OCT 19, 2006  Updated:              Detail Removed:

 Notations:   1   Participants:   4    Associated Sites:   0
 Documents:   0 Susp. Land Use:   0 Parcel Descriptions:   1

Location Description: LAT AND LONG DERIVED FROM 2006-05-18 NOTICE OF
 INDEPENDANT REMEDIATION

Record Status: ACTIVE - UNDER REMEDIATION
 Fee category: UNRANKED

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NOTATIONS

  Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: MAY 18, 2006                       Approved: MAY 18, 2006

 Ministry Contact: HANEMAYER, VINCENT (SURREY) C

 Notation Participants                              Notation Roles
 HANEMAYER, VINCENT (SURREY) C                      RECEIVED BY
 EBA ENGINEERING CONSULTANTS LTD                    ISSUED BY
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SITE PARTICIPANTS

   Participant: ARMENEAU, VINCE
       Role(s): FORMER PROPERTY OWNER
    Start Date: MAY 18, 2006                          End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   Participant: EBA ENGINEERING CONSULTANTS LTD
       Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
    Start Date: MAY 18, 2006                          End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   Participant: HANEMAYER, VINCENT (SURREY) C
       Role(s): MAIN MINISTRY CONTACT
    Start Date: MAY 18, 2006                          End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   Participant: 0758032 B.C. LTD.
       Role(s): PROPERTY OWNER
    Start Date: MAY 18, 2006                          End Date:
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PARCEL DESCRIPTIONS

Date Added: OCT 04, 2006 Crown Land PIN#:
LTO PID#: 023320079 Crown Land File#:
Land Desc: LOT 1 SECTION 22 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN KAP56206
No activities were reported for this site

End of Detail Report

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 As of: APR 20, 2008       BC Online: Site Registry                   08-04-21
                     For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:08:55
 Folio:                                                               Page   1
                                  Detail Report
SITE LOCATION
       Site ID:      2560                           Latitude:  50d 03m 17.9s
 Victoria File:                                    Longitude: 119d 24m 30.3s
 Regional File: 26250-20/2560
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: 11891 HIGHWAY 97 NORTH
         City: WINFIELD                      Prov/State: BC
  Postal Code: V4V 1Y1

 Registered: OCT 15, 1997  Updated: JUN 04, 2004  Detail Removed: JUN 04, 2004

 Notations:   9   Participants:  11    Associated Sites:   0
 Documents:   1 Susp. Land Use:   2 Parcel Descriptions:   1

Location Description: LAT/LONG DERIVED BY BC ENVIRONMENT REFERENCING TCN, NAD
 83.  X - REF FILE OW 11363.

Record Status: UNKNOWN STATUS
 Fee category: UNRANKED

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NOTATIONS

  Notation Type: CASE MANAGEMENT ITEM
 Notation Class: ADMINISTRATIVE
      Initiated: OCT 18, 2001                      Approved: OCT 18, 2001

 Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

 Notation Participants                             Notation Roles
 VERGAMINI, DON (KAMLOOPS) E                       ISSUED BY

 Note: LETTER ISSUED INDICATING THE MINISTRY HAS NO EVIDENCE THAT
 CONTAMINATION IS PRESENT OR IF CONTAMINATION IS AFFECTING HUMAN HEALTH, THE
 ENVIRONMENT OR SURROUNDING PROPERTIES.  UNTIL SUCH TIME AS FURTHER
 INFORMATION IS PRESENTED, THIS PROPERTY WILL BE HANDLED UNDER THE SITE
 PROFILE PROVISIONS OF THE CONTAMINATED SITES REGULATION.
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: CASE MANAGEMENT ITEM
 Notation Class: ADMINISTRATIVE
      Initiated: SEP 19, 2001                      Approved: SEP 19, 2001

 Ministry Contact: COLVEY, DICK

 Notation Participants                             Notation Roles
 GAS WEST PETROLEUM (CALGARY)                      SUBMITTED BY

 Note: LETTER SUBMITTED INDICATING THE PRODUCT LINES, WHEN TESTED, ALL FAILED
 WITH THE EXCEPTION OF THE DIESEL LINE.  LETTER REQUESTS INFORMATION WITH
 REGARD TO ANY ACTION THE MINISTRY MAY PROCEED WITH.
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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NOTATIONS

Notation Type: MONITORING REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: JUN 09, 1992 Approved: JUN 09, 1992

Ministry Contact: COLVEY, DICK

Notation Participants	Notation Roles
HBT AGRA LIMITED (KAMLOOPS)	SUBMITTED BY
53278 ALBERTA LTD.	SUBMITTED BY

Note: LETTER REPORT RE: SOIL TESTING, WINFIELD, BRITISH COLUMBIA.

- -

Notation Type: MONITORING REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: MAY 04, 1992 Approved: MAY 04, 1992

Ministry Contact: COLVEY, DICK

Notation Participants	Notation Roles
HBT AGRA LIMITED (KAMLOOPS)	SUBMITTED BY

Note: SOIL SAMPLE ANALYSIS FOR OIL AND GREASE SUBMITTED. APPROVAL, (VERBAL), TO BACKFILL THE EXCAVATION WITH CLEAN FILL WAS GIVEN TO HBT AGRA BASED ON THIS SOIL ANALYSIS.

- -

Notation Type: CASE MANAGEMENT ITEM
Notation Class: ADMINISTRATIVE
Initiated: MAY 01, 1992 Approved: MAY 01, 1992

Ministry Contact: COLVEY, DICK

Note: FAX FROM DICK COLVEY. SOILS SUITABLE FOR LANDFILL DISPOSAL, VERBAL AUTHORIZATION WILL BE GIVEN TO MOVE THE SOIL TO THE LANDFILL.

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Notation Type: MONITORING REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: MAY 01, 1992 Approved: MAY 01, 1992

Ministry Contact: COLVEY, DICK

Notation Participants	Notation Roles
HBT AGRA LIMITED (KAMLOOPS)	SUBMITTED BY

Note: SOIL SAMPLE ANALYSIS FROM THE AREA OF THE TANK NEST.

- -

Notation Type: POLLUTION ABATEMENT ORDER ISSUED
Notation Class: WASTE MANAGEMENT ACT: GENERAL
Initiated: APR 30, 1992 Approved: APR 30, 1992

Ministry Contact: NICKEL, RICHARD A

NOTATIONS

Notation Participants — Notation Roles
53278 ALBERTA LTD. — RECEIVED BY

Note: OW-11363. UNDERGROUND STORAGE TANKS RECENTLY REMOVED FROM THE SITE WERE INSPECTED AND FOUND TO CONTAIN HOLES AND THE SOIL THAT WAS EXCAVATED FROM THE TANK NEST HAD A STRONG ODOUR OF GASOLINE.

Required Actions: RETAIN CONSULTANT, TEST EXCAVATED SOIL, SUBMIT REPORT BY 92-05-31

- -

Notation Type: INSPECTION / VISIT
Notation Class: ADMINISTRATIVE
Initiated: APR 29, 1992 Approved: APR 29, 1992

Ministry Contact: COLVEY, DICK

Note: MEMO RE: WINFIELD ULTRA FUEL.

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Notation Type: SPILL REPORTED
Notation Class: ADMINISTRATIVE
Initiated: APR 28, 1992 Approved: APR 28, 1992

Ministry Contact: COLVEY, DICK

Note: SEE SPILL REPORT 92-010.

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SITE PARTICIPANTS

Participant: CHEMAC ENVIRONMENTAL SERVICES (KELOWNA, B.C.)
Role(s): ANALYTICAL LAB
Start Date: MAY 04, 1992 End Date:

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Participant: COLVEY, DICK
Role(s): MAIN MINISTRY CONTACT
Start Date: APR 28, 1992 End Date: MAR 29, 2002

- -

Participant: GAS WEST PETROLEUM (CALGARY)
Role(s): SECURED CREDITOR
Start Date: SEP 19, 2001 End Date:
Notes: CONTACT: ROGER BEATTIE

- -

Participant: GIANT INDUSTRIES CORPORATION (VERNON)
Role(s): FILL RECIPIENT
LANDFILL OPERATOR/OWNER
Start Date: JUN 01, 1992 End Date:

- -

Participant: HBT AGRA LIMITED (KAMLOOPS)

Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: APR 30, 1992 End Date:
Notes: MARK OIKAWA

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SITE PARTICIPANTS

Participant: HOFFMAN, KEN
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: MAY 01, 1992 End Date: AUG 20, 1996
Notes: CONSERVATION OFFICER

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Participant: NICKEL, RICHARD A
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: APR 30, 1992 End Date: MAY 31, 1996

- -

Participant: T.C. ELECTRIC LTD. (BURNABY)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: APR 28, 1992 End Date:
Notes: CRAIG CHRISTIE

- -

Participant: VERGAMINI, DON (KAMLOOPS) E
Role(s): MAIN MINISTRY CONTACT
Start Date: OCT 18, 2001 End Date:
Notes: CONTAMINATED SITES TECHNICIAN

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Participant: 471400 BC LTD.
Role(s): PROPERTY OWNER
Start Date: JUN 21, 1994 End Date:

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Participant: 53278 ALBERTA LTD.
Role(s): FORMER OPERATOR
FORMER PROPERTY OWNER
Start Date: APR 28, 1992 End Date:
Notes: LAKESHORE SERVICE: ROY PETERSEN

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DOCUMENTS

Title: SOIL TESTING, WINFIELD, BRITISH COLUMBIA
Authored: JUN 01, 1992 Submitted: JUN 09, 1992

Participants	Role
HBT AGRA LIMITED (KAMLOOPS)	AUTHOR
53278 ALBERTA LTD.	COMMISSIONER
COLVEY, DICK	REVIEWER

Notes: MONITORING REPORT.

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SUSPECTED LAND USE

Description: PETRO. PROD. DISPENSE FACILITY, INC. SERVICE STATION/CARDLOT
Notes:

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Site Reg Detail- Site ID 2560 Lat 50d

Description: PETRO/NATURAL GAS/PRODUCE WATER STRG ABVEGRND/UNDERGRND TANK
Notes: UNDERGROUND STORAGE TANKS REPLACED APRIL 1992

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PARCEL DESCRIPTIONS

Date Added: JUL 07, 1997 Crown Land PIN#:
LTO PID#: 012272558 Crown Land File#:

PARCEL DESCRIPTIONS

Land Desc: PARCEL A (PLAN B6864) OF PARCEL C SECTION 22 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 540

No activities were reported for this site

End of Detail Report

Detail Report

SITE LOCATION
Site ID: 2418 Latitude: 50d 02m 56.4s
Victoria File: Longitude: 119d 24m 12.4s
Regional File: 26250-20/2418
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 3191 WOODSDALE ROAD
City: WINFIELD Prov/State: BC
Postal Code: V4V 1X7

Registered: OCT 09, 1997 Updated: Detail Removed:

Notations: 5 Participants: 6 Associated Sites: 0
Documents: 3 Susp. Land Use: 2 Parcel Descriptions: 1

Location Description: LAT/LONG DERIVED BY BC ENVIRONMENT REFERENCING THE TRANSPORTATION CENTERLINE NETWORK (TCN), NAD 83

Record Status: ACTIVE - UNDER REMEDIATION
Fee category: UNRANKED

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NOTATIONS

Notation Type: SITE INVESTIGATION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: OCT 10, 1995 Approved: OCT 10, 1995

Ministry Contact: BOYES, DARRYL K

Notation Participants	Notation Roles
REID CROWTHER & PARTNERS LTD. (KELOWNA, B.C.)	SUBMITTED BY

Note: LETTER REPORT RE: GROUND WATER REMEDIATON AT WOODSDALE PETROCAN. RECOMMENDS GROUNDWATER TREATMENT BE CONTINUED

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Notation Type: MONITORING REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: OCT 26, 1993 Approved: OCT 26, 1993

Ministry Contact: BOYES, DARRYL K

Notation Participants	Notation Roles
REID CROWTHER & PARTNERS LTD. (KELOWNA, B.C.)	SUBMITTED BY

Note: LETTER RE: WOODSDALE PETRO-CAN - TRENCHING RESULTS.

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Notation Type: SITE INVESTIGATION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: OCT 15, 1993 Approved: OCT 15, 1993

Ministry Contact: BOYES, DARRYL K

NOTATIONS

Notation Participants — Notation Roles
JNJ ENTERPRISES LTD (WINFIELD) — SUBMITTED BY
REID CROWTHER & PARTNERS LTD. (KELOWNA, B.C.) — SUBMITTED BY

Note: TITLE: WOODSDALE GENERAL STORE SITE INVESTIGATION AND ENVIRONMENTAL ASSESSMENT. PRELIMINARY. INCLUDES REMEDIATION PLAN REPORT.

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Notation Type: SITE INVESTIGATION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: OCT 15, 1993 — Approved: OCT 15, 1993

Ministry Contact: BOYES, DARRYL K

Notation Participants — Notation Roles
JNJ ENTERPRISES LTD (WINFIELD) — SUBMITTED BY
REID CROWTHER & PARTNERS LTD. (KELOWNA, B.C.) — SUBMITTED BY

Note: TITLE: WOODSDALE PETROCAN ENVIRONMENT SITE ASSESSMENT.

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Notation Type: REMEDIATION PLAN REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: OCT 15, 1993 — Approved: OCT 15, 1993

Ministry Contact: BOYES, DARRYL K

Notation Participants — Notation Roles
JNJ ENTERPRISES LTD (WINFIELD) — SUBMITTED BY
REID CROWTHER & PARTNERS LTD. (KELOWNA, B.C.) — SUBMITTED BY

Note: TITLE: WOODSDALE GENERAL STORE, SITE INVESTIGATION AND ENVIRONMENTAL ASSESSMENT. INCLUDES ALL REMEDIATION OPTIONS AND RECOMMENDATIONS.

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SITE PARTICIPANTS

Participant: BOYES, DARRYL K
Role(s): MAIN MINISTRY CONTACT
Start Date: OCT 15, 1993 — End Date: APR 01, 1999

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Participant: CHEMAC ENVIRONMENTAL SERVICES (KELOWNA, B.C.)
Role(s): ANALYTICAL LAB
Start Date: MAY 10, 1993 — End Date:

- -

Participant: JNJ ENTERPRISES LTD (WINFIELD)
Role(s): FORMER OPERATOR
FORMER PROPERTY OWNER
Start Date: MAY 01, 1993 — End Date:

- -

Participant: PETRO-CANADA PRODUCTS (PORT MOODY)
Role(s): TRANSPORTER/SUPPLIER/PRODUCER

SITE PARTICIPANTS

Participant: REID CROWTHER & PARTNERS LTD. (KELOWNA, B.C.)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: MAY 01, 1993 End Date:
Notes: CHRIS LEPCOMBE

Participant: 458858 BC LTD (WINFIELD)
Role(s): PROPERTY OWNER
Start Date: JAN 22, 1996 End Date:

DOCUMENTS

Title: GROUND WATER REMEDIATION AT WOODSDALE PETROCAN
Authored: OCT 10, 1995 Submitted: OCT 17, 1995

Participants	Role
REID CROWTHER & PARTNERS LTD. (KELOWNA, B.C.)	AUTHOR

Notes: SITE INVESTIGATION. LETTER REPORT.

Title: WOODSDALE GENERAL STORE SITE INVESTIGATION AND ENVIRONMENTAL ASSESSMENT
Authored: OCT 15, 1993 Submitted: OCT 15, 1993

Participants	Role
REID CROWTHER & PARTNERS LTD. (KELOWNA, B.C.)	AUTHOR
JNJ ENTERPRISES LTD (WINFIELD)	COMMISSIONER
BOYES, DARRYL K	REVIEWER

Notes: SITE INVESTIGATION AND REMEDITATION PLAN, IE) OPTIONS AND RECOMMENDATIONS.

Title: WOODDALE PERTOCAN ENVIRONMENTAL SITE ASSESSMENT
Authored: MAY 01, 1993 Submitted: OCT 15, 1993

Participants	Role
REID CROWTHER & PARTNERS LTD. (KELOWNA, B.C.)	AUTHOR
JNJ ENTERPRISES LTD (WINFIELD)	COMMISSIONER
BOYES, DARRYL K	REVIEWER

Notes: SITE INVESTIGATION.

SUSPECTED LAND USE

Description: PETRO. PROD. DISPENSE FACILITY, INC. SERVICE STATION/CARDLOT
Notes:

Description: PETRO/NATURAL GAS/PRODUCE WATER STRG ABVEGRND/UNDERGRND TANK
Notes:

PARCEL DESCRIPTIONS

Date Added: FEB 09, 1996 Crown Land PIN#:

Site Reg Detail- Site ID 2418 Lat 50d
LTO PID#: 001858840 Crown Land File#:
Land Desc: PARCEL A (PLAN B5619) OF LOT 3 DISTRICT LOT 169 OSOYOOS DIVISION YALE DISTRICT PLAN 216 EXCEPT PLAN 36673

PARCEL DESCRIPTIONS

No activities were reported for this site

End of Detail Report

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 As of: APR 20, 2008       BC Online: Site Registry                    08-04-21
                     For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:13:36
 Folio:                                                               Page   1
                                Detail Report
SITE LOCATION
       Site ID:      8118                          Latitude:  50d 02m 08.8s
 Victoria File:                                   Longitude: 119d 24m 15.7s
 Regional File: 26250-20/8118
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: 10550 HIGHWAY 97
         City: WINFIELD                      Prov/State: BC
  Postal Code:

 Registered: DEC 11, 2002  Updated: MAY 25, 2006  Detail Removed: MAY 15, 2006

 Notations:   7   Participants:   6    Associated Sites:   0
 Documents:   1 Susp. Land Use:   1 Parcel Descriptions:   1

Record Status: INACTIVE - NO FURTHER ACTION
 Fee category: UNRANKED

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NOTATIONS

  Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: OCT 19, 2005                    Approved: OCT 19, 2005

 Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

 Notation Participants                           Notation Roles
 GOLDER ASSOCIATES LTD (KELOWNA)                 SUBMITTED BY
 VERGAMINI, DON (KAMLOOPS) E                     RECEIVED BY

 Note: 017-353-289
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: NOTICE OF INDEPENDENT REMEDIATION COMPLETION SUBMITTED
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: OCT 19, 2005                    Approved: OCT 19, 2005

 Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

 Notation Participants                           Notation Roles
 GOLDER ASSOCIATES LTD (KELOWNA)                 SUBMITTED BY
 VERGAMINI, DON (KAMLOOPS) E                     RECEIVED BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE
                 MINISTRY
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
      Initiated: DEC 12, 2002                    Approved:

 Ministry Contact: JARMAN, PETER

 Note: AUTO INSERTED FROM SITE PROFILE.  THE MANAGER DOES NOT REQUIRE OR ORDER
 A SITE INVESTIGATION AT THIS TIME.
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 As of: APR 20, 2008       BC Online: Site Registry                    08-04-21
                     For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:13:36
 Folio:                                                                Page   2
NOTATIONS

 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE REVIEWED - NO FURTHER INVESTIGATION REQUIRED BY
                 THE MINISTRY
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: DEC 12, 2002                        Approved:

 Ministry Contact: JARMAN, PETER

 Note: AUTO INSERTED FROM SITE PROFILE.  THE MANAGER DOES NOT REQUIRE OR ORDER
 A SITE INVESTIGATION AT THIS TIME.
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE INVESTIGATION REPORT SUBMITTED
 Notation Class: ADMINISTRATIVE
      Initiated: DEC 11, 2002                        Approved: DEC 11, 2002

 Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

 Notation Participants                               Notation Roles
 446844 BC LIMITED (WINFIELD)                        SUBMITTED BY

 Note: SITE INVESTIGATION REPORT TITLED INTRUSIVE SITE INVESTIGATION MIDWAY
 SHELL 10550 HIGHWAY 97 NORTH WINFIELD, B.C. SUBMITTED
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE RECEIVED
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: NOV 27, 2002                        Approved:

 Ministry Contact: JARMAN, PETER

 Notation Participants                               Notation Roles
 446844 BC LIMITED (WINFIELD)                        SITE PROFILE SUBMITTED
                                                     BY
 446844 BC LIMITED (WINFIELD)                        SITE PROFILE SUBMITTED
                                                     BY

 Note: SITE PROFILE TRIGGERED UPON APPLICATION FOR SUBDIVISION
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE RECEIVED
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
      Initiated: NOV 27, 2002                        Approved:

 Ministry Contact: JARMAN, PETER

 Notation Participants                               Notation Roles
 446844 BC LIMITED (WINFIELD)                        SITE PROFILE SUBMITTED
                                                     BY
 446844 BC LIMITED (WINFIELD)                        SITE PROFILE SUBMITTED
                                                     BY

 Note: SITE PROFILE TRIGGERED UPON APPLICATION FOR SUBDIVISION
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SITE PARTICIPANTS

Participant: GOLDER ASSOCIATES LTD (KELOWNA)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: OCT 19, 2005 End Date:

Participant: JARMAN, PETER
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: NOV 27, 2002 End Date:
Notes: ASSISTANT REGIONAL WASTE MANAGER

Participant: SEACOR ENVIRONMENTAL ENGINEERING INC (KAMLOOPS)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: MAR 19, 1999 End Date:
Notes: CONTACT: SAM REIMER

Participant: VERGAMINI, DON (KAMLOOPS) E
Role(s): MAIN MINISTRY CONTACT
Start Date: NOV 27, 2002 End Date:
Notes: CONTAMINATED SITES TECHNICIAN

Participant: WOEHRLE, WALTER
Role(s): SITE PROFILE CONTACT
Start Date: NOV 27, 2002 End Date:
Notes: CONTACT: WALTER WOEHRLE

Participant: 446844 BC LIMITED (WINFIELD)
Role(s): PROPERTY OWNER
SITE PROFILE COMPLETOR
Start Date: MAR 19, 1999 End Date:
Notes: CONTACT: JOCHEN WOEHRLE

DOCUMENTS

Title: INTRUSIVE SITE INVSTIGATION MIDWAY SHELL 10550 HIGHWAY 97 NORTH WINFIELD, B.C.
Authored: MAR 19, 1999 Submitted: DEC 11, 2002

Participants	Role
SEACOR ENVIRONMENTAL ENGINEERING INC (KAMLOOPS)	AUTHOR
446844 BC LIMITED (WINFIELD)	COMMISSIONER

SUSPECTED LAND USE

Description: PETRO. PROD. DISPENSE FACILITY, INC. SERVICE STATION/CARDLOT
Notes: INSERTED FOR SITE PROFILE DATED 2002-11-14(described on Site Profile dated 02-11-14)

PARCEL DESCRIPTIONS

Date Added: NOV 14, 2002 Crown Land PIN#:
LTO PID#: 017353289 Crown Land File#:
Land Desc: LOT 1 DISTRICT LOT 169 OSOYOOS DIVISION YALE DISTRICT PLAN KAP45157

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CURRENT SITE PROFILE INFORMATION (Sec. III to X)
Site Profile Completion Date: NOV 14, 2002

Local Authority Received:

Ministry Regional Manager Received: NOV 27, 2002 Decision: DEC 12, 2002
Decision: INVESTIGATION NOT REQUIRED

Site Registrar Received: Entry Date:

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE

Schedule 2 Reference	Description
F5	PETRO. PROD. DISPENSE FACILITY, INC. SERVICE STATION/CARDLOT

AREAS OF POTENTIAL CONCERN

Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?..NO

Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?...........NO

Discarded barrels, drums or tanks?..NO

Contamination resulting from migration of substances from other properties?..NO

FILL MATERIALS

Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activiities listed under Schedule 2?..NO

Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?..NO

Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?......................................NO

WASTE DISPOSAL

Materials such as household garbage, mixed municipal refuse, or demolition debris?...NO

Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?...NO

Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.................NO

Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?..NO

Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); or automobile and truck parts cleaning or repair?.....NO

TANKS OR CONTAINERS USED OR STORED

Underground fuel or chemical storage tanks?.....YES
Above ground fuel or chemical storage tanks?.....NO

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES

PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO
Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO
Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS

Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO
Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO
Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS

UNDERGROUND TANKS FOR FUEL ARE NEW FIBERGLASS DOUBLE WALLED TANKS INSTALLED IN 2001. SOIL TEST WAS PERFECT WITHOUT ANY PROBLEMS, ENVIRONMENTAL TEST WAS DONE THE SAME TIME AND PERFECT. BOTH TESTS ARE DONE IN 2001.

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 9007 Latitude: 50d 01m 16.0s
Victoria File: 26250-20/9007 Longitude: 119d 24m 18.0s
Regional File: 26250-20/9007
Region: KAMLOOPS, SOUTHERN INTERIOR

Site Address: 9558 GLENMORE ROAD
City: WINFIELD Prov/State: BC
Postal Code: V4V 1M5

Registered: MAY 31, 2004 Updated: MAR 17, 2005 Detail Removed: FEB 04, 2005

Notations: 5 Participants: 6 Associated Sites: 0
Documents: 0 Susp. Land Use: 1 Parcel Descriptions: 1

Location Description: LAT/LONG PROVIDED BY ENVIRONMENTAL CONSULTANT

Record Status: ACTIVE - UNDER REMEDIATION
Fee category: UNRANKED

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NOTATIONS

Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: FEB 04, 2005 Approved:

Ministry Contact: WARD, JOHN E H

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Notation Type: SITE PROFILE REVIEWED - NO FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: FEB 04, 2005 Approved:

Ministry Contact: WARD, JOHN E H

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Notation Type: SITE PROFILE RECEIVED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: JUL 02, 2004 Approved:

Ministry Contact: WARD, JOHN E H

Notation Participants	Notation Roles
DUMAINE, JOHN B	SITE PROFILE SUBMITTED BY
DUMAINE, JOHN B	SITE PROFILE SUBMITTED BY

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Notation Type: SITE PROFILE RECEIVED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: JUL 02, 2004 Approved:

NOTATIONS

Ministry Contact: WARD, JOHN E H

Notation Participants	Notation Roles
DUMAINE, JOHN B	SITE PROFILE SUBMITTED BY
DUMAINE, JOHN B	SITE PROFILE SUBMITTED BY

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Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED (WMA 28(2))
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: APR 28, 2004 Approved:

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants	Notation Roles
AMEC EARTH & ENVIRONMENTAL LIMITED (KAMLOOPS)	SUBMITTED BY

Note: ABOVEGROUND STORAGE TANK REMOVAL AND ASSOCIATED CONTAMINATED SOILS.

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SITE PARTICIPANTS

Participant: AMEC EARTH & ENVIRONMENTAL LIMITED (KAMLOOPS)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: APR 28, 2004 End Date:
Notes: CONTACT: STEVEN KROMHOUT

- -

Participant: DISTRICT OF LAKE COUNTRY
Role(s): MUNICIPAL/REGIONAL CONTACT
Start Date: APR 28, 2004 End Date:
Notes: CONTACT: MICHAEL MERCER

- -

Participant: DUMAINE, JOHN B
Role(s): PROPERTY OWNER
SITE PROFILE COMPLETOR
SITE PROFILE CONTACT
Start Date: JUL 02, 2004 End Date:

- -

Participant: LAKE COUNTRY MOTORS LTD
Role(s): PROPERTY OWNER
Start Date: APR 28, 2004 End Date:

- -

Participant: VERGAMINI, DON (KAMLOOPS) E
Role(s): MAIN MINISTRY CONTACT
Start Date: APR 28, 2004 End Date:
Notes: CONTAMINATED SITES OFFICER

- -

Participant: WARD, JOHN E H
Role(s): ALTERNATE MINISTRY CONTACT

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SUSPECTED LAND USE

Description: APPLIANCE/EQUIP OR ENGINE REPAIR/RECONDITION/CLEANING/SALVAG
Notes: INSERTED FOR SITE PROFILE DATED 2004-05-17(described on Site Profile dated 04-05-17)

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PARCEL DESCRIPTIONS

Date Added: MAY 27, 2004 Crown Land PIN#:
LTO PID#: 023039574 Crown Land File#:
Land Desc: LOT A SECTION 10 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP54482

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CURRENT SITE PROFILE INFORMATION (Sec. III to X)
Site Profile Completion Date: MAY 17, 2004

Local Authority Received: MAY 17, 2004

Ministry Regional Manager Received: Decision: FEB 04, 2005
Decision: INVESTIGATION NOT REQUIRED

Site Registrar Received: JUL 02, 2004 Entry Date: FEB 04, 2005

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE

Schedule 2 Reference	Description
E1	APPLIANCE/EQUIP OR ENGINE REPAIR/RECONDITION/CLEANING/SALVAG

AREAS OF POTENTIAL CONCERN

Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?...NO
Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?............NO
Discarded barrels, drums or tanks?.......................................NO
Contamination resulting from migration of substances from other properties?..NO

FILL MATERIALS

Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activiities listed under Schedule 2?...NO
Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?..NO
Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?....................................NO

WASTE DISPOSAL
Materials such as household garbage, mixed municipal refuse, or demolition debris?.....NO
Waste or byproducts such as tank bottoms, residues, sludge, or

flocculation precipitates from industrial processes or wastewater treatment?.....NO
Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.....NO
Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO
Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); or automobile and truck parts cleaning or repair?.....NO

TANKS OR CONTAINERS USED OR STORED
Underground fuel or chemical storage tanks?.....NO
Above ground fuel or chemical storage tanks?.....NO

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES
PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO
Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO
Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS
Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO
Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO
Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS

End of Detail Report

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 As of: APR 20, 2008       BC Online: Site Registry                     08-04-21
                     For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:12:10
 Folio:                                                               Page   1
                                  Detail Report
SITE LOCATION
       Site ID:       7234                         Latitude:  50d 01m 17.7s
 Victoria File: 26250-20/7234                     Longitude: 119d 23m 45.5s
 Regional File: 26250-20/7234
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: 9590 MCCARTHY ROAD
         City: KELOWNA                        Prov/State: BC
  Postal Code: V4V 1S5

 Registered: JUN 06, 2001  Updated: SEP 17, 2007  Detail Removed: SEP 17, 2007

 Notations:   7   Participants:   5    Associated Sites:   0
 Documents:   1 Susp. Land Use:   2 Parcel Descriptions:   2

Location Description: LAT/LONG DETERMINED BY BC ENVIRONMENT REFERENCING
 DIGITAL TRIM MAPS, NAD83, 1:20000 SCALE.

Record Status: INACTIVE - NO FURTHER ACTION
 Fee category: UNRANKED

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NOTATIONS

  Notation Type: NOTICE OF INDEPENDENT REMEDIATION COMPLETION SUBMITTED
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: AUG 22, 2007                     Approved: AUG 22, 2007

 Ministry Contact: ROSSER, CRAIG L

 Notation Participants                            Notation Roles
 SUMMIT ENVIRONMENTAL CONSULTANTS LTD. (VERNON)     SUBMITTED BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: JUL 31, 2007                     Approved: JUL 31, 2007

 Ministry Contact: ROSSER, CRAIG L

 Notation Participants                            Notation Roles
 SUMMIT ENVIRONMENTAL CONSULTANTS LTD. (VERNON)     SUBMITTED BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE REVIEWED - NO FURTHER INVESTIGATION REQUIRED BY
                 THE MINISTRY
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: MAY 23, 2001                     Approved:

 Ministry Contact: ANDERSON, RICHARD (DICK) G

 Notation Participants                            Notation Roles
 MARSHALL'S USED AUTO PARTS (KELOWNA)             RECEIVED BY
 MARSHALL'S USED AUTO PARTS (KELOWNA)             RECEIVED BY
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NOTATIONS

Note: BC ENVIRONMENT DOESN'T REQUIRE SITE INVESTIGATION AT THIS TIME AS LAND USE ISN'T CHANGING, ZONING BEING UPDATED TO REFLECT CURRENT OPERATIONS.

Required Actions: AS PER SECTION 26.1(9) OF THE WASTE MANAGEMENT ACT & DESPITE SECTION 4(1)(A) OF THE CONTAMINATED SITES REGULATION, THE PROPERTY OWNER SHALL SUBMIT TO THE APPLICABLE AUTHORITY AN UP TO DATE SITE PROFILE, AT THE TIME OF UNDERTAKING ANY FURTHER ACTIVITIES UNDER SECTION 26.1 OF THE WASTE MANAGEMENT ACT.

- -

Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAY 23, 2001 Approved:

Ministry Contact: ANDERSON, RICHARD (DICK) G

Notation Participants	Notation Roles
MARSHALL'S USED AUTO PARTS (KELOWNA)	RECEIVED BY
MARSHALL'S USED AUTO PARTS (KELOWNA)	RECEIVED BY

Note: BC ENVIRONMENT DOESN'T REQUIRE SITE INVESTIGATION AT THIS TIME AS LAND USE ISN'T CHANGING, ZONING BEING UPDATED TO REFLECT CURRENT OPERATIONS.

Required Actions: AS PER SECTION 26.1(9) OF THE WASTE MANAGEMENT ACT & DESPITE SECTION 4(1)(A) OF THE CONTAMINATED SITES REGULATION, THE PROPERTY OWNER SHALL SUBMIT TO THE APPLICABLE AUTHORITY AN UP TO DATE SITE PROFILE, AT THE TIME OF UNDERTAKING ANY FURTHER ACTIVITIES UNDER SECTION 26.1 OF THE WASTE MANAGEMENT ACT.

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Notation Type: SITE INVESTIGATION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: MAY 16, 2001 Approved: MAY 16, 2001

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants	Notation Roles
MARSHALL'S USED AUTO PARTS (KELOWNA)	SUBMITTED BY

Note: "STAGE I SITE INSPECTIONS: 9590 MCCARTHY RD., KELOWNA, BC".

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Notation Type: SITE PROFILE RECEIVED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAY 10, 2001 Approved: MAY 18, 2001

Ministry Contact: ANDERSON, RICHARD (DICK) G

Notation Participants	Notation Roles
MARSHALL'S USED AUTO PARTS (KELOWNA)	SUBMITTED BY
MARSHALL'S USED AUTO PARTS (KELOWNA)	SUBMITTED BY

NOTATIONS

Note: SITE PROFILE TRIGGERED UPON APPLICATION FOR REZONING AND SUBDIVISION

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Notation Type: SITE PROFILE RECEIVED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: MAY 10, 2001 Approved: MAY 18, 2001

Ministry Contact: ANDERSON, RICHARD (DICK) G

Notation Participants	Notation Roles
MARSHALL'S USED AUTO PARTS (KELOWNA)	SUBMITTED BY
MARSHALL'S USED AUTO PARTS (KELOWNA)	SUBMITTED BY

Note: SITE PROFILE TRIGGERED UPON APPLICATION FOR REZONING AND SUBDIVISION

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SITE PARTICIPANTS

Participant: ANDERSON, RICHARD (DICK) G
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: MAY 10, 2001 End Date: OCT 16, 2002
Notes: REGIONAL WASTE MANAGER

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Participant: MARSHALL'S USED AUTO PARTS (KELOWNA)
Role(s): PROPERTY OWNER
SITE PROFILE COMPLETOR
SITE PROFILE CONTACT
Start Date: SEP 27, 2000 End Date:
Notes: CONTACT: ALLAN MARSHALL

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Participant: ROSSER, CRAIG L
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: JUL 31, 2007 End Date:

- -

Participant: SUMMIT ENVIRONMENTAL CONSULTANTS LTD. (VERNON)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: SEP 27, 2000 End Date:

- -

Participant: VERGAMINI, DON (KAMLOOPS) E
Role(s): MAIN MINISTRY CONTACT
Start Date: MAY 10, 2001 End Date:
Notes: CONTAMINATED SITES TECHNICIAN

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DOCUMENTS

Title: STAGE I, PRELIMINARY SITE INSPECTIONS: 9590 MCCARTHY RD., KELOWNA, BC
Authored: SEP 27, 2000 Submitted: MAY 16, 2001

Participants	Role
SUMMIT ENVIRONMENTAL CONSULTANTS LTD. (VERNON)	AUTHOR

Notes: SITE INVESTIGATION - SUBMITTED FOR BC ENVIRONMENT INFORMATION ONLY.
REVIEW NOT REQUESTED AT THIS TIME.

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SUSPECTED LAND USE

Description: AUTO/TRUCK/BUS/SUBWAY/OTHER VEHICLE REPAIR/SALVAGE/WRECKING
Notes: INSERTED FOR SITE PROFILE DATED 2001-05-08(described on Site Profile dated 01-05-08)

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Description: PETRO/NATURAL GAS/PRODUCE WATER STRG ABVEGRND/UNDERGRND TANK
Notes: PETROLEUM PRODUCT STORAGE TANKS

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PARCEL DESCRIPTIONS

Date Added: MAY 08, 2001 Crown Land PIN#:
LTO PID#: 005673585 Crown Land File#:
Land Desc: LOT 3 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 3997

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Date Added: JUN 09, 2001 Crown Land PIN#:
LTO PID#: 025047426 Crown Land File#:
Land Desc: LOT A SECTIONS 10 AND 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP69077

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CURRENT SITE PROFILE INFORMATION (Sec. III to X)
Site Profile Completion Date: MAY 08, 2001

Local Authority Received: MAY 10, 2001

Ministry Regional Manager Received: MAY 10, 2001 Decision: MAY 23, 2001
Decision: INVESTIGATION NOT REQUIRED

Site Registrar Received: Entry Date:

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE
Schedule 2

Reference	Description
G2	AUTO/TRUCK/BUS/SUBWAY/OTHER VEHICLE REPAIR/SALVAGE/WRECKING

AREAS OF POTENTIAL CONCERN
Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?..NO
Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?............NO
Discarded barrels, drums or tanks?.......................................NO

FILL MATERIALS
Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activiities listed under Schedule

2?.....NO
Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?.....NO
Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?.....NO

WASTE DISPOSAL
Materials such as household garbage, mixed municipal refuse, or demolition debris?.....NO
Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?.....NO
Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.....NO
Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO
Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); or automobile and truck parts cleaning or repair?.....NO

TANKS OR CONTAINERS USED OR STORED
Underground fuel or chemical storage tanks?.....YES
Above ground fuel or chemical storage tanks?.....YES

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES
PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO
Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO
Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS
Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO
Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO
Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS
THIS PROPERTY HAS HAD A STAGE II ENVIRONMENT STUDY

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 3333 Latitude: 50d 01m 16.7s
Victoria File: Longitude: 119d 23m 41.3s
Regional File: 26250-20/3333
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 9595 MCCARTHY ROAD
City: KELOWNA Prov/State: BC
Postal Code: V4V 1S5

Registered: OCT 07, 1997 Updated: AUG 15, 2001 Detail Removed: JUL 26, 2001

Notations: 10 Participants: 9 Associated Sites: 0
Documents: 1 Susp. Land Use: 5 Parcel Descriptions: 1

Location Description: LAT/LONG DERIVED BY BC ENVIRONMENT USING DIFFERENTIAL GPS. CROSS REFERENCE - WASTE MANAGEMENT PERMIT PS-08881.

Record Status: ACTIVE - UNDER REMEDIATION
Fee category: SMALL SITE, COMPLEX CONTAMINATION

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NOTATIONS

Notation Type: MONITORING REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: JUL 26, 2001 Approved: JUL 26, 2001

Ministry Contact: REDFORD, DENNIS

Notation Participants	Notation Roles
NEWALTA CORPORATION (SURREY)	SUBMITTED BY

Note: MONITORING RESULTS SUBMITTED FOR GROUNDWATER SAMPLES COLLECTED IN MAY 2001.

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Notation Type: MONITORING REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: JUL 24, 1998 Approved: JUL 24, 1998

Ministry Contact: BOYES, DARRYL K

Notation Participants	Notation Roles
NEWALTA CORPORATION (SURREY)	SUBMITTED BY

Note: LETTER RE: ANALYTICAL RESULTS FOR GROUNDWATER MONITORING WELLS, 9595 MCCARTHY ROAD, WINFIELD (PS-08881).

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Notation Type: WASTE MANAGEMENT PERMIT AMENDED
Notation Class: WASTE MANAGEMENT ACT: GENERAL
Initiated: JUN 16, 1997 Approved: JUN 16, 1997

NOTATIONS

Ministry Contact: BOYES, DARRYL K

Notation Participants	Notation Roles
JARMAN, PETER	ISSUED BY

Note: MINOR AMENDMENT TO WASTE MANAGEMENT PERMIT PS-08881.

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Notation Type: WASTE MANAGEMENT PERMIT AMENDED
Notation Class: WASTE MANAGEMENT ACT: GENERAL
Initiated: OCT 25, 1996 Approved: OCT 25, 1996

Ministry Contact: JARMAN, PETER

Notation Participants	Notation Roles
JARMAN, PETER	ISSUED BY

Note: WASTE MANAGEMENT PERMIT PS-08881. SPECIAL WASTE COLLECTION & SHORT TERM SPECIAL WASTE STORAGE PERMIT. NAME CHANGE AMENDMENT - PERMITTEE AMENDED FROM LOCH ENVIRONMENTAL SERVICES LTD. TO NEWALTA CORPORATION.

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Notation Type: APPROVAL IN PRINCIPLE ISSUED
Notation Class: WASTE MANAGEMENT ACT: FEE REGULATION S.35(2)
Initiated: OCT 15, 1996 Approved: OCT 15, 1996

Ministry Contact: VERGAMINI, DON (PENTICTON)

Notation Participants	Notation Roles
NEWALTA CORPORATION (SURREY)	RECEIVED BY
VERGAMINI, DON (PENTICTON)	ISSUED BY

Note: LETTER RE: AUTHORIZATION TO DISPOSE OF SOILS CURRENTLY AT THE NEWALTA SITE LOCATED AT 9595 MCCARTHY ROAD, WINFIELD, BC. APPROVAL IN PRINCIPLE ISSUED TO DISPOSE OF HYDROCARBON CONTAMINATED SOIL TO THE LANDFILL.

- -

Notation Type: APPROVAL IN PRINCIPLE REQUESTED
Notation Class: WASTE MANAGEMENT ACT: FEE REGULATION S.35(2)
Initiated: OCT 07, 1996 Approved: OCT 07, 1996

Ministry Contact: VERGAMINI, DON (PENTICTON)

Notation Participants	Notation Roles
NEWALTA CORPORATION (SURREY)	REQUESTED BY

Note: APPROVAL IN PRINCIPLE REQUESTED TO DISPOSE OF HYDROCARBON CONTAMINATED SOIL TO LANDFILL

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Notation Type: APPROVAL IN PRINCIPLE ISSUED
Notation Class: WASTE MANAGEMENT ACT: FEE REGULATION S.35(2)
Initiated: JUL 29, 1996 Approved: JUL 29, 1996

Ministry Contact: VERGAMINI, DON (PENTICTON)

NOTATIONS

Notation Participants	Notation Roles
GOLIBAR HOLDINGS LTD. (KELOWNA, B.C.)	RECEIVED BY
VERGAMINI, DON (PENTICTON)	ISSUED BY

Note: LETTER RE: AUTHORIZATION TO DISPOSE OF SOILS CURRENTLY AT THE FORMER LOCH ENVIRONMENTAL SITE, 9595 MCCARTHY ROAD, WINFIELD, BC. APPROVAL TO DISPOSE OF HYDROCARBON CONTAMINATED SOIL TO A LANDFILL

- -

Notation Type: APPROVAL IN PRINCIPLE REQUESTED
Notation Class: WASTE MANAGEMENT ACT: FEE REGULATION S.35(2)
Initiated: JUL 28, 1996 Approved: JUL 28, 1996

Ministry Contact: VERGAMINI, DON (PENTICTON)

Notation Participants	Notation Roles
GOLIBAR HOLDINGS LTD. (KELOWNA, B.C.)	REQUESTED BY

Note: APPROVAL IN PRINCIPLE REQUESTED TO DISPOSE OF SOIL TO THE LANDFILL

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Notation Type: SITE INVESTIGATION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: JUL 01, 1996 Approved: AUG 26, 1996

Ministry Contact: BOYES, DARRYL K

Notation Participants	Notation Roles
EBA ENVIRONMENTAL LTD (HEAD OFFICE FOR BC)	SUBMITTED BY

Note: ENVIRONMENTAL SITE ASSESSMENT PROPOSED NEWALTA FACILITY WINFIELD, BRITISH COLUMBIA SUBMITTED

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Notation Type: WASTE MANAGEMENT PERMIT ISSUED
Notation Class: WASTE MANAGEMENT ACT: GENERAL
Initiated: AUG 03, 1994 Approved: AUG 03, 1994

Ministry Contact: BOYES, DARRYL K

Note: WASTE MANAGEMENT PERMIT PS-08881. AUTHORIZATION TO OPERATE A SHORT TERM SPECIAL WASTE STORAGE FACILITY.

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SITE PARTICIPANTS

Participant: ANALYTICAL SERVICE LABORATORIES LTD (VANCOUVER)
Role(s): ANALYTICAL LAB
Start Date: JUL 18, 1996 End Date:

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Participant: BOYES, DARRYL K
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: AUG 03, 1994 End Date: APR 01, 1999

SITE PARTICIPANTS

Participant: EBA ENVIRONMENTAL LTD (HEAD OFFICE FOR BC)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: JUL 01, 1996 End Date:

Participant: GOLIBAR HOLDINGS LTD. (KELOWNA, B.C.)
Role(s): FORMER PROPERTY OWNER
Start Date: JUL 28, 1996 End Date: SEP 01, 1996
Notes: APPROXIMATE DATE PROPERTY WAS SOLD

Participant: JARMAN, PETER
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: OCT 25, 1996 End Date:
Notes: ASSISTANT REGIONAL WASTE MANAGER

Participant: LOCH ENVIRONMENTAL SERVICES LTD. (WINFIELD)
Role(s): FORMER OPERATOR
Start Date: JUL 29, 1996 End Date:

Participant: NEWALTA CORPORATION (SURREY)
Role(s): PROPERTY OWNER
Start Date: JUL 01, 1996 End Date:
Notes: PROPERTY PURCHASED IN SEPTEMBER, 1996

Participant: REDFORD, DENNIS
Role(s): MAIN MINISTRY CONTACT
Start Date: JUL 26, 2001 End Date: JAN 01, 2007
Notes: EMERGENCY RESPONSE OFFICER

Participant: VERGAMINI, DON (PENTICTON)
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: JUL 28, 1996 End Date:

DOCUMENTS

Title: ENVIRONMENTAL SITE ASSESSMENT PROPOSED NEWALTA FACILITY WINFIELD, BRITISH COLUMBIA
Authored: JUL 01, 1996 Submitted: JUL 01, 1996

Participants	Role
EBA ENVIRONMENTAL LTD (HEAD OFFICE FOR BC)	AUTHOR
NEWALTA CORPORATION (SURREY)	COMMISSIONER

Notes: INCLUDES ANALYTICAL REPORT, SITE PLANS, BOREHOLE LOGS, AND FIELD WORK DESCRIPTIONS.

SUSPECTED LAND USE

Description: ANTIFREEZE BULK STORAGE AND RECYCLING
Notes:

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Description: INDUSTRIAL WASTE STORAGE, RECYCLING OR LANDFILLING
Notes:

- -

SUSPECTED LAND USE

Description: PAINT/LACQUER/VARNISH MANU/FORMULAT/RECYCLE/WHLSLE BULK STOR
Notes:

- -

Description: SPECIAL (HAZARDOUS) WASTE STORAGE, TREATMENT, DISPOSAL
Notes:

- -

Description: WASTE OIL, REPROCESSING, RECYCLING OR BULK STORAGE
Notes:

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PARCEL DESCRIPTIONS

Date Added: OCT 15, 1996 Crown Land PIN#:
LTO PID#: 007575106 Crown Land File#:
Land Desc: LOT 1 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 6040

No activities were reported for this site

End of Detail Report

As of: APR 20, 2008 BC Online: Site Registry 08-04-21
For: PC12108 KALA GROUNDWATER CONSULTING LTD. 09:14:03
Folio: Page 1

Detail Report

SITE LOCATION
Site ID: 9222 Latitude: 50d 01m 11.0s
Victoria File: Longitude: 119d 23m 29.0s
Regional File: 26250-20/9222
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 350 CARION ROAD
City: KELOWNA Prov/State: BC
Postal Code:

Registered: DEC 13, 2004 Updated: MAR 17, 2005 Detail Removed: MAR 02, 2005

Notations: 2 Participants: 3 Associated Sites: 0
Documents: 0 Susp. Land Use: 0 Parcel Descriptions: 1

Location Description: LAT/LONG SUPPLIED BY ENVIRONMENTAL CONSULTANT

Record Status: INACTIVE - NO FURTHER ACTION
Fee category: UNRANKED

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NOTATIONS

Notation Type: NOTICE OF INDEPENDENT REMEDIATION COMPLETION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: JAN 04, 2005 Approved: JAN 04, 2005

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants Notation Roles
EBA ENGINEERING CONSULTANTS LTD. SUBMITTED BY

Note: NOTICE OF COMPLETION OF INDEPENDENT REMEDIATION SUBMITTED

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Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: NOV 29, 2004 Approved: NOV 29, 2004

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants Notation Roles
EBA ENGINEERING CONSULTANTS LTD. SUBMITTED BY

Note: NOTICE OF INDEPENDENT REMEDIATION SUBMITTED

Required Actions: ACKNOWLEDGEMENT LETTER ISSUED BY THE MINISTRY ON DECEMBER
10, 2004

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SITE PARTICIPANTS

Participant: DANRIC CONSTRUCTION LTD (KELOWNA)
Role(s): PROPERTY OWNER

SITE PARTICIPANTS

Start Date: NOV 29, 2004 End Date:

Participant: EBA ENGINEERING CONSULTANTS LTD.
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: NOV 29, 2004 End Date:
Notes: CONTACT: RICHARD TOMASZEWSKI

Participant: VERGAMINI, DON (KAMLOOPS) E
Role(s): MAIN MINISTRY CONTACT
Start Date: NOV 29, 2004 End Date:
Notes: CONTAMINATED SITES OFFICER

PARCEL DESCRIPTIONS

Date Added: DEC 10, 2004 Crown Land PIN#:
LTO PID#: 023595418 Crown Land File#:
Land Desc: LOT 2 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP57943

No activities were reported for this site

End of Detail Report

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 As of: APR 20, 2008       BC Online: Site Registry                    08-04-21
                     For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:11:54
 Folio:                                                               Page   1
                                   Detail Report
SITE LOCATION
       Site ID:      6698                         Latitude:  50d 01m 06.8s
 Victoria File:                                  Longitude: 119d 23m 18.5s
 Regional File: 26250-20/6698
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: JIM BAILEY ROAD
         City: WINFIELD                      Prov/State: BC
  Postal Code: V4V 2L8

 Registered: DEC 01, 2000  Updated: APR 12, 2005  Detail Removed: APR 08, 2005

 Notations:   4   Participants:   3    Associated Sites:   1
 Documents:   0 Susp. Land Use:   2 Parcel Descriptions:   1

Location Description: S OF BEAVER LAKE RD.  LAT/LONG DERIVED BY BC ENVIRONMENT
 REFERENCING DIGITAL TRIM MAP COVERAGES, NAD 83, 1:20000 SCALE.

Record Status: INACTIVE - NO FURTHER ACTION
 Fee category: UNRANKED

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NOTATIONS

  Notation Type: SITE PROFILE REVIEWED - NO FURTHER INVESTIGATION REQUIRED BY
                 THE MINISTRY
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: JUN 15, 2000                        Approved: JUN 15, 2000

 Ministry Contact: ANDERSON, RICHARD (DICK) G

 Note: BC ENVIRONMENT DOES NOT REQUIRE A SITE INVESTIGATION AT THIS TIME
 BECAUSE A STAGE I & II PRELIMINARY SITE INVESTIGATION HAS ALREADY BEEN
 CARRIED OUT FOR THE PROPERTY & A SUMMARY OF THE RESULTS IS INCLUDED WITH THE
 SITE PROFILE SUMBISSION.
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE
                 MINISTRY
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
      Initiated: JUN 15, 2000                        Approved: JUN 15, 2000

 Ministry Contact: ANDERSON, RICHARD (DICK) G

 Note: BC ENVIRONMENT DOES NOT REQUIRE A SITE INVESTIGATION AT THIS TIME
 BECAUSE A STAGE I & II PRELIMINARY SITE INVESTIGATION HAS ALREADY BEEN
 CARRIED OUT FOR THE PROPERTY & A SUMMARY OF THE RESULTS IS INCLUDED WITH THE
 SITE PROFILE SUMBISSION.
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE RECEIVED
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: MAY 31, 2000                        Approved: MAY 31, 2000
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NOTATIONS

Ministry Contact: ANDERSON, RICHARD (DICK) G

Notation Participants	Notation Roles
WESTERN STAR TRUCKS INC. (KELOWNA)	SUBMITTED BY
WESTERN STAR TRUCKS INC. (KELOWNA)	SUBMITTED BY

Note: SITE PROFILE FOR THE PORTION OF THE FORMER ELDORADO RANCH PROPERTY DESCRIBED AS LOT 1, SECTIONS 1 & 2, TOWNSHIP 20, ODYD, PLAN KAP66741

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Notation Type: SITE PROFILE RECEIVED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAY 31, 2000 Approved: MAY 31, 2000

Ministry Contact: ANDERSON, RICHARD (DICK) G

Notation Participants	Notation Roles
WESTERN STAR TRUCKS INC. (KELOWNA)	SUBMITTED BY
WESTERN STAR TRUCKS INC. (KELOWNA)	SUBMITTED BY

Note: SITE PROFILE FOR THE PORTION OF THE FORMER ELDORADO RANCH PROPERTY DESCRIBED AS LOT 1, SECTIONS 1 & 2, TOWNSHIP 20, ODYD, PLAN KAP66741

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SITE PARTICIPANTS

Participant: ANDERSON, RICHARD (DICK) G
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: MAY 31, 2000 End Date: OCT 16, 2002
Notes: REGIONAL WASTE MANAGER

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Participant: COLVEY, DICK
Role(s): MAIN MINISTRY CONTACT
Start Date: MAY 30, 2000 End Date: MAR 29, 2002
Notes: SENIOR POLLUTION PREVENTION OFFICER

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Participant: WESTERN STAR TRUCKS INC. (KELOWNA)
Role(s): PROPERTY OWNER
SITE PROFILE COMPLETOR
SITE PROFILE CONTACT
Start Date: MAY 30, 2000 End Date:
Notes: CONTACT: DAWN KARNES

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ASSOCIATED SITES

Site id: 3973 Date: NOV 23, 2000
Notes: PRELIMINARY SITE INVESTIGATIONS FOR THE PORTION OF SITE 3973 & SITE 6698 PURCHASED BY WESTERN STAR WERE UNDERTAKEN TOGETHER. THE REPORTS INCLUDE INFORMATION WITH REGARD TO SITE 6698 & SITE 3973. THE REPORTS ARE LOCATED IN SITE FILE 3973.

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SUSPECTED LAND USE

Description: MUNICIPAL WASTE STORAGE, RECYCLING, COMPOSTING, LANDFILLING
Notes: WASTE WATER DISCHARGE - CAR WASH EFFLUENT(described on Site Profile dated 00-05-30)

- -

Description: PETRO/NATURAL GAS/PRODUCE WATER STRG ABVEGRND/UNDERGRND TANK
Notes: 500 GALLON ABOVE GROUND STORAGE TANK - DIESEL(described on Site Profile dated 00-05-30)

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PARCEL DESCRIPTIONS

Date Added: JUN 13, 2000 Crown Land PIN#:
LTO PID#: 024781827 Crown Land File#:
Land Desc: LOT 1 SECTIONS 1 AND 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP66741

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CURRENT SITE PROFILE INFORMATION (Sec. III to X)
Site Profile Completion Date: MAY 30, 2000

Local Authority Received: JUN 09, 2000

Ministry Regional Manager Received: JUN 09, 2000 Decision: JUN 15, 2000
Decision: INVESTIGATION NOT REQUIRED

Site Registrar Received: Entry Date:

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE
Schedule 2

Reference	Description
F7	PETRO/NATURAL GAS/PRODUCE WATER STRG ABVEGRND/UNDERGRND TANK
H15	MUNICIPAL WASTE STORAGE, RECYCLING, COMPOSTING, LANDFILLING

AREAS OF POTENTIAL CONCERN
Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?...NO
Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?............NO
Discarded barrels, drums or tanks?...NO

FILL MATERIALS
Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activiities listed under Schedule 2?..NO
Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?..NO
Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal

sanitary or stormwater discharges?.....NO

WASTE DISPOSAL

Materials such as household garbage, mixed municipal refuse, or demolition

debris?.....NO

Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?.....YES

Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.....NO

Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO

Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); or automobile and truck parts cleaning or repair?.....NO

TANKS OR CONTAINERS USED OR STORED

Underground fuel or chemical storage tanks?.....NO

Above ground fuel or chemical storage tanks?.....YES

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES

PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO

Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO

Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS

Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO

Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO

Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS

NOTE 1. NO PAST OR PRESENT ORDERS, PERMITS, APPROVALS, CERTIFICATES & NOTIFICATIONS PERTAINING TO THE ENVIRONMENTAL CONDITION, USE OR QUALITY OF SOIL, SURFACE WATER, GROUNDWATER OR BIOTA AT THE SITE WERE NOTED IN GOLDER ASSOCIATES INVESTIGATIONS. NOTE 2. INFORMATION USED TO COMPLETE SITE PROFILE WAS GATHERED FROM GOLDER ASSOCIATES LTD. REPORTS: (1) STAGE 1 PRELIMINARY SITE INVESTIGATION REF. 992-4126 (2) STAGE II PRELIMINARY SITE INVESTIGATION PROPOSED INDUSTRIAL PARK DEVELOPMENT REF. 002-4017 & (3) ADDENDUM TO STAGE I PRELIMINARY SITE INVESTIGATION RE. 992-4126. -STAGE 1 PRELIMINARY SITE INVESTIGATION: GOLDER PERSONNEL REVIEWED THE FOLLOWING: 1)

Site Reg Detail- Site ID 6698 Lat 50d

REVIEW OF SURFICIAL GEOLOGY 2) REVIEW OF THE FOLLOWING HISTORICAL AERIAL PHOTOGRAPHS FROM THE MINISTRY OF FORESTS IN KAMLOOPS:-BC 7593-NOS.40 & 41 (1975), - BC 84050-NOS.139 & 140 (1984) & BCC 94085-NOS34-36 (1994) 3) A REVIEW OF RECORDS OR INFORMATION AVAILABLE FROM THE FOLLOWING SOURCES: - TITLE SEARCH CONDUCTED BY GILLESPIE RENKEMA BURKE REGISTRY AGENTS, KAMLOOPS BC - BRITISH COLUMBIA MINISTRY OF ENVIRONMENT, LANDS & PARKS (BCE) - CITY OF KELOWNA BUILDING DEPARTMENT & FIRE DEPARTMENT - INSURERS ADVISORY

ORGANIZATION (IAO), VANCOUVER BC - PREVIOUS GOLDER INVESTIGATIONS WITHIN THE AREA 4) INTERVIEWS WITH PERSONS KNOWLEDGEABLE OF THE SITE &/OR ITS HISTORY 5) A SITE RECONNAISSANCE OF THE SUBJECT SITE & A REVIEW OF THE NEIGHBORING LAND USE ADDITIONAL INFORMATION: SEE THE SITE PROFILE DATED MAY 30, 2000 FOR ADDITIONAL INFORMATION REGARDING WASTE WATER DISCHARGE & ABOVE GROUND STORAGE TANKS.

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 2558 Latitude: 50d 01m 06.4s
Victoria File: Longitude: 119d 22m 47.8s
Regional File: 26250-20/2558
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: BEAVER LAKE ROAD
City: WINFIELD Prov/State: BC
Postal Code:

Registered: OCT 08, 1997 Updated: Detail Removed:

Notations: 2 Participants: 7 Associated Sites: 0
Documents: 1 Susp. Land Use: 1 Parcel Descriptions: 1

Location Description: EASTERN BOUNDARY OF WINFIELD. NEAR ENTRANCE TO GRAVEL PIT. LAT/LONG DERIVED BY BC ENVIRONMENT USING DGPS.

Record Status: INACTIVE - REMEDIATION COMPLETE
Fee category: UNRANKED

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NOTATIONS

Notation Type: REMEDIATION COMPLETION REPORT SUBMITTED
Notation Class: ADMINISTRATIVE
Initiated: JUN 12, 1995 Approved: JUN 12, 1995

Ministry Contact: HENDERSON, HOWARD

Notation Participants	Notation Roles
GEOVIRO ENGINEERING LTD. (VANCOUVER)	SUBMITTED BY
BC GAS INC (VANCOUVER)	SUBMITTED BY

Note: REMEDIATION OF MERCURY CONTAMINATED SOIL, WINFIELD GATE STATION, WINFIELD, BC. RESULTS OF LAB ANALYSIS INDICATE THAT THE SOIL PRESENT NOW HAS CONCENTRATIONS OF MERCURY LESS THEN LEVEL C CRITERIA. P. II

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Notation Type: CONCENTRATION CRITERIA APPROACH USED
Notation Class: ADMINISTRATIVE
Initiated: JUN 12, 1995 Approved: JUN 12, 1995

Ministry Contact: HENDERSON, HOWARD

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SITE PARTICIPANTS

Participant: ANALYTICAL SERVICE LABORATORIES LTD (VANCOUVER)
Role(s): ANALYTICAL LAB
Start Date: APR 21, 1995 End Date:

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Participant: BC GAS UTILITY LTD (HEAD OFFICE (LANDS SERVICES DEPT))
Role(s): OPERATOR

SITE PARTICIPANTS

PROPERTY OWNER
Start Date: SEP 13, 1994 End Date:
Notes: CLAY ROUSE

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Participant: CANTEST LIMITED (VANCOUVER)
Role(s): ANALYTICAL LAB
Start Date: SEP 15, 1994 End Date:

- -

Participant: CHEMICAL WASTE MANAGEMENT OF CANADA INC (VANCOUVER)
Role(s): FILL RECIPIENT
LANDFILL OPERATOR/OWNER
Start Date: MAY 09, 1995 End Date:

- -

Participant: COLVEY, DICK
Role(s): MAIN MINISTRY CONTACT
Start Date: AUG 31, 1995 End Date: MAR 29, 2002

- -

Participant: GEOVIRO ENGINEERING LTD. (VANCOUVER)
Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
Start Date: SEP 13, 1994 End Date:
Notes: STUART WYSE

- -

Participant: HENDERSON, HOWARD
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: JUN 12, 1995 End Date: AUG 23, 1996

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DOCUMENTS

Title: REMEDIATION OF MERCURY CONTAMINATED SOIL WINFIELD GATE STATION,
WINFIELD, B.C.
Authored: JUN 01, 1995 Submitted: JUN 12, 1995

Participants	Role
GEOVIRO ENGINEERING LTD. (VANCOUVER)	AUTHOR
BC GAS INC (VANCOUVER)	COMMISSIONER
HENDERSON, HOWARD	REVIEWER

Notes: REMEDIATION COMPLETE REPORT, INCLUDES: SITE PLAN, PICTURES, AND
ANALYTICAL RESULTS.

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SUSPECTED LAND USE

Description: MEASURE INSTR. (W/MERCURY) MANU/REPAIR/WHOLESALE BULK STORAG
Notes: BC GAS GATE STATION

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PARCEL DESCRIPTIONS

Date Added: OCT 16, 1996 Crown Land PIN#:
LTO PID#: 013536796 Crown Land File#:
Land Desc: THAT PART OF THE EAST 1/2 OF SECTION 2 SHOWN ON PLAN A15293;
TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT

No activities were reported for this site

PARCEL DESCRIPTIONS

End of Detail Report

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 As of: APR 20, 2008       BC Online: Site Registry                     08-04-21
                      For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:09:37
 Folio:                                                                 Page   1
                                   Detail Report
SITE LOCATION
       Site ID:       3816                         Latitude:  50d 00m 55.1s
 Victoria File:                                   Longitude: 119d 23m 28.3s
 Regional File: 26250-20/3816
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: 8999 JIM BAILEY ROAD
         City: WINFIELD                      Prov/State: BC
  Postal Code: V4V 2L8

 Registered: OCT 27, 1997  Updated: JUN 20, 2001  Detail Removed: JUN 15, 2001

 Notations:   1   Participants:   3    Associated Sites:   1
 Documents:   0 Susp. Land Use:   1 Parcel Descriptions:  35

Location Description: HIRAM WALKER PLANT SITE.  LAT/LONG DERIVED BY BC
 ENVIRONMENT REFERENCING TCN, NAD83.

Record Status: INACTIVE - NO FURTHER ACTION
 Fee category: UNRANKED

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NOTATIONS

  Notation Type: REMEDIATION COMPLETION REPORT SUBMITTED
 Notation Class: ADMINISTRATIVE
      Initiated: JUL 06, 1995                       Approved: JUL 06, 1995

 Ministry Contact: BOYES, DARRYL K

 Note: LETTER RE: DISMANTLING OF WINFIELD INDUSTRIAL SUBSTATION - JIM BAILEY
 ROAD, WINFIELD.   THE SUBSTATION HAS BEEN DISMANTLED AND LEVELLED TO THE
 ELEVATION OF THE SURROUNDING AREA, THERE APPEARS TO BE NO SIGNS  OF
 TRANSFORMER OIL OR LEAKAGE.
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SITE PARTICIPANTS

   Participant: BOYES, DARRYL K
       Role(s): MAIN MINISTRY CONTACT
    Start Date: JUL 06, 1995                          End Date: APR 01, 1999
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   Participant: HIRAM WALKER & SONS LIMITED
       Role(s): PROPERTY OWNER
    Start Date: AUG 14, 1995                          End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
   Participant: WEST KOOTENAY POWER LTD. (HEAD OFFICE - TRAIL, B.C.)
       Role(s): FORMER OPERATOR
                PROPERTY OWNER
    Start Date: MAR 13, 1975                          End Date:
         Notes: DAVE FUJIBAYASHI
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ASSOCIATED SITES

Site id: 3973 Date: JUN 16, 1997
Notes: COMMON PID

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SUSPECTED LAND USE

Description: ELECTRICAL TRANSMISSION OR DISTRIBUTION SUBSTATIONS
Notes: DISMANTLED 1995

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PARCEL DESCRIPTIONS

Date Added: MAY 14, 1997 Crown Land PIN#:
LTO PID#: 002183951 Crown Land File#:
Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 19099 EXCEPT PLANS KAP55339 AND KAP59703

- -

Date Added: MAY 28, 1997 Crown Land PIN#:
LTO PID#: 023150823 Crown Land File#:
Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP55339 EXCEPT PLAN KAP59704

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023838809 Crown Land File#:
Land Desc:

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839139 Crown Land File#:
Land Desc:

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839147 Crown Land File#:
Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839155 Crown Land File#:
Land Desc: LOT B SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839163 Crown Land File#:
Land Desc: LOT C SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839171 Crown Land File#:
Land Desc: LOT D SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839180 Crown Land File#:

PARCEL DESCRIPTIONS

PLAN KAP59703

Date Added: JAN 15, 2000 Crown Land PIN#:
LTO PID#: 024666891 Crown Land File#:
Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP65805

Date Added: JAN 15, 2000 Crown Land PIN#:
LTO PID#: 024666904 Crown Land File#:
Land Desc: LOT 2 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP65805

Date Added: JAN 15, 2000 Crown Land PIN#:
LTO PID#: 024666912 Crown Land File#:
Land Desc: LOT 3 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP65805

Date Added: JAN 15, 2000 Crown Land PIN#:
LTO PID#: 024666921 Crown Land File#:
Land Desc: LOT 4 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP65805

Date Added: JAN 15, 2000 Crown Land PIN#:
LTO PID#: 024666939 Crown Land File#:
Land Desc: LOT 5 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP65805

Date Added: JAN 15, 2000 Crown Land PIN#:
LTO PID#: 024666947 Crown Land File#:
Land Desc: LOT 6 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP65805

Date Added: JAN 15, 2000 Crown Land PIN#:
LTO PID#: 024666955 Crown Land File#:
Land Desc: LOT 7 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP65805

Date Added: JAN 15, 2000 Crown Land PIN#:
LTO PID#: 024666963 Crown Land File#:
Land Desc: LOT 8 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP65805

Date Added: MAY 20, 2000 Crown Land PIN#:
LTO PID#: 024779768 Crown Land File#:
Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP66761 EXCEPT PLAN KAP71932

Site Reg Detail- Site ID 3816 Lat 50d

Date Added: MAY 20, 2000 Crown Land PIN#:
LTO PID#: 024779776 Crown Land File#:
Land Desc: LOT B SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP66761

PARCEL DESCRIPTIONS

Date Added: NOV 25, 2000 Crown Land PIN#:
LTO PID#: 024900940 Crown Land File#:
Land Desc: STRATA LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT STRATA PLAN KAS2285 TOGETHER WITH AN INTEREST IN THE COMMON PROPERTY IN PROPORTION TO THE UNIT ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V

Date Added: NOV 25, 2000 Crown Land PIN#:
LTO PID#: 024900966 Crown Land File#:
Land Desc: STRATA LOT 2 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT STRATA PLAN KAS2285 TOGETHER WITH AN INTEREST IN THE COMMON PROPERTY IN PROPORTION TO THE UNIT ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V

Date Added: NOV 25, 2000 Crown Land PIN#:
LTO PID#: 024900974 Crown Land File#:
Land Desc: STRATA LOT 3 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT STRATA PLAN KAS2285 TOGETHER WITH AN INTEREST IN THE COMMON PROPERTY IN PROPORTION TO THE UNIT ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V

Date Added: NOV 25, 2000 Crown Land PIN#:
LTO PID#: 024900982 Crown Land File#:
Land Desc: STRATA LOT 4 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT STRATA PLAN KAS2285 TOGETHER WITH AN INTEREST IN THE COMMON PROPERTY IN PROPORTION TO THE UNIT ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V

Date Added: OCT 05, 2002 Crown Land PIN#:
LTO PID#: 025493345 Crown Land File#:
Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP71932

Date Added: NOV 26, 2005 Crown Land PIN#:
LTO PID#: 026493896 Crown Land File#:
Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

Date Added: NOV 26, 2005 Crown Land PIN#:
LTO PID#: 026493900 Crown Land File#:
Land Desc: LOT 2 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

Site Reg Detail- Site ID 3816 Lat 50d

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 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493918                    Crown Land File#:
  Land Desc: LOT 3 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493926                    Crown Land File#:
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PARCEL DESCRIPTIONS

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  Land Desc: LOT 4 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493934                    Crown Land File#:
  Land Desc: LOT 5 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
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 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493942                    Crown Land File#:
  Land Desc: LOT 6 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
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 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493951                    Crown Land File#:
  Land Desc: LOT 7 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493969                    Crown Land File#:
  Land Desc: LOT 8 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493977                    Crown Land File#:
  Land Desc: LOT 9 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493985                    Crown Land File#:
  Land Desc: LOT 10 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: DEC 03, 2005                  Crown Land PIN#:
   LTO PID#: 026494736                    Crown Land File#:
  Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79497
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No activities were reported for this site

End of Detail Report

Detail Report

SITE LOCATION

Site ID: 3973 Latitude: 50d 00m 33.9s
Victoria File: 26250-20/3973 Longitude: 119d 23m 24.4s
Regional File: 26100-20/3973
Region: PENTICTON, SOUTHERN INTERIOR

Site Address: 8999 JIM BAILEY ROAD
City: WINFIELD Prov/State: BC
Postal Code: V4V 1S4

Registered: NOV 07, 1997 Updated: NOV 08, 2006 Detail Removed: NOV 08, 2006

Notations: 18 Participants: 17 Associated Sites: 3
Documents: 11 Susp. Land Use: 6 Parcel Descriptions: 35

Location Description: LAT/LONG DERIVED BY BC ENVIRONMENT REFERENCING DIGITAL TRIM MAP COVERAGES (NAD83).

Record Status: INACTIVE - REMEDIATION COMPLETE
Fee category: MEDIUM SITE, COMPLEX CONTAMINATION

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NOTATIONS

Notation Type: CERTIFICATE OF COMPLIANCE ISSUED (WMA 27.6(2))
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: APR 08, 2003 Approved: APR 08, 2003

Ministry Contact: WARD, JOHN E H

Notation Participants	Notation Roles
PATRICK, GUY	ROSTERED EXPERT UNDER PROTOCOL SIX
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	RECEIVED BY
WARD, JOHN E H	ISSUED BY

Note: ISSUED ON THE ADVICE OF A ROSTERED PROFESSIONAL EXPERT (GUY PATRICK) UNDER PROTOCOL 6 OF THE CONTAMINATED SITES REGULATION. REPLACES CERTIFICATE ISSUED 2003-03-20

- -

Notation Type: CERTIFICATE OF COMPLIANCE ISSUED (WMA 27.6(2))
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAR 20, 2003 Approved: MAR 20, 2003

Ministry Contact: WARD, JOHN E H

Notation Participants	Notation Roles
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	REQUESTED BY
PATRICK, GUY	ROSTERED EXPERT UNDER PROTOCOL SIX

NOTATIONS

BROWN, DAVID F	RECEIVED BY
WARD, JOHN E H	ISSUED BY

Note: CANCELLED AND REPLACED BY 2003-04-08 CERTIFICATE OF COMPLIANCE

- -

Notation Type: DETAILED SITE INVESTIGATION REPORT: INTERNAL REVIEW REQUESTED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: NOV 28, 2000 Approved: NOV 28, 2000

Ministry Contact: VERGAMINI, DON (KAMLOOPS) E

Notation Participants	Notation Roles
GOLDER ASSOCIATES LTD (KELOWNA)	SUBMITTED BY

Note: REPORT SUBMITTED TITLED SUMMARY OF PRELIMINARY AND DETAILED SITE INVERSTIGATIONS REMEDIATION PROGRAM AND CONFIRMATION OF REMEDIATION, 8999 JIM BAILEY ROAD, KELOWNA, BC

- -

Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: JUN 06, 2000 Approved: JUN 06, 2000

Ministry Contact: ECKSTEIN, NORM A.

Notation Participants	Notation Roles
ECKSTEIN, NORM A.	RECEIVED BY
ECKSTEIN, NORM A.	RECEIVED BY

Note: LETTER SENT TO OWNER, ADVISING NO INVESTIGATION IS REQUIRED.

- -

Notation Type: SITE PROFILE REVIEWED - NO FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: JUN 06, 2000 Approved: JUN 06, 2000

Ministry Contact: ECKSTEIN, NORM A.

Notation Participants	Notation Roles
ECKSTEIN, NORM A.	RECEIVED BY
ECKSTEIN, NORM A.	RECEIVED BY

Note: LETTER SENT TO OWNER, ADVISING NO INVESTIGATION IS REQUIRED.

- -

Notation Type: SITE PROFILE RECEIVED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAY 31, 2000 Approved: JUN 06, 2000

Ministry Contact: COLVEY, DICK

Site Reg Detail- Site ID 3973 Lat 50d

Notation Participants   Notation Roles

NOTATIONS

ANDERSON, RICHARD (DICK) G   RECEIVED BY
ANDERSON, RICHARD (DICK) G   RECEIVED BY

Note: SITE PROFILE SUBMITTED AS REDEVELOPMENT PERMIT IS REQUIRED.

Required Actions: AS REMEDIATION IS ALREADY UNDERWAY, A SEPARATE INVESTIGATION IS NOT REQUIRED.

- -

Notation Type: SITE PROFILE RECEIVED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: MAY 31, 2000   Approved: JUN 06, 2000

Ministry Contact: COLVEY, DICK

Notation Participants   Notation Roles
ANDERSON, RICHARD (DICK) G   RECEIVED BY
ANDERSON, RICHARD (DICK) G   RECEIVED BY

Note: SITE PROFILE SUBMITTED AS REDEVELOPMENT PERMIT IS REQUIRED.

Required Actions: AS REMEDIATION IS ALREADY UNDERWAY, A SEPARATE INVESTIGATION IS NOT REQUIRED.

- -

Notation Type: NOTICE OF INDEPENDENT REMEDIATION INITIATION SUBMITTED (WMA 28(2))
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAY 30, 2000   Approved: JUN 09, 2000

Ministry Contact: COLVEY, DICK

Notation Participants   Notation Roles
EBA ENGINEERING CONSULTANTS LTD   SUBMITTED BY
ECKSTEIN, NORM A.   RECEIVED BY

Note: LETTER RECEIVED WITH 3 REPORTS. REPORTS WILL NOT BE REVIEWED UNTIL A CERTIFICATE OF COMPLIANCE IS REQUESTED.

Required Actions: 2000-06-01 - STANDARD LETTER SENT BY MELP ACKNOWLEDGING RECEIPT OF NOTICE OF INDEPENDENT REMEDIATION. OWNER IS TO ADVISE MINISTRY OF ANY OFFSITE CONTAMINATION DISCOVERED DURING REMEDIATION. 2000-06-09 - NOTIFICATION OF WORK ON SITE COMMENCING SENT BY EBA.

- -

Notation Type: APPROVAL IN PRINCIPLE ISSUED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: JUL 29, 1998   Approved: JUL 29, 1998

Ministry Contact: JARMAN, PETER

Notation Participants	Notation Roles
HIRAM WALKER & SONS LTD (WINDSOR ONTARIO)	RECEIVED BY
JARMAN, PETER	ISSUED BY

Note: THE REMEDIATION PLAN HAS BEEN REVIEWED AND RECEIVED APPROVAL IN PRINCIPLE FROM THE REGIONAL WASTE MANAGER. IT IS AUTHORIZED TO BE IMPLEMENTED SUBJECT TO CONDITIONS OUTLINED IN THE APPROVAL DOCUMENT.

Required Actions: 1. OBTAIN PERMITS/APPROVALS FOR CONDUCTING REMEDIATION FROM APPROPRIATE REGULATORY AGENCIES. 2. ENSURE ANY RELOCATION OF CONTAMINATED MATERIAL OFF-SITE WILL BE CARRIED OUT IN ACCORDANCE WITH THE WASTE MANAGEMENT ACT. 3. THE APPROVAL HOLDER IS FULLY RESPONSIBLE TO CHARACTERIZE AND MANAGE ALL SITE MATERIALS IN ACCORDANCE WITH THE REMEDIATION PLAN. 4. A PROJECT HEALTH & SAFETY PLAN WILL BE PREPARED. 5. SOILS FOUND TO BE CONTAMINATED ABOVE COMMERCIAL STANDARDS SHALL NOT BE USED FOR BACKFILL ON THE PROPERTY. 6. A MONITORING PROGRAM MAY BE REQUIRED AT THE DISCRETION OF THE REGIONAL WASTE MANAGER FOR THE PURPOSE OF CONFIRMING THAT THE SOIL/GROUNDWATER MEETS THE COMMERCIAL STANDARDS. 7. SUPPLY BC ENVIRONMENT WITH WEEKLY SUMMARIES OF REMEDIAL ACTIONS. 8. PROVISIONS OF THIS APPROVAL ARE WITHOUT PREJUICE TO THE RIGHT OF THE MINISTRY TO MAKE ORDERS OR REQUIRE ADDITIONAL REMEDIAL MEASURES. 9. ALL PERTINENT INFORMATION WITH RESPECT THE APPROVAL WILL BE INCLUDED ON THE SITE REGISTRY AND THEREFORE BECOME PART OF THE PUBLIC RECORD. 10. THE APPROVAL HOLDER WILL CONTINUE TO INDEMNIFY THE CROWN AND HER EMPLOYEES, AGAINST LOSS, DAMAGES, COSTS, ACTIONS, SUITS, AND CLAIMS ARISING FROM ANY CONTAMINATION REMAINING ON-SITE.

- -

Notation Type: APPROVAL IN PRINCIPLE REQUESTED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: JUN 26, 1998 Approved: JUN 26, 1998

Ministry Contact: VERGAMINI, DON (PENTICTON)

Notation Participants	Notation Roles
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	REQUESTED BY

Note: APPROVAL IN PRINCIPLE FOR THE REMEDIATION PLAN REQUESTED.

- -

Notation Type: REMEDIAL PLAN SUBMITTED WITHOUT RISK ASSESSMENT: INTERNAL REVIEW REQUESTED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: JUN 26, 1998 Approved: JUN 26, 1998

Ministry Contact: VERGAMINI, DON (PENTICTON)

Notation Participants	Notation Roles
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED	SUBMITTED BY

(VANCOUVER)

Note: TITLE: REMEDIATION PLAN, 8999 JIM BAILEY ROAD, KELOWNA, B.C. PROVIDES AN OVERVIEW OF THE CONTAMINATION CONDITIONS ENCOUNTERED AT THE SITE AND AN UNDERSTANDING OF THE METHODOLOGIES PROPOSED TO ADDRESS THE ANOMALOUS HYDROCARBON CONCENTRATIONS ENCOUNTERED IN SOILS AND GROUNDWATER DURING THE DETAILED SITE INVESTIGATION.

NOTATIONS

Required Actions: THE AREAS REQUIRING REMEDIATION ARE LIMITED TO THE FUEL STORAGE AREAS

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Notation Type: DETAILED SITE INVESTIGATION REPORT: INTERNAL REVIEW REQUESTED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: APR 28, 1998 Approved: APR 28, 1998

Ministry Contact: VERGAMINI, DON (PENTICTON)

Notation Participants	Notation Roles
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	SUBMITTED BY

Note: TITLE: DETAILED SITE INVESTIGATION, 8999 JIM BAILEY ROAD, KELOWNA, B.C.

- -

Notation Type: SITE INVESTIGATION REQUESTED
Notation Class: ADMINISTRATIVE
Initiated: OCT 20, 1997 Approved: OCT 20, 1997

Ministry Contact: JARMAN, PETER

Notation Participants	Notation Roles
HIRAM WALKER & SONS LTD (WINDSOR ONTARIO)	RECEIVED BY
JARMAN, PETER	ISSUED BY

Note: MINISTRY REVEIWED LETTER RE: PRELIMINARY SITE INVESTIGATION FOR 8999 JIM BAILEY ROAD & INTENDS TO REQUIRE OR ORDER A DETAILED SITE INVESTIGATION.

- -

Notation Type: PRELIMINARY SITE INVESTIGATION REPORT: INTERNAL REVIEW REQUESTED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: AUG 12, 1997 Approved: AUG 12, 1997

Ministry Contact: VERGAMINI, DON (PENTICTON)

Notation Participants	Notation Roles
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	SUBMITTED BY

Note: TITLE: PHASE 1 ENVIRONMENTAL SITE ASSESSMENT, 8999 JIM BAILLIE ROAD, KELOWNA, BC.

- -

Notation Type: SITE PROFILE - FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAY 27, 1997 Approved: MAY 27, 1997

Ministry Contact: JARMAN, PETER

Notation Participants Notation Roles

HIRAM WALKER & SONS LTD (WINDSOR ONTARIO) RECEIVED BY
HIRAM WALKER & SONS LTD (WINDSOR ONTARIO) RECEIVED BY

Note: LETTER RE: SITE PROFILE FOR 8999 JIM BAILEY ROAD, WINFIELD, BC.

Required Actions: SUBMIT A PRELIMINARY SITE INVESTIGATION REPORT FOR REVIEW

- -

Notation Type: SITE PROFILE REVIEWED - FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: MAY 27, 1997 Approved: MAY 27, 1997

Ministry Contact: JARMAN, PETER

Notation Participants Notation Roles
HIRAM WALKER & SONS LTD (WINDSOR ONTARIO) RECEIVED BY
HIRAM WALKER & SONS LTD (WINDSOR ONTARIO) RECEIVED BY

Note: LETTER RE: SITE PROFILE FOR 8999 JIM BAILEY ROAD, WINFIELD, BC.

Required Actions: SUBMIT A PRELIMINARY SITE INVESTIGATION REPORT FOR REVIEW

- -

Notation Type: SITE PROFILE RECEIVED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: MAY 26, 1997 Approved:

Ministry Contact: JARMAN, PETER

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Notation Type: SITE PROFILE RECEIVED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: MAY 26, 1997 Approved:

Ministry Contact: JARMAN, PETER

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SITE PARTICIPANTS

Participant: ANDERSON, RICHARD (DICK) G
Role(s): ALTERNATE MINISTRY CONTACT

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   Start Date: MAY 31, 2000                        End Date: OCT 16, 2002
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: BARNARD INVESTMENTS LTD. (VANCOUVER)
      Role(s): DEVELOPER/ASSOCIATED COMPANY
   Start Date: MAR 20, 2003                        End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: BROWN, DAVID F
      Role(s): ALTERNATE MINISTRY CONTACT
   Start Date: MAR 20, 2003                        End Date: MAR 31, 2004
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: COLVEY, DICK
      Role(s): ALTERNATE MINISTRY CONTACT
   Start Date: MAY 30, 2000                        End Date: MAR 29, 2002
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 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: EBA ENGINEERING CONSULTANTS LTD
      Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
   Start Date: JUL 01, 1997                        End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: ECKSTEIN, NORM A.
      Role(s): ALTERNATE MINISTRY CONTACT
   Start Date: MAY 30, 2000                        End Date: JAN 11, 2001
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: GOLDER ASSOCIATES LTD (BURNABY)
      Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
   Start Date: NOV 28, 2000                        End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: GOLDER ASSOCIATES LTD (KELOWNA)
      Role(s): ENVIRONMENTAL CONSULTANT/CONTRACTOR
   Start Date: JAN 13, 2000                        End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: HIRAM WALKER & SONS LTD (WINDSOR ONTARIO)
      Role(s): PROPERTY OWNER
               SITE PROFILE COMPLETOR
               SITE PROFILE CONTACT
   Start Date: MAY 26, 1997                        End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)
      Role(s): DEVELOPER/ASSOCIATED COMPANY
   Start Date: JUL 01, 1997                        End Date:
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: JARMAN, PETER
      Role(s): ALTERNATE MINISTRY CONTACT
   Start Date: MAY 26, 1997                        End Date:
        Notes: ASSISTANT REGIONAL WASTE MANAGER
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Participant: PARTRIDGE, ERIC
      Role(s): ALTERNATE MINISTRY CONTACT
   Start Date: NOV 28, 2000                        End Date:
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Participant: PATRICK, GUY
Role(s): ROSTERED EXPERT UNDER PROTOCOL SIX
Start Date: NOV 28, 2000 End Date:

Participant: VERGAMINI, DON (KAMLOOPS) E
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: NOV 28, 2000 End Date:

Participant: VERGAMINI, DON (PENTICTON)
Role(s): MAIN MINISTRY CONTACT
Start Date: JUL 01, 1997 End Date:
Notes: CONTAMINATED SITES TECHNICIAN

Participant: WARD, JOHN E H
Role(s): ALTERNATE MINISTRY CONTACT

SITE PARTICIPANTS

Start Date: NOV 28, 2000 End Date:

Participant: WESTERN STAR TRUCKS INC. (KELOWNA)
Role(s): POTENTIALLY AFFECTED PARTY
Start Date: NOV 28, 2000 End Date:

DOCUMENTS

Title: BACKGROUND MANGANESE CONCENTRATIONS IN GROUNDWATER
Authored: APR 03, 2003 Submitted: APR 03, 2003

Participants	Role
GOLDER ASSOCIATES LTD (BURNABY)	AUTHOR

Title: MINISTRY LETTER TO GUY PATRICK (ROSTERED EXPERT) REGARDING BACKGROUND MANGANESE CONCENTRATIONS IN GROUNDWATER
Authored: JUL 05, 2001 Submitted: JUL 05, 2001

Participants	Role
ANDERSON, RICHARD (DICK) G	AUTHOR
GOLDER ASSOCIATES LTD (BURNABY)	RECIPIENT
PATRICK, GUY	RECIPIENT

Title: ROSTERED PROFESSIONALS (GUY PATRICK) RECOMMENDATION FOR AN APPROVAL IN PRINCIPLE OR COC
Authored: MAY 28, 2001 Submitted: MAY 28, 2001

Participants	Role
GOLDER ASSOCIATES LTD (BURNABY)	AUTHOR
ANDERSON, RICHARD (DICK) G	RECIPIENT
PATRICK, GUY	ROSTERED EXPERT UNDER PROTOCOL SIX

Title: LETTER: SUMMARY OF BACKGROUND MANGANESE CONCENTRATIONS IN GROUNDWATER, LAKE COUNTRY, BRITISH COLUMBIA

Authored: MAY 03, 2001 Submitted: MAY 03, 2001

Participants	Role
GOLDER ASSOCIATES LTD (KELOWNA)	AUTHOR
ANDERSON, RICHARD (DICK) G	RECIPIENT

Title: SUMMARY OF PRELIMINARY AND DETAILED SITE INVESTIGATIONS, REMEDIATION PROGRAM AND CONFIRMATION OF REMEDIATION

Authored: NOV 28, 2000 Submitted: NOV 28, 2000

Participants	Role
GOLDER ASSOCIATES LTD (BURNABY)	AUTHOR

Title: LETTER: RECOMMENDATION FOR A CERTIFICATE OF COMPLIANCE - PREPARED BY GUY PATRICK (R P EXPERT)

Authored: NOV 28, 2000 Submitted: NOV 28, 2000

Participants	Role
WARD, JOHN E H	RECIPIENT

Title: SUPPLEMENTAL INVESTIGATION TP PREVIOUSLY CONDUCTED DETAILED SITE INVESTIGATION

DOCUMENTS

Authored: MAY 10, 2000 Submitted: JUN 01, 2000

Participants	Role
GOLDER ASSOCIATES LTD (KELOWNA)	AUTHOR

Title: REVIEW OF PHASE 1 ENVIRONMENTAL SITE ASSESMENT AND DETAILED SITE INVESTIGATION

Authored: JAN 13, 2000 Submitted: JUN 01, 2000

Participants	Role
GOLDER ASSOCIATES LTD (KELOWNA)	AUTHOR

Notes: REVIEW OF 1998 INVESTIGATION

Title: REMEDIATION PLAN, 8999 JIM BAILEY ROAD, KELOWNA, B.C.

Authored: JUN 24, 1998 Submitted: JUN 26, 1998

Participants	Role
EBA ENGINEERING CONSULTANTS LTD	AUTHOR
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	COMMISSIONER
VERGAMINI, DON (PENTICTON)	REVIEWER

Notes: AN APPROVAL IN PRINCIPLE WAS REQUESTED FOR THIS REMEDIAL PLAN.

Title: DETAILED SITE INVESTIGATION, 8999 JIM BAILEY ROAD, KELOWNA, B.C.

Authored: MAR 30, 1998 Submitted: APR 28, 1998

Participants	Role
EBA ENGINEERING CONSULTANTS LTD	AUTHOR
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	COMMISSIONER
VERGAMINI, DON (PENTICTON)	REVIEWER

Notes: SUBMITTED IN RESPONSE TO BC ENVIRONMENT'S LETTER DATED OCTOBER 20, 1997 REQUIRING A DETAILED SITE INVESTIGATION.

Site Reg Detail- Site ID 3973 Lat 50d

Title: PHASE 1, ENVIRONMENTAL SITE ASSESSMENT, 8999 JIM BAILLIE ROAD, KELOWNA, BC
Authored: JUL 01, 1997 Submitted: AUG 12, 1997

Participants	Role
EBA ENGINEERING CONSULTANTS LTD	AUTHOR
J.J. BARNICKE VANCOUVER MANAGEMENT LIMITED (VANCOUVER)	COMMISSIONER
VERGAMINI, DON (PENTICTON)	REVIEWER

Notes: PRELIMINARY SITE INVESTIGATION. SUBMITTED PURSUANT TO BC ENVIRONMENT'S LETTER OF MAY 26, 1997.

ASSOCIATED SITES

Site id: 3816 Date: JUN 16, 1997
Notes: COMMON PID

Site id: 6698 Date: NOV 23, 2000
Notes: PRELIMINARY SITE INVESTIGATIONS FOR THE PORTION OF SITE 3973 & SITE 6698 PURCHASED BY WESTERN STAR WERE UNDERTAKEN TOGETHER. THE REPORTS INCLUDE INFORMATION WITH REGARD TO SITE 6698 & SITE 3973. THE REPORTS ARE LOCATED IN SITE FILE 3973.

ASSOCIATED SITES

Site id: 8203 Date: MAR 25, 2003
Notes: SITE 8203 IS ONLY A PORTION OF THE FORMER DISTILLERY PROPERTY.

SUSPECTED LAND USE

Description: INDUSTRIAL WASTE LAGOONS OR IMPOUNDMENTS
Notes: SIX PERCOLATION BASINS USED FOR DISPOSAL OF INDUSTRIAL COOLING WATERS(described on Site Profile dated 97-05-14)

Description: MISCELLANEOUS INDUSTRIES, OPERATIONS OR ACTIVITIES
Notes: FORMER DISTILLERY

Description: PETRO/NATURAL GAS/PRODUCE WATER STRG ABVEGRND/UNDERGRND TANK
Notes: 3 UNDERGROUND TANKS (DIESEL/GASOLINE); 5 ABOVE GROUND TANKS (FUEL OIL/GASOLINE/DIESEL)

Description: SEWAGE LAGOONS OR IMPOUNDMENTS
Notes: INSERTED FOR SITE PROFILE DATED 97-05-14(described on Site Profile dated 97-05-14)

Description: SLUDGE DRYING OR COMPOSTING
Notes: INSERTED FOR SITE PROFILE DATED 97-05-14(described on Site Profile dated 97-05-14)

Description: TRUCK, RAIL OR MARINE BULK FREIGHT HANDLING

Notes: INSERTED FOR SITE PROFILE DATED 97-05-14(described on Site Profile dated 97-05-14)

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PARCEL DESCRIPTIONS

Date Added: MAY 14, 1997 Crown Land PIN#:
LTO PID#: 002183951 Crown Land File#:
Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 19099 EXCEPT PLANS KAP55339 AND KAP59703

- -

Date Added: MAY 28, 1997 Crown Land PIN#:
LTO PID#: 023150823 Crown Land File#:
Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP55339 EXCEPT PLAN KAP59704

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023838809 Crown Land File#:
Land Desc:

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839139 Crown Land File#:
Land Desc:

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839147 Crown Land File#:

PARCEL DESCRIPTIONS

Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839155 Crown Land File#:
Land Desc: LOT B SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839163 Crown Land File#:
Land Desc: LOT C SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839171 Crown Land File#:
Land Desc: LOT D SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

- -

Date Added: AUG 21, 1997 Crown Land PIN#:
LTO PID#: 023839180 Crown Land File#:
Land Desc: LOT E SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP59703

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                     Site Reg Detail- Site ID 3973 Lat 50d
 Date Added: JAN 15, 2000                     Crown Land PIN#:
   LTO PID#: 024666891                       Crown Land File#:
  Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP65805
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: JAN 15, 2000                     Crown Land PIN#:
   LTO PID#: 024666904                       Crown Land File#:
  Land Desc: LOT 2 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP65805
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: JAN 15, 2000                     Crown Land PIN#:
   LTO PID#: 024666912                       Crown Land File#:
  Land Desc: LOT 3 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP65805
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: JAN 15, 2000                     Crown Land PIN#:
   LTO PID#: 024666921                       Crown Land File#:
  Land Desc: LOT 4 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP65805
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: JAN 15, 2000                     Crown Land PIN#:
   LTO PID#: 024666939                       Crown Land File#:
  Land Desc: LOT 5 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP65805
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: JAN 15, 2000                     Crown Land PIN#:
   LTO PID#: 024666947                       Crown Land File#:
  Land Desc: LOT 6 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
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             KAP65805
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: JAN 15, 2000                     Crown Land PIN#:
   LTO PID#: 024666955                       Crown Land File#:
  Land Desc: LOT 7 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP65805
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: JAN 15, 2000                     Crown Land PIN#:
   LTO PID#: 024666963                       Crown Land File#:
  Land Desc: LOT 8 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP65805
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: MAY 20, 2000                     Crown Land PIN#:
   LTO PID#: 024779768                       Crown Land File#:
  Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP66761     EXCEPT PLAN KAP71932
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: MAY 20, 2000                     Crown Land PIN#:
   LTO PID#: 024779776                       Crown Land File#:
  Land Desc: LOT B SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
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            KAP66761
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 25, 2000                  Crown Land PIN#:
   LTO PID#: 024900940                    Crown Land File#:
  Land Desc: STRATA LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE
             DISTRICT            STRATA PLAN KAS2285 TOGETHER WITH AN
             INTEREST IN THE COMMON PROPERTY IN      PROPORTION TO THE UNIT
             ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 25, 2000                  Crown Land PIN#:
   LTO PID#: 024900966                    Crown Land File#:
  Land Desc: STRATA LOT 2 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE
             DISTRICT            STRATA PLAN KAS2285 TOGETHER WITH AN
             INTEREST IN THE COMMON PROPERTY IN      PROPORTION TO THE UNIT
             ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 25, 2000                  Crown Land PIN#:
   LTO PID#: 024900974                    Crown Land File#:
  Land Desc: STRATA LOT 3 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE
             DISTRICT            STRATA PLAN KAS2285 TOGETHER WITH AN
             INTEREST IN THE COMMON PROPERTY IN      PROPORTION TO THE UNIT
             ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 25, 2000                  Crown Land PIN#:
   LTO PID#: 024900982                    Crown Land File#:
  Land Desc: STRATA LOT 4 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE
             DISTRICT            STRATA PLAN KAS2285 TOGETHER WITH AN
             INTEREST IN THE COMMON PROPERTY IN      PROPORTION TO THE UNIT
             ENTITLEMENT OF THE STRATA LOT AS SHOWN ON FORM V
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: OCT 05, 2002                  Crown Land PIN#:
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PARCEL DESCRIPTIONS

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   LTO PID#: 025493345                    Crown Land File#:
  Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP71932
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493896                    Crown Land File#:
  Land Desc: LOT 1 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493900                    Crown Land File#:
  Land Desc: LOT 2 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
             KAP79495
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 Date Added: NOV 26, 2005                  Crown Land PIN#:
   LTO PID#: 026493918                    Crown Land File#:
  Land Desc: LOT 3 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN
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KAP79495

Date Added: NOV 26, 2005 Crown Land PIN#:
LTO PID#: 026493926 Crown Land File#:
Land Desc: LOT 4 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

Date Added: NOV 26, 2005 Crown Land PIN#:
LTO PID#: 026493934 Crown Land File#:
Land Desc: LOT 5 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

Date Added: NOV 26, 2005 Crown Land PIN#:
LTO PID#: 026493942 Crown Land File#:
Land Desc: LOT 6 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

Date Added: NOV 26, 2005 Crown Land PIN#:
LTO PID#: 026493951 Crown Land File#:
Land Desc: LOT 7 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

Date Added: NOV 26, 2005 Crown Land PIN#:
LTO PID#: 026493969 Crown Land File#:
Land Desc: LOT 8 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

Date Added: NOV 26, 2005 Crown Land PIN#:
LTO PID#: 026493977 Crown Land File#:
Land Desc: LOT 9 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

Date Added: NOV 26, 2005 Crown Land PIN#:
LTO PID#: 026493985 Crown Land File#:

PARCEL DESCRIPTIONS

Land Desc: LOT 10 SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79495

Date Added: DEC 03, 2005 Crown Land PIN#:
LTO PID#: 026494736 Crown Land File#:
Land Desc: LOT A SECTION 2 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP79497

CURRENT SITE PROFILE INFORMATION (Sec. III to X)

Site Profile Completion Date: MAY 14, 1997

Local Authority Received: MAY 23, 1997

Ministry Regional Manager Received: MAY 26, 1997 Decision: MAY 26, 1997

Site Reg Detail- Site ID 3973 Lat 50d

Decision: INVESTIGATION REQUIRED

Site Registrar Received: Entry Date:

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE
Schedule 2

Reference	Description
G7	TRUCK, RAIL OR MARINE BULK FREIGHT HANDLING
H11	INDUSTRIAL WASTE LAGOONS OR IMPOUNDMENTS
H19	SEWAGE LAGOONS OR IMPOUNDMENTS
H21	SLUDGE DRYING OR COMPOSTING

AREAS OF POTENTIAL CONCERN

Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?.....NO

Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?.....NO

Discarded barrels, drums or tanks?.....NO

FILL MATERIALS

Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activiities listed under Schedule 2?.....NO

Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?.....NO

Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?.....NO

WASTE DISPOSAL

Materials such as household garbage, mixed municipal refuse, or demolition debris?.....NO

Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?.....YES

Waste products from smelting or mining activities, such as smelter slag,

mine tailings, or cull materials from coal processing?.....NO

Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO

Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); or automobile and truck parts cleaning or repair?.....NO

TANKS OR CONTAINERS USED OR STORED

Underground fuel or chemical storage tanks?.....YES

Above ground fuel or chemical storage tanks?.....YES

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES

PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....YES

Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....YES

Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...YES

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS

Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO

Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO

Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....YES

X ADDITIONAL COMMENTS AND EXPLANATIONS

POLLUTION CONTROL PERMIT NO. PE-267 - DISCHARGE OF EFFLUENT TO LAND POLLUTION CONTROL PERMIT NO. PE-268 - DISCHARGE OF EFFLUENT TO VERNON CREEK WASTE MANAGEMENT PERMIT NO. PA-01465 - DISCHARGE OF CONTAMINANTS TO THE ATMOSPHERE CONDITIONAL WATER LISCENCE NO. 34767 - DIVERSION AND USE OF WATER FROM OKANAGAN LAKE - TRANSFERRED TO WINFIELD AND OKANAGAN CENTRE IRRIGATION DISTRICT

End of Detail Report

```
 As of: APR 20, 2008       BC Online: Site Registry                   08-04-21
                     For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:11:12
 Folio:                                                               Page   1
                                   Detail Report
SITE LOCATION
       Site ID:      4013                           Latitude:  50d 01m 17.4s
 Victoria File:                                    Longitude: 119d 23m 58.1s
 Regional File: 26100-20/4013
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: 9618 BOTTOM WOOD LAKE ROAD
         City: WINFIELD                     Prov/State: BC
  Postal Code: 4V4 1S7

 Registered: NOV 14, 1997  Updated: OCT 10, 2003  Detail Removed: OCT 10, 2003

 Notations:   5   Participants:   4    Associated Sites:   0
 Documents:   0 Susp. Land Use:   2 Parcel Descriptions:   1

Location Description: LONG/LAT DERIVED BY BC ENVRIRONMENT USING DIFFERENTIAL
 GPS.

Record Status: INACTIVE - NO FURTHER ACTION
 Fee category: NOT APPLICABLE

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NOTATIONS

  Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE
                 MINISTRY
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
      Initiated: JUN 09, 1997                       Approved:

 Ministry Contact: VERGAMINI, DON (PENTICTON)

 Notation Participants                              Notation Roles
 KUIPER, RUDY W                                     RECEIVED BY
 KUIPER, RUDY W                                     RECEIVED BY
 JARMAN, PETER                                      ISSUED BY
 JARMAN, PETER                                      ISSUED BY

 Note: MANAGER DOES NOT REQUIRE A PRELIMINARY OR DETAILED SITE INVESTIGATION
 FOR THIS PROPERTY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: CASE MANAGEMENT ITEM
 Notation Class: ADMINISTRATIVE
      Initiated: JUN 09, 1997                       Approved: JUN 09, 1997

 Ministry Contact: VERGAMINI, DON (PENTICTON)

 Notation Participants                              Notation Roles
 AGRITEC (WINFIELD)                                 SUBMITTED BY
 VERGAMINI, DON (PENTICTON)                         RECEIVED BY

 Note: MATERIAL SAFETY DATA SHEETS FOR THE FERTILIZERS STORED IN THE TANKS
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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NOTATIONS

Notation Type: SITE PROFILE REVIEWED - NO FURTHER INVESTIGATION REQUIRED BY THE MINISTRY
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: JUN 09, 1997 Approved:

Ministry Contact: VERGAMINI, DON (PENTICTON)

Notation Participants	Notation Roles
KUIPER, RUDY W	RECEIVED BY
KUIPER, RUDY W	RECEIVED BY
JARMAN, PETER	ISSUED BY
JARMAN, PETER	ISSUED BY

Note: MANAGER DOES NOT REQUIRE A PRELIMINARY OR DETAILED SITE INVESTIGATION FOR THIS PROPERTY

- -

Notation Type: SITE PROFILE RECEIVED
Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
Initiated: JUN 03, 1997 Approved:

Ministry Contact: JARMAN, PETER

- -

Notation Type: SITE PROFILE RECEIVED
Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
Initiated: JUN 03, 1997 Approved:

Ministry Contact: JARMAN, PETER

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SITE PARTICIPANTS

Participant: AGRITEC (WINFIELD)
Role(s): LEASEE/RENTER/TENANT
Start Date: JUN 09, 1997 End Date:

- -

Participant: JARMAN, PETER
Role(s): ALTERNATE MINISTRY CONTACT
Start Date: JUN 03, 1997 End Date:

- -

Participant: KUIPER, RUDY W
Role(s): PROPERTY OWNER
SITE PROFILE COMPLETOR
SITE PROFILE CONTACT
Start Date: JUN 03, 1997 End Date:

- -

Participant: VERGAMINI, DON (PENTICTON)
Role(s): MAIN MINISTRY CONTACT
Start Date: JUN 09, 1997 End Date:

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SUSPECTED LAND USE

Site Reg Detail- Site ID 4013 Lat 50d
Description: FERTILIZER MANUFACTURING OR WHOLESALE BULK STORAGE

SUSPECTED LAND USE

Notes: STORAGE OF FERTILIZER IN ABOVE GROUND STORAGE TANKS WITH CONTAINMENT

- -

Description: WELDING OR MACHINE SHOPS (REPAIR OR FABRICATION)
Notes: INSERTED FOR SITE PROFILE DATED 97-05-20(described on Site Profile dated 97-05-20)

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PARCEL DESCRIPTIONS

Date Added: OCT 31, 1997 Crown Land PIN#:
LTO PID#: 010619275 Crown Land File#:
Land Desc: LOT 2 DISTRICT LOT 118 OSOYOOS DIVISION YALE DISTRICT PLAN 39500

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CURRENT SITE PROFILE INFORMATION (Sec. III to X)
Site Profile Completion Date: MAY 20, 1997

Local Authority Received:

Ministry Regional Manager Received: JUN 03, 1997 Decision: JUN 09, 1997
Decision: INVESTIGATION NOT REQUIRED

Site Registrar Received: Entry Date:

III COMMERCIAL AND INDUSTRIAL PURPOSES OR ACTIVITIES ON SITE

Schedule 2 Reference	Description
C6	WELDING OR MACHINE SHOPS (REPAIR OR FABRICATION)

AREAS OF POTENTIAL CONCERN
Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?..NO
Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?............NO
Discarded barrels, drums or tanks?...NO

FILL MATERIALS
Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activiities listed under Schedule 2?...NO
Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?...NO
Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?....................................NO

WASTE DISPOSAL

Materials such as household garbage, mixed municipal refuse, or demolition debris?.....NO
Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater

treatment?.....NO
Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.....NO
Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?.....NO
Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); or automobile and truck parts cleaning or repair?.....NO

TANKS OR CONTAINERS USED OR STORED
Underground fuel or chemical storage tanks?.....NO
Above ground fuel or chemical storage tanks?.....YES

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES
PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO
Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO
Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS
Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO
Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO
Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS

End of Detail Report

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 As of: APR 20, 2008       BC Online: Site Registry                     08-04-21
                     For: PC12108  KALA GROUNDWATER CONSULTING LTD.   09:11:36
 Folio:                                                                Page   1
                                Detail Report
SITE LOCATION
       Site ID:       5735                         Latitude:  50d 01m 11.6s
 Victoria File: 26250-20/5735                     Longitude: 119d 23m 31.7s
 Regional File: 26250-20/5735
        Region: PENTICTON, SOUTHERN INTERIOR

 Site Address: 400 BEAVER LAKE ROAD
         City: KELOWNA                        Prov/State: BC
  Postal Code: V4V 1S5

 Registered: MAR 11, 1999  Updated: APR 30, 1999  Detail Removed: APR 22, 1999

 Notations:   4   Participants:   2    Associated Sites:   0
 Documents:   0 Susp. Land Use:   0 Parcel Descriptions:   6

Location Description: LAT/LONG DERIVED BY BC ENVIRONMENT REFERENCING DIGITAL
 TRIM MAP COVERAGES, NAD83 - 1:20000 SCALE.

Record Status: INACTIVE - NO FURTHER ACTION
 Fee category: NOT APPLICABLE

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NOTATIONS

  Notation Type: SITE PROFILE REVIEWED - NO FURTHER INVESTIGATION REQUIRED BY
                THE MINISTRY
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: MAR 03, 1999                        Approved:

 Ministry Contact: WARD, JOHN E H
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE - NO FURTHER INVESTIGATION REQUIRED BY THE
                MINISTRY
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
      Initiated: MAR 03, 1999                        Approved:

 Ministry Contact: WARD, JOHN E H
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE RECEIVED
 Notation Class: ENVIRONMENTAL MANAGEMENT ACT: GENERAL
      Initiated: FEB 03, 1999                        Approved:

 Ministry Contact: WARD, JOHN E H

 Notation Participants                               Notation Roles
 RIVERSIDE FOREST PRODUCTS LTD. (KELOWNA, B.C.)      SITE PROFILE SUBMITTED
                                                     BY
 RIVERSIDE FOREST PRODUCTS LTD. (KELOWNA, B.C.)      SITE PROFILE SUBMITTED
                                                     BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
  Notation Type: SITE PROFILE RECEIVED
 Notation Class: WASTE MANAGEMENT ACT: CONTAMINATED SITES NOTATIONS
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NOTATIONS

Initiated: FEB 03, 1999 Approved:

Ministry Contact: WARD, JOHN E H

Notation Participants	Notation Roles
RIVERSIDE FOREST PRODUCTS LTD. (KELOWNA, B.C.)	SITE PROFILE SUBMITTED BY
RIVERSIDE FOREST PRODUCTS LTD. (KELOWNA, B.C.)	SITE PROFILE SUBMITTED BY

= =

SITE PARTICIPANTS

Participant: RIVERSIDE FOREST PRODUCTS LTD. (KELOWNA, B.C.)
Role(s): PROPERTY OWNER
SITE PROFILE COMPLETOR
SITE PROFILE CONTACT
Start Date: FEB 03, 1999 End Date:

- -

Participant: WARD, JOHN E H
Role(s): MAIN MINISTRY CONTACT
Start Date: FEB 03, 1999 End Date:

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PARCEL DESCRIPTIONS

Date Added: JAN 22, 1999 Crown Land PIN#:
LTO PID#: 003785297 Crown Land File#:
Land Desc: LOT 12 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 6040

- -

Date Added: JAN 22, 1999 Crown Land PIN#:
LTO PID#: 003785319 Crown Land File#:
Land Desc: LOT 13 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 6040

- -

Date Added: JAN 22, 1999 Crown Land PIN#:
LTO PID#: 003785335 Crown Land File#:
Land Desc: LOT 14 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 6040

- -

Date Added: JAN 22, 1999 Crown Land PIN#:
LTO PID#: 010233571 Crown Land File#:
Land Desc: LOT 5 SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN 6040

- -

Date Added: MAR 06, 1999 Crown Land PIN#:
LTO PID#: 024384488 Crown Land File#:
Land Desc: LOT A SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT PLAN KAP63756

- -

Date Added: MAR 06, 1999 Crown Land PIN#:

PARCEL DESCRIPTIONS

Land Desc: LOT B SECTION 11 TOWNSHIP 20 OSOYOOS DIVISION YALE DISTRICT
PLAN KAP63756

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CURRENT SITE PROFILE INFORMATION (Sec. III to X)
Site Profile Completion Date: JAN 22, 1999

Local Authority Received: JAN 26, 1999

Ministry Regional Manager Received: FEB 03, 1999 Decision: MAR 03, 1999
Decision: INVESTIGATION NOT REQUIRED

Site Registrar Received: FEB 03, 1999 Entry Date: MAR 03, 1999

AREAS OF POTENTIAL CONCERN
Petroleum, solvent or other polluting substance spills to the environment greater than 100 litres?..NO
Residue left after removal of piled materials such as chemicals, coal, ore, smelter slag, air quality control system baghouse dust?............NO
Discarded barrels, drums or tanks?...NO

FILL MATERIALS
Fill dirt, soil, gravel, sand or like materials from a contaminated site or from a source used for any of the activiities listed under Schedule 2?..NO
Discarded or waste granular materials such as sand blasting grit, asphalt paving or roofing material, spent foundry casting sands, mine ore, waste rock or float?..NO
Dredged sediments, or sediments and debris materials originating from locations adjacent to foreshore industrial activities, or municipal sanitary or stormwater discharges?.....................................NO

WASTE DISPOSAL
Materials such as household garbage, mixed municipal refuse, or demolition debris?...NO
Waste or byproducts such as tank bottoms, residues, sludge, or flocculation precipitates from industrial processes or wastewater treatment?...NO
Waste products from smelting or mining activities, such as smelter slag, mine tailings, or cull materials from coal processing?.................NO
Waste products from natural gas and oil well drilling activities, such as drilling fluids and muds?..NO
Waste products from photographic developing or finishing laboratories; asphalt tar manufacturing; boilers, incinerators or other thermal facilities (eg. ash); appliance, small equipment or engine repair or salvage; dry cleaning operations (eg. solvents); or automobile and truck parts cleaning or repair?...NO

TANKS OR CONTAINERS USED OR STORED
Underground fuel or chemical storage tanks?.....NO
Above ground fuel or chemical storage tanks?.....NO

SPECIAL (HAZARDOUS) WASTES OR SUBSTANCES
PCB-containing electrical transformers or capacitors either at grade, attached above ground to poles, located within buildings, or stored?....NO
Waste asbestos or asbestos containing materials such as pipe wrapping, blown-in insulation or panelling buried?.....NO
Paints, solvents, mineral spirits or waste pest control products or pest control product containers stored in volumes greater than 205 litres?...NO

LEGAL OR REGULATORY ACTIONS OR CONSTRAINTS
Government orders or other notifications pertaining to environmental conditions or quality of soil, water, groundwater or other environmental media?.....NO
Liens to recover costs, restrictive covenants on land use, or other charges or encumbrances, stemming from contaminants or wastes remaining onsite or from other environmental conditions?.....NO
Government notifications relating to past or recurring environmental violations at the site or any facility located on the site?.....NO

X ADDITIONAL COMMENTS AND EXPLANATIONS

End of Detail Report

APPENDIX G - GARP SCREENING AND ASSESSMENT

Well ID: WIN 83230 (North Well)

HAZARDS	SCREENING		ASSESSMENT		NOTES
Water Supply System Well	NOT PRESENT	PRESENT (complete Assessment)	AT RISK (Water source potentially GARP)	AT LOW RISK	
A. Water Quality Results					
A1: Exhibits recurring presence of total coliform bacteria, fecal coliform bacteria, or *Escherichia coli (E. coli).*	☑	☐	☐	☑	No E. Coli or Total Coliforms detected.
A2: Has reported intermittent turbidity or has a history of consistent turbidity greater than 1 NTU.	☑	☐	☐	☐	Average daily turbdity data from North and South Well (January - April 2021) has no turbidity greater than 1 NTU.
B. Well Location					
B1: Situated inside setback distances from possible sources of contamination as per section 8 of the HHR[1]	☑	☐	☐	☑	
B2: Has an intake depth <15 m below ground surface that is located within a natural boundary of surface water or a flood prone area.	☑	☐	☐	☑	Top of screen is 19.81 m below ground
B3: Has an intake depth between the high-water mark and surface water bottom (or <15 m below the normal water level if surface water depth is unknown), and located within, or less than 150 m from the natural boundary of any surface water.	☑	☐	☐	☑	Located 35 m south from a small water body (445 m^2). Intake depth is > 15 m.
B4: Located within 300 m of a source of probable enteric viral contamination without a barrier to viral transport.	☐	☑	☑	☐	Located 35 m south of livestock watering pond and 15 m south of high-pressure sewer main. There is clay (some interbedded gravel) from 8.84 to 18.90 m that is likely acting as a barrier, but the thickness of the confining unit is variable and not know in the vicinity of these sources.
C. Well Construction					
C1: Does not meet GWPR[2] (section 7) for surface sealing.	☐	☑	☐	☑	Mud seal indicated in well log, but thickness and depth is unknown.
C2: Does not meet GWPR (section 10) for well caps and covers.	☑	☐	☐	☑	Has well fitted cap

1. HHR - Health Hazard Regulation
2. GWPR - Groundwater Protection Regulation
3. Reworded from original version to provide clarity.

Well ID: WIN 83230 (North Well)

HAZARDS	SCREENING		ASSESSMENT		NOTES
Water Supply System Well	NOT PRESENT	PRESENT (complete Assessment)	AT RISK (Water source potentially GARP)	AT LOW RISK	
C3: Does not meet GWPR (section 11) for floodproofing.	☑	☐	☐	☑	Well stick up and sloped ground
C4: Does not meet GWPR (section 12) for wellhead protection.	☑	☐	☐	☑	
D. Aquifer Type and Setting					
D1: Has an intake depth <15 m below ground surface	☑	☐	☐	☑	
D2: Is situated in an [unconfined, unconsolidated, or fractured bedrock aquifer that is highly vulnerable]. [3]	☑	☐	☐	☑	Aquifer 344 - Confined sand and gravel
D3: Is completed in a karst bedrock aquifer, regardless of depth.	☑	☐	☐	☑	

Stage 2: GARP Determination

☐ At Risk (GARP) ☑ At Risk (GARP-viruses only) ☐ At Low Risk

Stage 3: Risk Mitigation

Recommended Options:
☐ Treatment to meet provincial drinking water objectives
☑ Treatment to meet only the provincial drinking water objectives for viruses
☐ Provide alternate source of water
☐ Well Alteration / correct significant deficiencies in well construction
☐ Relocate the well
☐ Eliminate source(s) of contamination
☐ Stage 2 or 3 investigation
☑ Move to Stage 4: Long-term Monitoring
☐ Other: some recommendations for completing wellhead area during construction are provided in report.

Comments: Continue monitoring for *E. Coli,* total coliforms, and turbidity. Conduct monthly aerobic spore forming bacteria samples of the northern pond and the North Well for one year and then reassess the need to continue sampling.

1. HHR - Health Hazard Regulation
2. GWPR - Groundwater Protection Regulation
3. Reworded from original version to provide clarity.

Well ID: WIN 83017 (South Well)

HAZARDS	SCREENING		ASSESSMENT		NOTES
Water Supply System Well	NOT PRESENT	PRESENT (complete Assessment)	AT RISK (Water source potentially GARP)	AT LOW RISK	
A. Water Quality Results					
A1: Exhibits recurring presence of total coliform bacteria, fecal coliform bacteria, or *Escherichia coli (E. coli).*	☑	☐	☐	☑	No E. Coli or Total Coliforms detected.
A2: Has reported intermittent turbidity or has a history of consistent turbidity greater than 1 NTU.	☑	☐	☐	☑	Average daily turbdity data from North and South Well (January - May 2021) has no turbidity greater than 1 NTU.
B. Well Location					
B1: Situated inside setback distances from possible sources of contamination as per section 8 of the HHR[1]	☑	☐	☐	☑	
B2: Has an intake depth <15 m below ground surface that is located within a natural boundary of surface water or a flood prone area.	☑	☐	☐	☑	Top of screen is 20.93 m below ground
B3: Has an intake depth between the high-water mark and surface water bottom (or <15 m below the normal water level if surface water depth is unknown), and located within, or less than 150 m from the natural boundary of any surface water.	☑	☐	☐	☑	Located 60 m south from a small water body (445 m^2). Intake depth is > 15 m.
B4: Located within 300 m of a source of probable enteric viral contamination without a barrier to viral transport.	☐	☑	☑	☐	Located 60 m south of a small water body and 40 m south of high-pressure sewer main. There is silty clay from 0-4.57 m and firm clay from 13.11-16.15 m acting as potential barriers, but the thickness is variable at the Property.
C. Well Construction					
C1: Does not meet GWPR[2] (section 7) for surface sealing.	☑	☐	☐	☑	Bentonite seal reported in well log
C2: Does not meet GWPR (section 10) for well caps and covers.	☑	☐	☐	☑	Has well fitted cap
C3: Does not meet GWPR (section 11) for floodproofing.	☑	☐	☐	☑	Well stick up and sloped ground

1. HHR - Health Hazard Regulation
2. GWPR - Groundwater Protection Regulation
3. Reworded from original version to provide clarity.

Well ID: WIN 83017 (South Well)

HAZARDS	SCREENING		ASSESSMENT		NOTES
Water Supply System Well	NOT PRESENT	PRESENT (complete Assessment)	AT RISK (Water source potentially GARP)	AT LOW RISK	
C4: Does not meet GWPR (section 12) for wellhead protection.	☑	☐	☐	☑	
D. Aquifer Type and Setting					
D1: Has an intake depth <15 m below ground surface	☑	☐	☐	☑	
D2: Is situated in an [unconfined, unconsolidated, or fractured bedrock aquifer that is highly vulnerable]. [3]	☑	☐	☐	☑	Aquifer 344 - Confined sand and gravel
D3: Is completed in a karst bedrock aquifer, regardless of depth.	☑	☐	☐	☑	

Stage 2: GARP Determination

☐ At Risk (GARP) ☑ At Risk (GARP-viruses only) ☐ At Low Risk

Stage 3: Risk Mitigation

Recommended Options:
☐ Treatment to meet provincial drinking water objectives
☑ Treatment to meet only the provincial drinking water objectives for viruses
☐ Provide alternate source of water
☐ Well Alteration / correct significant deficiencies in well construction
☐ Relocate the well
☐ Eliminate source(s) of contamination
☐ Stage 2 or 3 investigation
☑ Move to Stage 4: Long-term Monitoring
☐ Other: some recommendations for completing wellhead area during construction are provided in report.

Comments: Continue monitoring for *E. Coli*, total coliforms, and turbidity

1. HHR - Health Hazard Regulation
2. GWPR - Groundwater Protection Regulation
3. Reworded from original version to provide clarity.