

# Ministry of Forests, Lands, Natural Resource Operations and Rural Development Water Licensing

## WATER LICENCE TECHNICAL REPORT

<b>Created Date:</b> Jan 04, 2019		<b>Due Date:</b> May 24, 2019	
<b>Job #:</b> 108994	<b>vFCBC Tracking #:</b> 100191898	Michaelsen, Sophie FLNR:EX (NEL-WS)	

## EXECUTIVE SUMMARY

### 1. SUMMARY REMARKS

The Doukhobor Heritage Retreat Society #1999 submitted an application for an existing use ground water licence, to divert and use 550m<sup>3</sup>/day for the purpose of waterworks for the retreat. The quantity in the application was based on the pumping capacity of the wells. The quantity recommended to be granted is 106 meters cubed per day or 38,690 meters cubed per year based on similar requirements for camps. The works are fully constructed and include three wells with the construction date of November 23, 2005, Well 4, November 28, 2005, Well 5 and June 12, 2013, Well 6.

The groundwater is diverted from an unmapped aquifer named Burton City Unconsolidated which appears to be a unconfined sand and gravel aquifer.

Based on the results from pumping tests on well 6 the potential for well interference is low. The nearest well is well 4 and it is located at a downslope gradient 90m away.

The three wells are likely hydraulically connected to Whatshan Lake, Whatshan River and Barnes creek.

The date of first use is based on the detailed well record for well 3.

The application was submitted for to First Nations Relations and submitted for consultation on May 14, 2019. The consultation was closed on Aug 16 2019 and no accommodations were requested. Consultation pursued with these First Nations can be considered sufficient as no site specific or other concerns were raised by the First Nations. As such, the proposed decision is not expected to result in new adverse impacts to First Nations rights and/or title.

### 2. APPLICATION INFORMATION

<b>FILE NO:</b>	20008994	<b>WATER DISTRICT:</b>	Nelson	<b>PRECINCT:</b>	18A - Nelson / Burton City
<b>CLIENT CONTACT:</b>	Doukhobor Cultural Heritage Retreat Society # 1999	<b>REGION:</b>	4 - Kootenay	<b>PCL REQUIRED:</b>	N
<b>CLIENT:</b>	Doukhobor Cultural Heritage Retreat Society # 1999 (49024)	<b>WATER USE PURPOSE &amp; QUANTITY</b>	00B - Waterworks (other than LP) 106m <sup>3</sup> /day	<b>AQUIFER(s): STREAM(s):</b>	Burton City Unconsolidated, Burton City Unconsolidated, Burton City Unconsolidated
<b>PRIORITY DATE:</b>	Nov 23, 2005	<b>CONNECTED</b>	Y	<b>CONNECTED WATER SOURCE(s):</b>	Burton City Unconsolidated, Burton City Unconsolidated, Burton City Unconsolidated
<b>AMENDMENT TYPE:</b>	N/A	<b>AMENDMENT SUBTYPE:</b>	N/A	<b>CURRENT (ORIGINAL)</b>	N/A

				LICENCE DETAILS	
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Related Licences

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### 3. RECOMMENDATIONS

Grant

Prepared by:



**Date:** February 28, 2020

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Michaelsen, Sophie FLNR:EX (NEL-WS)  
Water Officer

## A. BASIC APPLICANT INFORMATION

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**Applicant Name:** Doukhobor Cultural Heritage Retreat Society # 1999 (49024)

**Client Name (if different from applicant):**

**Home Phone:**

**Work Phone:** s.22

**Fax:**

**Other Phone:**

**Email Address:**

**Certificate(s) of Title No.:** CA2954639

**File No.:** 20008994

**Region:** 4 - Kootenay

**District:** Nelson

**Precinct:** 18A - Nelson / Burton City

**Quick Amendment:** No

**Transitioning Groundwater Use:** Yes

**Priority Date:** Nov 23, 2005

**Rationale for Priority Date (transitional licence only):**

### Application Details:

**Works:** well, well, well

**Status of Works:** Fully Constructed, Fully Constructed, Fully Constructed

**Purpose Use:** Waterworks (other than LP) WWK - Waterworks (Water Supply)

**Quantity Units:** 106 m3/day

<b>Aquifer Watershed Code/Name:</b> <b>Stream Watershed Code/Name:</b>	Columbia River	<b>PID:</b>	005-517-966	<b>Appurtenant Land - Legal Description:</b>	District Lot 8186 Kootenay District, Except Parcel A (Explanatory Plan 858961)
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<b>POD**:</b> <b>Mapsheet code:</b>	PW197885 82.E.100.1.2	<b>Well ID Plate:</b> 11278 <b>Well Tag Number:</b> 85994 <b>Status of Well:</b> Fully Constructed	<b>Source:</b> <b>Point of Re-Diversion:</b>	Burton City Unconsolidated N
<b>POD**:</b> <b>Mapsheet code:</b>	PW197886 82.E.100.1.2	<b>Well ID Plate:</b> 11279 <b>Well Tag Number:</b> 85904 <b>Status of Well:</b> Fully Constructed	<b>Source:</b> <b>Point of Re-Diversion:</b>	Burton City Unconsolidated N
<b>POD**:</b> <b>Mapsheet code:</b>	PW197887 82.E.100.1.2	<b>Well ID Plate:</b> 36029 <b>Well Tag Number:</b> 117687 <b>Status of Well:</b> Fully Constructed	<b>Source:</b> <b>Point of Re-Diversion:</b>	Burton City Unconsolidated N

\*\* PD (surface diversion), PW (well diversion), PG (groundwater diversion other than from a well)

## B. ADMINISTRATIVE DETAILS

### N/A ☐ 1. General Comments

This is an exiting use groundwater application for Doukhobor Heritage Retreat Society #1999 otherwise known as Whatshan Retreat. The Doukhobor Heritage Retreat Society originally drilled three bedrock wells that have poor yields ranging from 11-54 m<sup>3</sup>/day. In 2005 the Doukhobor Heritage Retreat Society hired Summit Environmental Consultants to investigate groundwater supply options for the retreat because the existing wells could not produce enough water especially in times of high occupancy. Summit environmental estimated that the Doukhobor Heritage Retreat Society would require approximately 218 m<sup>3</sup>/day to provide for current and future needs. The Summit Environmental report recommended that the retreat drill two more wells into the glacial aquifer or one well into the alluvial (glacial outwash) aquifer. In 2005 the Doukhobor Heritage Retreat Society drilled 2 wells in the alluvial (glacial outwash) aquifer. In 2013 the Doukhobor Heritage Retreat Society choose to dig another well in order to secure its groundwater supplies into the future (Western Water Associates 2013).

### N/A ☐ 2. Transitioning Groundwater Use Priority Date Rationale

The applicant provided a well construction completion certificate and detailed well record dated November 28, 2005 which meets the requirement of a well report (WSA sec 57) and can be considered evidence – date of first use (WSA sec 15 (2) (a)). In 2013 the Doukhobor Heritage Retreat Society drilled a third well to ensure they had an adequate water supply into the future. The retreats water consumption did not necessarily increase when the third well was dug that is why the priority date is November 28, 2005.

### N/A ☐ 3. Source(s) and Point(s) of Diversion Co<sup>m</sup>ments

Groundwater is sourced from an unmapped aquifer named Burton City Unconsolidated.

Point of well diversion (POD): PW197885, PW197886, and PW197887.

Location of PODs: the land is owned by the Doukhobor Heritage Retreat Society #1999, the PID is 005-517-966

The lithology from well drilling reports indicates that the aquifer is an unconfined sand and gravel aquifer. The vulnerability and productivity rating are unknown but the 2013 pumping test recommended an operating rate of no more than 1.9L/sec. well recharge is assumed to be primarily from Whatshan Lake.

Burton City Unconsolidated	PW197885
Burton City Unconsolidated	PW197886
Burton City Unconsolidated	PW197887

#### **N/A ☒ 4. Water Allocation Reserves, Notations(s), and Sensitive Streams**

There are no reserves or notations on Barnes Creek, Whatshan River or Whatshan lake.

##### **Reserves**

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##### **Notations**

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##### **Reference Point**

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**Sensitive Stream Designation** (if you have a groundwater diversion, is it hydraulically connected to a Sensitive Stream?):

#### **N/A ☒ 5. Relevant Water Objective(s)**

[insert details of any relevant water objectives]

#### **N/A ☒ 6. Designated Area for Water Sustainability Planning Processes**

[insert details of any designation of an area under the Water Sustainability Act]

#### **N/A ☒ 7. Drilling Authorization**

[insert details of any drilling authorization issued under the Water Sustainability Act or indicate “no drilling authorization”]

#### **N/A ☒ 8. Appurtenant Land Related Issues**

OTHER LICENCES ON APPURTENANT LAND:

OTHER APPLICATIONS ON APPURTENANT LAND:

APPURTENANT LAND WITHIN MUNICIPALITY, IMPROVEMENT DISTRICT OR IRRIGATION DISTRICT:

OTHER GENERAL COMMENTS RELATED TO APPURTENANT LAND AND OTHER TENURES:

#### **N/A ☒ 9. PERMIT OVER CROWN LAND**

[Insert details of any Permit Cover Crown Land]

#### **N/A ☒ 10. REFERRALS TO GOVERNMENT AND OTHER AGENCIES**

[insert details of any parties to whom the application was referred]

#### **N/A ☒ 11. NOTIFICATIONS/OBJECTIONS**

11a. NEARBY LICENSEES, AND DOWNSTREAM LICENSEES ON CONNECTED STREAMS [insert contact details]

11b. JOINT WORKS [insert contact details]

11c. OTHER LANDS PHYSICALLY AFFECTED BY WORKS [insert contact details]

#### **N/A ☒ 12. OTHER CONCERNED PARTIES**

[insert details of any other concerned parties]

#### **N/A ☒ 13. WATER LICENCES REQUIRING AMENDMENT**

[insert details of water licenses requiring amendment]

### **C. TECHNICAL INFORMATION**



## N/A ☐ 1. Physical, Hydrological and Hydrogeological Setting

The Dukhobor Heritage Retreat Society #1999 has commissioned two reports for the purposes of locating suitable well locations (Summit Environmental Consultants Ltd. Project #425-01.01 – Groundwater Study DHRS) and a completion report for their final well. There are 6 wells on the property but the first 3 wells are deep bedrock wells that have limited capacity and are not used. They are likely in a confined bedrock aquifer. The three wells that are in use are dug into glacial outwash which is likely a unconfined sand and gravel aquifer that is hydraulically connected to Whatshan Lake, Whatshan River and Barnes Creek. Below is a summary of the site description and hydrogeologic setting from Western Water Associates Completion Report: Whatshan Lake Retreat Well No. 6.

Whatshan Lake Retreat is located immediately south of the Whatshan Dam, which is owned and operated by B.C. Hydro. The project site is located within a transition zone between the Monashee Mountains to the west, and the Kootenay Mountains to the east. The facility straddles both banks of the Whatshan River, and also borders a stretch of Barnes Creek, to the west. The retreat buildings occupy the northeast part of the site, and the southern portions are partially developed with campsites. Figure 1 shows the well locations and the approximate location of the retreat's effluent disposal field.

Local geology, as summarized in Summit (2005) is comprised of a deep bedrock unit composed of intrusive igneous (granitic) rocks such as granodiorite and quartz monzonite, and may be part of the Whatshan Lake Batholith.

Overlying the bedrock is a layer of unconsolidated sediment interpreted to be primarily of glacial origin, and includes in places ice contact deposits, and glacial till, as well as a relatively thick, stratified glacial outwash deposit composed of sand and gravel with intervening silt layers. The glacial outwash was interpreted by Summit to occupy a paleochannel that runs between the Whatshan Dam and Barnes Creek, based on local well log data. Wells 4, 5 and 6 are completed in this formation. The outwash aquifer is thought to be recharged by seepage from Whatshan Lake, which then flows through the outwash aquifer to discharge in the valley below (i.e. to Barnes Creek and/or lower Whatshan River). Based upon well log and water level data, the hydraulic gradient in this aquifer is relatively steep; to the north of the retreat, well water levels are within 10 m of the ground surface whereas in Wells 4 and 5, completed at similar elevations to the south, groundwater levels are more than 35 m below ground.

## N/A ☐ 2. Description of Works to be Authorized

<b>Works:</b>	well	<b>Status of Works:</b>	Fully Constructed
<b>Works:</b>	well	<b>Status of Works:</b>	Fully Constructed
<b>Works:</b>	well	<b>Status of Works:</b>	Fully Constructed

## N/A ☐ 3. Well(s) location

<b>Well Tag Number:</b>	85994	<b>Latitude:</b>	49.91458	<b>Longitude:</b>	118.12355
<b>Well Tag Number:</b>	85904	<b>Latitude:</b>	49.91427	<b>Longitude:</b>	118.12419
<b>Well Tag Number:</b>	117687	<b>Latitude:</b>	49.91358	<b>Longitude:</b>	118.12506

## N/A ☐ 4. Well(s) construction

Well ID plate number Well date of construction Well depth	11278	Well ID tag number Well construction status Well diameter	85994 Fully Constructed
Well ID plate number Well date of construction Well depth	11279	Well ID tag number Well construction status Well diameter	85904 Fully Constructed
Well ID plate number Well date of construction Well depth	36029	Well ID tag number Well construction status Well diameter	117687 Fully Constructed

## N/A ☐ 5. Summary of Licence Demand

Licence/Application	Domestic (m <sup>3</sup> /day)	Other (m <sup>3</sup> /day)	Irrigation* (m <sup>3</sup> /yr)*	Other (m <sup>3</sup> /yr)	Other (m <sup>3</sup> /sec)	Storage (m <sup>3</sup> /yr)	Daily Seasonal Demand in m <sup>3</sup> /s
Existing GW Rights	0	0	0	0	0	0	0
Existing SW Rights	11.37	28.41	0	250	40.92	121,448,440.8	44.78
Quantity of water in this Application	0	0	0	0	0	0	0
Excluded users (e.g. domestic groundwater)	6	0	0	0	0	0	6
Totals	17.37	28.41		250	40.92	121,448,440.8	44.78

\* Irrigation Q based on (select N/A, 90, 100 or 120) day period, unless otherwise indicated.

## N/A ☐ 6. Source Supply-Demand Assessment

There is a wide range of well yields reported (3 to 30 L/s) from this information the well productivity can be assumed to be moderate. Domestic well density is low there are 6 wells in the database within a square kilometre but beyond that there are no other wells until you reach the east side of Whatshan lake.

## N/A ☐ 7. Well Pumping and Recovery Test

Western Water Associates Ltd. (WWAL) was hired to oversee the installation and testing of a new production well (well 6) for the Dukhobor Heritage Society Retreat owned water system at the Whatshan Lake Retreat. It was noted in the report that the tests were conducted over a period with heavy precipitation (~>100mm) and the Whatshan dam revisor was observed to be at capacity. The report recommended that the well be pumped at a rate of no more than 1.9L/sec (30 USgpm). Water levels in well 4 were measured three times during the step pumping test and did not show a response to well 6 (Western Water Associates 2013). Due to the precipitation event it is unknown if any well interference was masked by the heavy rainfall.

## N/A ☐ 8. Long-term Yield/Adequacy of Well Supply

This application is for existing ground water use the effects of the hydraulic connection to Whatshan Lake, Wharshan River and Barnes Creek have likely already been expressed. The groundwater likely flows in a south western direction from the lake to the wells. Whatshan Lake has a dam at the southern most point that is operated by BC Hydro. The Lake is not likely to experience any scarcity issues.

## N/A ☐ 9. Impact on Connected Source(s)

There are 3 wells located within 650m of the applicant wells. The Distance-Drawdown calculator was used to determine that drawdown would be approximately 0.012 m at the nearest well (400 m from the application well location) after 10 years of pumping at a rate of 100 m3/day. Impacts to these well users are anticipated to be minimal.

Aquifer: Burton City Unconsolidated

Aquifer: Burton City Unconsolidated

Aquifer: Burton City Unconsolidated

### Likely connected to surface water source? (Y/N)

Surface water source name #1	Whatshan Lake	% connected to source #1	7%	Distance to source #1	540m
Surface water source name #2	Whatshan River	% connected to source #2	78%	Distance to source #2	160m
Surface water source name #3	Barnes Creek	% connected to source #3	15%	Distance to source #3	370m
Surface water source name #4		% connected to source #4		Distance to source #4	
Surface water source name #5		% connected to source #5		Distance to source #5	

### Likely connected to aquifer source (if your aquifer likely connected to another aquifer)? (Y/N)

Groundwater source name #1		% connected to source #1	
Groundwater source name #2		% connected to source #2	
Groundwater source name #3		% connected to source #3	
Groundwater source name #4		% connected to source #4	



**N/A ☐ 10. Summary of Flow Records**

There is a hydrometric station on Barnes Creek (08NE077) which has been active since 1950, the mean annual discharge (MAD) is 3.96m<sup>3</sup>/sec. There are two other hydrometric stations Whatshan River at Needles (08NE046) which recorded data between 1944-1951 with a MAD of 11.1m<sup>3</sup>/sec and Whatshan River near Needles which recorded data between 1950-1964 the MAD at this station is 3.07m<sup>3</sup>/sec.

**N/A ☒ 11. Impact on Other Water Users**

[Describe any impacts on other licensed or unlicensed water users]

**N/A ☐ 12. Environmental Flow Needs (EFN) Consideration**

Consideration of EFN was not required due to this being an existing use groundwater authorization per S.55(4) of the Water Sustainability Regulation.

**N/A ☐ 13. Justification for Purpose and Quantity**

The applicant originally applied for a quantity of 550m<sup>3</sup>/day which was based on the total pumping capacity of the wells and was clarified in correspondence that quantity was not required. The *Water Quantity Requirements by Water Use Purpose* guidance document was used to estimate the quantity needed for the retreat. The applicant provided statistics of the retreats capacity and operating level. The maximum capacity of the camp is 106,200 attendees per year and the camp is currently operating at 60% capacity. That works out to and estimated 60,000 people in the peak season and 7,920 people in the off season. Using the campground-luxury-high estimate per camper rate of 0.567m<sup>3</sup> day per camper the required quantity equals 106m<sup>3</sup>/day or 38,690m<sup>3</sup>/year. Doug Geller from WWAL confirmed in an email, on December 17<sup>th</sup> 2019, that the proposed quantity is reasonable. The email saved in the project folder titled *Doukhobor Heritage Retreat Society #1999 quantity file 20008994*.

**N/A ☒ 14. Water Users' Community**

[Insert the name(s) of the Water Users' Community, if the licence is for or affects a Water Users' Community]

**N/A ☐ 15. Water Quality Issues (e.g. salinity, public health issues)**

The water quality is considered to be very good and met guidelines for Canadian Drinking Water Quality except for the aesthetic guideline level for iron (0.3mg/L). (Western Water Associates 2013)

**N/A ☒ 16. Environmental Considerations**

[Describe any relevant environmental considerations]

**N/A ☒ 17. Justification for Special Advice on Cover Letter**

[Describe the reasons for any special advice on licence cover letter, e.g. non-standard paragraphs]

**N/A ☒ 18. Justification for Additional Clauses for Licence**

[Describe the reasons for any additional clauses on the water licence e.g. non-standard clauses]

**N/A ☒ 19. Site Inspection**

[Document the results of any site inspection, if undertaken]

**N/A ☐ 20. First Nations Information and/or Results of Consultation**

The application was submitted to First Nations Relations and submitted for consultation on May 14, 2019. The consultation was closed on Aug 16 2019 and no accommodations were requested. Consultation pursued with these First Nations can be considered sufficient as no site specific or other concerns were raised by the First Nations. As such, the proposed decision is not expected to result in new adverse impacts to First Nations rights and/or title.

## D. LICENCE(S)

**New (amended) Licence No.** 501599

**Conditional/Final:** Conditional

**Licence Status:** Draft

**File No:** 20008994

**Region:** Kootenay

**District:** Nelson (18)

**Precinct:** Burton City (18A)

**PID:** 005-517-966

**Appurtenancy:**

District Lot 8186 Kootenay District, Except Parcel A  
(Explanatory Plan 85896I)

**Well Tag Number:** 117687, 85904, 85994

**Purpose/Uses:** 00B - Waterworks (other than LP)

**Quantity Units:** 106 m3/day

**Priority Date:** Nov 23, 2005

**Start of Annual Licence Cycle<sup>1</sup>:** January 1

**Source Name:** Burton City Unconsolidated

**Points Of Diversion:** PW197885, PW197886, PW197887

**Quantity Flag:** M, M, M

**Mapsheet Code:** 82.E.100.1.2, 82.E.100.1.2, 82.E.100.1.2

**Licence Holder - Billed Client:** Doukhobor Cultural Heritage  
Retreat Society # 1999

**Licensee Name:** Doukhobor Cultural Heritage Retreat Society #  
1999

**Client No.:** 49024

**Home Phone:**

**Work Phone:** s.22

**Fax:**

**Other Phone:**

**Email Address:**

**Exempt Client Details:**

**Licence Holder - Other:** Doukhobor Cultural Heritage Retreat  
Society # 1999

**Licence Documents Are To Be Sent To:** Doukhobor Cultural  
Heritage Retreat Society # 1999 (49024)

**Works (Status):** distribution system (Fully Constructed), pump  
(Fully Constructed), pumphouse (Fully Constructed), well (Fully  
Constructed), well (Fully Constructed), well (Fully Constructed)

**Well Id Plate:** 11278, 11279, 36029

**POD (Well):** PW197885, PW197886, PW197887

**Sector:** WWK - Waterworks (Water Supply)

**End of Annual Licence Cycle:** December 31

**Point Of Re-Diversion:** No, No, No

**Storage Flag:** N, N, N

**Water Rights Map:** 82.E.100.1.2, 82.E.100.1.2, 82.E.100.1.2



## **E. PERMIT(S) OVER CROWN LAND**

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**1. PCL NO.:**

**2. PCL REPLACEMENT:**

**3. PCL BILLING INSTRUCTIONS:**