



City of Whitehorse  
2121 - 2nd Avenue, Whitehorse, Yukon Y1A 1C2 Bus: (867) 667-6401 Fax: (867) 668-8398

March 26, 2019

File # 3850-01 WL-City

Yukon Water Board, A-419  
Suite 106, 419 Range Road  
Whitehorse, YT, Y1A 3V1

Attention: Roger Lockwood, Director

Dear Mr. Lockwood,

**Re: Water License MN18-059 – Ground Water Monitoring Well Replacement – GW4**

In accordance with Yukon Water Board License MN18-059, attached is the hydrogeological report for replacement of ground water monitoring well GW 4 located at the northeast corner of the Long Term Storage pond at the Livingstone Trail Environmental Control Facility. The report contains information required under Part F, Clause 32 of the water Licence. An electronic copy of the report has been uploaded to the Board's Waterline.

Should you have questions or required additional information, please contact the undersigned.

Yours truly,

**THE CITY OF WHITEHORSE**

Larry Shipman, A.Sc.T.  
Engineering Projects Officer

Att: WL NN18-059 Report

cc: T. Eshpeter, A/City Engineer



MORRISON HERSHFIELD

March 20, 2019

Taylor Eshpeter, P.Eng.  
Manager, Engineering Services  
City of Whitehorse  
[taylor.eshpeter@whitehorse.ca](mailto:taylor.eshpeter@whitehorse.ca)  
c (867) 689-2143

Dear Mr. Eshpeter:

**Re: Memo Report: Inspection and Replacement of Monitoring Well (GW4) @ LTECF  
City of Whitehorse (MH ref. 190198000)**

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A site visit was conducted to the subject monitoring well location by Jonathan Kerr (MH) and Larry Shipman (City of Whitehorse) on Feb 26, 2019. The well is GW4 and is located at the northern edge of the Livingstone Trail Environmental Control Facility (LTECF). During this site visit, the well was located and inspected. It was determined that the well was blocked and that it would need to be replaced with a new well.

The UTM location of the well to be replaced, as measured by a hand held GPS (NAD 83):

- 492,885E 6,743,052N Zone 8

Tree clearing and snow removal was required to gain access to the well location. To permit drill rig access, on March 18<sup>th</sup>, 2019, Midnight Sun Drilling (MSD) mobilized a skid steer to site and conducted tree clearing and snow clearing activities. On March 19<sup>th</sup>, MDS mobilized a track mounted auger rig to the site and conducted the following tasks:

1. At GW4, removed the well casing and protective casing. The well was approximately 25ft deep and was filled with bentonite chips to seal the well from potential surface water infiltration (Photo 1 and Photo 2)



**Photo 1. Well casing and protective casing removal at GW4**



**Photo 2. Bentonite chips used to seal GW4**

2. Upon closer inspection, it is believed that GW4 had been frost jacked out of the ground and had broken off at the screen. The bentonite seal located above the screen had subsequently sluff in, and had permanently clogged the well (Photo 3). The well required replacement.



**Photo 3. Bentonite found in screen of GW4**

3. Drilling and replacement of well, referred here in as GW4-2019 (see photos 4 and 5). Geological samples were collected throughout the drilling and logged as required. Grab samples were collected directly off the auger flights at regular intervals. The borehole log and well construction details are found attached.



**Photo 4. Track mounted auger rig used to drill and construct GW4-2019**



**Photo 5. Completed monitoring well (GW4-2019)**

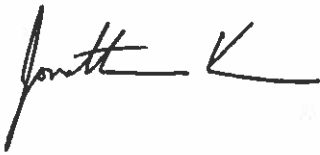
4. Access to GW4-2019 has now been established off the perimeter road (Photo 6).



**Photo 6 Access Trail – View looking from GW4-2019 up to perimeter road**

We trust the above information provides the appropriate information for your needs. If you require any clarification of the above please do not hesitate to contact the undersigned at 867-456-4747.

Sincerely,  
Morrison Hershfield Limited

A handwritten signature in black ink, appearing to read 'Jonathan Kerr', with a stylized flourish at the end.

**Jonathan Kerr, M.Sc., P.Ge**  
*Hydrogeologist*



Morrison Hershfield  
101-301 Hawkins Street  
Whitehorse, YT, Y1A 1X5

# RECORD OF BOREHOLE GW4-2019 (ENVIRONMENTAL)

CLIENT City of Whitehorse

PROJECT NAME Replacement of LTECF Monitoring Well

PROJECT NUMBER 190198000

PROJECT LOCATION Whitehorse, Yukon

DATE STARTED 3/19/19 COMPLETED 3/19/19

UTM Zone 8V 6743069m E 492877m N ELEVATION 681 masl

DRILLING CONTRACTOR Midnight Sun Drilling

GROUNDWATER LEVELS: (approx)

METHOD Track Auger - 150mm Diam. (Solid Stem)

▽ **STATIC WATER LEVEL** 6.455m below top of casing  
MEASUREMENT DATE (March 21, 2019)

LOGGED BY JK CHECKED BY FP

DRILLING SUPERVISED BY: MORRISON HERSHFIELD

DEPTH (m)	GRAPHIC LOG	SOIL DESCRIPTION	SAMPLE NUMBER	BLOW COUNTS	N VALUE	Headspace Organic Vapour Concentrations	Headspace Combustible Vapour Concentrations	ANALYSES & ROCK CORE PARAMETERS	WELL DIAGRAM
						▲ IBL (ppm)	⊗ HEX (ppm) 2500 5000 7500		
						500 1000 1500 2000	⊕ HEX (%LEL) 25 50 75		
0		(SP) SAND - fine, brown, trace rootlets, trace dark brown organics	GB1						Protective Casing
0.6		(SP) SAND - fine, light brown, very homogenous, dry	GB2						Bentonite Chips
1			GB3						
2			GB4						
3			GB5						
3.2		(SP) SAND - fine, olive brown, very homogenous, dry							Silica Sand
3.5		(MLS) SANDY SILT - fine, olive brown, dry	GB6						
3.8		(MLS) SANDY SILT - fine, olive brown, saturated							50 mm Diam. PVC, Slotted Screen
4.6		(MH) CLAYEY SILT - olive brown, saturated	GB7						
5			GB8						
6			GB8						
7									
7.5			GB10						

ENVIRONMENTAL BOREHOLE WITH BLOW COUNTS 190198000 LTECF GW WELL GP J GINT STD CANADA LAB GDT 3/20/19



P:\2019\19018\9000-LTECF GW Monitoring Wells CAD\07 Sheets\19019\0 - MW Location Map.dwg Plotted by Warren Pare