

20.0 BUILDING 2600: KLONDIKE GRADER STATION

20.1 Description of Existing Water Supply System

The Klondike Grader Station (Building 2600), located 65 km north on the Dempster Highway is serviced by a water supply that obtains water from an approximately 14.4 m deep well. The wellhead is located in a tin clad plywood utilidor approximately 10 m southeast of the maintenance garage. Water is piped within the insulated and heat traced utilidor to the Residence Building, Grader Station and a Storage Building (Building 2605). The wellhead is approximately 150 mm above grade, but was not equipped with a sanitary cap on the casing at the time of the assessment. A site plan is provided as Figure 2600-A in Appendix A20. The coordinates of the wellhead, as measured by a handheld GPS device, were recorded as:

- UTM ZONE 7
- Northing: 7150453
- Easting: 633968

There is currently no treatment or disinfection for this system. Although there is an in-line filter, it was not in use at the time of the assessment (lid and change-out cluster were missing). A schematic detailing the water supply system is provided as Figure 2600-B in Appendix A20. Photos of the well and water system are also included at the back of this appendix.

20.2 Description of Existing Wastewater Systems

Wastewater from the Grader Station Residence building is piped to an in-ground septic disposal system on the east side of the living complex. The on-site sewage disposal system (septic field) begins approximately 25 m away and likely downgradient from the well. It is unclear whether toilet fixtures and grey water from the other buildings are also connected to this septic system. A site plan showing the septic system is given by Figure 2600-A in Appendix A20. Effluent discharge may be to leach pits located further east and greater than 30 m downgradient from the well.

20.3 Water Quality Results

20.3.1 Water Quality Results from Previous Sampling

Bacteriological

Six water samples were collected from the Klondike Grader Station Living Complex water system by YTG representatives between September 2004 and June 2005 and were tested for total coliform and *E. Coli* by Yukon Environmental Health Services using the presence/absence test method. Results are tabulated in Table 2603-1 in Appendix A20. Total Coliform bacteria were reported as present in two of the six samples for which results were provided, and were present in the most recent sample for which results are report (June 9, 2005). *E.coli* were not present in any of these samples.

Potability

Water samples were collected from the Klondike Grader Station water system by a YTG representatives on September 29, 2004 and June 8, 2005. The samples were submitted to Northwest Labs in Surrey BC and ALS Environmental in Vancouver BC for potability analyses. The results of these analyses are summarized in Table 2600-2 in Appendix A20. EBA reviewed the analytical results to compare them with the Canadian Drinking Water Quality Guidelines (CDWQG) to observe general water quality, identify and recommend additional sampling and analytical and identify potential indicators of contamination. Details are as follows:

- At 13.0 NTU during the first sampling event and 12.5 NTU during the second sampling event, the reported turbidity was above the CDWQG MAC of 1.0 NTU and aesthetic objective (AO) of 5.0 NTU. Based on these turbidity readings, it is unlikely that the filtration system has been operational in the past year;
- At 0.74 mg/L during the first sampling event and 1.39 mg/L during the second sampling event, the total iron concentration was above the CDWQG AO of 0.3 mg/L;
- At 0.138 mg/L during the first sampling event and 0.142 mg/L during the second sampling event, the total manganese concentration was above the CDWQG AO of 0.05 mg/L;
- At 29 CU, the colour reported from the first sampling event was in exceedence of the CDWQG AO of 15 CU;

- The water quality results indicated that all other health based and AOs were met for the parameters analyzed;
- The water quality results indicated that groundwater is calcium bi-carbonate type with a pH of approximately 8; and,
- The hardness (as CaCO_3) was 201 mg/L during both sampling events, and is considered very hard.

20.3.2 Identification of Additional Analytical Testing Required

Additional analytical for the Klondike Grader Station maintenance building that was identified to be included during the water system assessments is detailed below:

- UV absorbance and UV transmissivity, as well as tannins and lignin, to determine potential for UV treatment as a disinfection option for this water system;
- Turbidity and colour;
- Total and dissolved iron and manganese;
- Total organic carbon (TOC);
- Extractable Petroleum Hydrocarbons (EPH) and Polycyclic Aromatic Hydrocarbons (PAH) to determine if known hydrocarbon contamination in soil and groundwater on the site is impacting on the water supply; and,
- Measurements in the field for total dissolved solids, conductivity, pH, and temperature.

Additional Analytical Results

A water sample was obtained by EBA during the water system assessment on August 18 2005, and was submitted to ALS Environmental in Vancouver BC for analysis of the parameters indicated above. These results are summarized in Table 3440-2 in Appendix A20 and the laboratory reports are included in Appendix B. The following points regarding the water quality results are of significance:

- Concentrations of EPH and PAH parameters were below laboratory detection limits;
- At 18.6 NTU, the turbidity of the water exceeded the CDWQG MAC of 5.0 NTU;
- Total iron at 1.32 mg/L was above the CDWQG AO of 0.3 mg/L;
- Dissolved iron was reported below the laboratory detection limit of 0.03 mg/L indicating that the elevated iron concentration is most likely attributed to elevated turbidity;

- Total and dissolved manganese at 0.138 and 0.133 mg/L were above the CDWQG AO of 0.05 mg/L; and
- Water quality analysis reported no other exceedences of CDWQG health based or AOs.

20.3.3 Indicators of Potential Contamination

Chloride, nitrate and nitrite concentrations can indicate impacts from septic waste. Chloride concentrations were low and can likely be considered as within the normal background ranges for groundwater in the area. Nitrate and nitrite concentrations for this sample are also low and likely within the normal background range for this area. These water quality results do not suggest that the aquifer from which the groundwater is obtained for the Klondike Grader Station is under the influence of septic wastes.

20.4 Conceptual Hydrogeology

The log for this well indicates that the well is completed at a depth of 14.3 m within a sand and gravel aquifer underlain by bedrock. The static water level measured during the water system assessment was 3.55 m below grade. The shallow depth of this aquifer combined with the absence of a fine-grained material leave this aquifer vulnerable to surficial sources of contamination. The direction of groundwater flow is likely south and parallel to the River with a component of flow towards the North Klondike River. Rapid changes in the river stage level may result in a reversing hydraulic gradient resulting in surface water recharging the aquifer. Due to the shallow nature of the well and the strong connection to the Klondike River, it is possible that this well is under the direct influence of surface water.

20.5 Potential Contaminant Sources

Details and photographs of potential contaminant sources observed during the site investigation are compiled in Appendix A20.

Potential contaminant sources within 30 m of the wellhead are:

- An on-site sewage disposal system (septic field) at 25 m;
- Klondike River at 15 m; and

- Above ground fuel storage tank (ASTs) at 15 m, 20 m, and 30 m.
- Access Consulting Group completed an Environmental Site assessment at the Klondike Maintenance Camp in 2003 (Access, 2004). Soil and groundwater at the Site were observed to have hydrocarbon parameter concentrations above the Yukon Contaminated Site Regulations for drinking water protection. We understand that additional assessment work may have been completed in 2005 by another consultant; however, the results of this additional assessment work were not available for review. Relevant points taken from the Access report are:
 - There is confirmed hydrocarbon contamination of soil within 40 m of the well;
 - There is inferred hydrocarbon contamination of shallow groundwater within 10 m of the well; and,
 - Contaminants include diesel fuel and gasoline.

In addition, there is an abandoned dug well located inside the present maintenance garage that is approximately 35 m upgradient of the well. It appears to have a hydrocarbon absorption pad in it which implies that it is being impacted from the adjacent soil and groundwater contamination.. Various monitoring wells were also observed on the property.

20.5.1 Spills Records and Contaminated Sites Search Results

It was reported by Environment Canada that one documented spill of an unknown quantity of diesel was discharged to ground in 2001 due to a leaking filter on a generator. No further information was available.

The Government of Yukon Environmental Programs Branch and Environment Canada Environmental Protection Branch did not identify any other recorded spill events or contaminated sites issues for this site or neighbouring sites in close proximity. However, as mentioned previously, it is known that environmental assessment of soil and groundwater contamination is underway at this site.

20.6 Identified Water System Deficiencies and Associated Risk

20.6.1 High and Medium Risk Deficiencies

High and medium risk deficiencies for this water system that were identified during this study include:

- Poor surface completion of the wellhead (was not equipped with a sanitary cap on the casing, there is evidence of rodents in the wellhead enclosure, the casing does not extend the required 500 mm above grade);
- There is no surface sanitary seal (grout or bentonite seal as required by the Canadian Groundwater Association's Guidelines for Water Well Construction);
- The well is completed at a depth of 14.4 m within a shallow, unconfined aquifer that is only 15 m from the Klondike River and may be under the direct influence of surface water;
- By definition of the Draft Yukon GUDI Assessment Guideline, the well is potentially under the direct influence of surface water because it is a vulnerable type (unconfined aquifer) with a production zone less than 15 m below grade, is within 60 m of a surfacewater body, and does not meet the requirements of the Guidelines for Water Well Construction.
- The well is located within 30 m of potential contaminant sources including a on-site sewage disposal system (possibly septic field or leach pits), and various ASTs;
- The site is known to have been subject to hydrocarbon spills and has documented hydrocarbon contamination of soil and groundwater above Y-CSR standards;
- There have been two positive total coliform test results out of six samples collected from the Living Quarters. The most recent result provided was positive for total coliform bacteria (June 9, 2005);
- Turbidity has been in exceedence of the CDWQG MAC; and,
- There is no treatment or disinfection system present.

20.6.2 Low Risk Deficiencies

- The total iron concentration has been in exceedence of the CDWQG AO;
- The manganese concentration is reportedly in exceedence of the CDWQG AO; and,
- The colour has been reportedly been in exceedence of the CDWQG AO.

20.7 Mitigative Options for Deficiencies

Mitigative options were developed to address the deficiencies identified in the previous section. Deficiencies are categorized by recommended level of priority (with Priority 1 being most critical).

Given the well location, construction, water quality and proximity to known contamination, it is recommended that this well not be used as a long term source of drinking water. Interim Priority 1 upgrades to ensure the safety of this water supply are recommended, while Priority 2 upgrades provide a long term option for a safe water supply. While the existing well is in use (ie. Option 1 - prior to Priority 2 upgrades) it would be prudent to sample routinely for potential contaminants of concern (EPH, PAH, benzene, toluene, ethylbenzene, xylene).

20.7.1 Priority 1

The following recommendations are provided in order to mitigate deficiencies that are of immediate concern. Priority 1 remedial recommendations include:

Option 1:

- The utilidor should be cleaned out and replaced with blown in foam insulation, the well cap replaced (if not completed already) and a localized near surface bentonite seal installed immediately around the wellhead;
- Sampling for EPH, PAH and BTEX should be completed during the spring snow melt and routinely (every 3 months) thereafter;
- The well and water system should be super-chlorinated;
- Disinfection treatment consisting of filtration to 1 micron (absolute), and a UV system that is NSF/ANSI certified (or equivalent) should be installed to ensure disinfection. Pretreatment consisting of a water softener may be necessary for optimum UV performance. These are conceptual design recommendations based on the information available for planning and budgeting purposes. Engineering input will be required for final system specifications.

There is insufficient data at present to assess the level of risk posed by the soil and groundwater contamination at this site. Option 1 should only be considered in conjunction with further routine chemical testing. As well, this option should only

be considered with routine bacteriological testing. In order to further reduce risk, a second option is proposed below:

Option 2:

Provide a bottled water station and post advisories (consultation with Environmental Health and Social Services is recommended) that water from taps should not be used for drinking.

20.7.2 Priority 2

Drill a replacement well located and constructed in consideration of the following:

- The well should be equipped with a surface seal to at least 6 m and a pitless adapter should be installed with the casing raised above grade (500 mm);
- The well must be located at a distance greater than 30 m and upgradient from any potential source of contamination;
- The well should be at least 15 m deep;
- The water from the new well must meet all CDWQG health based guidelines. If there are any exceedences in the CDWQG health-based guidelines then a treatment system must be designed and installed as necessary.

20.7.3 Priority 3

Following Priority 2 upgrades, the existing well should be properly decommissioned. It is anticipated that Priority 1 and 2 upgrades would mitigate all health risks.

20.8 Cost Estimates for Mitigative Options

Engineering costs for mitigative options are estimated to be 20% of construction costs, and would include inspection and completion reporting. The costs for materials and labour (not including engineering) are provided in the sections below. An additional contingency allowance of 20% is suggested for budgetary purposes.

20.8.1 Priority 1

Class D cost estimates for recommended Priority 1 upgrades are provided as follows:

Option 1:

- Temporary wellhead upgrades would cost approximately **\$500**.
- A treatment/disinfection system would cost in the order of **\$4,500**; assuming **\$600** for the duplex filtration system, **\$2,400** for the NSF/ANSI 55 certified UV disinfection, and **\$1500** for contactor mobilization/demobilization.
- Well and water system superchlorination would cost approximately **\$200**.

Option 2:

- A bottled water station would cost in the order of **\$250** and bottled water would cost approximately \$10 per 20 L bottle.

20.8.2 Priority 2

Option 1:

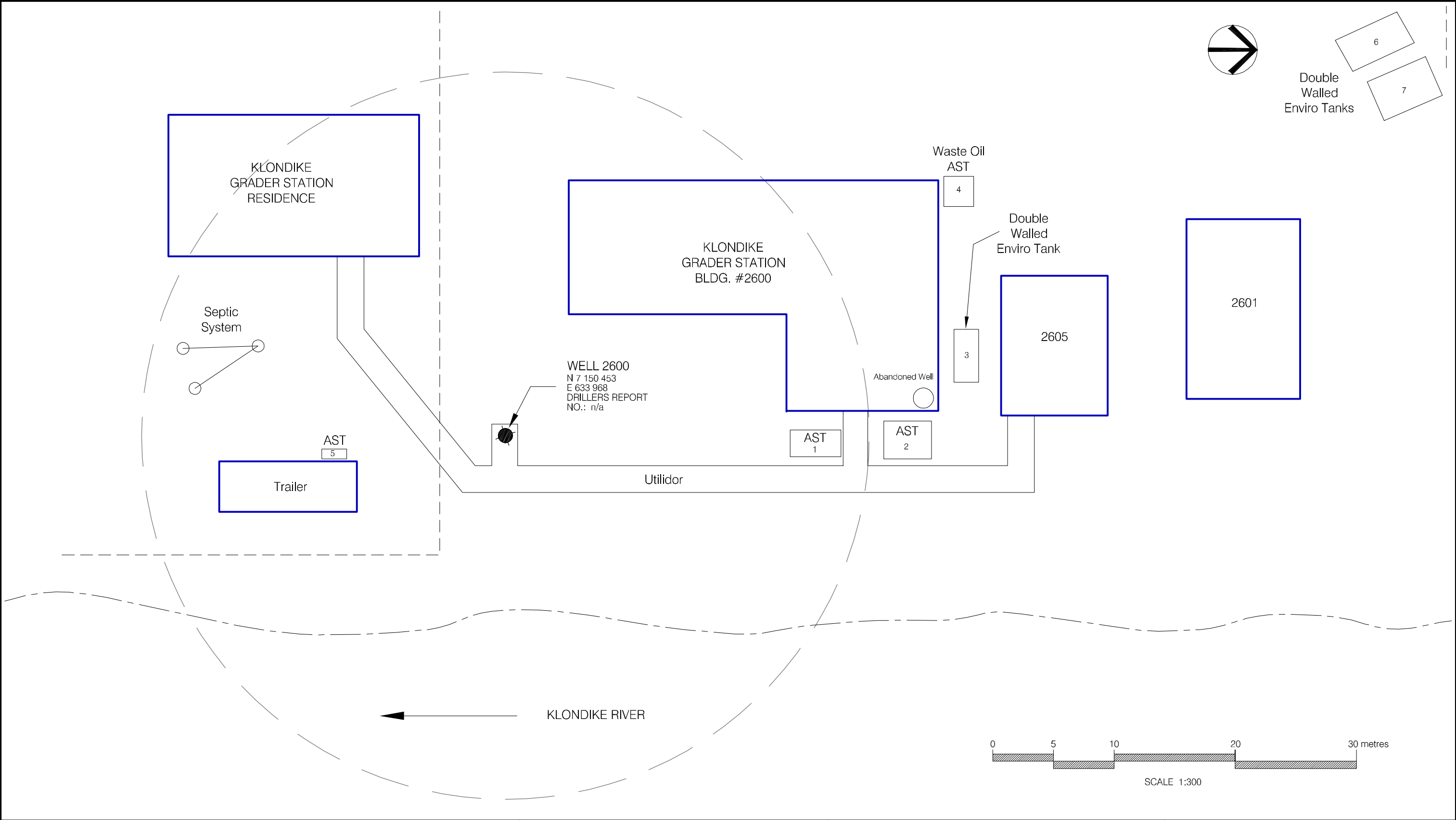
- A new well, assuming that it is drilled to approximately 15 m in depth through overburden deposits, would likely cost in the order of **\$36,000** to drill, test, and hook up (including pump, drop pipe and freeze-protected underground piping).

Option 2:

- A new well, assuming that it is drilled to approximately 15 m in depth through overburden deposits, would likely cost in the order of **\$36,000** to drill, test, and hook up (including pump, drop pipe and freeze-protected underground piping); and,
- The materials and labour costs for a treatment/disinfection system would cost in the order of **\$4,500**; assuming **\$600** for the duplex filtration system, **\$2,400** for the NSF/ANSI 55 certified UV disinfection, and **\$1500** for contactor mobilization/demobilization.


20.8.3 Priority 3

Decommissioning of the exiting well would cost approximately **\$1,000**. Consideration should be given to keeping this well as a monitoring well, or to utilize for potential future site remediation. If decided that this well should be decommissioned, consideration should be given to completing this work at the same time as Priority 2 work to save on mobilization/demobilization costs.




NOTES:

1. UTM COORDINATES OBTAINED WITH A HAND HELD GPS USING NAD83 SYSTEM AND ARE CONSIDERED TO BE ACCURATE TO 10.0 m, APPROXIMATELY.



30 m RADIUS FROM WATER WELL FOR CONSIDERATION OF PROXIMITY TO POTENTIAL CONTAMINANT SOURCES.

No.	REVISION	DESCRIPTION	DATE	APPROVED
0	ISSUED FOR CLIENT REVIEW		DD/MM/YY	XXX



EBA Engineering Consultants Ltd.

DESIGNED BY: R. MARTIN

DRAWN BY: J. BUYCK


DATE: SEPT. 2005

SCALE: AS SHOWN

PROJECT No.: 1260002.004

ACAD FILENAME: 004-NORTHERN REGION

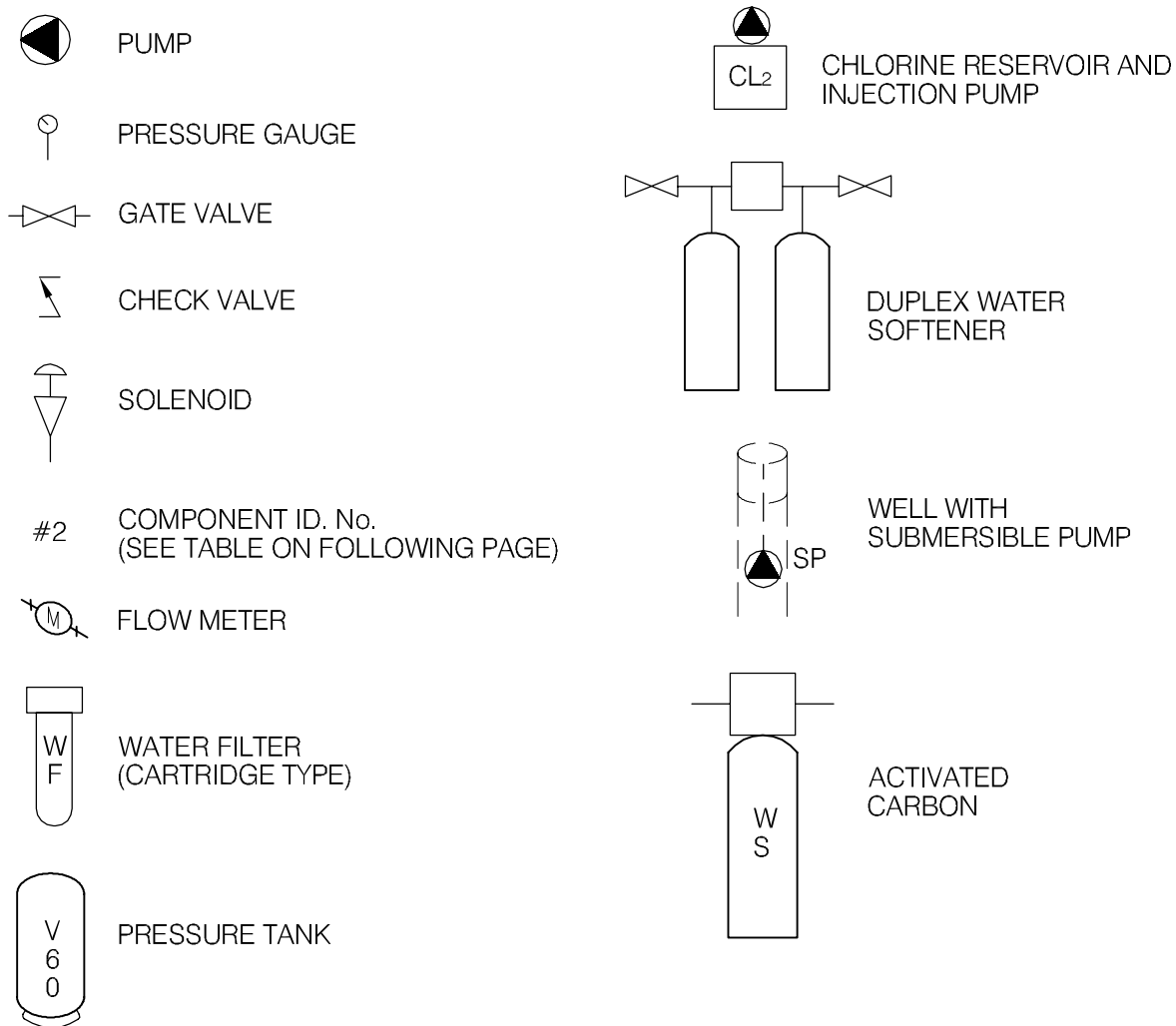
CLIENT:





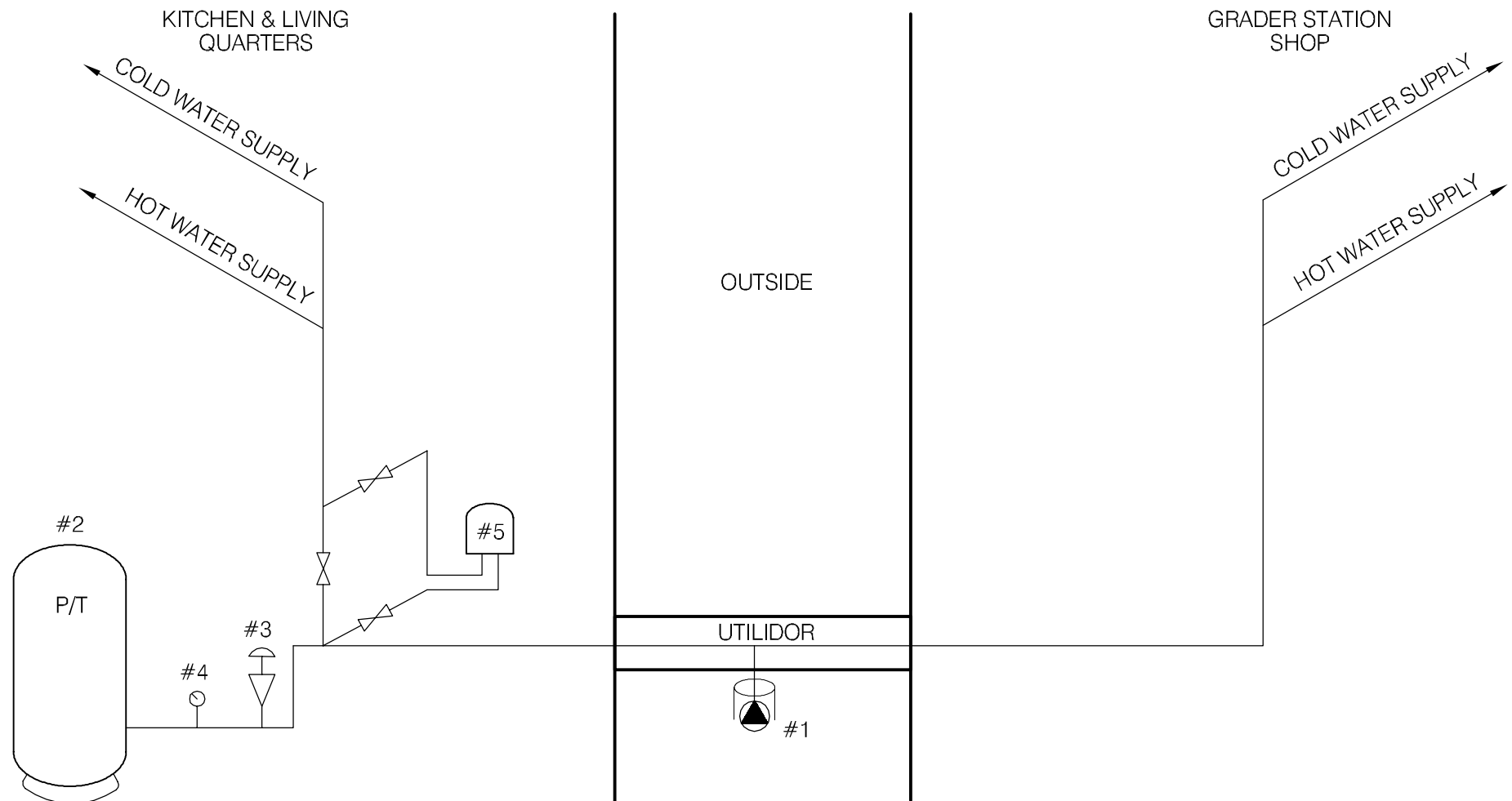
Highways and Public Works
Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT NORTHERN REGION	
GOVERNMENT OF YUKON HIGHWAYS & PUBLIC WORKS	
KLONDIKE GRADER STATION BUILDING # 2600 SITE LOCATION DIAGRAM WELL ID: 2600	REVISION ISSUE 0 FIGURE No. FIGURE 2600-A



LEGEND



 EBA Engineering Consultants Ltd.			PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT WESTERN REGION		
CLIENT			TITLE		
 Highways and Public Works Property Management Branch			SCHEMATIC SYSTEM LEGEND		
DATE	APRIL 2006	DWN.	JSB	CHKD.	RMM
FILE NO.	1260002	DRWG.	LEGEND		



DRAWING IS BASED UPON SCHEMATIC PROVIDED BY BERT ALBISSER OF AQUA TECH SUPPLIES AND SERVICES LTD.

 <div>EBA Engineering Consultants Ltd.</div>			PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT NORTHERN REGION		
CLIENT  <div>Yukon Highways and Public Works Property Management Branch</div>			TITLE WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 2600 KLONDIKE GRADER STATION - DAWSON, YT.		
DATE SEPT. 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.004	DWG.: FIGURE 2600-B	

Northern Region – Dempster Grader Station
Building # 2600

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	SUB. PUMP	MONARCH	RS12SIDE			4" - 1Hp.
2	PRESSURE TANK	CHALLENGER	PC122			122L
3	PRESSURE SWITCH	SQUARE D	GSG-2			5HP - 1/4" FIP
4	PRESSURE GAUGE	MARSH	0-100 PSI			2" - 1/4" FIP
5	INLINE FILTER	HARMSCO	HIF-7	(LID AND CHANGE OUT CLUSTER MISSING).		
6						
7						
8						
9						
10						

TABLE 2603 - 1: SUMMARY OF BACTERIOLOGICAL RESULTS

		Number of Sampling Events	Time Period over which Sampling was Done	Any Positive Total Coliform Results? (yes or no)	Fraction of Positive Total Coliform Results vs. Total Sampling Events	Any positive E.Coli results? (yes or no)	Most Recent Sampling Event Available for EBA Review	Is Most Recent Result Positive?
Building #	Building Name							
2603	Living Complex Klondike	6	Sept-04 to Jun-05	yes	2/6	no	9-Jun-05	yes



Table 2600 - 2: Water Quality Results

SOURCE:		Building 2600 - Klondike Grader Station			GCDWQ Criteria		
Location/ Resident		Dempster Highway					
Address							
Treatment		None					
Disinfection		None					
Source of Water		On-site well					
Purpose of Sampling		Base Line	Base Line	Additional Sampling			
Sample Location				Washroom faucet			
Date Sampled		29-Sep-04	8-Jun-05	18-Aug-05	Lower	Upper Limit	
Physical Tests (ALS)					AO	MAC	AO
Colour (CU)		29	<5.0	<5.0			15
Conductivity (uS/cm)			432				
Total Dissolved Solids		239	259				500
Hardness CaCO3		201	201		AO >200 = poor, > 500 unacceptable ^A		
pH		8.02	8.20		6.5		8.5
Turbidity (NTU)		13.0	12.5	18.6		1	5
UV Absorbance				0.005			
% UV Transmittance				98.9			
Dissolved Anions (ALS)							
Alkalinity-Total CaCO3		166	173				
Chloride Cl		2.1	2.64				250
Fluoride F		0.18	0.22			1.5	
Silicate SiO4							
Sulphate SO4		56.7	60.9				500
Nitrate Nitrogen N		<0.1	<0.10			10	
Nitrite Nitrogen N		<0.05	<0.10			1	
Ammonia Nitrogen N							
Total Phosphate PO4							
Total Metals (ALS)							
Aluminum T-Al		0.008	<0.010			0.1	
Antimony T-Sb		<0.0002	<0.00050			0.006	
Arsenic T-As		0.003	0.00261			0.025	
Barium T-Ba		0.083	0.071			1	
Boron T-B		0.021	<0.10			5	
Cadmium T-Cd		<0.00001	<0.00020			0.005	
Calcium T-Ca			51.2				
Chromium T-Cr		0.0011	<0.0020			0.05	
Copper T-Cu		<0.001	<0.0010			1	
Iron T-Fe		0.74	1.39	1.32			0.3
Lead T-Pb		<0.0001	<0.0010			0.01	
Magnesium T-Mg			17.7				
Manganese T-Mn		0.138	0.142	0.138			0.05
Mercury T-Hg			<0.00020			0.001	
Potassium T-K			0.83				
Selenium T-Se			<0.0010			0.01	
Sodium T-Na		10.9	11.3				200
Uranium T-U		<0.0005	0.00025			0.02	
Vanadium T-V							
Zinc T-Zn		<0.001	<0.050				5
Dissolved Metals							
Iron D-Fe				<0.030			0.3
Manganese D-Mn				0.133			0.05
Organic Parameters							
Tannin and Lignin				0.27			
Total Organic Carbon C				0.74			
Polycyclic Aromatic Hydrocarbons							
Acenaphthene				<0.000050			
Acenaphthylene				<0.000050			
Acridine				<0.000050			
Anthracene				<0.000050			
Benzo(a)anthracene				<0.000050			
Benzo(a)pyrene				<0.000010		0.00001	
Benzo(b)fluoranthene				<0.000050			
Benzo(g,h,i)perylene				<0.000050			
Benzo(k)fluoranthene				<0.000050			
Chrysene				<0.000050			
Dibenz(a,h)anthracene				<0.000050			
Fluoranthene				<0.000050			
Fluorene				<0.000050			
Indeno(1,2,3-c,d)pyrene				<0.000050			
Naphthalene				<0.000050			
Phenanthrene				<0.000050			
Pyrene				<0.000050			
Quinoline				<0.000050			
Extractable Hydrocarbons							
EPH10-19				<0.30			
EPH19-32				<1.0			
LEPH				<0.30			
HEPH				<1.0			
Field Chemistry (EBA)							
pH				8.1	6.5		8.5
TDS (ppm)				203			500
EC (uS/cm)				406			
Temperature (°C)				7.1			
Free Available Chlorine							

Notes:

A. Guidelines indicated for hardness are not CDWQG, rather they are general aesthetic guidelines

- exceedences are indicated in yellow highlighting.

Italics, and underline indicates exceedence of proposed MAC (ie. arsenic)

Bold with Yellow highlighting indicates exceedence of CDWQG Aesthetic Objective (AO)

Bold Underline with Yellow highlighting indicates exceedence of CDWQG MAC

Results are expressed as milligrams per litre except for pH and Colour (CU)

Conductivity (umhos/cm), Temperature (°C) and Turbidity (NTU)

< = Less than the detection limit indicated.

AO = Aesthetic Objective

MAC = Maximum Acceptable Concentration (Health Based)



SMALL PUBLIC WATER SYSTEM ASSESSMENT**PART A: EBA Site Inspection**Inspector: Ryan Martin, Luke LebelDate August 18, 2005

WELL ID #	Owner	Location Description
2600	YTG	Klondike Grader Station

1. Well Location and Potential Contaminant Sources

a. General location of well: (Community, Subdivision, etc.)

Dempster Highway

b. Specific location: (Road or street, Building number, name of owner and/, legal description,

Km 65 Dempster Highwayc. GPS location: N 7150453 E 633968 elv 974m ±8m UTM Zone 7d. Is there electric power? ☒ Yes ☐ Noe. Is there outside water access? ☒ Yes ☐ No

f. Does the well system have:

☐ 15 or more service connections to a piped distribution system? If so how many _____Maintenance garage, living complex, generating station☐ 5 or more delivery sites on a trucked distribution system? If so how many _____g. Nearest building, specify Maintenance garageh. Distance from well to building ~10mi. If there is an effluent disposal field, is its location known? ☒ Yes ☐ Noj. Distance from well to nearest point of known field: ~25mk. Well location relative to field: ☐ upslope ☐ downslope ☒ lateral

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l. Is there any part of a sewage disposal system(s) or other potential sources of pollution that may pose a health and safety risk within 30 m? ☒ Yes ☐ No

m. Is the well located within 300 m from a sewage lagoon or pit? ☐ Yes ☒ No

n. Is the well located within 120 m from a solid waste site or dump, cemetery? ☐ Yes ☒ No

o. Is the infrastructure protecting the wellhead, pumphouse, storage tank and/or water treatment plant designed and secured to prevent:

Unauthorized access by humans? ☐ Yes ☒ No
Unlocked enclosure

Entrance by animals? ☐ Yes ☒ No
Access possible. Mouse droppings observed. No cap on well

p. Is well site subject to flooding? ☐ Yes ☒ No

q. Is the well site well drained? ☒ Yes ☐ No

r. Is there a buried fuel tank on the property? ☐ Yes ☒ No *unlikely*

If yes, is it ☐ in use ☐ abandoned

Is the location known? ☐ Yes ☐ No

Distance from the well to known buried tank _____

s. Are there any other known contaminant sources on the property?

☒ Yes ☐ No Describe _____

If yes, specify the source: ☐ dump ☐ sewage lagoon ☐ cemetery ☐ other

Potential Source 1: AST 1; Distance from well to Potential Source 1: ~20m

Potential Source 2: AST 2; Distance from well to Potential Source 2: ~30m

Potential Source 3: AST 3; Distance from well to Potential Source 3: ~35m

Potential Source 4: River; Distance from well to Potential Source 4: ~15m
AST 4 @ ~40m, AST 5 @ ~15m, AST 6+7 @ ~60m

t. Are there other wells on this property? ☒ Yes ☐ No

Dug well (abandoned) @ ~35m. Various monitoring wells
How many? _____ ☐ in use ☐ abandoned ☐ require proper sealing

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2. Well and Wellhead information:

- a. When was well installed? Year 1988 Month September
- b. Type: ☒ drilled ☐ dug ☐ sand point ☐ other _____
- c. Is there a drillers log for the well: ☒ Yes ☐ No
- d. Is there a surface seal to 6 m ☐ Yes ☒ No ☐ unknown ☐ unlikely
- e. Surface casing: ☐ Yes Diameter _____ ☒ No
- f. Well casing: Diameter 15 cm Material: ☒ steel ☐ plastic ☐ concrete
- g. Depth of well: 47 ft ☐ measured (if possible) ☐ reported ☒ from log
- h. Static water level below ground: 3.55 m bc
☒ measured (if possible) ☐ reported ☒ from log ☐ flowing
12 ft from log
- i. (If granular) Is the well completed: ☐ open end casing ☒ with a well screen
☐ with slotted pipe ☐ unknown other _____
- j. (If bedrock) Does the well have a liner? ☐ yes ☐ No ☐ steel ☐ plastic
- k. If there is a well screen: length 4 ft slot size(s) 25 slot
Location of screen: from unknown, likely 43 ft to 47 ft to from log reported
- l. Is there a sump below the screen? ☐ Yes ☒ No
- m. Is the well head: ☐ in pumphouse ☐ in pit ☐ pitless adaptor ☐ in a building
☒ in a wooden enclosure other, describe _____
- n. If the well head is located in a wooden enclosure,

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- i. Is the well head below grade? describe in detail ~0.15 m above grade
- ii. Are there signs of ponding on the enclosure(e.g. water stains, etc.)? ☐ Yes ☒ No
- iii. Is the wellhead enclosed by fiberglass insulations? ☒ Yes ☐ No
- iv. Any evidence of rodents? Specify Yes. Mouse droppings in insulation
- v. Does the well casing have a proper seal cap? ☐ Yes ☒ No
- If no, describe condition None present. Well is open

3. Water Supplying This Well:

- a. By definition is the water from a surface water source or under the direct influence of surface water?
- ☒ Yes ☐ No ☐ farther investigation required.

If yes is there treatment or disinfection ☐ Yes ☒ No

Explain (filtration, disinfection etc...) _____

4. Aquifer Supplying This Well:

- a. The aquifer is: ☒ bedrock ☒ granular sediment ☐ unknown
overburden well into broken bedrock
- b. Does water level and/or well capacity show seasonal fluctuation? ☐ Yes ☒ No
unlikely

5. Pump Installation:

- a. Is the well equipped with a pump? ☒ yes ☐ No
- b. Type of pump: ☐ hand ☒ electric submersible ☐ jet
- ☐ shallow well centrifugal ☐ other, _____
- c. Description: Manufacturer _____ Model _____
- horsepower _____ capacity _____ voltage _____

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d. Date installed: _____ By: _____

e. For submersible pump, depth of setting below surface 4.70 m bc

f. Drop pipe for submersible pump: ☐ steel ☒ plastic

g. Pump delivers water to: ☒ pressure tank ☐ elevated tank ☐ other

h. Are there automatic pump controls: ☒ Yes ☐ No

i. Is there provision for taking water samples before water reaches storage? ☒ Yes ☐ No

j. Is there a water meter on the system? ☐ Yes ☒ No

k. Is the pump and piping protected from freezing? ☒ Yes ☐ No

If yes, describe: Heat trace and insulation

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

b. Recommendations: _____

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PART B: EBA Site Inspection

Inspector: BERT ALBISSEER

Date AUG 18/05

WELL ID #	Owner	Location Description
<u>2600</u>	<u>YTG</u>	<u>DEMPSTON GRADER STATION</u>

6. Water Treatment

a. Is well water treated? ☐ Yes ☒ No; Type of treatment:

☐ chlorination ☐ iron and or manganese removal ☐ other _____

b. Is water entering plumbing or piped distribution system treated with chlorine or another treatment that is as effective as chlorine used to achieve disinfection throughout the system?

☐ Yes ☒ No If so how _____

c. If treated with chlorine, is the free residual chlorine concentration less than 0.2 mg/L

☐ Yes ☒ No _____ reading.

Tested at _____ (location)

d. Is testing for chlorine residual concentration done at the tap (eg. Kitchen faucet) or from representative points in a piped distribution system, including a point from tap at the end line

☐ Yes ☒ No If yes how often? _____

e. If the drinking water is being transported by water delivery truck does it have a minimum chlorine free residual of 0.4 mg/L at the time of fill. ☐ Yes ☒ No

7. Water Quality (observations):

a. Does the water stain plumbing? ☒ yes ☐ No ☐ slight ☒ severe

Type of stain: ☐ brown ☒ red ☐ black

b. Does the water contain sediment? ☐ Yes ☒ No ☐ occasional ☐ constant

c. Is there an unpleasant odour? ☒ Yes ☐ No ☐ H₂S ☐ Other _____

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- d. Is there an unpleasant taste? ☒ Yes ☐ No ☐ brackish ☐ Other _____
- e. Is there a history of bad bacterial analyses? ☐ Yes ☐ No
- f. Is there a chemical analysis? ☒ Yes ☐ No ☐ adequate ☐ incomplete
- g. Is there analysis of trihalomethanes (THMs) where the water source is a surface water supply or a well under the direct influence of surface water? ☐ Yes ☒ No
- h. Is the drinking water tested daily with an accurate reading chlorine test kit capable of reading in the range 0 to 3.5 mg/L of free chlorine residual in increments of 0.1mg/L? ☐ Yes ☒ No ☐ unknown
- i. If yes is the test performed in accordance with manufactures directions? ☐ Yes ☒ No ☐ unknown
- j. Is a record of the date, time, name of person performing the test and results of the drinking water sample kept? ☐ Yes ☒ No

TANK AND PIPING DETAILS

Tank Room

Is there a water tank? Yes No Details: PRESSURE TANK

Where is it located?

Comments: RESIDENTIAL COMPLEX MECHANICAL ROOM

Is the room in which the water tank is located heated to maintain an optimum temperature of 4°C for stored water?

YES NO

Comments: _____

Are there windows in the add-on that may allow direct sunlight onto the water holding tank? YES
NO

Comments: _____

Are there other heat sources near the tank? YES NO

Comments: _____

Is there waterproof flooring with a sealed base to contain spills? YES NO

Comments: _____

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Overall Tank

What are the tank size and dimensions?

What material is the tank constructed of? _____

Is tank and associated piping constructed of safe materials (i.e. CSA approved and material that does not affect the taste of the water)? YES NO

Comments: _____

Tank Inlet, Outlet and Lid

Is there adequate access on the tank for cleaning (i.e. min 15" access lid)? YES NO

Does the lid have a tight seal and is it watertight when closed? YES NO

Does the tank have an overflow or high level whistle? YES NO

Is the water tank drain accessible? YES NO

WATER TANK AND WATER QUALITY CONDITION

Are there signs of staining or biofouling? YES NO

Comments: _____

Is there any sediment or scum in bottom of tank? YES NO

Comments: _____

Is there any odour associated with the water or tank? YES NO

Have there been any bacteriological analyses conducted previously? YES NO

Does the tank appear that it has been cleaned recently? YES NO

Are the tanks easily assessed for the purpose of cleaning and disinfection? YES NO

8. Conclusions

a. Comments on overall installation:

THIS IS A PROFESSIONAL INSTALLATION WITH
THE EXCEPTION OF THE WELL HEAD.

b. Recommendations:

LIFT PUMP, CLEAN & SUPER CHLORINATE THE
WELL. INSTALL WATER TREATMENT TO SUIT
THE WATER QUALITY ANALYSIS FOLLOWED
BY 5 MICRON FILTER AND 15 GPM
UV SYSTEM (NECESS CERTIFIED) RETRANGE
PIPING TO SUIT TREATMENT SYSTEM.

Les
trouis
Laurry



Environment
Canada

Environnement
Canada

Enforcement and Emergencies Section
91782 Alaska Highway, Whitehorse, YT Y1A 5B7
PH: 867.667.3400 FAX: 867.667.7962

Spill Report Information

Spill #	0124
Jurisdiction	Yukon
Community	
Address	
Highway	Klondike Highway
Milepost	M 41
Feature	North Klondike River
Location and Cause	Klondike Camp - leaking fuel filter on generator
Latitude	64.4529
Longitude	-138.215
Incident Date	5/19/2001
Lead Agency	Yukon Government - Environmental Programs
Other Agency	
Company(s)	YTG Highways
Amount	
Units	
Quantity	Unknown
Release Description	Leaked
Additional Quantitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	no further info on file



Photo 069: 2600 Klondike grader station facing southeast.



Photo 067: 2600 Wellhead with surrounding enclosure and utilidor.



Photo 065: 2600 Wellhead – note that at the time of the assessment there was no well cap and evidence of mice around the wellhead.



Photo 196: 2600 Abandoned dug well.