9.0 BUILDING 4793: SWIFT RIVER GRADER STATION

9.1 Description of Existing Water system

Building 4793, the Swift River Grader Station, is provided water from a 7 m deep dug well located in the maintenance garage of the grader station. The well location and other details about the surrounding area are provided in Figure 4793-A in Appendix A9. The coordinates of the wellhead, as measured by a GPS device, were recorded as:

- UTM ZONE 9
- Northing: 6653783
- Easting: 377966

Water passes through a sediment filter and then is stored in a 1000 L water storage tank prior to entering the domestic plumbing system. A schematic detailing the water system is provided as Figure 4793-B in Appendix A9. There is a sign posted in the grader station kitchen stating that the water is not for human consumption. Bottled water is provided for drinking.

9.2 Description of Existing Wastewater Systems

The septic field for the Swift River Grader Station is located on the southwest corner of the property approximately 38 m from the well. A site plan showing the location of the septic system is given by Figure 4793-A in Appendix A9.

9.3 Water Quality Results

9.3.1 Water Quality Results from Previous Sampling

Bacteriological

Six samples were collected from the Swift River Grader Station water system between September 2004 and March 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 4793-1 in Appendix A9. Coliform bacteria and *E. coli* were reported as absent in each of the six samples for which results are provided.

Potability

YTG representatives collected a water sample from the Swift River Grader Station water system on October 13, 2004. The sample was submitted to Northwest Labs in Surrey, BC for detailed potability analyses. The results of these analyses are summarized in Table 4793-2 in Appendix A9. EBA reviewed the analytical results to compare them with the CDWQG, to observe general water quality, identify and recommend additional sampling and analytical, and to identify potential indicators of contamination.

- At 2.9 NTU, turbidity exceeded CDWQG health based upper limit of 1.0 NTU;
- At 0.40 mg/L, the iron concentration exceeded the CDWQG aesthetic objective of 0.30 mg/L;
- The water quality results indicated that all other health based and aesthetic objectives were met for the parameters analyzed. The total dissolved solids concentration of 53 mg/L and is considered to be very fresh.
- The hardness (as $CaCO_3$) was 25.9 mg/L, and is considered very soft.

9.3.2 Identification of Additional Analytical Testing Required

Additional analytical that was identified to be included during the water system assessments is detailed below:

- UV absorbance, as well as tannins and lignin, to determine potential for UV treatment as a disinfection option for this water system;
- As turbidity had previously been in exceedence of CDWQG MAC, a sample was taken to analyze for turbidity;
- As total iron had previously exceeded the CDWQG aesthetic objectives, samples were taken to determine total and dissolved iron content;
- Total Organic Carbon to assist with treatment system selection; and,
- Measurements in the field for total dissolved solids, conductivity, pH, and temperature.

Additional Analytical Results

A water sample obtained by EBA during the field program on June 20, 2005, was submitted to ALS Environmental in Vancouver, BC for analysis. These results are summarized in Table 4793-2 in Appendix A9 and the laboratory reports are included in Appendix B.

- At 0.92 NTU, turbidity was below the CDWQG MAC;
- At 0.277 mg/L, the iron content was reported below the CDWQG aesthetic objective.

9.3.3 Indicators of Potential Contamination

Chloride, nitrate and nitrite concentrations can indicate impacts from surface water sources or septic waste. Variability in water quality, particularly turbidity, can indicate that there is a surface water pathway and the groundwater is subject to direct surface water infiltration. Chloride concentrations were low and are considered to be within the normal background ranges for groundwater in the region. Nitrate and nitrite concentrations for this sample were low and are within the normal background range for the region. However, as there were major changes in groundwater quality between the sampling events, and because the well has a production zone less than 15 m below grade, by definition of the Draft Yukon GUDI Assessment Guideline, the well is considered to be under the direct influence of surface water.

9.4 Conceptual Hydrogeology

No log was available for this well, or any other wells in the Swift River area. This well appears to be a dug water table well with a static water depth of 5.12 m. The relatively shallow depth (7.0 m) and shallow static water level of this well indicate that there is likely no significant confining layer present. The direction of groundwater flow as inferred from topography and air photos is east towards Seagull Creek or south towards Swift River. The aquifer would be considered vulnerable to surface sources of contamination.

9.5 Potential Contaminant Sources

Potential contaminant sources observed during the site investigation are provided in field notes in Appendix A9. Photos of potential contaminant sources are also provided.

A summary of potential contaminant sources within 30 m of the well is provided below:

- Used oil tank at 16 m;
- Active industrial activity within 30 m.

9.5.1 Spills Records and Contaminated Sites Search Results

The Government of Yukon Environmental Programs Branch and Environment Canada Environmental Protection Branch identified two spill events for sites neighbouring the Swift River Grader Station, and they are outlined below. No contaminated sites issues, however, were reported for this property or neighbouring properties.

On March 1, 1993, it was identified that approximately 250 L of calcium chloride solution had been accidentally dumped at the Swift River Lodge during a de-icing, but there had been no effort made to collect the solution. The runoff had reportedly travelled towards Swift River, downgradient from this well and would not likely have posed a risk to this water system.

On February 1, 1999, it was identified that approximately 10 L of diesel fuel was spilled at the Yukon Electric Company facility when an EnviroTank was overfilled. The contaminated snow was reportedly removed and this spill likely poses a minimal risk to this water system. This spill location is likely greater than 60 m cross-gradient from this well.

9.6 Identified Water System Deficiencies and Associated Risk

9.6.1 High and Medium Risk Deficiencies

Because there is a sign posted warning that the water is not to be used for human consumption and drinking water is provided for grader station staff, all deficiencies associated with this water system are considered either medium or low risk.

The following deficiencies were identified as medium-risk for the Swift River Grader Station:

- Poor surface completion of the well (located in maintenance garage, only 80 mm above grade);
- The well is not equipped with a surface sanitary seal, (grout or bentonite as required by the Canadian Groundwater Association's Well Construction Guidelines);
- 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), has a production zone less than 15 m below grade, and does not meet the requirements of the Guidelines for Water Well Construction);
- The turbidity has previously been in exceedence of CDWQG MAC. Additionally, seasonal variations in turbidity suggest that the groundwater supplying the well might be subject to surface water infiltration;
- There is no disinfection for this system; and,
- The well is located within 30 m of potential sources of contamination, including a used oil tank at 16 m and an underground fuel storage tank nest at approximately 12 m. The used oil tank is double-walled with secondary containment (EnviroTank). There are also industrial activities occurring within 30 m of the well that could potentially pose a risk to this water system.

9.6.2 Low Risk Deficiencies

The following deficiencies were identified as low-risk for the Swift River Grader Station:

- The iron concentration of the water has been previously reported in exceedence of CDWQG aesthetic objectives;
- The capacity of the well is reportedly inadequate for the grader station (as per conversation with grader station staff).

9.7 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). Deficiencies are categorized as they are assuming that the Government of Yukon Environmental Health and Social Services agrees with the current posted advisory wording "Not for Human Consumption". The Property Management Agency should confirm that this wording is appropriate.

9.7.1 Priority 1

There are no Priority 1 mitigative options for this site, as long as the water is not being used as a source for drinking water.

9.7.2 Priority 2

Because the well is likely under the influence of surface water, and in consideration of the proximity of the well to potential sources of contamination and the other deficiencies associated with this well, it is recommended that water from the current well not be used for human consumption. Three options have been considered to provide a water supply for the Swift River Grader Station:

Option 1:

The water system supplying the grader station may be considered adequate as long as the water is not used for potable purposes. For this option bottled water should continue to be supplied for drinking water. It is recommended, however, that standard wellhead upgrades be done in order to protect the aquifer.

Option 2:

The second option involves abandoning the current well and obtaining potable water from the existing well at the Swift River Living Complex. During the water system assessment it appeared that this well had the least deficiencies and had superior water quality to the other YTG maintained wells in Swift River. This option would involve the following:

- Further study would have to be done on the living complex well in order to determine that this well is suitable to serve the other YTG maintained buildings at Swift River. This would involve obtaining the well log in order to determine the depth, and other wellhead construction details that were unavailable during this assessment. Sustainable well yield would also need to be verified by pumping tests;
- The wellhead at the living quarters requires improvement. Upgrades would involve installing a surface sanitary seal (grout or bentonite) to a depth of at least 3 m, and extending the well casing at least 500 mm above grade;
- A underground piped water distribution line should be installed, and should be properly freeze-protected through heat-trace and insulation; and,
- An NSF/ANSI 55 certified UV disinfection system complete with NSF-61 certified pre-filtration to 1 micron absolute should be installed near the point of entry in the Swift River Living complex.

These are conceptual design recommendation based on the information available, and are intended to be used for planning and budgeting purposes. Engineering input will be required for final system specifications or design.

Option 3:

The third option considered involves construction of a new well. A new well could potentially be used to supply all the YTG maintained buildings in Swift River, including the grader station, living complex, and foreman's residence. The new well should be constructed in consideration of the following recommendations:

- The well should be equipped with a surface seal to at least 6 m and the casing should be extended above grade (500 mm) within a lockable enclosure that is inaccessible to animals and unauthorized personnel;

- The well should be located upgradient from the current well and must be greater than 30 m from any potential source of contamination;
- 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; and
- An NSF/ANSI certified UV disinfection system should be installed at a centralized location complete with adequate NSF approved pre-filtration.

These are conceptual design recommendations based on the information available, and are intended to be used for planning and budgeting purposes. Engineering input will be required for final system specifications or design.

9.7.3 Priority 3

Low-risk deficiencies would be mitigated through high-risk upgrades.

9.8 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.

9.8.1 Priority 2

Class D cost estimates for mitigative options to address the well deficiencies for this site are outlined below.

Option 1:

- Extending the steel culvert around the wellhead to at least 500 mm above the maintenance garage floor, as well as other standard upgrades to protect the aquifer, would cost in the order of **$500**.

Option 2:

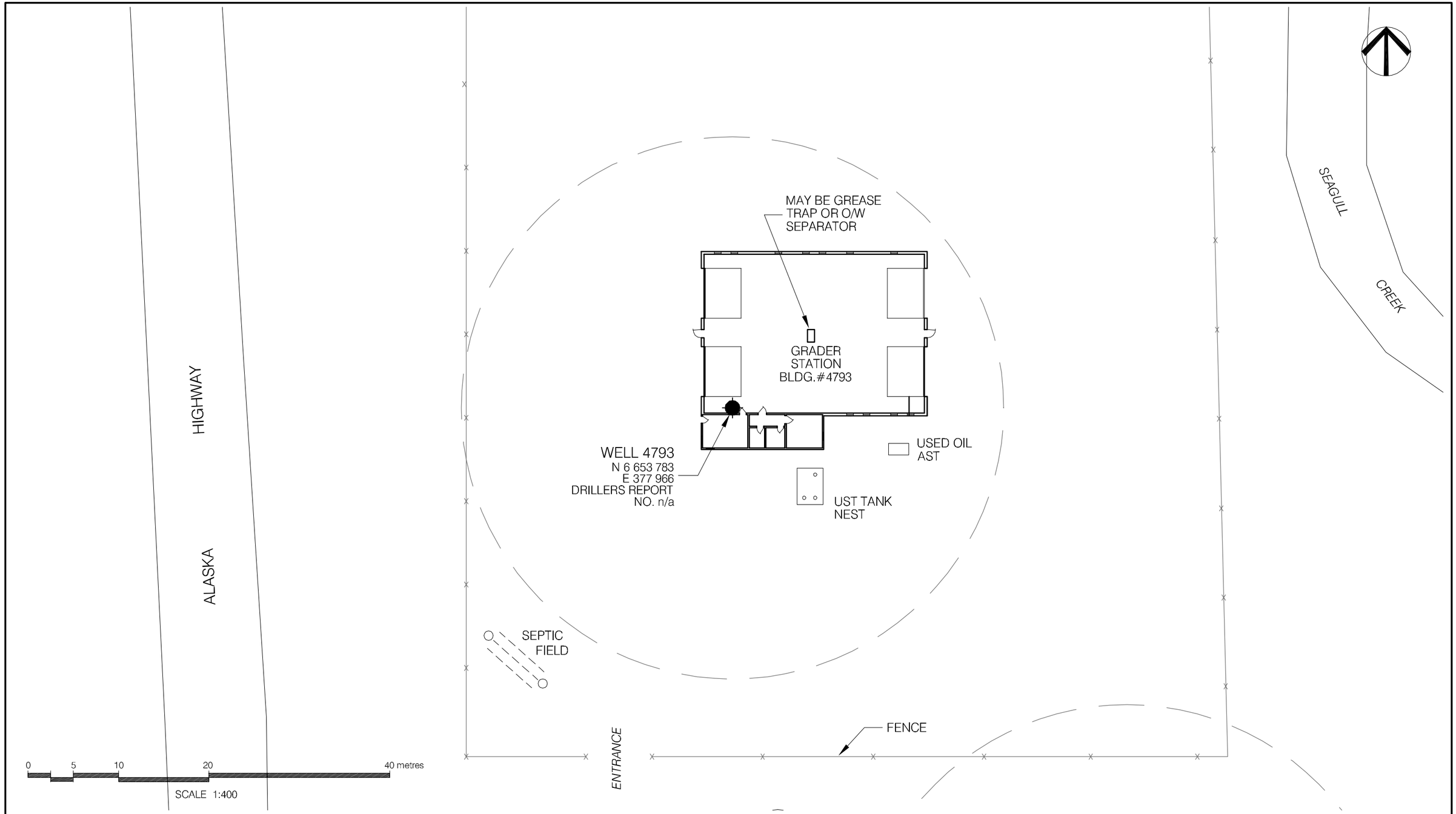
- Obtaining the well log (if possible), and completion of additional system assessment, would likely cost in the order of **$2,000**. Since this well would

serve three sites, the cost to the grader station building would be approximately **$700**;

- The cost associated with improving the living quarters well would cost in the order of **$5,000**. Since this well would serve three sites, the cost to the grader station would be approximately **$1,700**;
- Approximately 70 m of water distribution line, installed shallow with adequate freeze protection, assuming $120 per metre installed, would cost about **$8,400**;
- Filtration and UV disinfection system would cost in the order of **$3,700** installed. Since this proposed treatment/disinfection system would be located in a centralized location that would serve all three sites the cost to the grader station could be considered as **$1200**, and,
- The existing well should be properly decommissioned in accordance with the Guidelines for Water Well Construction. This would cost approximately **$500**.

Option 3:

- It is recommended that **$30,000** be budgeted for materials and labour to drill, test, and complete the well. Since this well would serve three sites, the cost to the grader station would be approximately **$10,000**;
- Approximately 200 m of water distribution line would be required to serve all three buildings, and assuming $120 per metre, this would amount to a total installed cost of **$24,000**. Note that for this option, heat trace would need to be extended from each building, to the middle of the distribution pipe. Since this well would serve three sites, the cost to the grader station would be in the order of **$8,000**;
- An adequate disinfection system would cost in the order of **$1200** assuming costs are split between the three systems that would be served by this well;
- If the new well is successful, the old well should be decommissioned in accordance with Guidelines for Water Well Construction. It is estimated that this would cost approximately **$500**.



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.	DESCRIPTION	DD/MM/YY	APPROVED
0	ISSUED FOR CLIENT REVIEW	XXX	

REVISION

EBA Engineering Consultants Ltd.

DESIGNED BY:	R. MARTIN
DRAWN BY:	J. BUYCK
DATE:	JULY 2005
SCALE:	AS SHOWN
PROJECT No.:	1260002.002
ACAD FILENAME:	002-EASTERN REGION

CLIENT: Yukon Highways and Public Works Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
EASTERN REGION

GOVERNMENT OF YUKON
HIGHWAYS & PUBLIC WORKS

SWIFT RIVER GRADER STATION
BUILDING # 4793
SITE LOCATION DIAGRAM
WELL ID: 4793

REVISION ISSUE 0

FIGURE No. FIGURE 4793-A

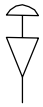
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

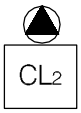

SOLENOID

#2 COMPONENT ID. No.
(SEE TABLE ON FOLLOWING PAGE)

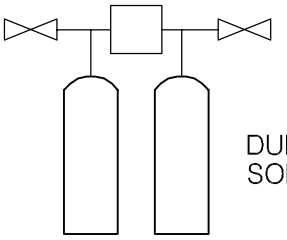
FLOW METER

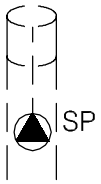
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

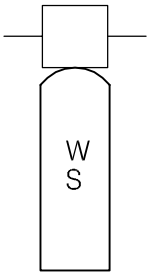


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

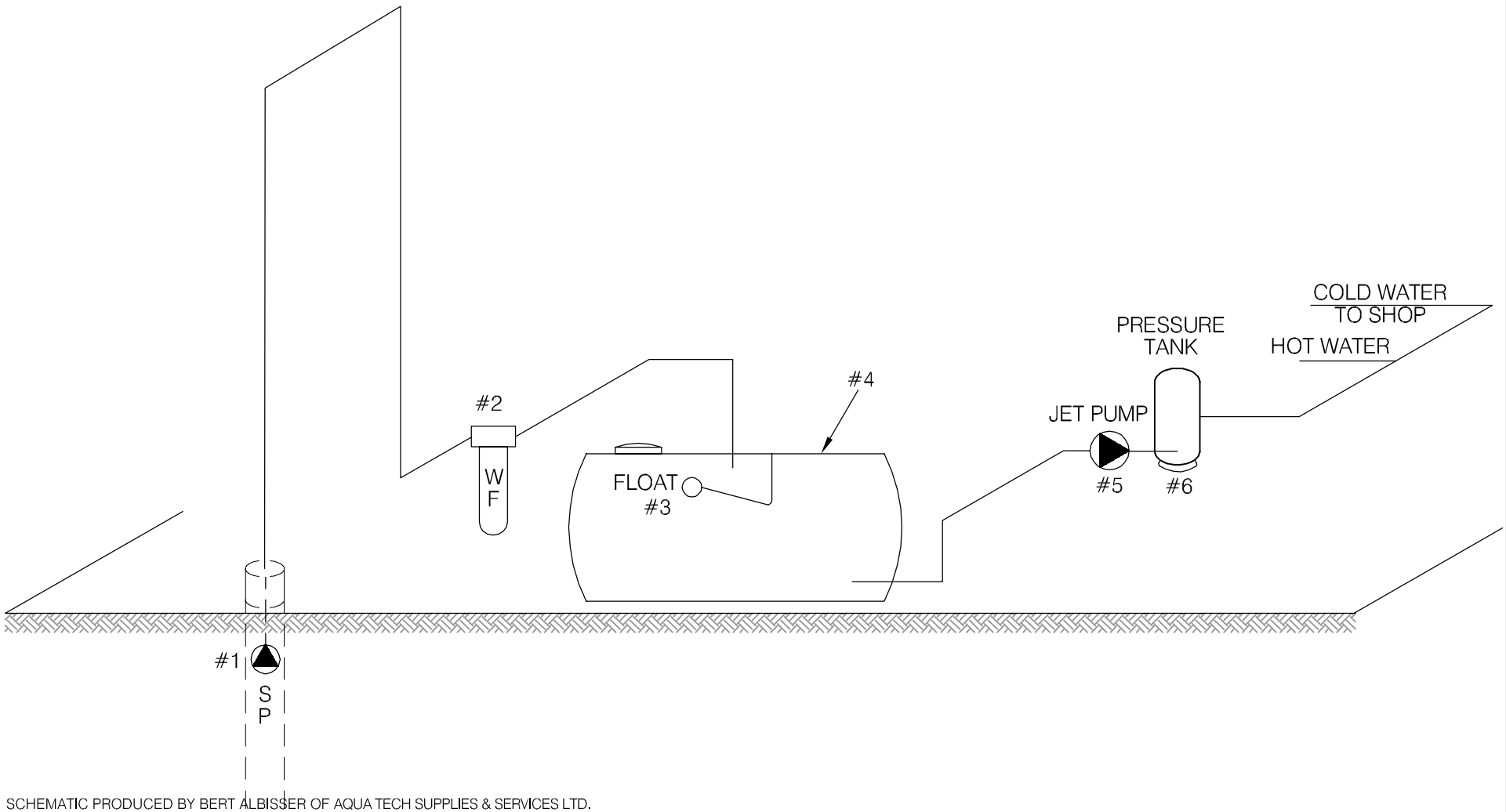


WELL WITH
SUBMERSIBLE PUMP



ACTIVATED
CARBON

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



SCHEMATIC PRODUCED BY BERT ALBISSER OF AQUA TECH SUPPLIES & SERVICES LTD.

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT EASTERN REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 4793 SWIFT RIVER GRADER STATION	
DATE JULY 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.002		DWG.: FIGURE 4793-B

Z:\0201Drawings\1260002 Water Assessment YTG\002 - Eastern Region\swift\1260002 Swift River Grader Station_4793 Schematic.dwg, 7/20/2005 4:02:41 PM, Adobe PDF

Eastern Region – Swift River Grader Station
Building # 4793

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	SUB. PUMP	GRUNDFOS	SQ			3" - 1"
2	IN LINE FILTER	AMETEK	10" BB			10" x 1"
3	FLOAT CONTROL	STE RHOMBUS	PUMPMASTER	-PUMP UP		
4	STORAGE TANK	MARMIT	HORIZONTAL	LEE TANK		250 GALLON
5	JET PUMP	MONARCH	MJC-60			1/2 HP.
6	PRESSURE TANK	CON AIRE	SCA42E			25 GALLON
7						
8						
9						
10						

TABLE 4793- 1: SUMMARY OF BACTERIOLOGICAL RESULTS

Building #	Building Name	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?
4793	Swift River Grader Station	6	Sept-04 to Mar-05	no	0/6	no	9-Mar-05	no

Table 4793-2: Water Quality Results

Location/ Resident	Swift River		GCDWQ Criteria		
Address	km 1181 Alaska Highway				
Treatment	Sediment Filter				
Disinfection	No				
Source of Water	On-Site Well				
Purpose of Sampling	Baseline	Additional Sampling			
Sample Location		Kitchen Tap			
Date Sampled	13-0ct-04	20-Jun-05	**Lower Limit**	**Upper Limit**	
Physical Tests *(ALS)*			**AO**	**MAC**	**AO**
Colour (CU)	10				15
Total Dissolved Solids	53				500
Hardness CaCO3	25.9		AO >200 = poor, > 500 unacceptable[A]		
pH	7.29		6.5		8.5
Turbidity (NTU)	2.9	0.92		1	5
UV Absorbance		0.011			
Dissolved Anions *(ALS)*					
Alkalinity-Total CaCO3	35				
Chloride Cl	8.2				250
Fluoride F	0.74			1.5	
Sulphate SO4	4.66				
Nitrate Nitrogen N	0.06			10	
Nitrite Nitrogen N	<0.005			1	
Total Metals *(ALS)*					
Aluminum T-Al	0.022				
Antimony T-Sb	<0.0002			0.006	
Arsenic T-As	<0.0002			0.025	
Barium T-Ba	0.016			1	
Boron T-B	0.004			5	
Cadmium T-Cd	0.00002			0.005	
Chromium T-Cr	<0.0005			0.05	
Copper T-Cu	0.574			1	
Iron T-Fe	0.40	0.277			0.3
Lead T-Pb	0.0043			0.01	
Manganese T-Mn	0.012				0.05
Sodium T-Na	8.8				200
Uranium T-U	0.0005			0.02	
Zinc T-Zn	0.189				5
Dissolved Metals					
Iron D-Fe		<0.030			0.3
Organic Parameters					
Tannin and Lignin		0.10			
Total Organic Carbon C		0.72			
Field Chemistry (EBA)					
pH		8.25	6.5		8.5
TDS (ppm)		108			500
EC (uS/cm)		218			
Temperature (°C)		15.7			

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)

eba

Table 4793-3: Summary of Well Assessment Results
SMALL PUBLIC DRINKING WATER SYSTEMS

Well Identification			GPS Coordinates		
Building #	**Building Name**	**Location**	**Northing (+/- 10 m)**	**Easting (+/- 10 m)**	**Grade Elevation (+/- 10 m)**
4793	**Grader Station**	**Swift River**	6653783	377966	888

Well Details							
Well Casing Diameter (mm)	**Year Well Installed**	**Well Log?**	**Well Depth (m bg)**	**Reported Low Permeabilty Protective Layer?**	**Pump Setting (m bg)**	**Well Capacity - Tested, or Reported by User**	**Static Water Level Below Ground (m-btwc)**
100 mm pvc pipe		No	6.96 (may be pump)	Unlikely		Well has very low yield	5.2

Potential Contaminant Sources					
Distance from well to nearest point of septic field (m)	**Distance from well to nearest building (m)**	**Distance to surface water body (m)**	**AST present on property?**	**Distance from well to AST (m)**	**Other potential sources of contamination observed on property, and distance to well**
38	Inside maintenance garage	Approximately 60 m to Swift River			Used oil tank at 16 m

Well Construction Details					
Wellhead Above ground (m)	**Well Cap**	**Well Screen**	**Surface Seal**	**Apron Grading**	**Comments**
0.08 m above grade	No		No	No	This well is likely a dug well

EBA Engineering Consultants Ltd.
Creating and Delivering Better Solutions

SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin, Luke Lebel Date June 20, 2005

WELL ID #	Owner	Location Description
4793	YTG	Swift River Grader Station

1. Well Location and Potential Contaminant Sources

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

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

c. GPS location: N 6653783 E377966 elv 888m ±11m

d Is there electric power? ☒ Yes ☐ No

e 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_____
Swift River Grader Station

☐ 5 or more delivery sites on a trucked distribution system? If so how many_____

g. Nearest building, specify Swift River Grader Station

h. Distance from well to building located inside

i. If there is an effluent disposal field, is its location known? ☒ Yes ☐ No N 6653771 E 377942

j. Distance from well to nearest point of known field: 38m

k. Well location relative to field: ☒ upslope slightly ☐ downslope ☒ lateral

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
Located inside maintenace garage on floor

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
located inside maintenance garage

Entrance by animals? ☐ Yes ☒ No
No signs of animals, access possible

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

q. Is the well site well drained? ☒ Yes ☐ No
floor slopes toward garage sump

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

If yes, is it ☒ in use ☐ abandoned

Is the location known? ☒ Yes ☐ No

Distance from the well to known buried tank ~12m

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: Used oil AST ; Distance from well to Potential Source 1: ~16m
Potential Source 2: Seagull Creek; Distance from well to Potential Source 2: ~40m
Potential Source 3: _____; Distance from well to Potential Source 3: _____
Potential Source 4: _____; Distance from well to Potential Source 4: _____

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

How many? 2 ☒ in use ☐ abandoned ☐ require proper sealing
living complex + utility building wells

2. Well and Wellhead information:

a. When was well installed? Year unknown Month _____

b. Type: ☐ drilled ☒ dug likely ☐ 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
Rudementary; not fixed

f. Well casing: Diameter 10 cm Material: ☐ steel ☒ plastic ☐ concrete inside 30cm steel culvert

g. Depth of well: 6.96m bg could be pump ☒ measured (if possible) ☐ reported ☐ from log

h. Static water level below ground: 5.20m bg

☒ measured (if possible) ☐ reported ☐ from log ☐ flowing

i. (If granular) Is the well completed: ☐ open end casing ☐ with a well screen

☐ with slotted pipe ☐ unknown other unknown

j. (If bedrock) Does the well have a liner? ☐ yes ☐ No ☐ steel ☐ plastic unknown

k. If there is a well screen: length unknown slot size(s) _____
Location of screen: from _____ to _____ from log reported

l. Is there a sump below the screen? ☐ Yes ☐ No unknown

m. Is the well head: ☐ in pumphouse ☐ in pit ☐ pitless adaptor ☒ in a building
Maintenance garage of grader station

☐ in a wooden enclosure other, describe _____

n. If the well head is located in a wooden enclosure,

i. Is the well head below grade? describe in detail_____

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 No signs, access possible

v. Does the well casing have a proper seal cap? ☐ Yes ☒ No

If no, describe condition unfixed, Ø15cm lid over culvert + pvc pipe

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 ☐ Yes ☒ No

Explain (filtration, disinfection etc…)_____

---

4. Aquifer Supplying This Well:

a. The aquifer is: ☐ bedrock ☒ granular sediment likely ☐ unknown

b. Does water level and/or well capacity show seasonal fluctuation? ☐ Yes ☐ No
well very low yield

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 _____

d. Date installed: _____ By: _____

e. For submersible pump, depth of setting below surface _____

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

g. Pump delivers water to: ☒ pressure tank ☒ ~~elevated~~ storage 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: located inside maintenance garage

l. Comments on pump installation: _____

_____

6. Conclusions

a. Comments on overall installation:

_____

_____

_____

_____

_____

_____

_____

b.Recommendations: _____

_____

_____

_____

_____

_____

_____

PART B: EBA Site Inspection

Inspector: BERT AUBISSEK Date JUNE 20/05

WELL ID #	Owner	Location Description
4793	VTG.	SWIFT RIVER GRAVEL STATION

6. **Water Treatment**

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

☐ chlorination ☐ iron and or manganese removal ☑ other IN LINE SEDIMENT FILTER.

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 ☐ H_2S ☐ Other _____

WATER NOT USED FOR DRINKING WATER

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:

Where is it located?
Comments: IN SHED AREA.

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:

Overall Tank

What are the tank size and dimensions?
30" Ø x 52" LONG.

What material is the tank constructed of? POLYETHELYNE

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 N/A.

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 SHALLOW WELL SYSTEM. THE WELL IS LOCATED IN THE SHED AREA AND DOES NOT HAVE A SANITARY SEAL. STORAGE TANK HAS TO BE REMOVED FROM THE SYSTEM TO ACCESS IT FOR CLEANING.

b. Recommendations:

DRILL A PROPER WATER WELL FOR THIS FACILITY.

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 #	9321
Jurisdiction	Yukon
Community	
Address	
Highway	Alaska Highway
Milepost	M 733
Feature	Swift River
Location and Cause	Swift River Lodge - de-icing operation being conducted without collection of solution
Latitude	60.0080555555556
Longitude	-131.184166666667
Incident Date	3/1/1993
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	
Company(s)	Swift River Lodge
Amount	250
Units	Litres
Quantity	Estimate
Release Description	Dumped
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Calcium Chloride
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	de-icing solution not being contained - no runoff to river yet but potential - advised operation to be moved and solution contained - toxic to fish

Environment Canada Environnement Canada

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Spill Report Information

Spill #	9902
Jurisdiction	Yukon
Community	Swift River
Address	
Highway	Alaska Highway
Milepost	M 733
Feature	Swift River
Location and Cause	YECL Envirotank overfilled - tanker truck driver unsure of storage tanks capacity
Latitude	60.004
Longitude	-131.1864
Incident Date	2/1/1999 11:50:00 AM
Lead Agency	Yukon Government - Environmental Programs
Other Agency	
Company(s)	Healey Enterprises (Fort Nelson, BC)
Amount	10
Units	Litres
Quantity	Estimate
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	fuel ran down sides of tank into snow - contaminated snow to be recovered and free product soaked up - pump shut off as soon as fuel came out vent - no further information

Photo 0232: 4793 Wellhead in maintenance garage

Photo 0229: 4793 Wellhead

Photo 0235: 4793 Septic field

Photo 0236: 4793 Underground fuel storage tank nest (front), used oil tank (back), maintenance garage (back left)

Photo 0230: 4793 Well

Photo 0231: 4793 Water storage tank

Photo 0228: 4793 Sign warning that water is not to be used as drinking water