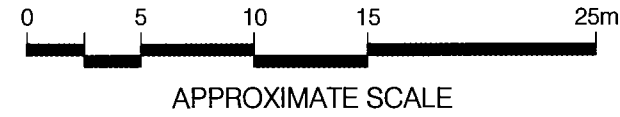
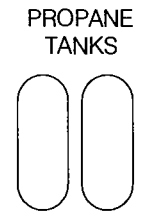
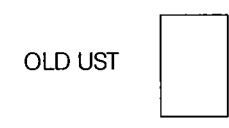



WELL 1153
 N 6 671 418
 E 516 896
 DRILLERS REPORT
 NO. 204020037




NOTES:
 1. UTM COORDINATES OBTAINED WITH A HAND HELD GPS USING NAD83 SYSTEM AND ARE CONSIDERED TO BE ACCURATE TO 10.0 m, APPROXIMATELY.
 2. LOCATION OF BUILDINGS & STRUCTURES ON THIS PROPERTY ARE APPROXIMATE ONLY.

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

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

EBA Engineering Consultants Ltd.

DESIGNED BY: R. MARTIN
 DRAWN BY: J. BUYCK
 DATE: JUNE 2005
 SCALE: AS SHOWN
 PROJECT No.: 1260002.001
 ACAD FILENAME: 001-WHITEHORSE REGION

CLIENT:

 Highways and Public Works
 Property Management Branch

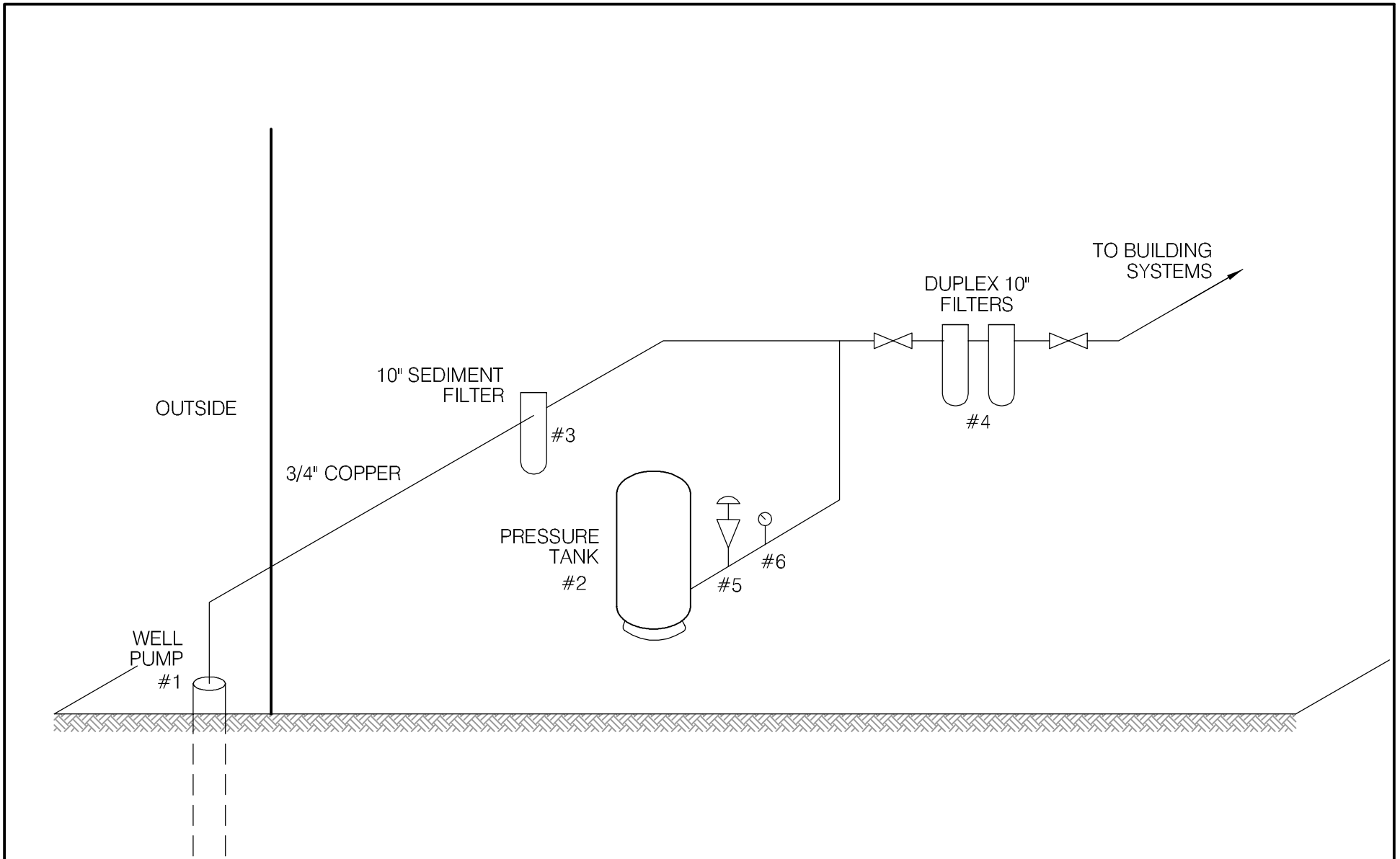
SMALL PUBLIC WATER SYSTEMS ASSESSMENT
 WHITEHORSE REGION

GOVERNMENT OF YUKON
 HIGHWAYS & PUBLIC WORKS



CARCROSS YTG GRADER
 STATION BUILDING 1135
 SITE LOCATION DIAGRAM
 WELL ID: 1153

REVISION ISSUE
 0

DRAWING No.
 FIGURE 1153A



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

 EBA Engineering Consultants Ltd.		PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT WHITEHORSE REGION	
CLIENT  Highways and Public Works Property Management Branch		TITLE WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 1153 CARCROSS GRADER STATION	
DATE	APRIL 2006	DWN.	JSB
CHKD.	FMM	FILE NO.	1260002.001
		DWG.:	FIGURE 1153B

**Whitehorse Region – Carcross Grader Station
Building # 1153**

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	4" SUBMERSIBLE PUMP					
2	PRESSURE TANK	CHALLENGER	PC66			
3	SEDIMENT FILTER	OMNI PURE	10"			
4	DUPLEX FILTER	AMETEK 10"	10" CLEAR.	CPS GAC10		3/4" x 10"
5	PRESSURE SWITCH	PUMPTROL	FSG2			1/4" FIPT.
6	PRESSURE GAUGE		2 1/2"			0-100PSI
7						
8						
9						
10						

Table 1153-2: Water Quality Results

SOURCE:		Building 1153 - Carcross Grader Station			GCDWQ Criteria		
Location/ Resident Address		Carcross Lot 10101					
Treatment		Filtration					
Source of Water		On-Site Well					
Purpose of Sampling		Baseline	Additional Sampling	Baseline			
Sample Location		Kitchen Tap					
Date Sampled		1-Nov-04	11-May-05	26-Jun-05	Lower Limit	Upper Limit	
Physical Tests (ALS)					AO	MAC	AO
Colour (CU)		25		<5			15
Conductivity (uS/cm)		584		610			
Total Dissolved Solids		332		377			500
Hardness CaCO3		294	269	308	AO >200 = poor, > 500 unacceptable ^A		
pH		7.9		8.14	6.5		8.5
Turbidity (NTU)		1.4		17.0		1	5
UV Absorbance			<0.0010				
Dissolved Anions (ALS)							
Alkalinity Total - CaCO3		245		282			
Chloride Cl		2		1.00			250
Fluoride F		0.38		0.317		1.5	
Sulphate SO4		71.0		88.6			500
Nitrate Nitrogen N		<0.1		<0.10		10	
Nitrite Nitrogen N		<0.05		<0.10		1	
Ammonia Nitrogen N							
Total Metals (ALS)							
Aluminum T-Al		<0.02		<0.010			
Antimony T-Sb		<0.0004		<0.0005		0.006	
Arsenic T-As		0.0177		0.0158		0.025	
Barium T-Ba		0.0423		0.035		1	
Boron T-B		<0.02		<0.10		5	
Cadmium T-Cd		<0.0002		<0.0002		0.005	
Calcium T-Ca		57.5		62.8			
Chromium T-Cr		0.001		<0.0020		0.05	
Copper T-Cu		0.003		0.0015		1	
Iron T-Fe		1.06		1.23			0.3
Lead T-Pb		0.0004		<0.0010		0.01	
Magnesium T-Mg		32.9		36.7			
Manganese T-Mn		0.068		0.0635			0.05
Mercury T-Hg		<0.0002		<0.0002		0.001	
Potassium T-K		2.8		2.62			
Selenium T-Se		<0.0004		<0.0010		0.01	
Sodium T-Na		14		16.8			200
Uranium T-U		0.0047		0.00457		0.02	
Vanadium T-V							
Zinc T-Zn		0.059		<0.050			5
Dissolved Metals (ALS)							
Aluminum D-Al			<0.10			0.1	
Antimony D-Sb			<0.0050			0.006	
Arsenic D-As			0.0182			0.025	
Barium D-Ba			<0.20			1.0	
Boron D-B			<1.0			5	
Cadmium D-Cd			<0.0020			0.005	
Calcium D-Ca			59.9				
Chromium D-Cr			<0.020			0.05	
Cobalt D-Co							
Copper D-Cu			<0.010			1.0	
Iron D-Fe			0.526			0.3	
Lead D-Pb			<0.010			0.01	
Lithium D-Li							
Magnesium D-Mg			29.1				
Manganese D-Mn			0.08				0.05
Mercury D-Hg			<0.00020			0.001	
Molybdenum D-Mo							
Nickel D-Ni							
Potassium D-K			2.8				
Selenium D-Se			<0.010			0.01	
Silver D-Ag							
Sodium D-Na			11.5				200
Uranium D-U			0.0049			0.02	
Zinc D-Zn			<0.50				5.0
Trihalomethanes							
Bromochloromethane			-				
Bromoform			-				
Chloroform			-				
Dibromochloromethane			-				
Total Trihalomethanes			-			0.1	
Organic Parameters							
Tannin and Lignin							
Total Organic Carbon C							
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				
Haloacetic Acids							
Bromoacetic Acid			-				
Bromochloroacetic Acid			-				
Chloroacetic Acid			-				
Dibromoacetic Acid			-				
Dichloroacetic Acid			-				
Trichloroacetic Acid (TCA)			-				
Field Chemistry (EBA)							
pH			7.71		6.5		8.5
TDS (ppm)			235				500
EC (uS/cm)			460				
Temperature (deg C)			10.3				
Free Available Chlorine (mg/L)							

Notes:
 A. Guidelines indicated for hardness are not CDWQG, rather they are general aesthetic guidelines - exceedences are indicated in yellow highlighting.
 Shading indicates exceedence of Proposed MAC guideline (arsenic).
Bold Underline with Yellow shading 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)



**Table 1153-3: Summary of Well Assessment Results
SMALL PUBLIC DRINKING WATER SYSTEMS**

Well Identification and Location					
Building #	Building Name	Location	Northing (+/- 10 m)	Easting (+/- 10 m)	Grade Elevation (+/- 10 m)
1153	Carcross Grader Station	Carcross	6671418	516896	675

Well Details							
Well Casing Diameter (mm)	Year Well Installed	Well Log?	Well Depth (m bg)	Reported Low Permeability Protective Layer?	Pump Setting (m bg)	Well Capacity - Tested, or Reported by User	Static Water Level Below Ground (m-btwc)
150	1984	No	?	?	?	?	?

Well Construction Details				
Wellhead Above ground (m)	Well Cap	Well Screen	Surface Seal	Apron Grading
Approximately at grade (within 0.01)	Split Cap Gasket	?	Unlikely	Slopes towards wellhead enclosure

**Table 1153-4: Potential Contaminant Sources
Building 1153 – Carcross Grader Station:**

Potential Contaminant Source	Potential Contaminants	Distance from Water Source	Northing	Easting
Rock Pit	<i>Organic</i> and inorganic chemicals.	9 m		
Vehicle Parking	<i>Biological</i> ¹ , inorganic ² and organic parameters.	2 m		
Waste Oil Tank	<i>Biological</i> , inorganic and organic parameters.	18 m		
Drums	<i>Biological</i> , inorganic and organic parameters.	30 m to 60 m		
Septic tank	<i>Biological and Inorganic</i> parameters.	22 m		
Septic Field	<i>Biological and Inorganic</i> parameters.	34 m	6671388	516858
Salt Storage	<i>Inorganic</i> parameters	22 m		
Sewage lines, tanks or lift stations	<i>Biological</i> , inorganic and organic parameters.	Approx. 20 m		
Above ground storage tanks (ASTs)	<i>Organic parameters.</i>	N/A		
Naturally occurring sources of contamination	<i>Radionuclides, Bacteria and Viruses from surfacewater sources.</i>	Well Head in Pit.		

Notes: *Bold highlighting of distances indicates non-compliance with proposed guidelines*

1- Biological parameters include: bacteria, viruses, protozoa (parasitic organisms), helminthes (intestinal worms), and bio aerosols (inhalable moulds and fungi).

2 – Inorganic contaminants could include arsenic in embalming chemicals (prior to early 1900's), and heavy metals in caskets.

Required Setback Distances Draft Guidelines for Part III – Small Public Drinking Water Systems:

300 m (1,000 ft) from a sewage lagoon or pit and manure heaps

120 m (400 ft) from a solid waste dump or a cemetery

30 m (100 ft) from any other potential source of contamination

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SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin
Luke Lebel

Date May 11, 2005

WELL ID #	Owner	Location Description
1153	YTG	Carcross Grader Station

1. Well Location and Potential Contaminant Sources

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

Carcross

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

Carcross Grader Station, Tagish Road

c. GPS location: 516898 Easting 6671480 Northing 675m ± 6m

d. Is there electric power? Yes No

e. Does the well system have:

15 or more service connections to a piped distribution system? If so how many _____

Services carcross maintenance camp

5 or more delivery sites on a trucked distribution system? If so how many _____

f. Nearest building, specify Carcross Maintenance Camp Garage

g. Distance from well to building 4m

h. If there is an effluent disposal field, is its location known? Yes No

i. Distance from well to nearest point of known field: ~34m

j. Well location relative to field: upslope downslope lateral

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k. 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

Sewage tank ~22m away, Field 34m away, Rock pit and used oil

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

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

n. 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 Entrance by animals? Yes No
only painted tin casing and put plywood unfastened on top There are few signs of animals

o. Is well site subject to flooding? Yes No
Heavy water stains and dampness, still wet after a long period of dry weather. Signs of flooding.

p. Is the well site well drained? Yes No
There is little drainage surrounding ground is level with the height of the well head or slightly above

q. 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 _____

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

Yes No Describe _____

If yes, specify the source: dump sewage lagoon cemetery other
salt ~22m away

Potential Source 1: Used oil; Distance from well to Potential Source 1: 18m

Potential Source 2: Vehicle Park; Distance from well to Potential Source 2: 2m

Potential Source 3: Rock Pit; Distance from well to Potential Source 3: 9m

Potential Source 4: Metal Parts; Distance from well to Potential Source 4: Within 10m
- Drums less than 60m but greater than 30m
- Hopper into building - GWT

s. Are there other wells on this property? Yes No

How many? _____ in use abandoned require proper sealing

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2. Well and Wellhead information:

- * a. When was well installed? Year _____ Month _____
- 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 122cm No
prf wooden enclosure with painted tin casing
- f. Well casing: Diameter 15cm Material: steel plastic concrete
- * g. Depth of well: _____ measured (if possible) reported from log
- * h. Static water level below ground: _____
 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 _____
- * j. (If bedrock) Does the well have a liner? yes No steel plastic
- * k. If there is a well screen: length _____ slot size(s) _____
Location of screen: from _____ to _____ from log reported
- l. Is there a sump below the screen? Yes No *unlikely*
- m. Is the well head: in pumphouse in pit pitless adaptor in a building
A wooden prf enclosure with a tin casing.
 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 well head is almost exactly at grade level
- ii. Are there signs of ponding on the enclosure (e.g. water stains, etc.)? Yes No
There are signs of dampness on the pvt studs and on piping insulation. Ponding likely. There is also rust on well head.
- iii. Is the wellhead enclosed by fiberglass insulations? Yes No
well head is not insulated. Piping has styrofoam insulation and sackcloth blanket to insulate it
- iv. Any evidence of rodents? Specify There are some (few) mouse droppings
- v. Does the well casing have a proper seal cap? Yes No
If no, describe condition split cap. Although it is rusty and grimy with small open holes for heat trace and electrical

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...) only a 3-line filters

4. Aquifer Supplying This Well:

* a. The aquifer is: bedrock granular sediment unknown

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

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 _____

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 on all piping and insulation on above ground

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

-There is a major concern with flooding. There is evidence that the well casing and surface casing has been flooded due to rust, status, ect.
-The well is in very close proximity to many potential contaminants such as salt, metal, used oil, effluent,

b. Recommendations: _____

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PART B: EBA Site Inspection

Inspector: BERT ALBISSER

Date MAY 11/05

WELL ID #	Owner	Location Description
1153	YTG	CARCROSS MAINTENANCE CAMP

6. Water Treatment

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

chlorination iron and or manganese removal other SEDIMENT

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 ~~no~~
- 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: _____

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

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8. Conclusions

a. Comments on overall installation:

SYSTEM IS NOT UP TO NEW STANDARDS.

b. Recommendations:

INSTALL CHLORINATION SYSTEM WITH PROPER RETENTION FACILITY. IMPROVE FILTRATION SYSTEM TO COMMERCIAL QUALITY FILTERS.
RAISE WELL CASING TO 18" ABOVE GRADE AND INSTALL PROPER SURFACE SEAL.
INITIATE CHLORINE RESIDUAL TESTING PROCEDURE.

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PART C Property Manager/ System Operator Questionnaire

Inspector: TERRY JACKSON Date May 10 2005

Property manager: Y.T.G. Carcross Casader station

1) Water Source:

- a. Is the well water the major source of drinking water? Yes No
- b. Is the well water used for other non-drinking purposes? Yes No

2) Well information:

- a. When was your well installed? Year 1984 Month _____
- b. Type: drilled dug sand point other _____
- c. Is there a driller's log for the well?: Yes No
- d. Do you know the depth of your well? If so, please indicate: 110' 1/2 hp pump.
- e. Who was the well constructed by?
Indicate contractor's name: _____
- f. Are you, the owner Yes or other: _____
- g. Who maintains the well? Y.T.G.
- h. Are there other wells on this property? Yes No
How many? ____; Are they: in use abandoned require proper sealing
- i. Is there a buried fuel tank on the property? Yes No
If yes, is it in use abandoned
Is the location known? _____
How was it abandoned? _____

3) Pump Installation

- a. Who installed your pump, and when did they install it? _____
- b. What type of pump do you have? _____
- c. Pump delivers water to: pressure tank elevated tank other _____

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4) Water Treatment

a. Is your well water treated? Yes No

Type of treatment: chlorination iron and or manganese removal

other filters

5) Well Capacity:

a. Well capacity: User's opinion adequate inadequate

b. Are there any times of year when your well goes dry, or does not produce enough water?

c. Has well capacity decreased since it was installed? Yes No

6) Water Quality:

a. In general, do you like your water?: yes no

b. Does the water stain household plumbing? yes No slight severe

Type of stain: brown red black

c. Does the water contain sediment? Yes No occasional constant

d. Is there an unpleasant odour? Yes No

Sulphur (rotten egg smell) Other _____

e. Is there an unpleasant taste? Yes No brackish Other _____

f. Hardness: Is it hard to lather with soap?: yes, very moderate no

g. Is water softener being used? Yes No

h. Are samples for bacterial analysis (coliforms) taken regularly? Yes No

If so, at what time intervals? _____
Who takes them? _____

i. Is there a history of bad bacterial analyses? Yes No

j. Is there a chemical analysis? Yes No adequate incomplete

7) Do you have any overall comments or complaints about your water well system?

should only be used for non-potable situations

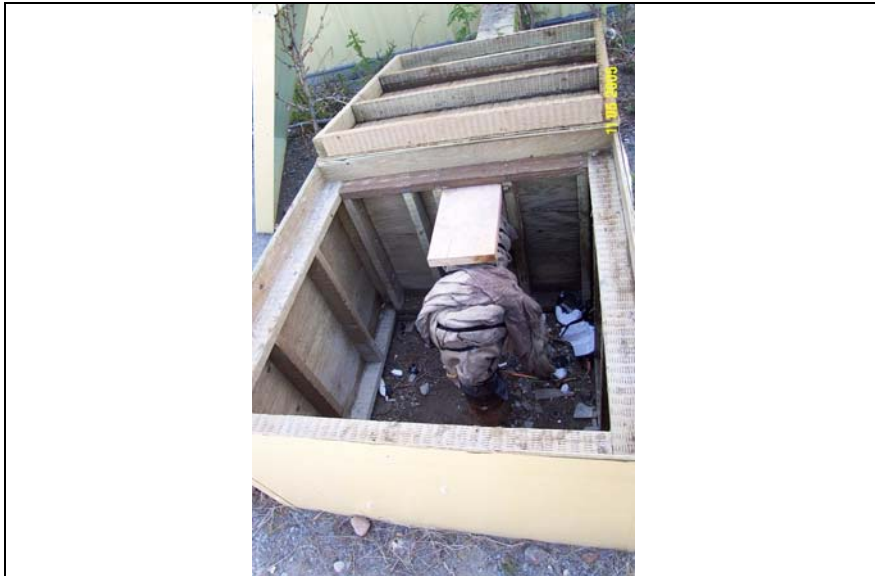


Photo 0131: 1153 Well Head



Photo 0134: Floor Drain System



Photo 0135: Water Tanks/Brine Tanks



Photo 0136: Pressure Tank and Three In-Line Filters