



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 BUILDING ON PROPERTY IS 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

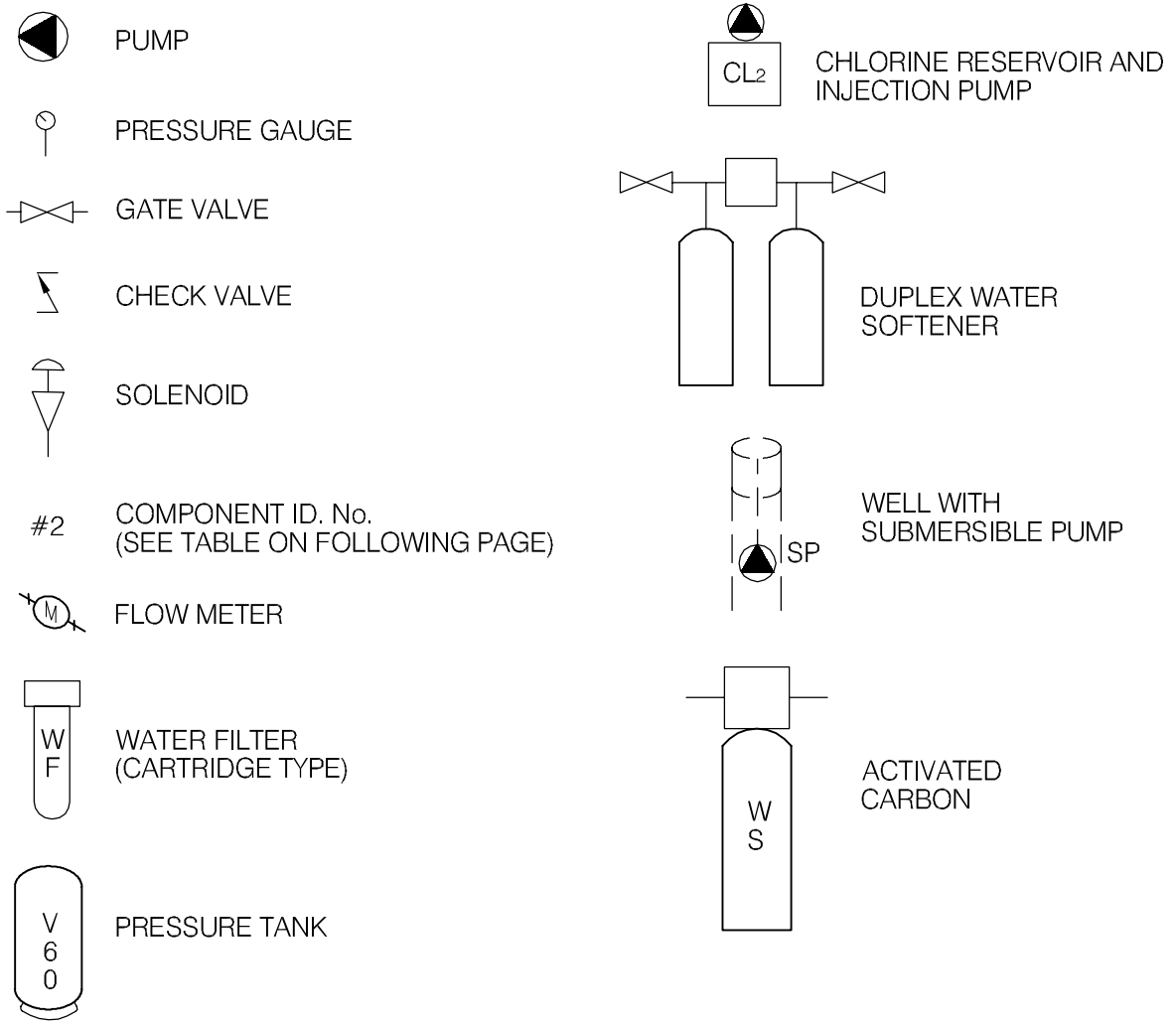
GOVERNMENT OF YUKON
 HIGHWAYS & PUBLIC WORKS

CARMACKS AIRPORT
 TERMINAL BUILDING 6522
 SITE LOCATION DIAGRAM
 WELL ID: 6522



REVISION ISSUE
 0

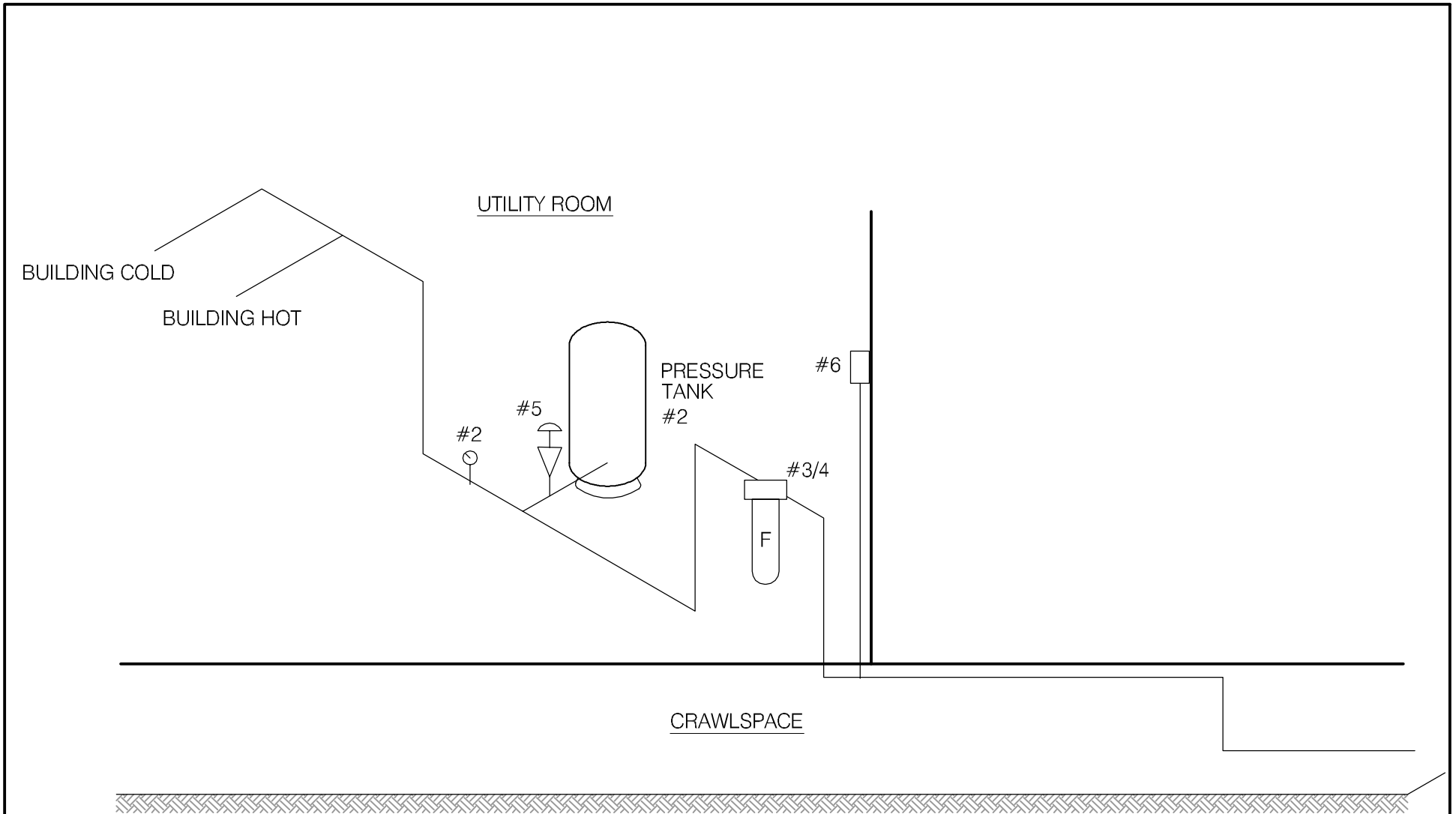
DRAWING No.
 FIGURE 6522A

LEGEND





Z:\0201\Drawings\1260002 Water Assessment YTG\001 - Whitehorse Region\1260002003 Whitehorse Schematic_LEGEND.dwg, 4/11/2006 10:28:07 AM, Adobe PDF, jbuyck

 <p>EBA Engineering Consultants Ltd.</p>	<p>PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT WHITEHORSE REGION</p>					
<p>CLIENT</p> 	<p>TITLE</p> <p style="text-align: center;">SCHEMATIC SYSTEM LEGEND</p>					
<table style="width: 100%; border: none;"> <tr> <td style="border: none;">DATE APRIL 2006</td> <td style="border: none;">DWN. JSB</td> <td style="border: none;">CHKD. RMM</td> </tr> </table>	DATE APRIL 2006	DWN. JSB	CHKD. RMM	<table style="width: 100%; border: none;"> <tr> <td style="border: none;">FILE NO. 1260002</td> <td style="border: none;">DRWG. LEGEND</td> </tr> </table>	FILE NO. 1260002	DRWG. 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 WHITEHORSE REGION	
CLIENT 		TITLE WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 6522 CARMACKS AIRPORT	
DATE	APRIL 2006	DWN.	JSB
CHKD.	FMM	FILE NO.	1260002.001
		DWG.:	FIGURE 6522B

**Whitehorse Region – Carmacks Airport Terminal
Building # 6522**

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	Sub Pump.					4" x 1/2 Hr.
2	PRESSURE TANK	WELXTROL	WX-202			
3	SEDIMENT FILTER	CUNO	3/4" x 10"			2" x 10
4	FILTER CARTR.	STRING WOUND.	10 MICRON			
5	PUMP CONTROL	SQ: D.	FSG-2			1/4" NPT
6	HEAT T/STAT	PYROTEMAX	INDOOR.			
7						
8						
9						
10						

TABLE 6522 - 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							
6522	Carmacks Airport Terminal	5	Oct-04 to Feb-05	no	0/5	no	23-Feb-05	no



Table 6522-2: Water Quality Results

SOURCE:		Building 6522 - Carmacks Airport			GCDWQ Criteria		
Location/ Resident		Carmacks					
Address		Lot 1066 Quad 115 I/1					
Treatment		No					
Source of Water		On-Site Well					
Purpose of Sampling		Baseline	Additional Sampling	Baseline			
Sample Location		Washroom Tap	Washroom Tap	6-Jul-05	Lower Limit	Upper Limit	
Date Sampled		5-Oct-04	13-May-05	6-Jul-05	AO	MAC	AO
Physical Tests (ALS)							
Colour (CU)	5		<5				15
Conductivity (uS/cm)	532		652				500
Total Dissolved Solids	365		417				500
Hardness CaCO3	331		336		AO >200 = poor, > 500 unacceptable ^A		
pH	7.9		8.19		6.5		8.5
Turbidity (NTU)	2.9		17.6			1	5
UV Absorbance		<0.0010					
Dissolved Anions (ALS)							
Alkalinity-Total CaCO3	229		247				
Chloride Cl	1		0.93				250
Fluoride F	0.24		0.204			1.5	
Sulphate SO4	109		133				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			0.1	
Antimony T-Sb	0.0007		<0.0005			0.006	
Arsenic T-As	<0.0004		0.00052			0.025	
Barium T-Ba	0.018		0.021			1	
Boron T-B	0.05		<0.10			5	
Cadmium T-Cd	<0.0002		<0.0002			0.005	
Calcium T-Ca	61.2		65.2				
Chromium T-Cr	0.0012		<0.0020			0.05	
Copper T-Cu	<0.001		0.0042			1	
Iron T-Fe	0.497		1.44				0.3
Lead T-Pb	0.0017		<0.0010			0.01	
Magnesium T-Mg	40.4		42.2				
Manganese T-Mn	0.25		0.255				0.05
Mercury T-Hg	<0.0002		<0.0002			0.001	
Potassium T-K	2.5		2.49				
Selenium T-Se	<0.0004		<0.0010			0.01	
Sodium T-Na	11		10.9				200
Uranium T-U	0.0034		0.00244			0.02	
Zinc T-Zn	0.01		<0.050				5
Dissolved Metals							
Aluminum D-Al						0.1	
Antimony D-Sb						0.006	
Arsenic D-As						0.025	
Barium D-Ba						1.0	
Beryllium D-Be							
Boron D-B						5	
Cadmium D-Cd						0.005	
Calcium D-Ca							
Chromium D-Cr						0.05	
Cobalt D-Co							
Copper D-Cu							1.0
Iron D-Fe		<0.030					0.3
Lead D-Pb						0.01	
Lithium D-Li							
Magnesium D-Mg							
Manganese D-Mn		0.296					0.05
Mercury D-Hg						0.001	
Molybdenum D-Mo							
Nickel D-Ni							
Selenium D-Se						0.01	
Silver D-Ag							
Sodium D-Na							200
Thallium D-Tl							
Titanium D-Ti							
Uranium D-U						0.02	
Vanadium D-V							
Zinc D-Zn							5.0
Polycyclic Aromatic Hydrocarbons							
Acenaphthene							
Acenaphthylene							
Acridine							
Anthracene							
Benzo(a)anthracene							
Benzo(a)pyrene						0.00001	
Benzo(b)fluoranthene							
Benzo(g,h,i)perylene							
Benzo(k)fluoranthene							
Chrysene							
Dibenz(a,h)anthracene							
Fluoranthene							
Fluorene							
Indeno(1,2,3-c,d)pyrene							
Naphthalene							
Phenanthrene							
Pyrene							
Quinoline							
Extractable Hydrocarbons							
EPH10-19							
EPH19-32							
LEPH							
HEPH							
Field Chemistry (EBA)							
pH		7.66			6.5		8.5
TDS		320					500
EC (uS/cm)		625					
Temperature		13.0					
Free Available Chlorine							

Notes:

A. Guidelines indicated for hardness are not CDWQ, 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 CDWQ 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 6522-3: 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)
6522	Carmacks Airport Terminal	Carmacks	6887553	437781	545

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	1992	No	23.4 (May be pump)	?	?	?	15.315

Well Construction Details				
Wellhead Above ground (m)	Well Cap	Well Screen	Surface Seal	Apron Grading
0.6 below grade	Split Cap Gasket	?	Unlikely	No, ground is even



**Table 6522-4: Potential Contaminant Sources
Building 6522 – Carmacks Airport Terminal**

Potential Contaminant Source	Potential Contaminants	Distance from Water Source	Northing	Easting
Dump or Landfill	<i>Organic</i> and inorganic chemicals.	5 km		
Cemetery	<i>Biological</i> ¹ , inorganic ² and organic parameters.	5 km		
Sewage lagoon	<i>Biological</i> , inorganic and organic parameters.	>300 m		
Sewage lines, tanks and lift stations	<i>Biological</i> , inorganic and organic parameters.	Approx. 19 m		
Septic fields	<i>Biological and Inorganic</i> parameters.	25 m likely up-gradient	6887575	437789
Airplane fueling station	<i>Organic and Inorganic</i> parameters.	100 m		
Undergrounds Fuel Storage Tanks (USTs)	<i>Organic</i> parameters.	>>30 m		
Aviation fuel drums (ASTs)	<i>Organic parameters.</i>	30 m	6887562	437811
Mobile aviation fuel storage tanks	<i>Organic parameters.</i>	20 m (temporary)		
Naturally occurring sources of contamination	<i>Radionuclides, Bacteria and Viruses from surfacewater sources.</i>	>150 m		

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

SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A. EBA Site Inspection

Inspector: Ryan Martin
Luke Lebel

Date May 13, 2005

WELL ID #	Owner	Location Description
6522	YTG	Carmacks Airport Terminal

1. Well Location and Potential Contaminant Sources

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

Carmacks

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

Carmacks Airport Terminal, Campbell Highway

c. GPS location: 6887553, 437781

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 NO

5 or more delivery sites on a trucked distribution system? If so how many NO

f. Nearest building, specify Terminal Building

g. Distance from well to building 17m

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

i. Distance from well to nearest point of known field: 22 to tank, 25 to field

j. Well location relative to field: upslope downslope lateral

↳ could be upgradient

TANK = 6887575 N
437789 E

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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

Septic field and tank ~ 22m away

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
well is in part enclosed pit that is built shut. However, not locked

Entrance by animals? Yes No
There are few signs of mouse droppings - access is possible however

o. Is well site subject to flooding? Yes No
There is some evidence of water staining

p. Is the well site well drained? Yes No
well is located next to a drainage (minor for runoff) ditch

q. Is there a buried fuel tank on the property? Yes No
NOT OBVIOUS

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 Fuel Storage

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

Potential Source 1: Drums; Distance from well to Potential Source 1: ~

Potential Source 2: Temp Tanks; Distance from well to Potential Source 2: _____

Potential Source 3: _____; Distance from well to Potential Source 3: _____

Potential Source 4: _____; Distance from well to Potential Source 4: _____

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

How many? _____ in use abandoned require proper sealing

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2. Well and Wellhead information:

- * a. When was well installed? Year 1992 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 _____ No
- f. Well casing: Diameter 15cm Material: steel plastic concrete
grimey and rusty w/ open holes for heat trace and electrical
- * g. Depth of well: 22.835m bc measured (if possible) reported from log
LDOR DEEPER (MAY BE PUMP)
- * h. Static water level below ground: 15.375m bc
 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
- m. Is the well head: in pumphouse in pit pitless adaptor in a building
part enclosed pit
 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 Yes -
- ii. Are there signs of ponding on the enclosure(e.g. water stains, etc.)? Yes No
↳ some moisture evident on PWF @ bottom of enclosure
- iii. Is the wellhead enclosed by fiberglass insulations? Yes No
- iv. Any evidence of rodents? Specify None obvious, but likely accessible
- v. Does the well casing have a proper seal cap? Yes No

If no, describe condition spltd cap w gasket
→ obvious holes

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...) -sediment filter

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

There is a raw water tap in pit

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

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

There is heat trace (all) styrofoam insulation protecting piping; fibreglass insulation in wellhead enclosure
If yes, describe: _____

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

- Well Pit
- Potential. Contam within 30m
- No GFI on Heat tape
- Requires Disinfection

b. Recommendations: _____

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PART B: EBA Site Inspection

Inspector: _____

Date _____

WELL ID #	Owner	Location Description
6522	YTG	CRAMACKS AIRPORT

6. Water Treatment

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

chlorination iron and or manganese removal other SED. FILTRATION

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 *N/A*
- f. Is there a chemical analysis? Yes No adequate incomplete *N/A*
- 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:

PRESSURE TANK (UTILIM 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: _____

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:

THIS INSTALLATION REQUIRES TO BE UPGRADED
TO MEET SPECIFICATIONS. CASING WILL NEED
TO BE EXTENDED TO 18" ABOVE GRADE.
SURFACE SEAL WILL NEED TO BE INSTALLED.

b. Recommendations:

INSTALL SURFACE SEAL
EXTEND CASING ABOVE GROUND.
INSTALL GFI PROTECTION ON HEAT TAPE.
INSTALL MOST SUITABLE TREATMENT SYSTEM.



Photo 0148: 6522 Wellhead Enclosure (pitt, front) and Mobile Aviation Fuel Storage



Photo 0149: 6522 Wellhead



Photo 0150: 6522 Wellhead Enclosure (pitt, front), Carmacks Airport Terminal Building (back left), and Septic Field (back center)



Photo 0153: 6522 Aviation Fuel Drums



Photo 0151: 6522 Fueling Station

Photo 0018: 6522 Pressure Tank (left) and Water Heater (right)

