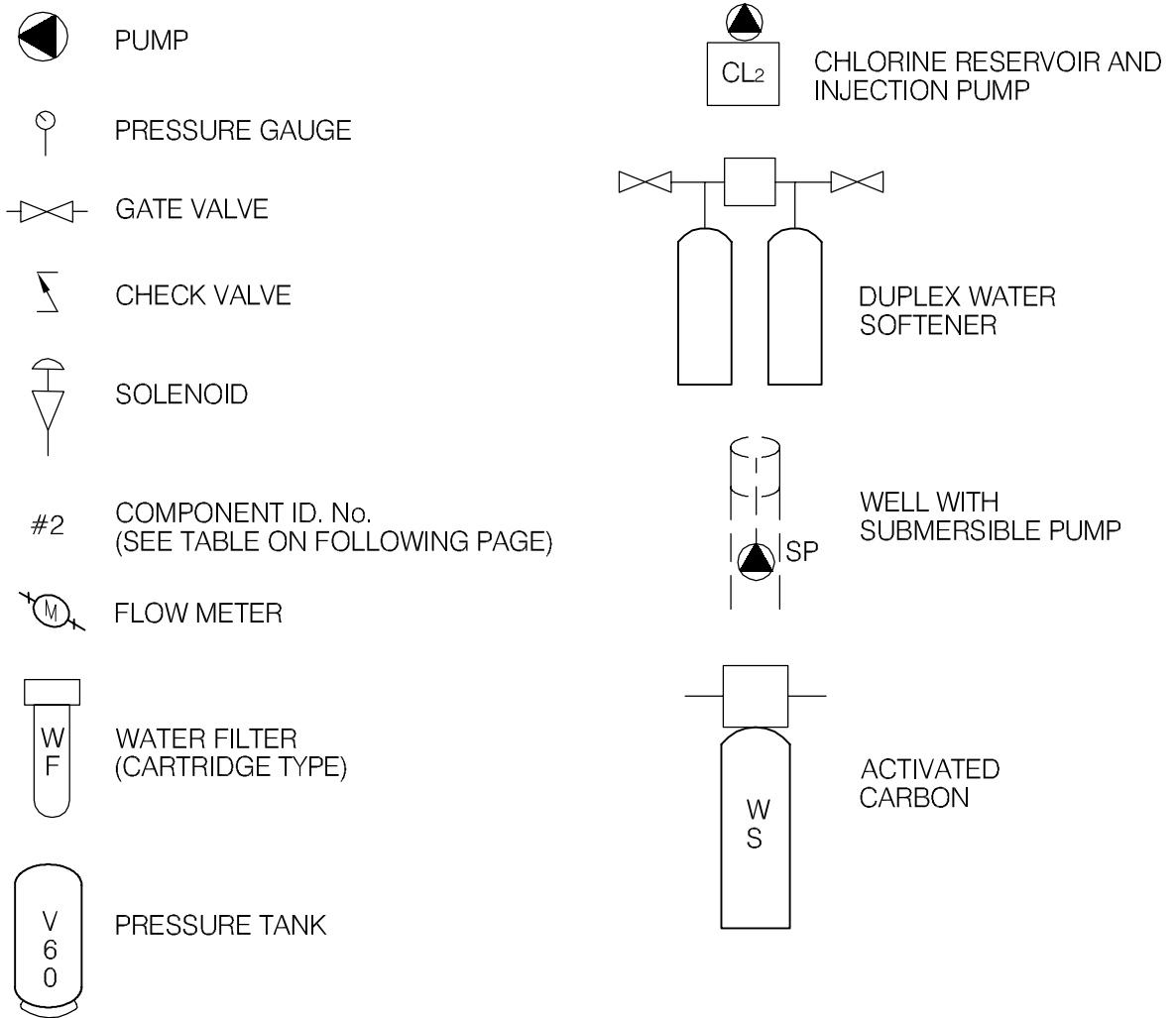


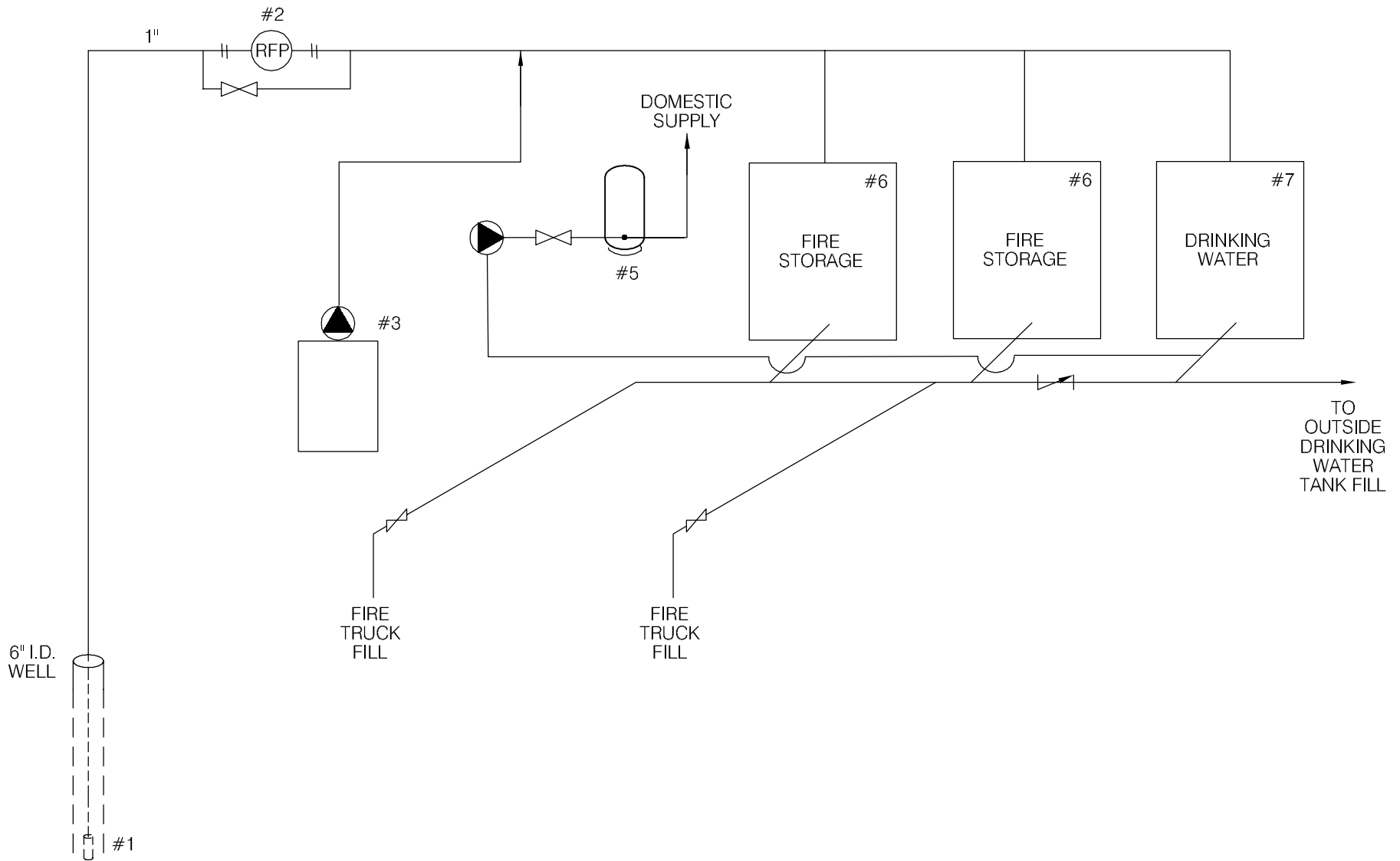


LEGEND





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

 EBA Engineering Consultants Ltd.	PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT WHITEHORSE REGION
CLIENT <div style="text-align: center; margin-top: 10px;">  Highways and Public Works Property Management Branch </div>	TITLE <div style="text-align: center; margin-top: 10px;"> SCHEMATIC SYSTEM LEGEND </div>
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.: 1334 LAKEVIEW FIRE HALL - MARSH LAKE	
DATE	APRIL 2006	DWN.	JSB
CHKD.	RMM	FILE NO.	1260002.001
		DWG.:	FIGURE 1334B

Whitehorse Region – Lakeview Firehall
Building # 1334

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	4" Sub. Pump	GOULDS	25G100412		K29278	4"
2	1" Flow Meter Pump.	HAYES.				1"
3	CHLORINATION SYSTEM	GRANDFOS.	DME8-10	96472847	692	3/8"
4	DOMESTIC PUMP	MYERS.	H750S			1 1/4" x 3/4"
5	PRESSURE TANK.	WELL RITE	WR60-02			
6	STORAGE TANKS		FIRE WATER			6'4" x 5'4"
7	STORAGE TANK		DRINKING WATER			6'4" x 5'4"
8	SPARE CHLORINE PUMP	LMI	A161-162S.			3/8"
9						
10						

TABLE 1334 - 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
Building #	Building Name						
1334	Lakeview Firehall (Fill Station)	9	Sept-04 to Mar-05	no	0/9	no	2-Mar-05

Table 1334-2: Water Quality Results

SOURCE:		Building 1334 - Lakeview Fire Hall		GCDWQ Criteria		
Location/ Resident Address		Judas Creek Subdivision,				
Treatment		Chlorination				
Source of Water		On-Site Well				
Purpose of Sampling		Baseline	Additional Sampling			
Sample Location			Kitchen Tap			
Date Sampled			9-May-05	Lower Limit	Upper Limit	
Physical Tests (ALS)				AO	MAC	AO
Colour (CU)		<5.0				15
Conductivity (uS/cm)		678				
Total Dissolved Solids		405				500
Hardness CaCO3		163		AO >200 = poor, > 500 unacceptable ^A		
pH		8.22		6.5		8.5
Turbidity (NTU)		0.38			1	5
Dissolved Anions (ALS)						
Alkalinity-Total CaCO3		276				
Chloride Cl		6.67				250
Fluoride F		0.328			1.5	
Sulphate SO4		109				500
Nitrate Nitrogen N		<0.10			10	
Nitrite Nitrogen N		<0.10			1	
Total Metals (ALS)						
Aluminum T-Al		<0.010				
Antimony T-Sb		<0.00050			0.006	
Arsenic T-As		0.0059			0.025	
Barium T-Ba		0.021			1	
Boron T-B		0.25			5	
Cadmium T-Cd		<0.00020			0.005	
Calcium T-Ca		52.3				
Chromium T-Cr		<0.0020			0.05	
Copper T-Cu		0.020			1	
Iron T-Fe		0.095				0.3
Lead T-Pb		<0.0010			0.01	
Magnesium T-Mg		47.5				
Manganese T-Mn		0.0327				0.05
Mercury T-Hg		<0.00020			0.001	
Potassium T-K		3.22				
Selenium T-Se		<0.0010			0.01	
Sodium T-Na		19.4				200
Uranium T-U		0.00054			0.02	
Zinc T-Zn		<0.050				5
Trihalomethanes						
Bromodichloromethane		<0.0010				
Bromoform		<0.0010				
Chloroform		<0.0010				
Dibromochloromethane		<0.0010				
Total Trihalomethanes		<0.0040			0.1	
Haloacetic Acids						
Bromoacetic Acid		<0.0020				
Bromochloroacetic Acid		<0.0020				
Chloroacetic Acid		<0.020				
Dibromoacetic Acid		<0.0020				
Dichloroacetic Acid		<0.0020				
Trichloroacetic Acid (TCA)		<0.0020				
Field Chemistry (EBA)						
pH		7.99		6.5		8.5
TDS		330				500
EC (uS/cm)		650				
Temperature		10				
Free Available Chlorine		0.36				250

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 1334-3: 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)
1334	Lakeview Fire Hall	Marsh Lake	6702194	540097	678

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)
150	1992	Yes	28	Silt - 0m to 7m Clay - 21m to 28m	?	?	17.8

Well Construction Details				
Wellhead Above ground (m)	Well Cap	Well Screen	Surface Seal	Apron Grading
1.7 below grade	Split Cap Gasket	Yes 1.2m	Unlikely	No, but slopes away from pit

**Table 1334-4: Potential Contaminant Sources
Building 1334 – Lakeview Fire Hall**

Potential Contaminant Source	Potential Contaminants	Distance from Water Source	Northing	Easting
Dump or Landfill	<i>Organic</i> and inorganic chemicals.	>120 m		
Cemetery	<i>Biological</i> ¹ , inorganic ² and organic parameters.	Approximately 800 m		
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. 20 m		
Septic fields	<i>Biological and Inorganic</i> parameters.	34 m		
Gas stations	<i>Organic and Inorganic</i> parameters.	>30 m		
Undergrounds Fuel Storage Tanks (USTs)	<i>Organic</i> parameters.	>30 m		
Above ground storage tanks (ASTs)	<i>Organic parameters.</i>	27 m	6681117	538692
Aviation Fuel Drums	<i>Organic parameters</i>	48 m	6621185	538644
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

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SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin

Date May 9, 2005

WELL ID #	Owner	Location Description
1334	YTG	Lakeview Fire Hall

1. Well Location and Potential Contaminant Sources

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

Judas creek subdivision, Marsh Lake

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

Lakeview Fire Hall

c. GPS location: 0540097 Easting; 6702194 Northing Elevation 678m ± 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 _____
water is piped to a public-use storage tank

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

f. Nearest building, specify Lakeview Fire Hall, 4m

g. Distance from well to building 4m
0540097 Easting; 6702193 Northing, Elevation 676m ± 22m

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 and with ~5m drop

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

Fuel tank 27m 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
There is only a broken lock and a large flower pot on top

Entrance by animals? Yes No
There was no evidence of animals near the wellhead

o. Is well site subject to flooding? Yes No
It is located in a pit

p. Is the well site well drained? Yes No
The grade elevation at the pit is higher than the surrounding ground

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

0540068
6702188
Elev 675m
± 15m
Potential Source 1: Gas Storage Tank; Distance from well to Potential Source 1: 27m

Potential Source 2: _____; 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

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 June
- 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 1.2m No
Galvanized steel covert with a pwf 0.78m square box at surface
- f. Well casing: Diameter 15cm Material: steel plastic concrete
(6")
- g. Depth of well: 28.2m measured (if possible) reported from log
- h. Static water level below ground: 19.6m at time of drilling
 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 4ft slot size(s) 25 slot
Location of screen: from 88ft to 92ft 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
The pit is walled by a 1.2m galvanized steel covert with a pwf box on top
 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 1.8m below grade
- ii. Are there signs of ponding on the enclosure(e.g. water stains, etc.)? Yes No
Evidence of water stains on culvert and the pit is in a generally unsanitary condition
- iii. Is the wellhead enclosed by fiberglass insulations? Yes No
- iv. Any evidence of rodents? Specify There is no direct evidence of rodents, despite general unsanitary condition of pit
- v. Does the well casing have a proper seal cap? Yes No

If no, describe condition _____

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...) Chlorine treatment

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: June 8, 1992 By: Fredellen Enterprises

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

f. Drop pipe for submersible pump: steel plastic
(likely)

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
a valve must first be installed

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

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

b. Recommendations:

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PART B: EBA Site Inspection

Inspector: _____

Date _____

WELL ID #	Owner	Location Description
1334	YTG.	LAKEVIEW FIRE HALL.

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 . 36 (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 **NOT APPLICABLE.**

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:

Where is it located?

Comments: IN FIRE HALL

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 (FILE HAUL STORAGE TANK)

What are the tank size and dimensions?

~~N/A~~ AG 1250

What material is the tank constructed of?

~~N/A~~ FIBREGLASS

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 ~~N/A~~

Does the lid have a tight seal and is it watertight when closed? YES (NO) ~~N/A~~

Does the tank have an overflow or high level whistle? (YES) NO ~~N/A~~ SIB PIPED OUTSIDE.

Is the water tank drain accessible? YES (NO) ~~N/A~~ NO DRAIN.

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: VERY LITTLE

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:

TANK FIRE SOLENOID VALVE SHOULD BE MOVED TO THE TANK AREA. 3/4" DOMESTIC WATER PIPE S/B INSTALLED AT A POINT PRIOR TO THE SOLENOID TO SUPPLY FRESH CHLORINATED WATER TO THE BUILDING.

PRESENT PIPING CONFIGURATION PRESENTS A HEALTH RISK FROM CONTAMINATED WATER OF FIRE TANK. CL2 INJECTION VALVE CRACKED.

b. Recommendations:

MOVE SOLENOID.

DISCONNECT PRESENT FEED TO DOMESTIC PUMP.

INSTALL 1" FEED LINE TO PUMP SYSTEM.

INSTALL BACKFLOW PREVENTER IN FIREMAN SUPPLY LINE.

PIPE OVERFLOW TO OUTSIDE PIPING TO PREVENT INDOOR FLOODING.

INSTALL NEW INJECTION VALVE RIGHT AWAY.

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PART C: Property Manager/ System Operator Questionnaire

Inspector: JERRY Jackson Date April 9/05

Property manager: V.T.G.

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 JUNE Month 1992

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: 1992'

e. Who was the well constructed by?

Indicate contractor's name: Fredbye Contracting

f. Are you, the owner Yes or other: inspector

g. Who maintains the well? Community Services

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? Fredbye Contracting 1992

b. What type of pump do you have? 1 hp. GOULD 256100412

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 _____

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?

The well is good but the tank inside is too small

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? 2 week
Who takes them? Community Services / T.C.

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?

In Peak Demand pump, is small, pipe to tanks from pump should be increased.

JUNE 8, 1992.

WELL LOG JUDAS CREEK FIREHALL

MARSH LAKE
FIREHALL.

0-6' SILT & SAND.
6-23' SILT, SAND, SOME GRAVEL.
23-72' SAND
72-86' SAND, GRAVEL & CLAY (FAIRLY PACKED).
86-92' SAND, SOME GRAVEL & CLAY.

DEPTH OF WELL 92'

STATIC LEVEL 64'

PUMPING LEVEL @ 15 B.P.M 65' AFTER 8 HRS OF PUMPING.
RECOVERY ALMOST INSTANT TO STATIC

SCREEN 25 SMT EXPOSED 4'

COMMENTS: BAILED WELL FOR 2 HRS @ 40 B.P.M.
AND DREW WATER DOWN TO 72'.

RECOVERY TO CLOSE, TO STATIC, WAS 20 SECONDS.

WOULD NOT HESITATE TO PUMP @ 50 B.P.M WITHOUT ANY
PROBLEMS.

WATER SAMPLES TAKEN IN. TO NEATH.

FREDCLARK ENTERPRISES LTD.

Fred Danisoff

393-6216



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 #	8714
Jurisdiction	Yukon
Community	
Address	
Highway	Alaska Highway
Milepost	KM 1414
Feature	Marsh Lake
Location and Cause	500 m S Lake View Marina turn-off - transport went off road and jackknifed resulting in punctured saddle fuel tank
Latitude	60.4658333333333
Longitude	-134.252222222222
Incident Date	11/22/1987 3:30:00 PM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	Yukon Territorial Government - Highways
Company(s)	Diablo Transportation Inc (California)
Amount	0.4
Units	Tonnes (Metric)
Quantity	Actual
Release Description	Spilled
Additional Quantit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	min env dmg - fuel absorbed by snow and ground in road-side ditch - no surface water drainage in area - transport hauling explosives - not damaged



Photo 0071: 1334 Wellhead



Photo 0072: 1334 DME Chlorinator and LMI Chlorinator back-up system.



Photo 0073: 1334 Flow Meter



Photo 0074: 1334 Tanks and Truck Fill (domestic tank far right)