18.0 BUILDING 4841: WATSON LAKE VISITOR RECEPTION CENTRE

18.1 Description of Existing Water system

Building 4841, the Watson Lake Visitor Reception Centre, is served by the community piped water distribution system operated by the Town of Watson Lake. The piped system reportedly occasionally malfunctions and freezes if it is used during the colder months of the year. Since the visitor reception centre is only open seasonally during the summer, this is rarely a problem; however there is a 10.7 m deep well located in the basement of the reception centre in the case that the community system fails. This well was not equipped with a proper cap at the time of the assessment. The visitor reception centre has no treatment or disinfection. A schematic detailing the well water system is provided as Figure 4841-B in Appendix A18.

18.2 Description of Existing Wastewater Systems

The visitor reception centre is served by a piped sewer collection system provided by the Town of Watson Lake. There are service lines, and potentially sewer mains within 30 m the well.

18.3 Water Quality Results

Because the well was not in service at the time of inspection, there are no water quality or bacteriological results available to review. Since the system is on a piped distribution system from the Town of Watson Lake, it can be assumed that the water quality is under their responsibility and is treated and monitored in order to ensure the safety of the entire community water supply, including this site.

18.4 Conceptual Hydrogeology

There is no log available for this well. The depth of the well is 10.69 m with a static water level 6.235 m below grade. The log for the adjacent Grader Storage Building (4836) indicates alternating coarse and fine deposits to 17.8 m depth. This is consistent with the lithology of most wells in the area, which are completed at depths of less than 30 m within surficial morainic and colluvial deposits. These deposits are described as gravel, sand and silt, with occurrences of silty till sediments. This well is located on the north side of a groundwater flow divide and the expected direction of groundwater flow is northeasterly towards Wye Lake.

18.5 Potential Contaminant Sources

18.5.1 Spills Records and Contaminated Sites Search Results

The Government of Yukon Environmental Programs Branch and Environment Canada Environmental Protection Branch did not identify any recorded spill events or contaminated sites issues for this property or neighbouring properties.

18.6 Identified Water System Deficiencies and Associated Risk

18.6.1 High and Medium Risk Deficiencies

- There are not high risk deficiencies associated with this site assuming that the piped community system is utilized.

18.6.2 Low Risk Deficiencies

The following deficiencies were identified as low-risk for the Watson Lake Visitor Reception Centre are with respect to the existing well that is not in use:

- The wellhead is located in the basement of the visitor reception centre and is not equipped with a proper cap on the casing and is open.
- There is no surface sanitary seal (grout or bentonite seal as required by the Canadian Groundwater Association's Well Construction Guidelines);
- At 10.7 m deep, the well is considered to be a shallow well. The well, therefore, would be considered to be at high-risk of contamination from surface sources;
- By definition of the Draft Yukon GUDI Assessment Guideline, the well is potentially under the direct influence of surface water because it is a vulnerable type (unconfined aquifer with a production zone that is less than 15 m below grade and does not meet the requirements of the Guidelines for Water Well Construction; and,
- There is no treatment or disinfection system present.

Additionally, it has been reported that if the piped distribution system from the community is running during the late fall, winter, or early spring months, it has the tendency to freeze and become inoperable. It is for this reason that the well has not been decommissioned; it is used as a back-up system in case the visitor reception centre needs to be open at a time in the year when the piped distribution system may fail.

18.7 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.

18.7.1 Priority 2

- In order to project the aquifer, it would be prudent superchlorinate and install a well cap or welded cover.

18.7.2 Priority 3

- In order to mitigate the deficiencies associated with the existing well at the Watson Lake Visitor Reception Centre, the piped distribution system from the Town of Watson Lake should be repaired as so to prevent freezing, and the existing well should be properly decommissioned in accordance with the Guidelines for Water Well Construction.

18.8 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.

18.8.1 Priority 2

Shock chlorination and installation of a well cap would cost approximately **$250**

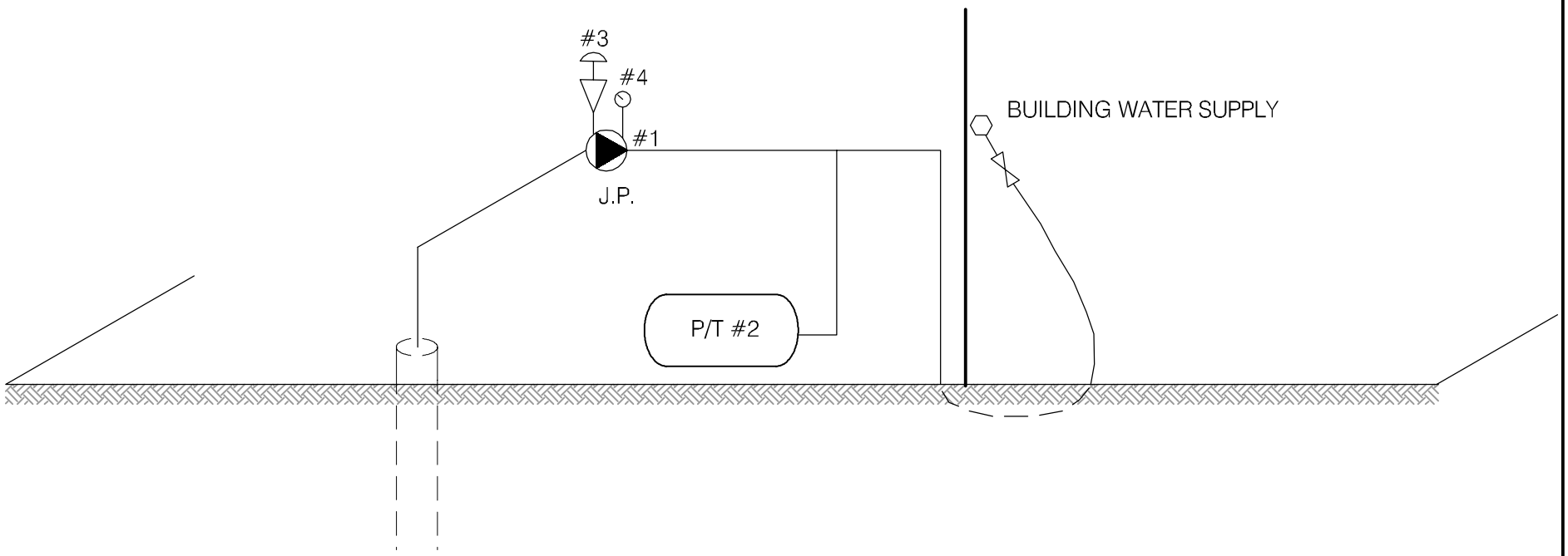
18.8.2 Priority 3

Class D cost estimates for mitigative option to address the well deficiencies for this site are as follows:

- The cost to repair the existing piped distribution system to ensure that it is protected against freezing cannot be estimated at this time**.**

- The estimated cost to properly decommission the well would be in the order of **$1000**.

LOCATED IN BASEMENT STORAGE AREA



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.: 4841 WATSON LAKE VISITOR RECEPTION CENTRE	
DATE JULY 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.002		DWG.: FIGURE 4841-B

Z:\0201Drawings\1260002 Water Assessment YTG\002 - Eastern Region\watson\Schematics\1260002 Visitor Reception Centre_4841 Schematic.dwg, 7/21/2005 10:25:17 AM, Adobe PDF

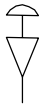
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

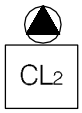

SOLENOID

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

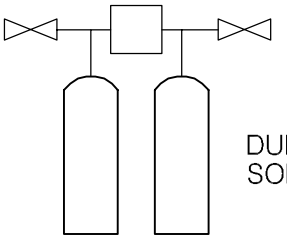
FLOW METER

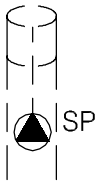
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

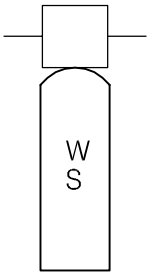


CHLORINE RESERVOIR AND
INJECTION PUMP


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

Eastern Region – Watson Lake Visitor Reception Centre
Building # 4841

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	MONARCH JET Pump	MONARCH	MJC-50		3703	1/2 HP.
2	PRESSURE TANK	WELL RITE	TR25			8.5 GAL 3/4" MIPT
3	PRESSURE SWITCH	SQ. D	FSG-2			2 AR 1/4" FIPT
4	PRESSURE GAUGE	MARSH	0-100			2" - 1/4" FIPT.
5						
6						
7						
8						
9						
10						

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 22, 2005

WELL ID #	Owner	Location Description
4841	YTG	Watson Lake Visitor Reception Centre

1. Well Location and Potential Contaminant Sources

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

b. Specific location: (Road or street, Building number, name of owner and/, legal description,
Sign Post Forest – Alaska Hwy

c. GPS location: N 6658536 E 515881 elv 707m ±10m

d Is there electric power? ☐ Yes ☒ No well not currently in service

e Is there outside water access? ☒ Yes ☐ No
Town water

f. Does the well system have:

☐ 15 or more service connections to a piped distribution system ? If so how many_____
well not in service → only visitor reception centre when it is in service

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

g. Nearest building, specify Inside basement of visitor reception centre

h. Distance from well to building _____

i. If there is an effluent disposal field, is its location known? ☐ Yes ☒ No building on piped sewage system

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

k. Well location relative to field: ☐ upslope ☐ 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
Sewage main or service lines likely <30m from well

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 In basement of visitor reception centre
Entrance by animals? ☐ Yes ☒ No There is no cap on the casing

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

q. Is the well site well drained? ☒ Yes ☐ No
There appears to be good drainage away from building

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

If yes, is it ☐ in use ☐ abandoned

Is the location known? ☐ Yes ☐ No

Distance from the well to known buried tank _____

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

☐ Yes ☐ No Describe _____

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

Potential Source 1:_____; Distance from well to Potential Source 1:_____
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:_____

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

How many?_____ ☐ in use ☐ abandoned ☐ require proper sealing

2. Well and Wellhead information:

a. When was well installed? Year unknown 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 unknown ☐ No

f. Well casing: Diameter 9 cm unknown Material: ☒ steel ☐ plastic ☐ concrete Thin-walled

g. Depth of well: ~~unknown~~ 10.690 m ~~3.735 m~~ bc ☒ measured (if possible) ☐ reported ☐ from log

h. Static water level below ground: ~~unknown~~ 4.733m 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 unknown

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

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 in basement of visitor reception centre
☐ 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 ~1.5m bg

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, access possible

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

If no, describe condition metal plate

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 likely ☐ 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

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 n/a

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

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

h. Are there automatic pump controls: ☒ Yes ☐ No
likely when in operation

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 unlikely

k. Is the pump and piping protected from freezing? ☒ Yes ☐ No
If yes, describe: when in operation - it is used as a back-up if town water distribution system is frozen

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:
well is only used as a back-up system in the spring if the piped distribution system freezes. During the site inspection the wellhead was not located. The well has not been used in over three years

b.Recommendations: _____

PART B: EBA Site Inspection

Inspector: BERT ALBISSER Date JUNE 22/05

WELL ID #	Owner	Location Description
4841	YTG	WATSON LAKE RECEPTION CENTER.

6. **Water Treatment**

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

☐ chlorination ☐ iron and or manganese removal ☐ other _____

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

☐ Yes ☐ No If so how _____

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

☐ Yes ☐ No _____ reading.

Tested at _____ (location)

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

☐ Yes ☐ No If yes how often? _____

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

7. **Water Quality (observations):** WELL NOT IN USE

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 _____

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: _____

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

8. Conclusions

a. Comments on overall installation:

THE WELL IS FOR EMERGENCY USE ONLY.
THE CASING SHOULD BE EXTENDED TO A
SAFE HEIGHT TO PREVENT FLOODING.
PRIOR TO ANY USE THE WELL & ITS PIPING
SYSTEM MUST BE SHOCK CHLORINATED.

b. Recommendations:

AS ABOVE

Photo 0030: 4841 Well (centre), jet pump (behind well), and pressure tank (behind jet pump) in basement of Visitor Reception Centre – system not currently in use