19.0 BUILDING 4842: CASSIAR WEIGH SCALES

19.1 Description of Existing Water system

Building 4842, the Cassiar Weigh Scales, is served by a water system that delivers water from an approximately 27.7 m deep well. The well is located in a pit approximately 4.5 m from the weigh scales office building. The well location, and other site details are provided by Figure 4842-A in Appendix A19. The coordinates of the wellhead, as measured by a handheld GPS device, were recorded as:

- UTM ZONE 9
- Northing: 6654368
- Easting: 496710

There is no treatment or disinfection for the water obtained from the well. In addition to the well, there is also an approximately 800 L water storage tank located directly outside the office building that serves the cold water tap in the kitchen. It is likely that this tank receives treated water from delivery for consumption, and the well supply is intended for non-potable use only; however, there were no signs present at the weigh scales that indicated such. The water storage tank was empty during the water system assessment and the only water that was available for sampling was obtained from a bathroom tap served by the well. A schematic detailing the well water system is provided as Figure 4842-B in Appendix A19.

19.2 Description of Existing Wastewater Systems

The septic tank for the Cassiar Weigh Scales is located south of the weigh scales office on the opposite side of the well approximately 13 m away. Whether the septic tank is routinely pumped out, or discharges effluent to an inground sewage disposal field is unknown at this time. A site plan showing the septic system is given by Figure 4842-A in Appendix A19.

19.3 Water Quality Results

19.3.1 Water Quality Results from Previous Sampling

Bacteriological

Two samples were collected from the Cassiar Weigh Scales 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 summarized in Table 4842-1. Coliform bacteria and *E. coli* were reported as absent in each of the two samples for which results were provided.

Potability

A water sample was collected by YTG representatives from the Cassiar Weigh Scales 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 4842-2 in Appendix A19. EBA reviewed the analytical results to compare them with the Canadian Drinking Water Quality Guidelines (CDWQG) to observe general water quality, identify and recommend additional sampling and analytical, and to identify potential indicators of contamination.

- At 0.43 mg/L, the iron concentration exceeded the CDWQG aesthetic objective of 0.3 mg/L;
- All other health based and aesthetic objectives were met for the parameters analyzed.
- The hardness (as $CaCO_3$) was 194 mg/L, and is considered very hard.

19.3.2 Identification of Additional Analytical Testing Required

Additional analytical for the Cassiar Weigh Scales 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;
- Analysis for total and dissolved iron and manganese to determine the amount of each associated with suspended compared to dissolved particles;
- 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 was obtained by EBA during the field program on June 22, 2005, and was submitted to ALS Environmental in Vancouver, BC for analysis of parameters indicated

above. These results are summarized in Table 4842-2 in Appendix A19 and the laboratory reports are included in Appendix B.

- The concentration of total iron in the water was reported to have been 2.26 mg/L, while the reported concentration of dissolved iron was less than the detection limit of 0.030 mg/L. The significance is that iron content in the water can be attributed mainly to suspended solids in the water and as such, filtration methods and/or well rehabilitation measures to decrease turbidity would likely significantly reduce the iron content in the water; and
- The concentration of total manganese in the water was reported to have been 0.0612 mg/L and the reported concentration of dissolved manganese was 0.0618 mg/L. In both cases the manganese concentrations are higher than the CDWQG aesthetic objectives of 0.05 mg/L. The significance of this is that manganese content in the water can be attributed entirely to dissolved particles in the water and as such filtration methods and well rehabilitation measures to decrease turbidity would unlikely reduce the manganese content in the water.

19.3.3 Indicators of Potential Contamination

No elevated concentrations of indicator parameters were observed in the sample results reviewed.

19.4 Conceptual Hydrogeology

There is no log available for this well. The depth of the well is greater than 27.72 m and the static water level is 20.71 m below grade. There are no well logs available for review for wells in the vicinity of the site. The well is located on the south side of a groundwater flow divide. Groundwater in this area most likely flows in a southerly to southeasterly direction towards Albert Creek.

19.5 Potential Contaminant Sources

Potential contaminant sources observed during the site investigation are provided in field notes in Appendix A19. Photos of potential contaminant sources are provided in Appendix A19. A summary of potential contaminant sources within 30 m of the well is provided below:

- Septic tank 13 m from the well (effluent field potentially within 30 m, however, this requires verification);
- Above ground fuel storage tank 1 m from the well, and;
- A drainage feature runs within 1 m of the well during wet periods, which may result in surface water infiltration to the well.

19.5.1 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.

19.6 Identified Water System Deficiencies and Associated Risk

19.6.1 High and Medium Risk Deficiencies

The following deficiencies were identified as high-risk for the Cassiar Weigh Scales:

- Potential sources of contamination within 30 m of the well, including the septic tank, and potentially septic field (if present), a drainage stream that runs within 1 m the wellhead, and an above ground fuel storage tank located 1 m from the well;
- There is no surface sanitary seal (grout or bentonite seal 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 does not meet the requirements of the Guidelines for Water Well Construction;
- There is no treatment disinfection system present;
- Poor surface completion of the wellhead (located in a pit below grade);
- The water intended for drinking water is delivered and stored in a water tank outside of the building. There is no enclosure of any kind around the storage tank, nor is there any insulation to prevent freezing;
- There are no signs stating that drinking water is only delivered to the kitchen cold water faucet; and,
- There was no water in the delivered water storage tank at the time of inspection, and as such there was no drinking water available at that time.

19.6.2 Low Risk Deficiencies

The following deficiencies were identified as low-risk for the Cassiar Weigh Scales:

- The total iron concentration of the water is in exceedence of CDWQG aesthetic objectives; and,

- Both the total and dissolved manganese concentrations are in exceedence of CDWQG aesthetic objectives.

19.7 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).

There are two available options to address the deficiencies associated with this site. The options are outlined below:

Option 1:
The first option involves improving and upgrading the bulk water delivery system.

Option 2:
This option recognizes that water delivery is expensive and the current water delivery system is not up to standards. This option proposes installing treatment and using the well as the exclusive water supply source.

19.7.1 Priority 1

It should be noted that it was unclear whether there was a septic field at this site, or whether it was only a holding tank. An investigation should be carried out in order to determine if there is an actual effluent disposal field on the property and its proximity with respect to the well.

Option 1:

- An enclosure should be built around the wellhead in order to prevent freezing or overheating, and to prevent unauthorized human or animal access;
- Signs should be posted in the building at all point of use locations that drinking water should be obtained the cold water faucet in the kitchen only; and,
- It should be ensured that water is properly disinfected at the source.

Option 2:

- The well and water system should be superchlorinated and a NSF-61 certified filtration system (to 1 micron absolute) followed by a residential size water softener should be installed;

- A NSF-55 certified UV system should be installed after the softener to provide disinfection of drinking water;
- The water storage tank for delivered water should be removed once the treatment system is installed, and the well be used as the main source of drinking water; and,
- Secondary containment should be installed around the existing above ground fuel storage tank.

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

19.7.2 Priority 2

Option 1:

- Residual chlorine testing should be regularly conducted in order to ensure a minimum FAC concentration of 0.2 mg/L at the point of use.

Option 2:

- The wellhead completion should be improved. This would involve raising the well casing to a minimum of 500 mm above ground level and retrofitting a proper surface-seal to 3 m below grade; and,
- The ground surface around the wellhead should be graded to promote surface drainage away from the well by rerouting the existing drainage feature further away from the well.

19.8 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.

19.8.1 Priority 1

Class D cost estimates for high-risk mitigative options to address the well deficiencies for this site are as follows:

Option 1:

- To build a secure enclosure around the water storage tank would likely cost in the order of **$1,000**.

Option 2:

- Superchlorination of the well and water system would cost approximately **$200**,
- The cost for the proposed filtration and softening system would amount to a total installed cost of approximately **$3,000**;
- To supply and install an UV system would cost approximately **$2,200**;
- Disconnecting and removing the existing water storage tank would likely incur minimal cost; and,
- To install secondary containment on the AST would likely cost in the order of **$1,000**.

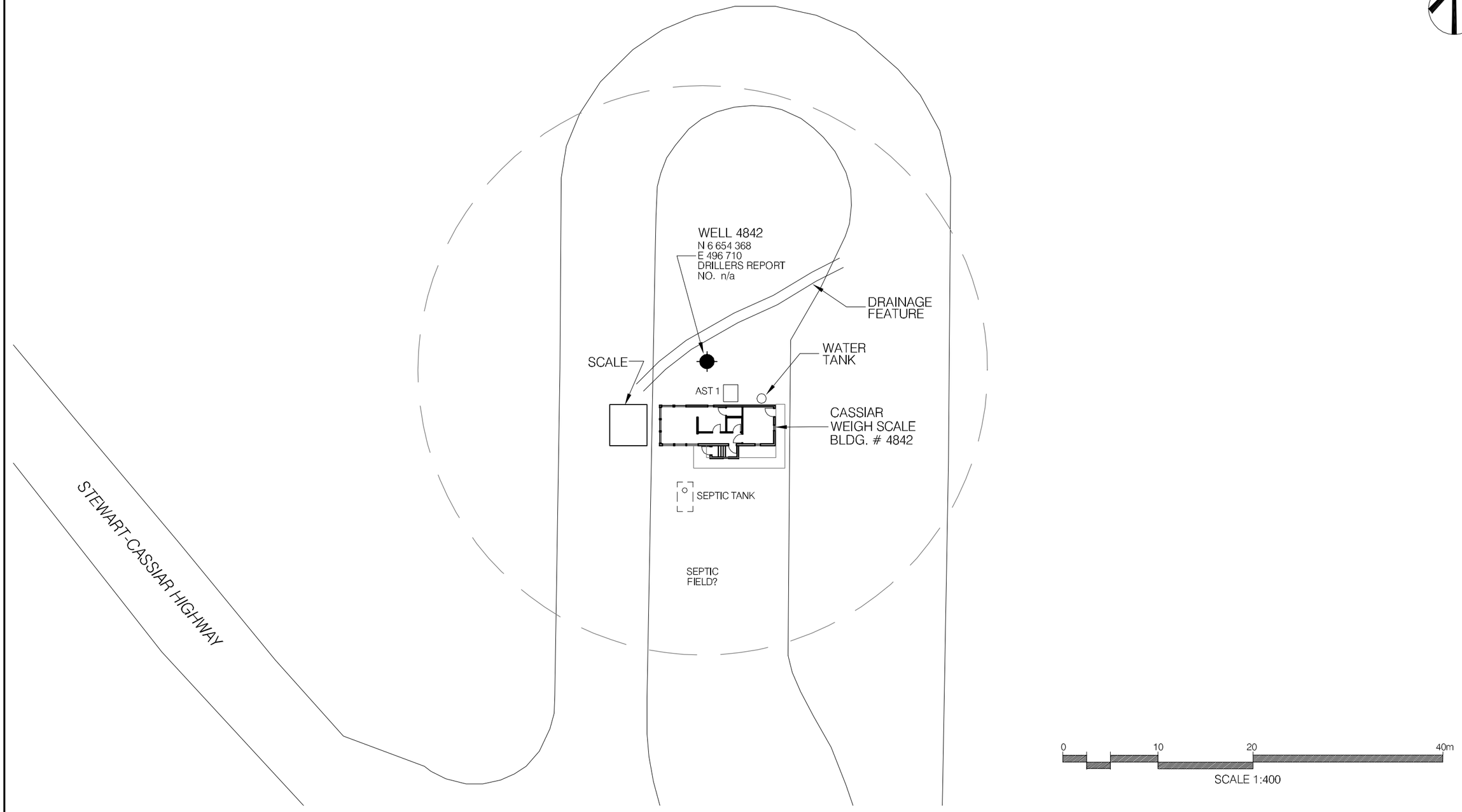
19.8.2 Priority 2

Option 1:

- Routinely checking FAC would fall under normal operation and maintenance costs.

Option 2:

- The cost for the wellhead upgrades, including raising the wellhead, installing a surface seal to 3 m below grade, and installing a 150 mm pitless adapter would cost in the order of **$5,000**;



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 AND STRUCTURES 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:	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

CASSIAR WEIGH SCALE
BUILDING # 4842
SITE LOCATION DIAGRAM
WELL ID: 4842-A

REVISION ISSUE: 0

FIGURE No.: 4842-A

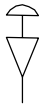
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

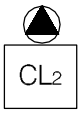

SOLENOID

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

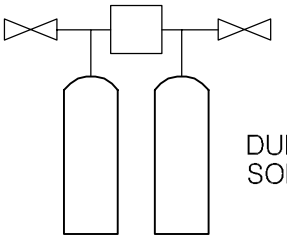
FLOW METER

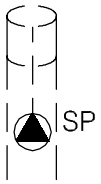
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

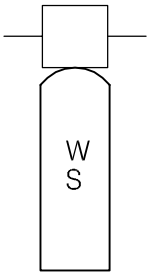


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

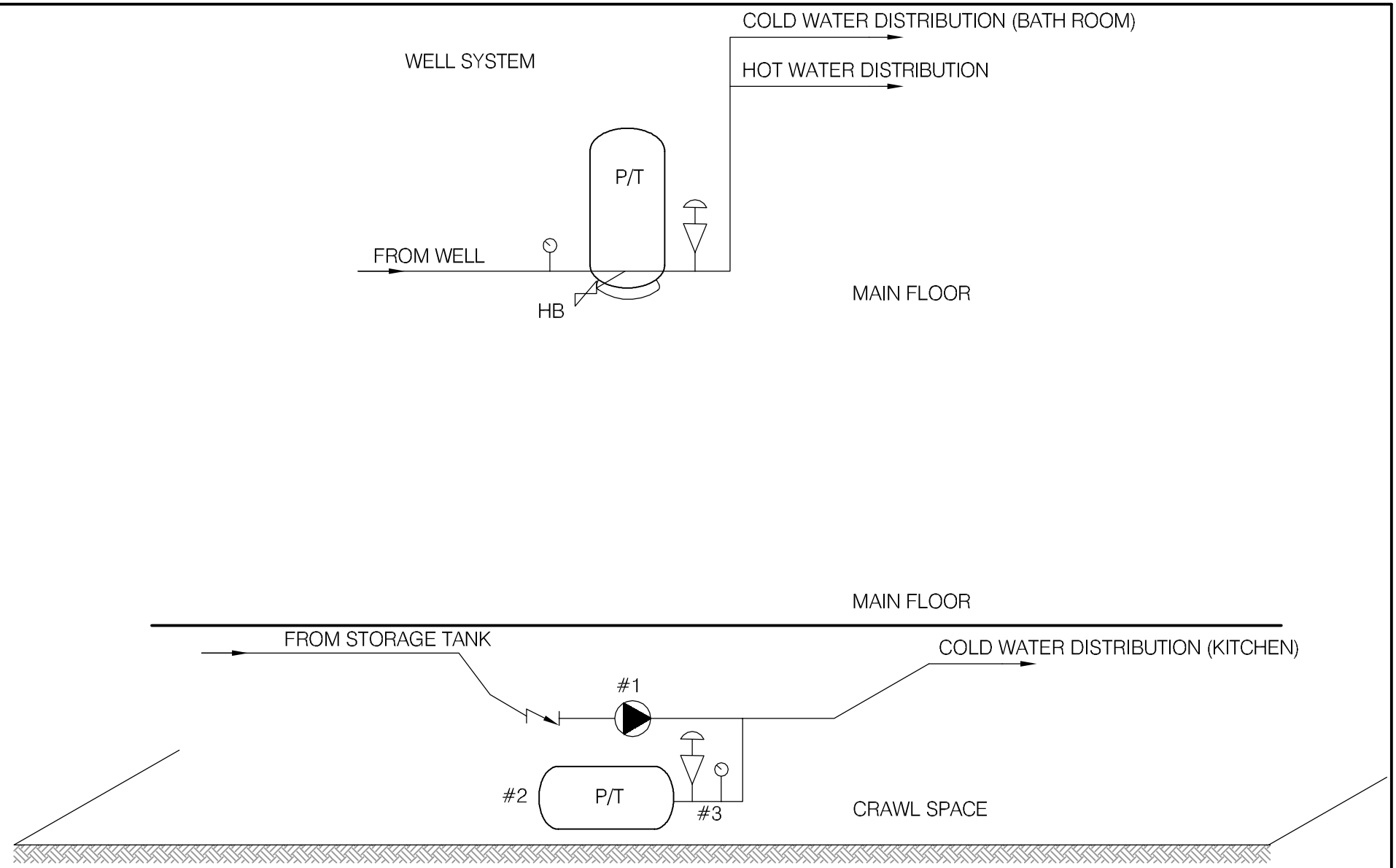


WELL WITH
SUBMERSIBLE PUMP



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.: 4842 CASSIAR WEIGH SCALES	
DATE JULY 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.002		DWG.: FIGURE 4842-B

Eastern Region – Cassier Weigh Scales
Building # 4842

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	JET PUMP	LEADER PUMPS	ECOMATIC	110	0799208665	
2	PRESSURE TANK	"	14L			
3	CONTROLS	"	PART OF PACKAGE			
4	SUB. PUMP					4" - 1/2 HP.
5	PRESSURE TANK	WELL X TROL	WX-202			30 GAL.
6	HEAT TRACE T/STAT	THERMON	HT STAT			2 @ FILLERY.
7						
8						
9						
10						

TABLE 4842- 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?
4842	Cassier Weigh Scales	2	Sept-04 to Mar-05	no	0/2	no	13-Oct-04	no

Table 4842-2: Water Quality Results

SOURCE:	Building 4842 - Cassiar Weigh Scales		GCDWQ Criteria		
Location/ Resident	Watson Lake				
Address					
Treatment	No				
Disinfection	No				
Source of Water	On-Site Well				
Purpose of Sampling	Baseline	Additional Sampling			
Sample Location		Washroom Tap			
Date Sampled	13-Oct-04	22-Jun-05	**Lower**	**Upper Limit**	
Physical Tests *(ALS)*			**AO**	**MAC**	**AO**
Colour (CU)	8				15
Total Dissolved Solids	204				500
Hardness CaCO3	194		AO >200 = poor, > 500 unacceptable[A]		
pH	8.20		6.5		8.5
Turbidity (NTU)	0.6			1	5
UV Absorbance		0.0300			
Dissolved Anions *(ALS)*					
Alkalinity-Total CaCO3	190				
Chloride Cl	4.2				250
Fluoride F	0.05			1.5	
Sulphate SO4	13.3				500
Nitrate Nitrogen N	0.39			10	
Nitrite Nitrogen N	<0.005			1	
Total Metals *(ALS)*					
Aluminum T-Al	<0.005				
Antimony T-Sb	<0.0002			0.006	
Arsenic T-As	0.0004			0.025	
Barium T-Ba	0.166			1	
Boron T-B	0.009			5	
Cadmium T-Cd	<0.00001			0.005	
Chromium T-Cr	0.0012			0.05	
Copper T-Cu	0.01			1	
Iron T-Fe	**0.43**	**2.26**			0.3
Lead T-Pb	0.0001			0.01	
Manganese T-Mn	0.03	**0.0612**			0.05
Sodium T-Na	3.6				200
Uranium T-U	0.0005			0.02	
Zinc T-Zn	0.004				5
Dissolved Metals *(ALS)*					
Iron D-Fe		<0.030			0.3
Manganese D-Mn		**0.0618**			0.05
Organic Parameters					
Tannin and Lignin		0.21			
Total Organic Carbon C		2.00			
Field Chemistry (EBA)					
pH		7.60	6.5		8.5
TDS (ppm)		312			500
EC (uS/cm)		624			
Temperature (°C)		12.3			

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 4842-3: 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)**
4842	**Cassiar Weigh Scales**	**Watson Lake**	6554368	496710	730

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		No	27.72 (may be pump)				19.5

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**
13	4.5	Greater than 60 m	AST	1	Nearby service station: 75 m to pumps

Well Construction Details					
Wellhead Above ground (m)	**Well Cap**	**Well Screen**	**Surface Seal**	**Apron Grading**	**Comments**
1.25 m below grade	Split seal gasket cap		Unlikely	No, there is a drainage stream that runs within 1 m of the wellhead enclosure	

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
4842	YTG	Cassiar weigh Scale

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,
Junction 39 - Cassiar Hwy / Alaska Hwy Junction

c. GPS location: N 6654368 E 496710 elv 736 m ±6m

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_____
weigh Scales office

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

g. Nearest building, specify weigh Scales office

h. Distance from well to building ~4.5m

i. If there is an effluent disposal field, is its location known? ☒ Yes ☐ No N 6654360 E 496701

j. Distance from well to nearest point of known field: ~13m

k. Well location relative to field: ☐ upslope ☐ downslope ☒ lateral
it may only be a holding tank

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

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 Unlocked/ unfastened lid on top of wellhead enclosure

Entrance by animals? ☐ Yes ☒ No Access is possible

p. Is well site subject to flooding? ☒ Yes ☐ No Evidence of water staining on enclosure

q. Is the well site well drained? ☐ Yes ☐ No There is a small, natural drainage ditch ~13m from well head enclosure

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

If yes, is it ☒ in use ☐ abandoned UST nest

Is the location known? ☒ Yes ☐ No

Distance from the well to known buried tank ~94m

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: AST 1 ; Distance from well to Potential Source 1: 1m

Potential Source 2: Alaska Hwy ; Distance from well to Potential Source 2: 65m

Potential Source 3: Junction 37 pumps; Distance from well to Potential Source 3: ~75m

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 _____ ☒ No

f. Well casing: Diameter 15 cm Material: ☒ steel ☐ plastic ☐ concrete

g. Depth of well: 727.72 (LD BOTTOM OR PUMP) ☑ measured (if possible) ☐ reported ☐ from log

h. Static water level below ground: 19.455

☐ 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
wooden pwf pit - wellhead is ~2cm above the floor (sand) level of the pit
☒ 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 0.90 m below grade (is only 2cm above pit floor)

ii. Are there signs of ponding on the enclosure(e.g. water stains, etc.)? ☒ Yes ☐ No
Heavy where piping enters enclosure

iii. Is the wellhead enclosed by fiberglass insulations? ☒ Yes ☐ No

iv. Any evidence of rodents? Specify Access possible

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

If no, describe condition split gasked cap

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
Unknown

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: unknown 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 and fibreglass insulation

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

Water from well is for washroom sink, toilet, and hot water supply only. There is a water tank for delivered water that supplies the kitchen cold water tap - this is likely supposed to be the drinking water for the building.

b. Recommendations: _____

PART B: EBA Site Inspection

Inspector: BERT ALB Date _____

WELL ID #	Owner	Location Description
4842	YTG.	JUNCTION 37 WEIGH SCALES

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):**

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: OUTSIDE

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: No ENCLOSURE

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" x 72" TALL

What material is the tank constructed of? POLYETHYLEN

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: NOT IN USE WHEN INSPECTED.

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:

THIS JET PUMP INSTALLATION IS OF POOR QUALITY MATERIAL AND WORKMANSHIP. THE PUMP RUNS CONTINUALLY - IT WILL NOT BRING THE SYSTEM UP TO PRESSURE. THE SUCTION PIPE HAS NUMEROUS HOSE CLAMP JOINT AND IS THERE FOR SUBJECT TO AIR LEAKS.

b. Recommendations:

REPLACE PUMP SYSTEM WITH SUBMERSIBLE PUMP SYSTEM. INSTALL TREATMENT AS REQUIRED. SUPERCHLORINATE THE TOTAL SYSTEM AND INSTALL AN APPROPRIATE UV SYSTEM.

Photo 0238: 4842 Cassiar Weigh Scales (back), wellhead enclosure (centre), above ground fuel storage tank (left centre), water storage tank for kitchen cold water tap (left)

Photo 0237: 4842 Pressure tank (centre) and pump controls (right)

Photo 0240: 4842 Wellhead in pit

Photo 0239: 4842 Possible septic field