

16.0 BUILDING 2544: DAWSON CITY AIRPORT TERMINAL BUILDING

16.1 Description of Existing Water Supply System

The water system for the Dawson City Airport Terminal Building (Building 2544) is supplied by a 12.2 m deep well that is located in pit below grade approximately 4 m east of the terminal building adjacent to the airport apron. A site plan is provided as Figure 2544-A in Appendix A16. The coordinates of the wellhead, as measured by a handheld GPS device, were recorded as:

- UTM ZONE 7
- Northing: 7103361
- Easting: 591523

There are no treatment or disinfection components to this water system. A schematic detailing the water supply system is provided as Figure 2544-B in Appendix A16. An 8.1 m deep abandoned well is located in the crawl space underneath the terminal building approximately 9 m from the well that is in use. Photos of the well and water system are also included at the back of Appendix A16.

16.2 Description of Existing Wastewater Systems

A septic holding tank serving the Airport Terminal is located near the northwest corner of the building, approximately 28 m west of the well. The septic system location is indicated on Figure 2544-A in Appendix A16. It is unclear whether there is an in-ground septic disposal field associated with this tank. If there is a septic field, it may be within 30 m of the well. A steel casing, which may indicate the location of a septic field was observed protruding from the ground to the west of the airport building. The purpose of this casing should be determined.

16.3 Water Quality Results

16.3.1 Water Quality Results from Previous Sampling

Bacteriological

Seven samples were collected from the Dawson City Airport Terminal Building water system between October 2004 and June 2005 and were tested for total coliform and *E. coli* by Yukon Environmental Health Services using the

presence/absence test method. Results are tabulated in Table 2544-1 in Appendix A16. Coliform bacteria and *E. coli* were reported as absent in each of the seven samples for which results are provided.

Potability

Water samples were collected from the Dawson City Airport Terminal Building water system on September 29, 2004 and June 8, 2005. The samples were submitted to Northwest Labs in Surrey BC and ALS Environmental in Vancouver BC for potability analyses. The results of these analyses are summarized in Table 2544-2 in Appendix A16. 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. Relevant details are as follows:

- The water quality results indicated that all health based and aesthetic objectives were met for the parameters analyzed;
- The water quality results indicated that the groundwater is calcium bicarbonate type with a pH of approximately 7.4; and,
- The hardness (as CaCO_3) was in the order of 170 mg/L during both sampling events, and is considered moderately hard.

16.3.2 Identification of Additional Analytical Testing Required

Additional analytical for the Dawson City Airport Terminal Building that was identified to be included during the water system assessments is detailed below:

- UV absorbance and UV transmissivity, as well as tannins and lignin, to determine potential for UV treatment as a disinfection option for this water system;
- Total organic carbon (TOC); 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 water system assessment on August 19 2005, and was submitted to ALS Environmental in Vancouver BC for analysis of the additional parameters indicated above. These results are summarized in Table 2544-2 in Appendix A16 and the laboratory reports are included in Appendix B.

16.3.3 Indicators of Potential Contamination

Chloride, nitrate and nitrite concentrations can indicate impacts from surficial sources of contamination such as septic waste. Chloride concentrations were low and are within the normal background range for groundwater in the area. Nitrate and nitrite concentrations for this sample are also low and within the normal background range for this area. These water quality results indicate that the groundwater sample obtained from W-2544 was not under the influence of anthropogenic sources of nutrients or anions that may be derived from septic wastes.

16.4 Conceptual Hydrogeology

This well is completed at a depth of 12.2 m within a coarse gravel, cobble and boulder aquifer. The well log indicates a static water level of 4.7 m below ground with no fine-grained material overlying the aquifer. The aquifer is very vulnerable to surficial sources of contamination and is likely under the direct influence of surface water.

This well is situated southeast of the Klondike River and is likely completed within the alluvial floodplain deposits. Water levels and groundwater flow direction in the aquifer is most likely closely connected to water levels in the Klondike River. The ambient groundwater flow direction in the vicinity of the well is likely northwesterly down the river valley and towards the river.

16.5 Potential Contaminant Sources

Details and photographs of potential contaminant sources observed during the site investigation are compiled in Appendix A16.

Potential contaminant sources within 30 m of the wellhead are:

- A septic holding tank at 28 m;
- An above ground fuel storage tank (AST) at 30 m; and
- An abandoned well at 9 m.

In addition, an underground fuel storage tank and several spill events have taken place at the site.

16.5.1 Spills Records and Contaminated Sites Search Results

The following spill events were documented by Environment Canada Spills records and included in Appendix A16:

- It was reported that during the month of August 1982, two spills occurred at the airport due to overfilling of fuel tanks.
- During the month of June 1988, two spills occurred on the gravel tarmac behind the airport terminal.
- Various spills of fuel occurred between 1992 and 1994 due to overfilling of the UST resulting in approximately 4500 L of heating fuel being discharged.
- Two other spills of unknown quantities of aviation fuel occurred on the airport property in 1999 and 2001. Little information on cleanup is available.

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

16.6 Identified Water System Deficiencies and Associated Risk

16.6.1 High and Medium Risk Deficiencies

High and medium risk deficiencies for this water system that were identified during this study include:

- Poor surface completion of the wellhead (located in a pit below grade);
-

- There is no surface sanitary seal (grout or bentonite seal as required by the Canadian Groundwater Association's Guidelines for Water Well Construction;
- At 12.2 m in depth, the well is considered to be a shallow well completed within a shallow - unconfined aquifer. The well is vulnerable to surface sources of contamination including chemical and biological contaminants;
- 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), has a production zone that is less than 15 m below grade, and does not meet the requirements of the Guidelines for Water Well Construction.
- The well is located within 30 m of potential contaminant sources, including an abandoned well and an AST and fueling area;
- There have been several historical spill events on the airport property, some of which were in relatively close proximity to the well; and,
- There is no treatment or disinfection system present.

16.6.2 Low Risk Deficiencies

There were no low-risk deficiencies identified for this site. All deficiencies are considered to be either high or medium risk.

16.7 Mitigative Options for Deficiencies

The following mitigative options are recommended to address the immediate risk deficiencies associated with the water system at the Dawson City Airport Terminal Building. A detailed hydrogeological assessment was completed by EBA in November 2005 to establish the groundwater flow regime in the vicinity of the site. The results of this assessment are summarized in a letter report to PMA (EBA 2006). A summary of the results of this study is provided below:

- Potential contaminants of concern including polycyclic aromatic hydrocarbons, extractable petroleum hydrocarbons and glycols were not detected above laboratory detection limits for the sample collected on November 22nd, 2005.
- Several potential contaminants of concern exist within the 50-day zone of travel of the well capture zone.

Deficiencies are categorized by recommended level of priority (with Priority 1 being most critical).

16.7.1 Priority 1

The following Priority 1 mitigative options are recommended to address the high-risk deficiencies associated with the water system at the Dawson City Airport Terminal:

- An adequate disinfection system should be installed due to the vulnerability of this aquifer to potential biological parameters and the absence of a bentonite grout seal. Based on water quality results, it is anticipated that a UV system could be utilized without pre-treatment. Since the well has been flagged as being potentially under the direct influence of surface water (EBA 2006) it is recommended that NSF-16 certified filtration (to 1 micron absolute) followed by an NSF/ANSI 55 certified UV disinfection (or equivalent) system be installed. These are conceptual design recommendations based on the information available for planning and budgeting purposes. Engineering input will be required for final system specifications.
- Recommendations to implement management strategies and contingency planning are outlined in the letter report of March 2006, and include the following:
 - Implementation of a monthly monitoring program for potential contaminants of concern including hydrocarbons (PAH, BTEX/VPH) and glycols.
 - Regulation and management of activities within the well capture zone including the relocation of proposed fuel storage and handling facilities at the Initial Attack Base.
 - Development of contingency plans so that alternate water supply sources can be supplied in the event of a spill or fuel release within the well capture zone.

Given the inherent vulnerability of the aquifer and risk posed by existing potential contaminants of concern within the well capture zone, consideration should be given to converting this system to bulk water delivery. Alternatively, the well could

be re-located to a location upgradient from all potential contaminant sources. Given the size of the site, and the risk posed by the airport runway and fuel handling activities, this new well would have to be located a significant distance away from the airport terminal building (> 400 m) to ensure no high-risk activities are occurring within the capture zone.

16.7.2 Priority 2

The following Priority 2 upgrades are recommended to mitigate remaining health risks to this water system:

- Standard wellhead upgrades consisting of pitless adapter (snappy type), casing extension, retrofitting of a bentonite/grout surface sanitary seal, casing insulation and installation of a high visibility lockable PVC stick-up casing protector.
- Decommissioning of abandoned wells in accordance with proposed regulations.

16.7.3 Priority 3

No low risk deficiencies have been identified for this site.

16.8 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.

16.8.1 Priority 1

Class D estimated costs for Priority 1 recommended upgrades are detailed below:

- A filtration and UV disinfection system would cost approximately **\$3,000** for materials and labour.
- The recommended monthly sampling program would cost approximately **\$500** per month (**\$6,000** per year) and should be included in an operation budget.



- Capital costs for regulation of activities within the well capture zone including the relocation of proposed fuel storage and handling facilities would cost in the order of **\$10,000**. There would be ongoing costs to continue to regulate activities at this are of the site, which are difficult to quantify at this time. Development of contingency plans can be incorporated into the standard spill response plan for airport operations. Depending on contingency measures provided, costs may be variable.

The life cycle costs to convert to water delivery, or to drill a new well that is upgradient of all potential contaminant source should be considered against the recommended monitoring program to decide upon a long-term water supply option. If it is intended to continue using the existing well, it is recommended that Priority 2 upgrades be completed as described below.

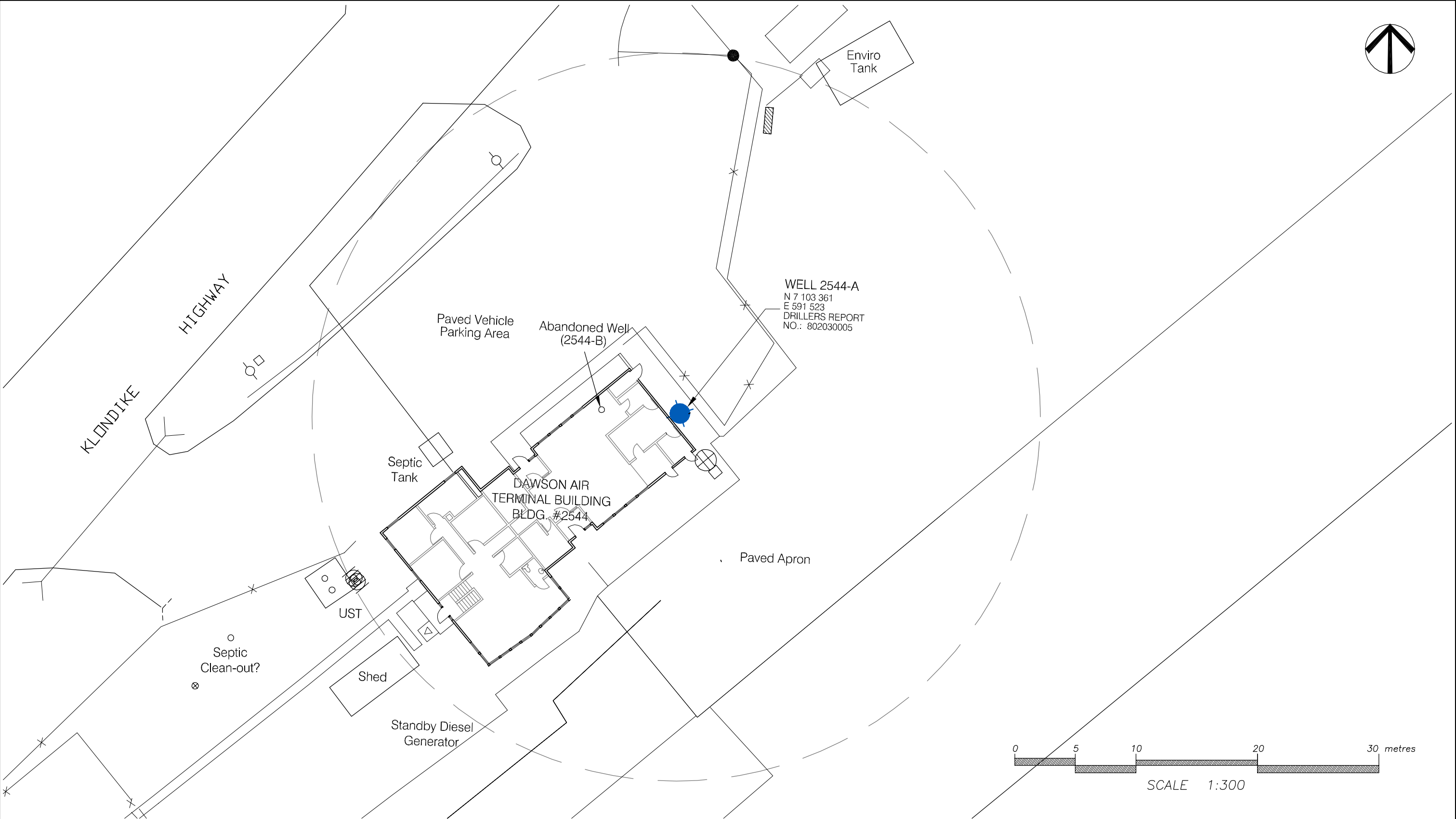
16.8.2 Priority 2

- The recommended standard wellhead upgrades would cost approximately **\$3,000** for materials and labour;
- Decommissioning of two abandoned shallow wells would cost approximately **\$500** per well including materials and labour as long as this work is completed at the same time as the wellhead upgrades (e.g. mob/demob costs are shared).

16.8.3 Priority 3


There are no Priority 3 upgrades recommended at this time.






NOTES:


1. UTM COORDINATES OBTAINED WITH A HAND HELD GPS USING NAD83 SYSTEM AND ARE CONSIDERED TO BE ACCURATE TO 10.0 m, APPROXIMATELY.

 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			

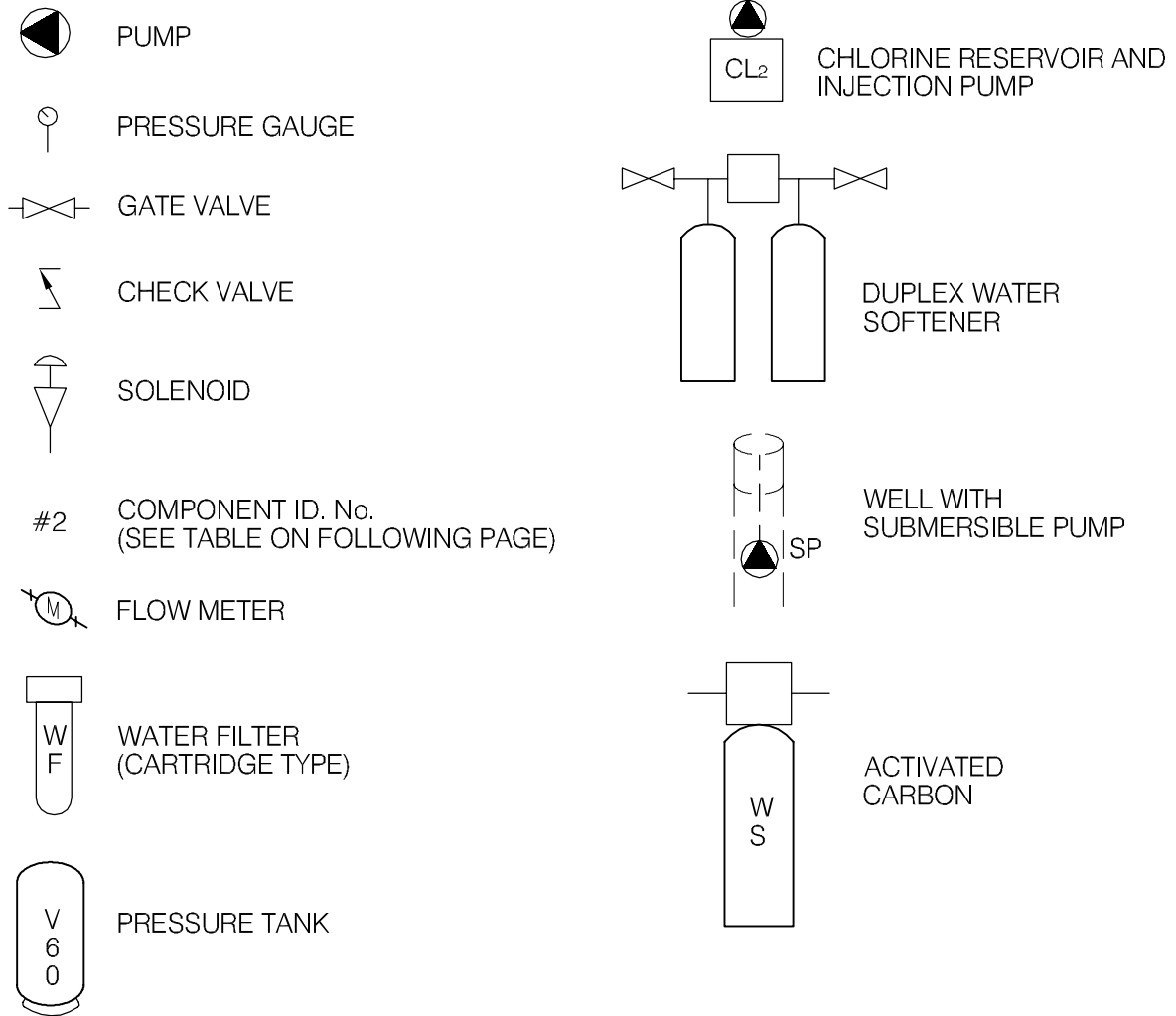
**EBA Engineering Consultants Ltd.**

DESIGNED BY: R. MARTIN
DRAWN BY: J. BUYCK
DATE: SEPT. 2005
SCALE: AS SHOWN
PROJECT No.: 1260002.004
ACAD FILENAME: 004-NORTHERN REGION

CLIENT:

Highways and Public Works
Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT NORTHERN REGION	
GOVERNMENT OF YUKON HIGHWAYS & PUBLIC WORKS	
DAWSON AIR TERMINAL BUILDING BUILDING # 2544 SITE LOCATION DIAGRAM WELL ID: 2544	REVISION ISSUE 0 FIGURE No. FIGURE 2544-A

LEGEND



EBA Engineering Consultants Ltd.

CLIENT

Yukon
Highways and Public Works
Property Management Branch

PROJECT

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
WESTERN REGION

TITLE

SCHEMATIC SYSTEM
LEGEND

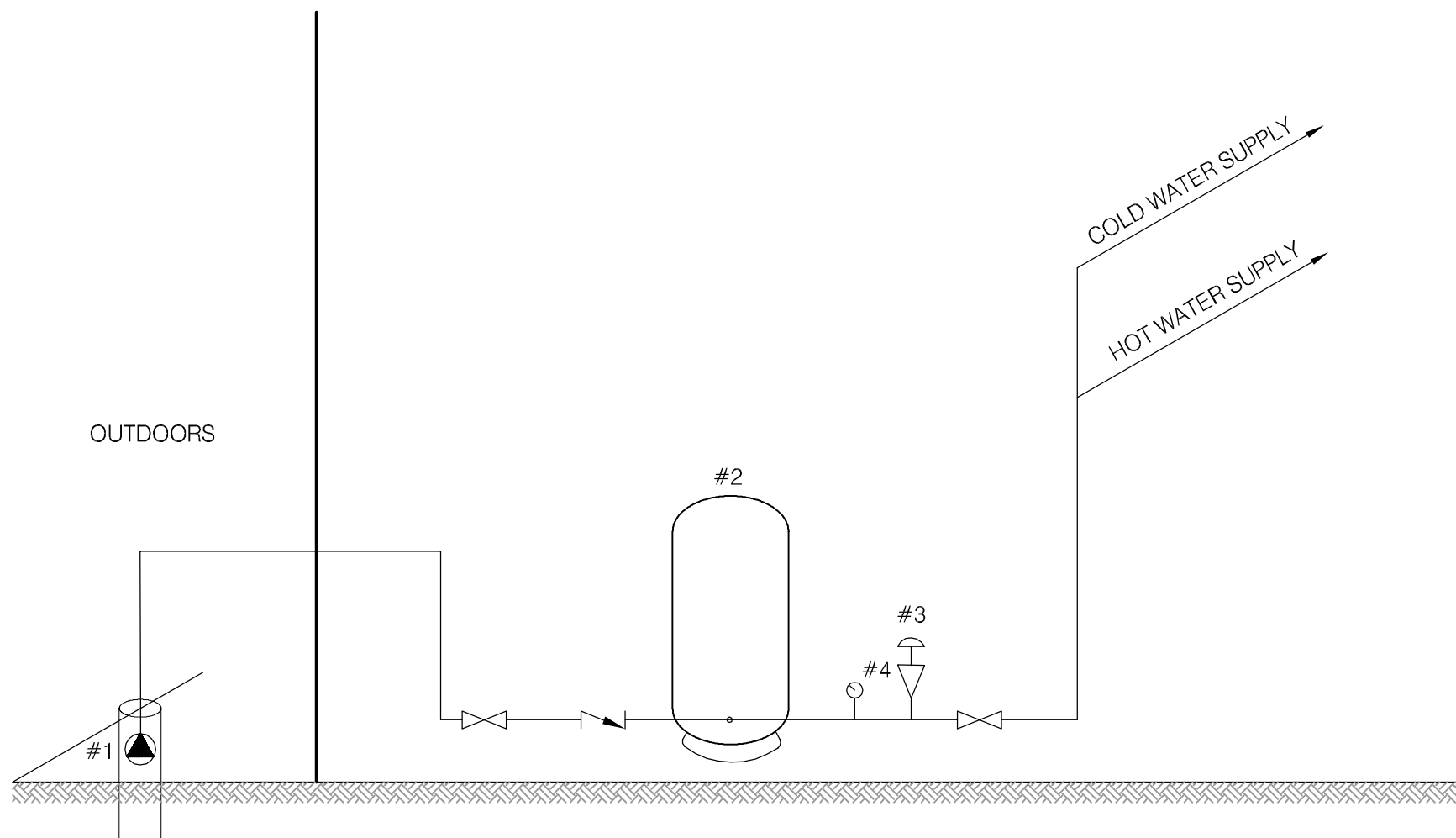
DATE APRIL 2006

DWN. JSB



CHKD. RMM

FILE NO. 1260002

DRWG. LEGEND



DRAWING IS BASED UPON SCHEMATIC PROVIDED BY BERT ALBISSER OF AQUA TECH SUPPLIES AND SERVICES LTD.

 <div>EBA Engineering Consultants Ltd.</div>			PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT NORTHERN REGION						
CLIENT  <div>Yukon Highways and Public Works Property Management Branch</div>			TITLE WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 2544 AIR TERMINAL BUILDING - DAWSON, YT.						
DATE	SEPT. 2005	DWN.	JSB	CHKD.	RMM	FILE NO.	1260002.004	DWG.:	FIGURE 2544-B

Northern Region – Dawson City Air Terminal Building
Building # 2544

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	SUB. Pump	N/A	4" - 1/2 HP			1/2 HP.
2	PRESSURE TANK	CHALLENGER	PC 144			44 GALLON
3	PRESSURE SWITCH	SQUARE D	FSG-2			2 HP - 1/4 FIPT
4	PRESSURE GAUGE	MARSH	0-100 PSI			2" - 1/4 FIPT.
5						
6						
7						
8						
9						
10						

TABLE 2544 - 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?
2544	Dawson City Airport Terminal Building	7	Oct-04 to Jun-05	no	0/7	no	9-Jun-05	no



Table 2544 - 2: Water Quality Results

SOURCE:		Building 2544 - Dawson City Airport Terminal Building			GCDWQ Criteria		
Location/ Resident		Dawson City					
Address							
Treatment		None					
Disinfection		None					
Source of Water		On-site well					
Purpose of Sampling		Base Line	Base Line	Additional Sampling			
Sample Location							
Date Sampled		29-Sep-04	8-Jun-05	19-Aug-05	Lower	Upper Limit	
Physical Tests (ALS)					AO	MAC	AO
Colour (CU)		<5	<5.0				15
Conductivity (uS/cm)			326				
Total Dissolved Solids		187	191				500
Hardness CaCO3		170	163		AO >200 = poor, > 500 unacceptable ^A		
pH		7.4	7.41		6.5		8.5
Turbidity (NTU)		0.4	0.15			1	5
UV Absorbance				0.025			
% UV Transmittance				94.4			
Dissolved Anions (ALS)							
Alkalinity-Total CaCO3		112	108				
Chloride Cl		2	1.79				250
Fluoride F		0.05	0.066			1.5	
Silicate SiO4							
Sulphate SO4		55.3	61.5				500
Nitrate Nitrogen N		0.3	0.94			10	
Nitrite Nitrogen N		<0.05	<0.10			3.4	
Ammonia Nitrogen N							
Total Phosphate PO4							
Total Metals (ALS)							
Aluminum T-Al		<0.005	<0.010			0.1	
Antimony T-Sb		0.0003	<0.00050			0.006	
Arsenic T-As		0.0027	0.00243			0.025	
Barium T-Ba		0.018	<0.020			1	
Boron T-B		0.006	<0.10			5	
Cadmium T-Cd		0.00003	<0.00020			0.005	
Calcium T-Ca			44.3				
Chromium T-Cr		0.0009	<0.0020			0.05	
Copper T-Cu		0.153	0.339			1	
Iron T-Fe		0.02	<0.030				0.3
Lead T-Pb		<0.0001	<0.0010			0.01	
Magnesium T-Mg			12.7				
Manganese T-Mn		0.023	0.0046				0.05
Mercury T-Hg			<0.00020			0.001	
Potassium T-K			0.55				
Selenium T-Se			<0.0010			0.01	
Sodium T-Na		2.4	<2.0				200
Uranium T-U		<0.0005	0.00011			0.02	
Vanadium T-V							
Zinc T-Zn		0.013	<0.050				5
Organic Parameters							
Tannin and Lignin				<0.10			
Total Organic Carbon C				1.71			
Field Chemistry (EBA)							
pH					6.5		8.5
TDS (ppm)							500
EC (uS/cm)							
Temperature (°C)							
Free Available Chlorine							

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)



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SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin, Luke Lebel

Date August 19, 2005

WELL ID #	Owner	Location Description
2544	YTG	Dawson City Airport Terminal Building

1. Well Location and Potential Contaminant Sources

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

Dawson City

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

Dawson City Airport

c. GPS location: N 7103361 E 591523 elev 375m \pm 9m

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 _____

Airport Terminal Building

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

g. Nearest building, specify Terminal building

h. Distance from well to building ~4m

i. If there is an effluent disposal field, is its location known? ☐ Yes ☐ No *

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

k. Well location relative to field: ☐ upslope ☐ downslope ☐ lateral

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- 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

Septic tank @ ~28m

- 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

Enclosure is unlocked, but is inside airport secure area

Entrance by animals? ☒ Yes ☐ No

Access possible, but unlikely

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

- q. Is the well site well drained? ☒ Yes ☐ No

- r. 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 ~36m

- 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: ~30m

Potential Source 2: AST 2+3; Distance from well to Potential Source 2: 760m

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? 1 (possibly 2) ☐ in use ☒ abandoned ☐ require proper sealing

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2. Well and Wellhead information:

- a. When was well installed? Year 1988 Month September
- 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: 40 ft ☐ measured (if possible) ☐ reported ☒ from log
- h. Static water level below ground: 15.5 ft
☐ 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 2.5 ft slot size(s) 18 slot
Location of screen: from 37.5 ft to 40 ft 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
☐ 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 ~ 0.45m below grade
- 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, but access possible
- v. Does the well casing have a proper seal cap? ☒ Yes ☐ No
- If no, describe condition split gasket 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 or disinfection ☐ Yes ☒ No

Explain (filtration, disinfection etc...) _____

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
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

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: Insulation + 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: BERT ALBISER

Date AUG 19/05

WELL ID #	Owner	Location Description
2544	YTG	DAWSON CITY AIRPORT

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 ☐ 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: PRESSURE TANK

Where is it located?

Comments: CRAWL SPACE

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

8. Conclusions

a. Comments on overall installation:

THIS INSTALLATION IS OF GOOD QUALITY AND
WORKMANSHIP.

b. Recommendations:

INSTALL TREATMENT AS DICTATED BY WATER
QUALITY ANALYSIS, SUITABLE FOR UV SYSTEM.
INSTALL 10 GPM UV SYSTEM (NSF55 CERTIFIED)

Les.
Travis
Lorrey

P.O. Box 2106
Whitehorse, Yukon
Phone: 667-4795

rown Clay - br cl
lue Clay - bl cl
and - sd
andy Clay - sdy cl
oft Shale - s shl
ard Rock - hd rk
andstone - ss
ine Gravel- f gr
oulders - bdrs

MIDNIGHT SUN

Job (Month) (Day) (Year)

Started..1464..4...19.73.

DRILLING CO. LTD. Completed. 444.6... 19.73..

Invoice No.....

NAME AND ADDRESS OF CLIENT	DESCRIPTION OF WORK	LOCATION OF WORK
V.T.G.	WATER WELL	Sec. <u> </u> Twp. <u> </u> Rge. <u> </u> W.
		DAWSON CITY AIRPORT

[illegible]

D. of Casing & Pipe				Remarks:
Type	Size	Type		
				CASING PERFORATED 21'-28'
				31' OF 5" CASING
				Bailed AT 11 A.M.
				6-5"
				Well Cased: Casing to ft. and Total Big Time (above) hrs.
				Casing from ft. to ft. Total Standby (above) hrs.
				STATIC 13 from ground level LEVEL: 15 from top of casing Drilling Mud Used (above) sacks

SIGNATURES

For Midnight Sun.....

For Client.....

DRILLER GORDON TORGERSON



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Spill Report Information

Spill #	8219
Jurisdiction	Yukon
Community	Dawson City
Address	
Highway	
Milepost	
Feature	Dawson City
Location and Cause	Airport - bulk tank overfill due to operator error
Latitude	64.045361
Longitude	-139.123528
Incident Date	8/10/1982 6:30:00 AM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	
Company(s)	White Pass & Yukon Route
Amount	0.83
Units	Tonnes (Metric)
Quantity	Actual
Release Description	Spilled
Additional Quantit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Aviation Fuel (Jet A Or B)
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	not located near surface water - should be little damage except to vegetation in vicinity of tank - most fuel expected to evaporate within a few hours



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Spill Report Information

Spill #	8221
Jurisdiction	Yukon
Community	Dawson City
Address	
Highway	
Milepost	
Feature	Dawson City
Location and Cause	Airport - overfill of fuel tank on aircraft
Latitude	64.045361
Longitude	-139.123528
Incident Date	8/17/1982 2:00:00 PM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	
Company(s)	White Pass & Yukon Route
Amount	0.5
Units	Tonnes (Metric)
Quantity	Estimate
Release Description	Spilled
Additional Quantitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Aviation Fuel (Jet A Or B)
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	not located near surface water - little likelihood of damage due to volume and volatility - peat used to soad up small puddle on tarmac



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Spill Report Information

Spill #	8807
Jurisdiction	Yukon
Community	Dawson City
Address	
Highway	
Milepost	
Feature	Dawson City
Location and Cause	Airport - fuel valve opened on unattended fuel truck - suspect it was intentional
Latitude	64.045361
Longitude	-139.123528
Incident Date	6/20/1988 9:00:00 AM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	Yukon Government - Highways
Company(s)	McKenzie Petroleum
Amount	0.23
Units	Tonnes (Metric)
Quantity	Actual
Release Description	Spilled
Additional Quantitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	most absorbed into ground - drinking water well 45m away - groundwater table 4m below surface - sand applied to puddles and removed to landfill



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Spill Report Information

Spill #	8829
Jurisdiction	Yukon
Community	Dawson City
Address	
Highway	
Milepost	
Feature	Dawson City
Location and Cause	Airport - apparent spill of fuel on a gravel tarmac behind terminal - two areas appear to have fuel residue
Latitude	64.045361
Longitude	-139.123528
Incident Date	6/29/1988 9:10:00 AM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	Yukon Government - other
Company(s)	
Amount	
Units	
Quantity	Unknown
Release Description	Spilled
Additional Quantitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Hydrocarbons
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	source of spill unknown - suspect from oil spill previous week - oil reappearing - advised to clean-up using sorbent cloth



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Spill Report Information

Spill #	9204
Jurisdiction	Yukon
Community	Dawson City
Address	
Highway	
Milepost	
Feature	Dawson City
Location and Cause	Airport - 200 m NE of airport terminal building - overfill of underground storage tank - human error
Latitude	64.045361
Longitude	-139.123528
Incident Date	3/13/1992 8:00:00 PM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	
Company(s)	White Pass Transportation Ltd
Amount	3500
Units	Litres
Quantity	Actual
Release Description	Spilled
Additional Quantitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Aviation Fuel (Jet A Or B)
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	fuel overflowed onto snow packed ground - contaminated snow removed to Quigley dump - clean-up inspected by YTG Fire Marshall



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Spill Report Information

Spill #	9447
Jurisdiction	Yukon
Community	Dawson City
Address	
Highway	
Milepost	
Feature	Dawson City
Location and Cause	Airport - contamination of soil around UST's - unknown if tanks leaking or due to refueling practices
Latitude	64.045361
Longitude	-139.123528
Incident Date	9/21/1994
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	
Company(s)	YTG Aviation & Marine Branch
Amount	
Units	
Quantity	Unknown
Release Description	Chronic Discharge
Additional Quantit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Aviation Fuel (Jet A Or B)
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	contaminated soil excavated and landfarmed



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Spill Report Information

Spill #	9455
Jurisdiction	Yukon
Community	Dawson City
Address	
Highway	
Milepost	
Feature	Dawson City
Location and Cause	Airport - domestic fuel storage tank at Transport Canada residence - fuel line failed
Latitude	64.045361
Longitude	-139.123528
Incident Date	7/12/1994 4:04:00 PM
Lead Agency	Municipality - identified in Community
Other Agency	
Company(s)	Transport Canada
Amount	1000
Units	Litres
Quantity	Actual
Release Description	Spilled
Additional Quantitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Furnace Oil
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	contractor Klondike Mechanical doing clean-up - Transport Canada will contact City of Dawson to ensure clean-up to standard



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Spill Report Information

Spill #	9914
Jurisdiction	Yukon
Community	Dawson City
Address	
Highway	
Milepost	
Feature	Dawson City
Location and Cause	Airport - on apron at North 60 Petro trailer - valve on trailer not closed properly
Latitude	64.045361
Longitude	-139.123528
Incident Date	5/19/1999 5:00:00 AM
Lead Agency	Yukon Government - Environmental Programs
Other Agency	
Company(s)	Sumit Air
Amount	
Units	
Quantity	Unknown
Release Description	Spilled
Additional Quantitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	volume spilled not noted in file - flying fuel into camps - valve not closed properly after loading - loader and dump truck ready for clean-up - no further information on file



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Spill Report Information

Spill #	0203
Jurisdiction	Yukon
Community	Dawson City
Address	
Highway	
Milepost	
Feature	Dawson City
Location and Cause	Airport - truck roll over - think it was a B-train
Latitude	64.045361
Longitude	-139.123528
Incident Date	1/19/2002 11:30:00 AM
Lead Agency	Yukon Government - Highways
Other Agency	
Company(s)	
Amount	
Units	
Quantity	Unknown
Release Description	
Additional Quantitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Hydrocarbons
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	limited info on initial report to spill line due to poor phone connection - person reporting taking pictures - YG-EMO coordinating response - no other info on file



Photo 088: 2544 Dawson City Air Terminal Building.



Photo 089: 2544 Enviro ASTs for bulk fuel storage.



Photo 090: 2544 Wellhead.



Photo 234: 2544 Abandoned well (bottom) pressure tank & pump controls (top).