15.0 BUILDING 5653: MAYO AIRPORT TERMINAL BUILDING

15.1 Description of Existing Water Supply System

The Mayo Airport Terminal Building (Building 5653) is currently serviced by a water supply system that delivers water from a 38 m deep well located in a pit below grade. At the time of water system assessment there was no cap on the wellhead, however, it is understood that a cap was installed when Aqua Tech completed well cleaning, downhole video camera inspection and redevelopment work on this well in October 2005. A site plan is provided as Figure 5653-A in Appendix A15. The coordinates of the wellhead, as measured by a handheld GPS device, were recorded as:

- UTM ZONE 8
- Northing: 7054513
- Easting: 456406

This system is equipped with a 5-micron filter however; there is no other treatment or disinfection for this system. A schematic detailing the water system is provided as Figure 5653-B in Appendix A15. Photos of the well and water system are also included at the back of this appendix.

15.2 Description of Existing Wastewater Systems

Wastewater from the terminal building is discharged into a septic system located to the southeast of the building. The tank is approximately 34 m southeast of the well. It is unknown whether the septic system uses a holding tank and sewage eduction, or an effluent disposal field, however due to the location of the tank it can likely be inferred that a septic field (if present) would be located greater than the required 30 m from the well. A site plan showing the location of the septic tank is given by Figure 5653-A in Appendix A15.

15.3 Water Quality Results

15.3.1 Water Quality Results from Previous Sampling

Bacteriological

Nine samples were collected from the Mayo 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 5653-1 in Appendix A15. One sample out of nine reported the presence of total coliform bacteria. The most recent sample results provided, however, reported that coliform bacteria were not present. E. coli was reported as not present in all samples for which results were provided.

Potability

YTG representatives collected water samples from the Mayo Airport Terminal Building water system on September 27, 2004. The samples were submitted to Northwest Labs in Surrey BC for potability analyses. Results are summarized in Table 5653-2 in Appendix A15. EBA reviewed the analytical results to compare them with the Canadian Drinking Water Quality Guidelines (CDWQG) to observe general water quality; to identify and recommend additional sampling and analytical; and to identify potential indicators of contamination. Relevant details are as follows:

- At 0.0756 mg/L, the arsenic concentration was above the CDWQG MAC of 0.025 mg/L;
- At 23.5 NTU, turbidity was above both the CDWQG MAC of 1.0 NTU and aesthetic objective (AO) of 5.0 NTU;
- At 2.62 mg/L, the total iron concentration was in exceedence of the CDWQG AO of 0.3 mg/L;
- At 0.272 mg/L, the total manganese concentration was in exceedence of the CDWQG AO of 0.05 mg/L;
- The colour was greater than 60 CU, which is above the CDWQG AO of 15 CU;
- The water quality results indicated that all other health based and AOs were met for the parameters analyzed; and,
- The hardness (as $CaCO_3$) was 349 mg/L, and is considered very hard.

15.3.2 Identification of Additional Analytical Testing Required

Additional analytical for the Mayo Airport Terminal building that was identified to be included during the water system assessment 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;
- Detailed potability analyses including metals, anions and nutrients;
- Silica and phosphate, to determine the potential for a point of entry arsenic removal system;
- Total organic carbon (TOC); and
- Measurements in the field for total dissolved solids, conductivity, pH, and temperature.

Additional Analytical Results

EBA collected a water sample during the field program on August 17 2005, and shipped it under chain of custody to ALS Environmental in Vancouver BC for analysis of selected parameters as indicated above. The results are summarized in Table 3440-2 in Appendix A15 and the laboratory reports are included in Appendix B. The following points regarding the water quality results are of significance:

- At 65.4 NTU, the turbidity of the water exceeded the CDWQG health based MAC of 5.0 NTU;
- Total arsenic at 0.0575 mg/L was above the CDWQG MAC of 0.025 mg/L, dissolved arsenic at 0.0200 mg/L was below the current MAC, but above the proposed MAC of 0.005 mg/L;
- Total iron at 3.77 mg/L was in exceedence of the CDWQG AO of 0.3 mg/L, dissolved iron concentration was below the laboratory detection limit of 0.03 mg/L indicating that elevated iron is most likely related to elevated turbidity; and
- Total and dissolved manganese at 0.289 and 0.273 mg/L respectively were both above the CDWQG AO of 0.05 mg/L.

15.3.3 Indicators of Potential Contamination

Chloride, nitrate and nitrite concentrations can indicate impacts from surface water sources or septic waste. Chloride concentrations were low and are within the normal background ranges for groundwater in the area. Nitrate and nitrite concentrations for this sample were also low and within the normal background range for this area. These water quality results indicate that the groundwater sample obtained from W-5653 was not under the influence of anthropogenic sources of nutrients or anions that may be derived from septic wastes.

15.4 Conceptual Hydrogeology

A driller's well log was not available for review for this well. Examination of well logs in the Mayo area show that well completion depths and lithology in the area is highly variable. Wells are completed at various depths, ranging from shallow dug wells to drilled wells greater than 150 m deep. The Mayo area has been affected by one or more glaciations, sediments in the Village of Mayo area tend to consist of recent alluvium overlying fine-grained silts with varying interbedded sand and gravel. Sediment deposits are generally underlain by metamorphic bedrock, which is exposed in much of the upland areas. Widespread discontinuous permafrost is known to exist in the Mayo area and has been noted in several of the well logs examined.

The Airport well is completed at a depth of approximately 56 m below grade with a static water level of 7.70 m below ground. Based on topography and proximity to surface water sources, the groundwater flow direction is inferred to be in the range of south to west towards the Mayo and/or Stewart River. Given the depth of the well, and based on the surficial geology of the area, it is likely that the well is completed in a confined aquifer and may have thick sequences of fine grained soils overlying the aquifer.

15.5 Potential Contaminant Sources

Details and photographs of potential contaminant sources observed during the site investigation are compiled in Appendix A15.

Potential contaminant sources within 30 m of the wellhead are:

- An underground fuel storage tank (UST) at 18 m.

In addition, there is a cemetery located 63 m south of the well; the proposed required setback distance from wells to Cemeteries in the proposed Part III - Small Water Systems Regulations is 120 m. As mentioned in the previous section, the well is completed at a depth of 56 m, likely within a confined aquifer and may have thick sequences of fine grained soils overlying the aquifer. Additionally, the well is inferred to be upgradient of the cemetery and the proximity to the cemetery is not considered to be a significant concern.

15.5.1 Spills Records and Contaminated Sites Search Results

It was reported by Environment Canada that three spills occurred in the 1970's at the White Pass and Yukon Route tank farm (WPYR) which is approximately 200 m south of the site. The first spill resulted in approximately 1600 L of furnace oil being discharged due to a machanical faliure. Reportedly the spill was contained and hydrocarbon impacted soils were disposed of off-site. Later in the decade, two other spills resulted in dicharges of 3700 L of fuel oil and 1600 L of gasoline respectively. Spill records are inclued in Appendix A15.

Another spill was reported in 1991 at the WPYR site when an unknown quantity of fuel caught fire and a truck exploded. 756, 000 L of water was used and reportedly, runoff was contained.

Two reported spills also occurred at the North 60 Petroleum Tank Farm in 1997 and 1999 due to the overfilling of a storage tank. Approximately 1000 L of diesel was spilled, however no record of remediation was reported.

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 in close proximity.

The well serving this facility is approximately 200 m from the spill site locations in a direction inferred to upgradient. The depth of the well and the fact that it is likely upgradient would provide protection from surficial sources of contamination. It is considered very unlikely that these reported spills or other activities at the bulk fuel sites would have impacted on deep groundwater in the vicinity of the airport well.

15.6 Identified Water System Deficiencies and Associated Risk

15.6.1 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);
- There is no driller's log available to review well construction and lithology;
- 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).
- The well is located within 30 m of potential contaminant sources including a UST;
- A water sample collected for bacteriological analysis tested positive for total coliform bacteria;
- The total arsenic concentration was in exceedence of the CDWQG MAC;
- The turbidity was in exceedence of both the CDWQG MAC and AO; and,
- There is no disinfection system present.

We understand that Aqua Tech Services and Supplies Ltd. completed chemical and physical well cleaning and redevelopment in October 2005. It is recommended that a follow-up sample be collected to determine whether well rehabilitation has improved water quality at this well. It is possible that reduced turbidity due to re-development will result in lowered iron, manganese and possibly arsenic concentrations. Existing water chemistry will be critical for final treatment system design.

15.6.2 Low Risk Deficiencies

- The Airport's well is located approximately 63 m from the closest property line of the adjacent cemetery, which is less than the proposed 120 m minimum setback distance required within the proposed Part III –Small Water System Regulations. However, based on the inferred groundwater flow direction and depth to well, this is considered a low risk to the drinking water supply serving the Airport;
- The iron concentration was in exceedence of the CDWQG aesthetic objective (AO);
- The manganese concentration was in exceedence of the CDWQG aesthetic objective; and,
- The colour has been reported above the CDWQG AO.

15.7 Mitigative Options for Deficiencies

Without treatment to remove arsenic to below the existing MAC, this water system should not be used for a potable water supply. Advisories and a bottled water station were present on the CARS side of the Terminal at the time of the assessment, however, there were no advisories in the waiting area. Until Priority 1 upgrades are completed, appropriate advisories should be posted on both sides of the airport building.

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).

15.7.1 Priority 1

The following mitigative options should be carried out to address the high-risk deficiencies associated with the water system at the Mayo Airport Terminal Building:

- Standard wellhead upgrades consisting of a pitless unit installation, extension of casing to at least 500 mm above grade, and retrofitting the wellhead with a bentonite/grout surface sanitary seal should be completed.
- A duplex water softener should be installed for UV system pre-treatment and general water quality improvement.

- A NSF/ANSI 55 certified UV system (or equivalent) should be installed to ensure disinfection. These are conceptual design recommendations based on the information available for planning and budgeting purposes. Engineering input will be required for final system specifications.
- A reverse osmosis system should be installed to provide drinking water with arsenic concentrations below the MAC and proposed MAC. The RO would also provide secondary treatment at the dedicated taps because viruses, bacteria and protozoa would not pass through the RO membrane. Dedicated drinking water taps could be plumbed into both sides of the building to provide drinking water to staff and to general public. Signs should be posted indicating that drinking water should be obtained from the dedicated drinking water taps only.
- The well and water system should be shock chlorinated.

15.7.2 Priority 2

The existing UST should be removed and replaced with a double walled tank with "Kamlock" fill connections and flex hosing. Any hydrocarbon-impacted soils should be documented and removed from the site for treatment at a land farm. This work should be completed under the supervision of a qualified environmental consultant.

All other health risks would be mitigated by the proposed Priority 1 upgrades.

15.7.3 Priority 3

The proposed Priority 1 and 2 upgrades should mitigate all health risks associated with this water system. As well, the proposed Priority 1 upgrades should improve aesthetic water quality by reducing hardness, iron and manganese, which would help to reduce fixture staining and plumbing encrustation. The wellhead upgrades, UV treatment and RO system installation in Priority 1 would further reduce any risk to water quality posed by the existing cemetery that is 63 m south of the well.

15.8 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.

15.8.1 Priority 1

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

- To complete the recommended wellhead upgrades consisting of pitless unit installation, well casing extension, piping and heat trace upgrades would cost in the order of **$5,000** for materials and labour.
- A filtration and UV treatment/disinfection system would likely amount to a total installed cost of about **$3,000**;
- A duplex softening system of adequate size would cost approximately **$4,000** installed; and,
- Supply and installation of a reverse osmosis system with a dedicated drinking water tap in the kitchen areas and in the terminal waiting area would cost approximately **$800**.

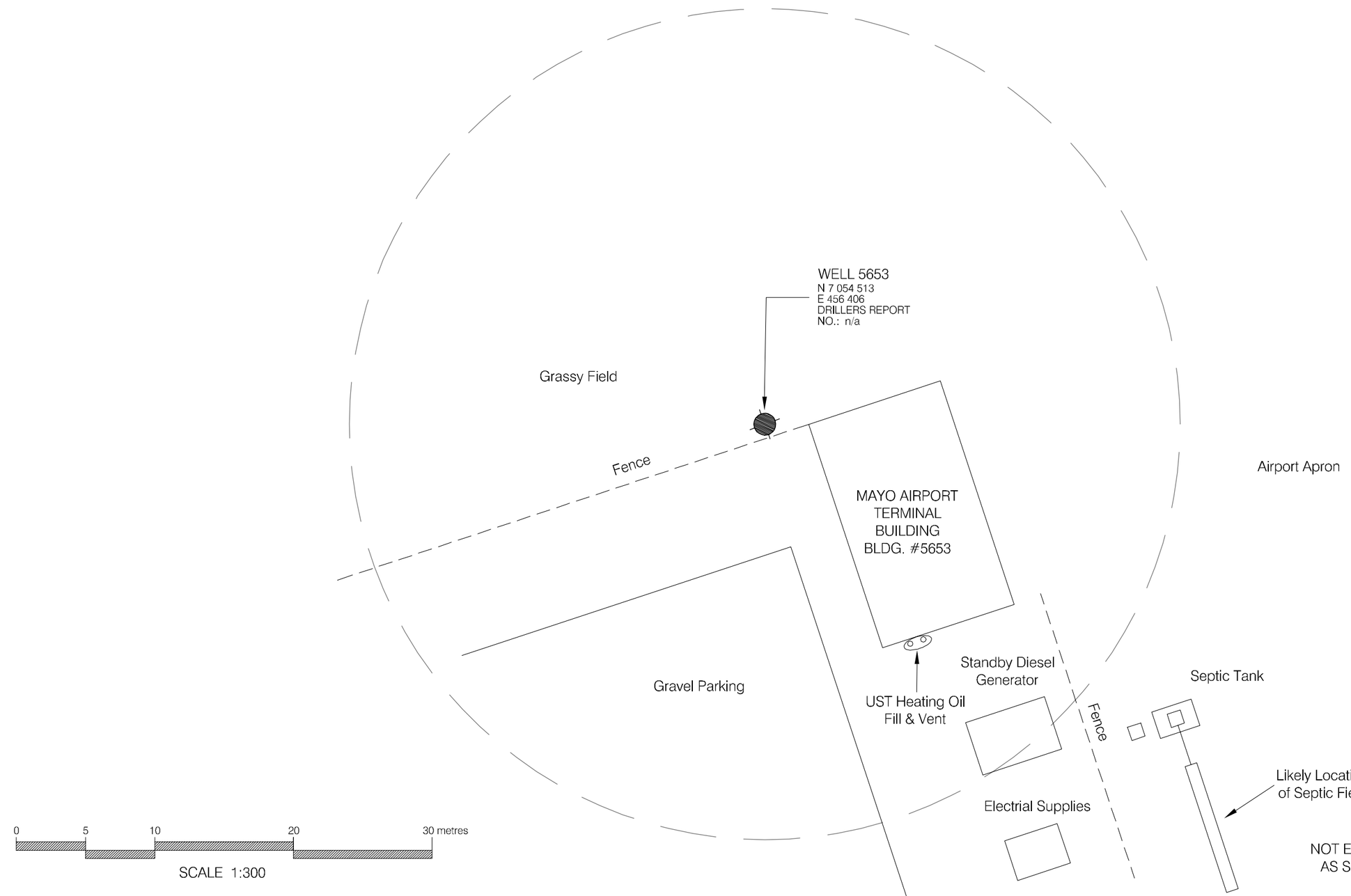
Therefore the total estimated cost for all recommended Priority 1 upgrades is approximately **$12,800**.

15.8.2 Priority 2

Estimated costs for UST removal, tank disposal, removal of any associated hydrocarbon impacted soils, and replacement with a double walled AST with Kamlock fill connection and flex hose would cost in the order of **$8,000** assuming that there is negligible soil contamination. The costs could be significantly higher if soil contamination in present in the vicinity of the building.

15.8.3 Priority 3

There are no recommended Priority 3 upgrades at this time. Priority 1 and 2 upgrades should mitigate all health risks.



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: Yukon
Highways and Public Works
Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
NORTHERN REGION

GOVERNMENT OF YUKON
HIGHWAYS & PUBLIC WORKS

MAYO TERMINAL BUILDING
BUILDING # 5653
SITE LOCATION DIAGRAM
WELL ID: 5653

REVISION ISSUE 0

FIGURE No. FIGURE 5653–A

\\eba.local\corp\Whitehorse\Data\0201Drawings\1260002 Water Assessment YTG\004 - Northern Region\mayo\1260002004 Mayo Terminal Building_5653A Site Plan.dwg, 1/13/2006 3:52:34 PM, Adobe PDF, jbuyck

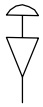
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

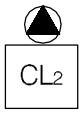

SOLENOID

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

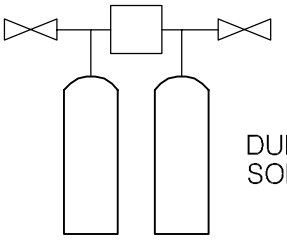
FLOW METER

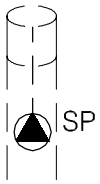
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

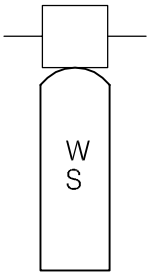


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

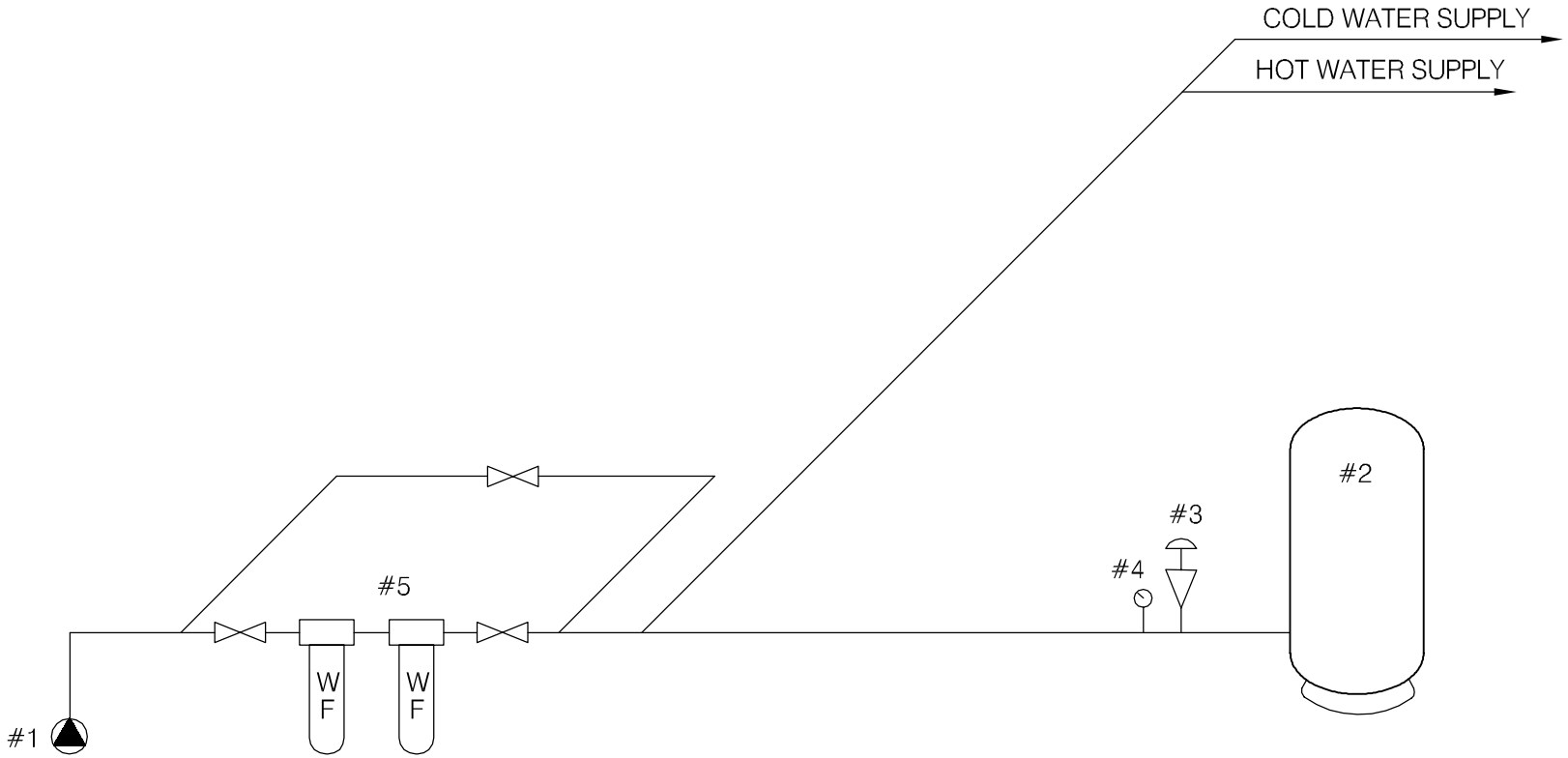


WELL WITH
SUBMERSIBLE PUMP



ACTIVATED
CARBON

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT WESTERN 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



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

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT NORTHERN REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 5653 AIR TERMINAL BUILDING - MAYO, YT.	
DATE SEPT. 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.004		DWG.: FIGURE 5653-B

Z:\0201Drawings\1260002 Water Assessment YTG\004 - Northern Region\mayo\1260002004 Mayo Terminal Building_5653B Schematic.dwg, 4/5/2006 2:43:42 PM, Adobe PDF, jbuyck

Northern Region – Airport Terminal Building
Building # 5653

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	SUB PUMP	MONARCH	SB5 EX			3/4HP - 4"
2	PRESSURE TANK	CHALLENGER	PC66			20 GALLON
3	PRESSURE SWITCH	SQUARED	FSG-2			2HP - 1/4" FIPT
4	PRESSURE GAUGE	MARSH	0-100-2"			2" - 1/4 FIPT
5	INLINE FILTER	ENVIRO GUARD	5 MICRON	SED & 30	MICRON GAC	10" - 3/4"
6						
7						
8						
9						
10						

TABLE 5653- 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?
5653	Mayo Airport Terminal Building	9	Oct-04 to Jun-05	**yes**	1/9	no	9-Jun-05	no

Table 5653 - 2: Water Quality Results

SOURCE:	Building 5653 - Mayo Airport Terminal Building		GCDWQ Criteria		
Location/ Resident	Mayo				
Address					
Treatment	Filtration				
Disinfection	None				
Source of Water	On-site well				
Purpose of Sampling	Base Line	Additional Sampling			
Sample Location		Washroom faucet			
Date Sampled	27-Sep-04	17-Aug-05	**Lower**	**Upper Limit**	
Physical Tests *(ALS)*			**AO**	**MAC**	**AO**
Colour (CU)	>60	<5.0			15
Conductivity (uS/cm)		652			
Total Dissolved Solids	388	436			500
Hardness CaCO3	349	333	AO >200 = poor, > 500 unacceptable[A]		
pH	8.14	8.15	6.5		8.5
Turbidity (NTU)	**23.5**	**65.4**		1	5
UV Absorbance		0.027			
% UV Transmittance		94			
Dissolved Anions *(ALS)*					
Alkalinity-Total CaCO3	313	296			
Chloride Cl	<0.5	<0.50			250
Fluoride F	0.11	0.121		1.5	
Silicate SiO4		11.4			
Sulphate SO4	72.8	85.8			500
Nitrate Nitrogen N	<0.01	<0.10		10	
Nitrite Nitrogen N	<0.005	<0.10		1	
Ammonia Nitrogen N					
Total Phosphate PO4		0.0794			
Total Metals *(ALS)*					
Aluminum T-Al	<0.005	<0.010		0.1	
Antimony T-Sb	<0.0002	<0.00050		0.006	
Arsenic T-As	**0.0756**	**0.0575**		0.025	
Barium T-Ba	0.037	0.033		1	
Boron T-B	0.011	<0.10		5	
Cadmium T-Cd	<0.00001	<0.00020		0.005	
Calcium T-Ca		83			
Chromium T-Cr	0.0019	<0.0020		0.05	
Copper T-Cu	<0.001	<0.0010		1	
Iron T-Fe	**2.62**	**3.77**			0.3
Lead T-Pb	<0.0001	<0.0010		0.01	
Magnesium T-Mg		30.7			
Manganese T-Mn	**0.272**	**0.289**			0.05
Mercury T-Hg		<0.00020		0.001	
Potassium T-K		2.04			
Selenium T-Se		<0.0010		0.01	
Sodium T-Na	8.7	9.6			200
Uranium T-U	<0.0005	0.00042		0.02	
Vanadium T-V		<0.030			
Zinc T-Zn	0.026	0.196			5
Dissolved Metals					
Arsenic D-As		0.0200		0.025	
Iron D-Fe		<0.030			0.3
Manganese D-Mn		**0.273**			0.05
Organic Parameters					
Tannin and Lignin		0.41			
Total Organic Carbon C		2.17			
Field Chemistry (EBA)					
pH		8.13	6.5		8.5
TDS (ppm)		324			500
EC (uS/cm)		649			
Temperature (°C)		5.6			
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)

eba

SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin, Luke Lebel Date August 17, 2005

WELL ID #	Owner	Location Description
5653	YTG	Mayo Airport Terminal Building

1. Well Location and Potential Contaminant Sources

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

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

c. GPS location: N 7054513 E 456406 elv 508m ± 12m

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_____
Mayo 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 ~3m

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

j. Distance from well to nearest point of known field: Tank @ ~34m, field >34m (if present)

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
Service lines only. Septic tank is pumped once per year. There may be a field, but unknown

m. Is the well located within 300 m from a sewage lagoon or pit? ☐ Yes ☒ No unlikely

n. Is the well located within 120 m from a solid waste site or dump, cemetery? ☒ Yes ☐ No
~63m from cemetery

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 enclosure
Entrance by animals? ☐ Yes ☒ No Access possible

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 ~18 m

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: Bulk Fuel Storage; Distance from well to Potential Source 1: >60m
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 unlikely

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: 38.100 m bc could be pump ☒ measured (if possible) ☐ reported ☐ from log

h. Static water level below ground: 7.700 m bc

☒ measured (if possible) ☐ reported ☐ from log ☐ flowing

i. (If granular) Is the well completed: ☐ open end casing ☐ with a well screen

☐ with slotted pipe ☒ unknown other _____

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

k. If there is a well screen: length _____ slot size(s) _____
Location of screen: from _____ to _____ from log reported

l. Is there a sump below the screen? ☐ Yes ☐ No unknown

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,

i. Is the well head below grade? describe in detail ~ 1.2m 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 has been removed

iv. Any evidence of rodents? Specify Access possible

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

If no, describe condition No cap - only garbage bag above well casing

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
unlikely

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 _____

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
But directly against floor

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: Has been disconnected / removed

l. Comments on pump installation: _____

_____

6. Conclusions

a. Comments on overall installation:

_____

_____

_____

_____

_____

_____

_____

b.Recommendations: _____

_____

_____

_____

_____

_____

_____

_____

PART B: EBA Site Inspection

Inspector: BERT ALBISSER Date AUG 17 /05

WELL ID #	Owner	Location Description
5653	YTG	MAYO AIR PORT

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: PRESSURE TANK

Where is it located?
Comments: FURNACE ROOM

Is the room in which the water tank is located heated to maintain an optimum temperature of 4°C for stored water?
YES NO
Comments: _____

Are there windows in the add-on that may allow direct sunlight onto the water holding tank? YES NO
Comments: _____

Are there other heat sources near the tank? YES NO
Comments: _____

Is there waterproof flooring with a sealed base to contain spills? YES NO
Comments: _____

Overall Tank

What are the tank size and dimensions?

_____

What material is the tank constructed of? _____

Is tank and associated piping constructed of safe materials (i.e. CSA approved and material that does not affect the taste of the water)? YES NO

Comments: _____

Tank Inlet, Outlet and Lid

Is there adequate access on the tank for cleaning (i.e. min 15" access lid)? YES NO

Does the lid have a tight seal and is it watertight when closed? YES NO

Does the tank have an overflow or high level whistle? YES NO

Is the water tank drain accessible? YES NO

WATER TANK AND WATER QUALITY CONDITION

Are there signs of staining or biofouling? YES NO
Comments: _____

Is there any sediment or scum in bottom of tank? YES NO
Comments: _____

Is there any odour associated with the water or tank? YES NO

Have there been any bacteriological analyses conducted previously? YES NO

Does the tank appear that it has been cleaned recently? YES NO

Are the tanks easily assessed for the purpose of cleaning and disinfection? YES NO

8. Conclusions

a. Comments on overall installation:

THE WATER SYSTEM IS OLD AND JUDGING BY SCALE AND RUST BUILDUP IN JANITORIAL SINK IN FURNACE ROOM, HEAVILY SCALED UP WITH CALCIUM & RUST DEPOSIT.

b. Recommendations:

INSTALL COMMERCIAL TREATMENT SYSTEM AS DICTATED BY THE CHEMICAL ANALYSIS. PAST KNOWLEDGE I WOULD RECOMMEND DUPLEX SOFTNER SYSTEM, SMALL COMMERCIAL RO SYSTEM WITH LARGE PRESSURE TANK.

Environment Canada Environnement Canada

Enforcement and Emergencies Section
91782 Alaska Highway, Whitehorse, YT Y1A 5B7
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Spill Report Information

Spill #	7613
Jurisdiction	Yukon
Community	Mayo
Address	
Highway	
Milepost	
Feature	Mayo
Location and Cause	WPYR tank farm - failure of loading hose
Latitude	63.6133333333333
Longitude	-135.879166666667
Incident Date	8/26/1976 10:00:00 PM
Lead Agency	Department of Indian Affairs and Northern Development
Other Agency	
Company(s)	White Pass & Yukon Route
Amount	1512
Units	Litres
Quantity	Actual
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Furnace Oil
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	spill dyked off immediately - contaminated area 15' x 150' - cleaned-up (contaminants removed to Mayo dump)

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Enforcement and Emergencies Section
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Spill Report Information

Spill #	7718
Jurisdiction	Yukon
Community	Mayo
Address	
Highway	
Milepost	
Feature	Mayo
Location and Cause	tank farm - tank overfilled
Latitude	63.6133333333333
Longitude	-135.879166666667
Incident Date	8/22/1977 9:00:00 AM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	Department of Indian Affairs and Northern Development
Company(s)	White Pass & Yukon Route
Amount	3742
Units	Litres
Quantity	Actual
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Fuel Oil
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	no fuel recovered - possible contamination of groundwaters but not known - suggests action be taken as too many spills with no recovery in area

Environment Canada Environnement Canada

Enforcement and Emergencies Section
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Spill Report Information

Spill #	7727
Jurisdiction	Yukon
Community	Mayo
Address	
Highway	
Milepost	
Feature	Mayo
Location and Cause	tank farm - tank overfilled
Latitude	63.6133333333333
Longitude	-135.879166666667
Incident Date	3/28/1977 9:00:00 AM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	
Company(s)	White Pass & Yukon Route
Amount	1512
Units	Litres
Quantity	Actual
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Gasoline
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	spill within dyke - none reported outside dyke - cleaned-up

Environment Canada Environnement Canada

Enforcement and Emergencies Section
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Spill Report Information

Spill #	9130
Jurisdiction	Yukon
Community	Mayo
Address	
Highway	
Milepost	
Feature	Mayo
Location and Cause	White Pass yard - garage caught on fire - explosion ensued
Latitude	63.6166666666667
Longitude	-135.884444444444
Incident Date	11/26/1991
Lead Agency	Yukon Government - Fire Marshall
Other Agency	
Company(s)	White Pass
Amount	
Units	
Quantity	Unknown
Release Description	Burned
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Hydrocarbons
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	fuel or propane truck exploded inside building - building consumed - used 756,000L water - water runoff contained in ditch - oil and fuel in water

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Enforcement and Emergencies Section
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Spill Report Information

Spill #	9703
Jurisdiction	Yukon
Community	Mayo
Address	
Highway	
Milepost	
Feature	Mayo
Location and Cause	North 60 Petroleum Bulk Plant - overfill of bulk storage tank - miscommunication between truck operator and plant operator
Latitude	63.6134
Longitude	-135.8793
Incident Date	1/15/1997 6:40:00 PM
Lead Agency	Yukon Government - Public Safety
Other Agency	Environment Canada - Environmental Protection Service
Company(s)	North 60 Petroleum
Amount	1000
Units	Litres
Quantity	Estimate
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	300 L recovered - EC recommended excavation of contaminated soil and installation of monitoring wells - fuel discrpency of 22,000 L reported by Mayo plant - not verified

Environment Canada Environnement Canada

Enforcement and Emergencies Section
91782 Alaska Highway, Whitehorse, YT Y1A 5B7
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Spill Report Information

Spill #	9947
Jurisdiction	Yukon
Community	Mayo
Address	
Highway	
Milepost	
Feature	Mayo
Location and Cause	North 60 Petroleum Tank Farm - overfill of storage tank
Latitude	63.6134
Longitude	-135.8793
Incident Date	12/10/1999 5:10:00 PM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	
Company(s)	North 60 Petroleum
Amount	
Units	
Quantity	Unknown
Release Description	Spilled
Additional Quanitit	negligible amount
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	overfill caused product to run down sides of tank and small amount to ground at base of tank within berm - no loss noted in records check - minimal amount spilled - no action

Photo 0187: 5653 Mayo Airport wellhead enclosure.

Photo 0189: 5653 Pressure tank and pump controls.

Photo 027: 5653 Mayo Airport Terminal Building.

Photo 007: 5653 Septic tank (front) and bulk fuel storage (back).