20.0 BUILDING 3186: DESTRUCTION BAY GRADER STATION

20.1 Description of Existing Water Supply System

Building 3186, the Destruction Bay Grader Station, is currently served by a water supply system that delivers water from a well located in the grader station garage. There is also an abandoned well located less than a meter away from the current well, and is not equipped with a proper cap and was open at the time of the assessment. The well locations and other details regarding the site are provided in Figure 3186-A in Appendix A20. The coordinates of the wellhead, as measured by a handheld GPS device, were recorded as:

- UTM ZONE 7
- Northing: 6792596
- Easting: 617886

There is no treatment or disinfection system for the water supplying this system. There is a sign posted in the washroom stating "Contaminated Water, Do Not Consume" and it appeared that bottled water is provided. A schematic detailing the well supply system is provided as Figure 3186-B in Appendix A20.

20.2 Description of Existing Wastewater Systems

There are three Septic effluent disposal systems that were identified during the water system assessment. There is a septic tank near the northeast corner of the building, located approximately 23 m east and downgradient from the well. This tank likely serves the domestic sewage system, and effluent is likely discharged to an in ground disposal system southeast of the tank. There is a leach pit located near the northwest corner of the building, approximately 13 m northeast and likely downgradient from the well, and it likely serves the sump in the wash pad. There is a rock pit located off from the southeast side of the building that likely serves the sumps in the garage, and it is approximately 17 m east and cross-gradient from the well. A site plan showing the septic systems is provided as Figure 3186-A in Appendix A20.

20.3 Water Quality Results

20.3.1 Water Quality Results from Previous Sampling

Bacteriological

Nine samples were collected from the Destruction Bay Grader Station water system between September 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 3186-1 in Appendix A20. Coliform bacteria and *E. coli* were reported as absent in each of the nine samples for which results are provided.

Potability

Water samples were previously collected from the Destruction Bay Grader Station water system on October 19, 2004 and June 15, 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 3186-2 in Appendix A20. 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 indicators of potential contamination. Items are note were:

- During the first sampling event, the arsenic concentration was reported as 0.0329 mg/L, which is in exceedence of the current CDWQG MAC of 0.025 mg/L. The arsenic concentration was reported as 0.0184 mg/L during the second sampling event, which although is not in exceedence of the current CDWQG MAC, is in exceedence of the proposed new MAC of 0.005 mg/L;
- The turbidity was 21.1 NTU during the first sampling event and 12.7 NTU during the second sampling event, and was in both cases in exceedence of the CDWQG MAC of 1.0 NTU and aesthetic objective of 5.0 NTU;
- The colour during the first sampling event was greater than 60 CU;
- The iron concentration was 2.94 mg/L during the first sampling event and 1.34 mg/L during the second sampling event, and was in both cases in exceedence of the CDWQG aesthetic objective of 0.3 mg/L;
- The manganese concentration was 0.165 mg/L during the first sampling event and 0.137 mg/L during the second sampling event, and was in both cases in exceedence of the CDWQG aesthetic objective of 0.05 mg/L;
- The water quality results indicated that all other health based and aesthetic objectives were met for the parameters analyzed;

- The water quality results indicated that the groundwater from which this system receives its water supply is a magnesium bicarbonate type water; and,
- The hardness (as $CaCO_3$) was 399 mg/L during the first sampling event and 350 mg/L during the second sampling event, and is considered extremely hard.

20.3.2 Identification of Additional Analytical Testing Required

Additional analytical for the Destruction Bay Grader Station that was identified to be included during the water system assessments is detailed below:

- The full suite of total and dissolved metals, including vanadium, as there had been exceedences of arsenic, iron, and manganese;
- Turbidity and colour;
- Silica and phosphate to determine potential for a point of entry arsenic removal system;
- 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);
- Extractable Petroleum Hydrocarbons (EPH) and Polycyclic Aromatic Hydrocarbons (PAH) to determine if there are any signs of hydrocarbon contamination; and,
- Measurements in the field for total dissolved solids, conductivity, pH, and temperature.

Additional Analytical Results

A water sample was obtained during the water system assessment on July 28, 2005, and was submitted to ALS Environmental in Vancouver, BC for analysis. These results are summarized in Table 3186-2 in Appendix A20 and the laboratory reports are included in Appendix B.

- At 0.0353 mg/L, the reported total arsenic concentration was in exceedence of the CDWQG MAC of 0.025 mg/L. The dissolved arsenic concentration was 0.0217 mg/L, signifying that a large portion of the arsenic concentration can be attributed to dissolved particles;
- At 23.0 NTU, the turbidity was in exceedence of the CDWQG MAC of 1.0 NTU
- At 2.20 mg/L, the total iron concentration was in exceedence of the CDWQG aesthetic objective of 0.3 mg/L. The dissolved iron concentration was 0.033 mg/L, signifying that the iron content can be mainly attributed to suspended solids;
- At 0.238 mg/L, the total manganese concentration was in exceedence of the CDWQG aesthetic objective of 0.05 mg/L. The dissolved manganese concentration

was 0.201 mg/L, signifying that the manganese content can be mainly attributed to dissolved particles;
- The screening for EPH and PAH indicated that each of the parameters analyzed was below analytical detection limits and CDWQG; and,
- Water quality results from additional analytical sampling reported that all other health based and aesthetic objectives were met for the parameters analyzed.

20.3.3 Indicators of Potential Contamination

Chloride, nitrate and nitrite concentrations can indicate impacts from surfacewater sources or septic waste. Chloride concentrations were reported to be low and can be considered to be 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 do not suggest that the aquifer from which the groundwater is obtained for the Destruction Bay Grader Station is under the influence of surfacewater sources or septic wastes.

20.4 Conceptual Hydrogeology

There was no log available for review for this well. The direction of groundwater flow as inferred from topographical maps and aerial photographs is likely east to northeasterly towards Kluane Lake.

20.5 Potential Contaminant Sources

Potential contaminant sources from observations during the water system assessment are compiled in field notes in Appendix A20. Photos of potential contaminant sources are also provided in Appendix A20.

Potential contaminant sources within 30 m of the wellhead are:

- A leach pit at approximately 13 m;
- Rock pit at 17 m;
- Underground fuel storage tank at less than 25 m;
- Used antifreeze drums at 7 m; and,
- An above ground used oil storage tank at 9 m.

In addition, a tar emulsion above ground storage tank is located 45 m upgradient from the wellhead, and a tar or creosote above ground storage tank is located at 55 m upgradient.

There is a fuel pumping area located approximately 36 m upgradient fromt the well. The septic tank that serves the grader station is 23 m away, and the location of the septic discharge field associated with this tank is unknown, but may be within 30 m. The underground fuel storage tank is located somewhere under the concrete floor of the grader station maintenance garage, but the exact location is unknown.

20.5.1 Spills Records and Contaminated Sites Search Results

The Environment Canada Environmental Protection Branch did identify recorded spill events near this site.

On September 26, 2003, approximately 500 L of diesel fuel spilled at the Yukon Electrical Company complex in Destruction Bay due to a faulty vent. The spill had reportedly been cleaned up but the soil was reportedly not removed.

There had been multiple spill events of raw sewage due to failures with the community sewage system in Destruction Bay. On two occations in 1993, a mechanical failure caused approximately 37 800 L and 11 340 L of raw sewage to spill. The sewage had in both cases reportedly flowed over the ground surface and ponded near Kluane Lake. Additionally, four recorded spill events occurred in 1995 and 1996 caused by leaking or broken sewer mains, spilling raw sewage in the Destruction Bay area. Two events recorded spills of approximately 200 L each, but the other two events spilled an unknown amount.

The Government of Yukon Environmental Programs Branch and Environment Canada Environmental Protection Branch did not identify any other recorded spill event or any contaminated sites issues for this site or neighbouring sites. Spill records are provided in Appendix A20.

20.6 Identified Water System Deficiencies and Associated Risk

20.6.1 High and Medium Risk Deficiencies

- Poor surface completion of the wellhead (located in a corner of the maintenance garage, does not extend the required 500 mm above 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 log available to review lithology and construction;

- By definition of the Draft Yukon GUDI Assessment Guideline, the well is potentially under the direct influence of surface water because the completion depth is unknown and the well construction 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 underground fuel storage tank, used antifreeze drums, a waste oil storage tank, and industrial activities;
- There are two Septic effluent leach pits located within 30 m of the well. The septic tank is located approximately 23 m from the well, and although the exact location of the septic field is unknown it may be within 30 m of the well;
- There is an uncapped abandoned well located less than 1 m from the current well;
- Turbidity has consistently been above both the CDWQG MAC of 1.0 NTU and aesthetic objective of 5.0 NTU. The most recent sampling event reported turbidity to be 23.0 NTU;
- Arsenic has been reported to be above the current CDWQG MAC of 0.025 mg/L. The most recent sampling event reported the arsenic concentration to be 0.0353 mg/L; and,
- There is no treatment or disinfection system.

20.6.2 Low Risk Deficiencies

- The well is within 60 m and downgradient from a tar tank and a tar or creosote tank;
- The water system is very old and in disrepair;
- Colour had previously exceeded the CDWQG aesthetic objective of 15 CU. The most elevated colour was greater than 60 CU;
- The iron concentration has consistently been in exceedence of the CDWQG aesthetic objective of 0.3 mg/L. The most elevated reported iron concentration was 2.94 mg/L; and,
- The manganese concentration has consistently been in exceedence of the CDWQG aesthetic objective of 0.05 mg/L. The most recent sampling event reported the manganese concentration to be 0.238 mg/L.

20.7 Mitigative Options for Deficiencies

To address the high-risk deficiencies identified by EBA in the Draft report for this water system, PMA coordinated the drilling, construction and testing of a new well to serve the Destruction Bay Grader Station. The construction of the well is documented in a report to PMA entitled “Well Completion Report- Destruction Bay Grader Station” (EBA 2005). The well completion report also included details of decommissioning of an abandoned well and recommendations pertinent to maintaining the safety of the new water supply well.

The new well has not yet been commissioned, therefore the following interim mitigative measures are provided until the new well is hooked up to the supply system.

20.7.1 Priority 1

- The new well should be connected to the building water supply system, and the existing well should be properly decommissioned as soon as weather permits;
- An NSF/ASNI 55 certified UV treatment system (or equivalent) should be installed to provide disinfection. Pretreatment will likely be required. Engineering input from a qualified water treatment consultant should be obtained for final system design.
- The new well must be sampled for bacteriological results prior to use as a potable water supply;
- PMA should continue to provide drinking water via a bottled water station until the new well is hooked-up; and,
- Consult with EHSS to ensure that the existing advisory is adequate.

20.7.2 Priority 3

The existing well should be properly decommissioned once the new well is commissioned.

20.8 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.

20.8.1 Priority 1

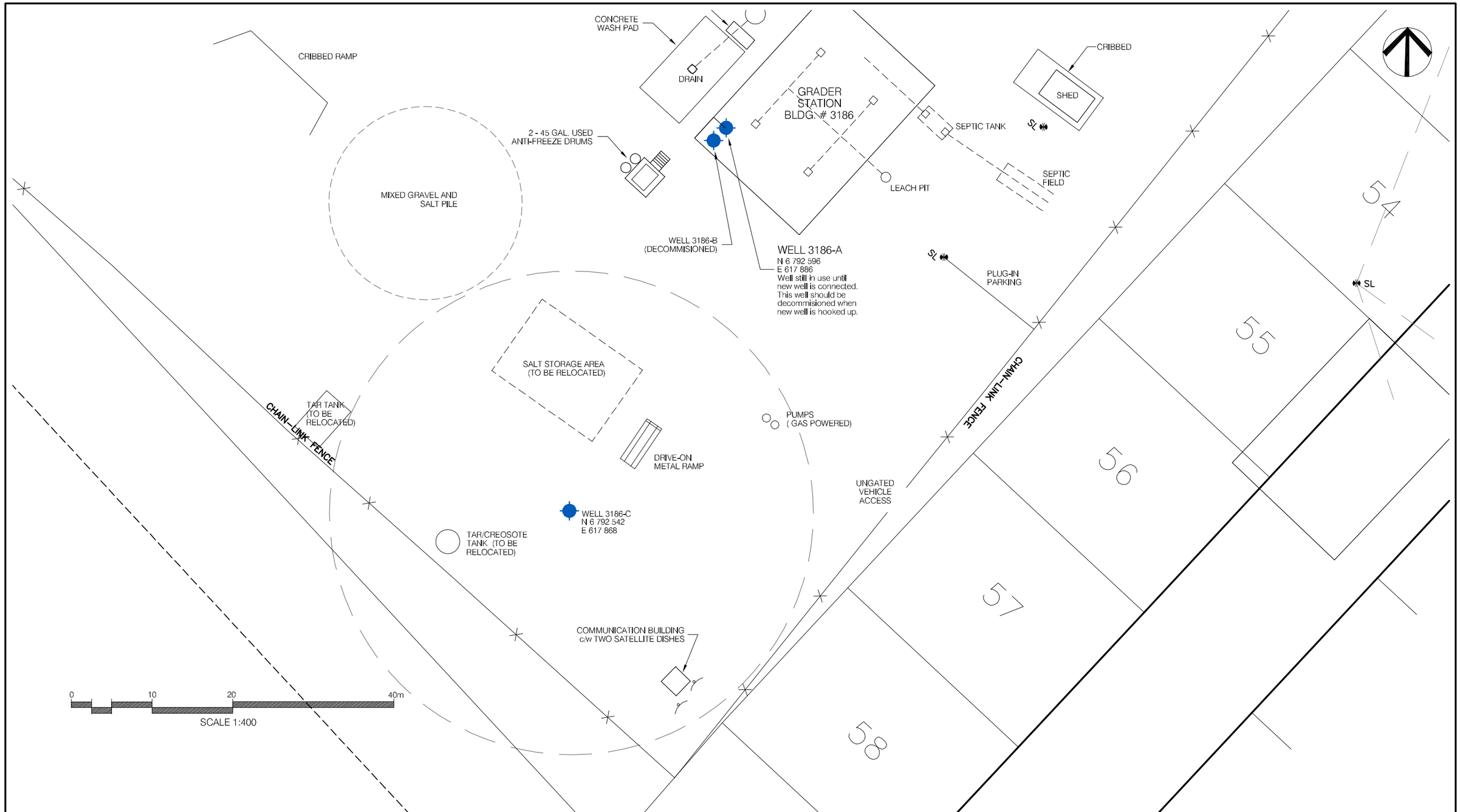
Connection of the new water supply well is estimated to cost in the order of **$7,400** assuming that the well is connected with a pitless adapter.

20.8.2 Priority 2

A suitable treatment/disinfection system would likely cost in the order of **$3,700**, assuming **$2,200** for the UV disinfection, and **$1,500** for a residential size water softener.

20.8.3 Priority 3

The cost associated with decommissioning the existing water wells is estimated at approximately **$1,000**.



NOTES:

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

30 m RADIUS FROM WATER WELL FOR CONSIDERATION OF PROXIMITY TO POTENTIAL CONTAMINANT SOURCES.

BUILDING STRUCTURES RELATIVE TO PROPERTY LINES ARE APPROXIMATE ONLY.

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:	AUG. 2005
SCALE:	AS SHOWN
PROJECT No.:	1260002.003
ACAD FILENAME:	003-WESTERN REGION

CLIENT: Yukon
Highways and Public Works
Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
WESTERN REGION

GOVERNMENT OF YUKON
HIGHWAYS & PUBLIC WORKS

DESTRUCTION BAY GRADER STATION BUILDING # 3186 SITE LOCATION DIAGRAM WELL ID: 3186-C

REVISION ISSUE: 0

FIGURE No.: FIGURE 1

Z:\0201Drawings\1260002 Water Assessment YTG\003 -Western Region\destruction\1260002 D Bay Grader Station_3186A Site Plan.dwg, 4/5/2006 8:50:34 AM, Adobe PDF, jbuyck

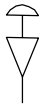
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

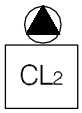

SOLENOID

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

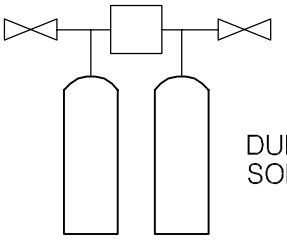
FLOW METER

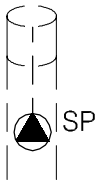
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

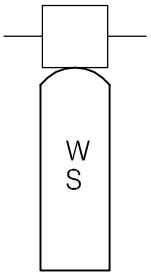


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

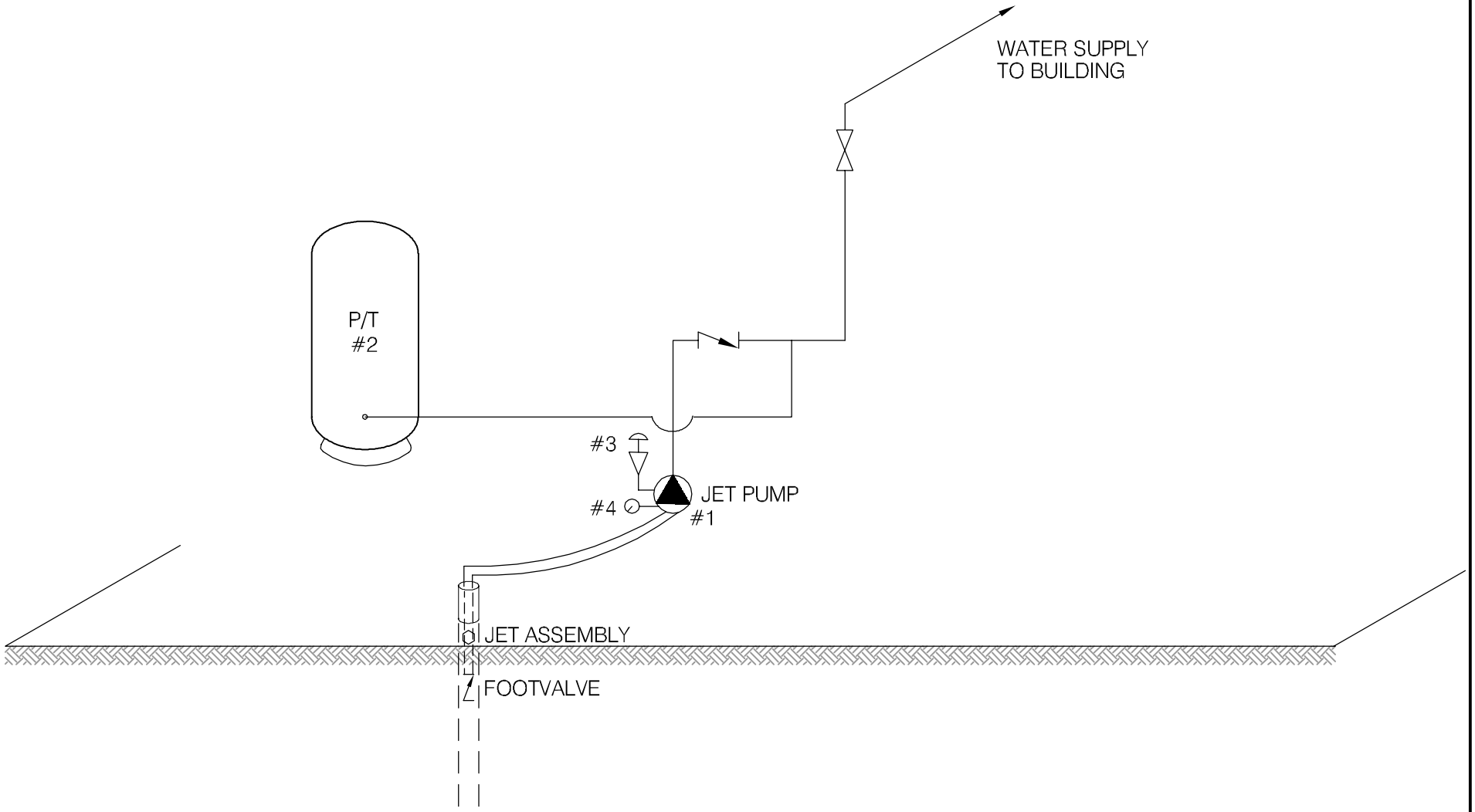


WELL WITH
SUBMERSIBLE PUMP



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



SCHEMATIC PRODUCED BY BERT ALBISSER OF AQUA TECH SUPPLIES AND SERVICES LTD.

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT WESTERN REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 3186 DESTRUCTION BAY GRADER STATION	
DATE SEPT. 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.003		DWG.: FIGURE 3186-B

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Western Region – Destruction Bay Grader Station
Building # 3186

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	JET PUMP	MONARCH	MJC-50		2004	1/2 HP
2	PRESSURE TANK	CHALLENGER	PC-144		070494	
3	PRESSURE SWITCH	SQUARE D	FSG-2			2HP 1/4" NPT
4	PRESSURE GAUGE	MARSH	2" (0-100 PSI)			1/4" NPT
5						
6						
7						
8						
9						
10						

TABLE 3186- 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?
3186	Destruction Bay Grader Station	9	Sept-04 to Jun-05	no	0/9	no	16-Jun-05	no

Table 3186-2: Water Quality Results

SOURCE:	Building 3186 - Destruction Bay Grader Station			GCDWQ Criteria		
Location/ Resident	Destruction Bay					
Address						
Treatment	None					
Disinfection	None					
Source of Water	On-site well					
Purpose of Sampling	Base Line	Base Line	Additional Analytical			
Sample Location						
Date Sampled	19-Oct-05	Jun-15-05	28-Jul-05	Lower	Upper Limit	
Physical Tests *(ALS)*				AO	MAC	AO
Colour (CU)	>60	6.0	5.8			15
Conductivity (uS/cm)		749	-			
Total Dissolved Solids	452	492	-			500
Hardness CaCO3	399	350	403	AO >200 = poor, > 500 unacceptable[A]		
pH	8.20	8.36	-	6.5		8.5
Turbidity (NTU)	**21.1**	**12.7**	**23.0**		1	5
UV Absorbance			0.08			
% UV Transmittance			82.8			
Dissolved Anions *(ALS)*						
Alkalinity-Total CaCO3	291	247	-			
Chloride Cl	0.9	0.79	-			250
Fluoride F	0.25	0.276	-		1.5	
Silicate SiO4			15.7			
Sulphate SO4	127	181	-			500
Nitrate Nitrogen N	0.07	<0.10	-		10	
Nitrite Nitrogen N	<0.005	0.31	-		3.2	
Ammonia Nitrogen N			-			
Total Phosphate PO4			0.109			
Total Metals *(ALS)*						
Aluminum T-Al	0.008	0.023	0.305			
Antimony T-Sb	<0.0002	<0.00050	<0.00050		0.006	
Arsenic T-As	**0.0329**	***0.0184***	**0.0353**		0.025	
Barium T-Ba	0.306	0.206	0.307		1	
Boron T-B	1.14	0.99	1.22		5	
Cadmium T-Cd	<0.00001	<0.00020	<0.00020		0.005	
Calcium T-Ca		47.5	56.6			
Chromium T-Cr	<0.001	<0.0020	<0.0020		0.05	
Copper T-Cu	0.0003	0.0192	0.0069		1	
Iron T-Fe	**2.94**	**1.34**	**2.20**			0.3
Lead T-Pb	0.0003	<0.0010	<0.0010		0.01	
Magnesium T-Mg		56.2	66.1			
Manganese T-Mn	**0.165**	**0.137**	**0.238**			0.05
Mercury T-Hg		<0.00020	<0.00020		0.001	
Potassium T-K		4.02	4.49			
Selenium T-Se		<0.0010	<0.0010		0.01	
Sodium T-Na	20.9	22.2	24.7			200
Uranium T-U	<0.0005	<0.00010	<0.00010		0.02	
Vanadium T-V			0.033			
Zinc T-Zn	0.019	<0.050	<0.050			5
Dissolved Metals *(ALS)*						
Aluminum D-Al			<0.010		0.1	
Antimony D-Sb			<0.00050		0.006	
Arsenic D-As			***0.0217***		0.025	
Barium D-Ba			0.290		1.0	
Boron D-B			1.22		5	
Cadmium D-Cd			<0.00020		0.005	
Calcium D-Ca			54.2			
Chromium D-Cr			<0.0020		0.05	
Copper D-Cu			0.0022			1.0
Iron D-Fe			0.033			0.3
Lead D-Pb			<0.0010		0.01	
Magnesium D-Mg			64.9			
Manganese D-Mn			0.201			0.05
Mercury D-Hg			<0.00020		0.001	
Potassium D-K			4.67			
Selenium D-Se			<0.0010		0.01	
Sodium D-Na			24.5			200
Uranium D-U			<0.00010		0.02	
Vanadium D-V			<0.030			
Zinc D-Zn			<0.050			5.0
Organic Parameters						
Tannin and Lignin			0.46			
Total Organic Carbon C			3.64			
Polycyclic Aromatic Hydrocarbons						
Acenaphthene			<0.000050			
Acenaphthylene			<0.000050			
Acridine			<0.000050			
Anthracene			<0.000050			
Benz(a)anthracene			<0.000050			
Benzo(a)pyrene			<0.000010		0.00001	
Benzo(b)fluoranthene			<0.000050			
Benzo(g,h,i)perylene			<0.000050			
Benzo(k)fluoranthene			<0.000050			
Chrysene			<0.000050			
Dibenz(a,h)anthracene			<0.000050			
Fluoranthene			<0.000050			
Fluorene			<0.000050			
Indeno(1,2,3-c,d)pyrene			<0.000050			
Naphthalene			<0.000050			
Phenanthrene			<0.000050			
Pyrene			<0.000050			
Quinoline			<0.000050			
Extractable Hydrocarbons						
EPH10-19			<0.30			
EPH19-32			<1.0			
LEPH			<0.30			
HEPH			<1.0			
Field Chemistry (EBA)						
pH			8.39	6.5		8.5
TDS (ppm)			376			500
EC (uS/cm)			748			
Temperature (°C)			9.3			
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 July 28, 2005

WELL ID #	Owner	Location Description
3186	YTG	Destruction Bay Grader Station

1. Well Location and Potential Contaminant Sources

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

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

c. GPS location: N 6792596 E 617886 eN 802m ± 8m

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_____
Destruction Bay Grader Station

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

g. Nearest building, specify Located inside grader station

h. Distance from well to building

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

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
leach pit @ 13m, septic tank @ 23m - effluent field unknown, rock pit @ 17m

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 unlikely

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 Accessable to anyone with access to building
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 It is somewhere under the grader station floor <25m

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: Used antifreeze drum; Distance from well to Potential Source 1: ~7m
Potential Source 2: waste oil AST; Distance from well to Potential Source 2: ~9m
Potential Source 3: Tar tank; Distance from well to Potential Source 3: ~45m
Potential Source 4: Tar or creosote tank; Distance from well to Potential Source 4: ~55m
Salt and cold mix storage >60m; fuel pumping area @ ~36m

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

How many? 1 ☐ in use ☒ abandoned ☒ require proper sealing
~0.65 m from existing well

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 10cm Material: ☒ steel ☐ plastic ☐ concrete

g. Depth of well: unknown ☐ measured (if possible) ☐ reported ☐ from log

h. Static water level below ground: unknown

☐ 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 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
corner of maintenance garage

☐ 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 no, 0.15m above 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 Access possible

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

If no, describe condition solid plate, double-holed

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 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: _____ 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: located inside heated building

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

There is a sign in washroom stating "Contaminated water, Do Not Consume"
It appears that bottled water is provided. There is an abandoned well
with a static water level of 3.07m below grade.
TDS 376 ppm
EC 748 µS
pH 8.39
Temp 9.3°C

b. Recommendations: _____

PART B: EBA Site Inspection

Inspector: BEER ALBISSER Date July 28/05

WELL ID #	Owner	Location Description
3186	YTG	DESTRUCTION BAY GRADER STATION

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: STOP AREA NORTHWEST CORNER

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:

THIS IS AN ACCEPTABLE, BUT OLD INSTALLATION

b. Recommendations:

DRILL A NEW WELL. THIS WELL IS NOT A GOOD CANDIDATE FOR IMPROVEMENT

Environment Canada Environnement Canada

Enforcement and Emergencies Section
91782 Alaska Highway, Whitehorse, YT Y1A 5B7
PH: 867.667.3400 FAX: 867.667.7962

Spill Report Information

Spill #	0334
Jurisdiction	Yukon
Community	Destruction Bay
Address	
Highway	
Milepost	
Feature	Destruction Bay
Location and Cause	vent leak
Latitude	61.25274646
Longitude	-138.80244846
Incident Date	9/26/2003 12:00:00 PM
Lead Agency	Yukon Government - Environmental Programs
Other Agency	
Company(s)	Yukon Electrical Company Ltd
Amount	500
Units	Litres
Quantity	Estimate
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	cleaned-up but soil had not been removed at time of report - no further information on file

Environment Canada Environnement Canada

Enforcement and Emergencies Section
91782 Alaska Highway, Whitehorse, YT Y1A 5B7
PH: 867.667.3400 FAX: 867.667.7962

Spill Report Information

Spill #	9303
Jurisdiction	Yukon
Community	Destruction Bay
Address	
Highway	
Milepost	
Feature	Destruction Bay
Location and Cause	untreated sewage spilled due to mechanical failure - rubber coupling separated on the force main pipe elbow
Latitude	61.252546
Longitude	-138.800598
Incident Date	2/5/1993 2:30:00 PM
Lead Agency	Department of Indian Affairs and Northern Development
Other Agency	Yukon Government - Transportation
Company(s)	Community of Destruction Bay
Amount	37,800
Units	Litres
Quantity	Estimate
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Raw Sewage
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	effluent flowed over natural terrain and collected in a pond beside Kluane Lake - some collected, most frozed - to be excavated to sewage lagoon

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Enforcement and Emergencies Section
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Spill Report Information

Spill #	9304
Jurisdiction	Yukon
Community	Destruction Bay
Address	
Highway	
Milepost	
Feature	Destruction Bay
Location and Cause	untreated sewage spilled due to mechanical failure - coupling/pipe separation again
Latitude	61.252546
Longitude	-138.800598
Incident Date	3/29/1993
Lead Agency	Department of Indian Affairs and Northern Development
Other Agency	Yukon Government - Transportation
Company(s)	Community of Destruction Bay
Amount	11340
Units	Litres
Quantity	Estimate
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Raw Sewage
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	similar to PACY 9303 - sewage collected in same pond - repairs to sewage system to be completed - spill being cleaned up with vacuum truck

Environment Canada Environnement Canada

Enforcement and Emergencies Section
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Spill Report Information

Spill #	9515
Jurisdiction	Yukon
Community	Destruction Bay
Address	
Highway	
Milepost	
Feature	Destruction Bay
Location and Cause	pipeline sleeve broke 10m from final discharge - unknown cause for breakage
Latitude	61.2480555555556
Longitude	-138.793888888889
Incident Date	5/12/1995
Lead Agency	Department of Indian Affairs and Northern Development
Other Agency	
Company(s)	YTG
Amount	180
Units	Litres
Quantity	Estimate
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Raw Sewage
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	spill occurred sometime at the end of April 1995 - not reported to spill line - pipeline repaired - improvements to system to be made byt YTG in summer

Environment Canada Environnement Canada

Enforcement and Emergencies Section
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Spill Report Information

Spill #	9634
Jurisdiction	Yukon
Community	Destruction Bay
Address	
Highway	
Milepost	
Feature	Destruction Bay
Location and Cause	break in main sewer line
Latitude	61.2480555555556
Longitude	-138.793888888889
Incident Date	6/12/1996
Lead Agency	Department of Indian Affairs and Northern Development
Other Agency	
Company(s)	YTG
Amount	
Units	
Quantity	Unknown
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Raw Sewage
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	pump activated 3x per day - approx 500 ga each time but sewage doesn't reach lagoon - DIAND inspected - to be repaired - no risk to environment

Environment Canada Environnement Canada

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

Spill #	9649
Jurisdiction	Yukon
Community	Destruction Bay
Address	
Highway	
Milepost	
Feature	Destruction Bay
Location and Cause	leaking sewer line
Latitude	61.2480555555556
Longitude	-138.793888888889
Incident Date	8/7/1996
Lead Agency	Department of Indian Affairs and Northern Development
Other Agency	
Company(s)	YTG
Amount	50
Units	Gallons (US, liquid)
Quantity	Estimate
Release Description	Leaked
Additional Quanitit	rate of spill reported at 1L/s
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Raw Sewage
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	leak stopped 8/9/96 - line repaired by patching - Tony will take up with YTG on way back from site - no further information on file

Environment Canada Environnement Canada

Enforcement and Emergencies Section
91782 Alaska Highway, Whitehorse, YT Y1A 5B7
PH: 867.667.3400 FAX: 867.667.7962

Spill Report Information

Spill #	9672
Jurisdiction	Yukon
Community	Destruction Bay
Address	
Highway	
Milepost	
Feature	Destruction Bay
Location and Cause	leaking utilidor - similar to Spill No. 9649
Latitude	61.2480555555556
Longitude	-138.793888888889
Incident Date	9/24/1996 2:30:00 PM
Lead Agency	Department of Indian Affairs and Northern Development
Other Agency	
Company(s)	YTG
Amount	
Units	
Quantity	Unknown
Release Description	Leaked
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Raw Sewage
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	eduction truck needed to pump up before it enters creek - no further information on file

Photo 0608: 3186 Destruction Bay Grader Station maintenance garage

Photo 0609: 3186 Existing well (right) and abandoned well (left)

Photo 0601: 3186 Leach pit

Photo 0604: 3186 Scrap metal

Photo 0605: 3186 leach pit

Photo 0606: 3186 septic tank

Photo 0599: 3186 Tar tank

Photo 0607: 3186 Asphalt piles and salt storage