Transport Canada | Transports Canada

Prairie and Northern Region
Programs Branch
1100, 9700 Jasper Avenue
Edmonton, AB
T5J 4E6

Your file Votre référence
N4L3-1571
Our file Notre référence
SK-7184-1

July 30, 2001

Rita Becker
Licensing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NT
X0E 1J0

Dear Ms. Becker:

Further to our submission of the *Resolute Bay Airport Landfill Environmental Site Investigation* (April 1999) on June 6, 2000, please find enclosed the *Resolute Bay Airport Landfill 2000 Summary Report* (March 2001). This report summarizes the site investigation which was conducted by Transport Canada in July 2000 at the Resolute Bay Airport Landfill.

If you have any questions or concerns, please call me at (780)-495-3980.

Sincerely,

for

Timothy Johnson
Environmental Compliance Officer
Environmental Affairs
Programs, Prairie & Northern Region
Ph: (780)-495-3980
Fax: (780)-495-4748

Encl.

Canada

RESOLUTE BAY AIRPORT
LANDFILL
2000 SUMMARY REPORT

Transport Canada, Prairie and Northern Region
Programs, Environmental Affairs
March 2001

Executive Summary

In 2000 Transport Canada Prairie and Northern Region (TC-PNR) implemented an environmental monitoring program at the decommissioned Resolute Bay Airport landfill site. The monitoring program was designed as a follow-up to an earlier study commissioned by Transport Canada (TC), the "Environmental Site Investigation (ESI) of the Resolute Bay Airport Landfill (1998)" conducted by Dillon Consulting. The purpose of the ESI was to study the landfill site to identify the condition of the landfill, and to determine if any changes were occurring at the site.

The ESI did not identify any major non-compliance issues, although concerns about potential health hazards related to chemicals used in past airport operations that may have been disposed of in the landfill were addressed. In addition to the ESI a community consultation meeting was held in November of 1998. At the meeting local residents of Resolute Bay expressed concern over the potential for contamination down gradient of the landfill site and near the ocean.

In response to the above concerns TC conducted a site investigation at the Resolute Bay Airport landfill in July 2000. The investigation included sampling various matrices (soil, water, sediment) at the landfill and down gradient of the landfill. The goals of the site investigation were to:

- obtain further analytical data from the landfill site,
- monitor the site for potential contaminant migration,
- obtain representative data down gradient of the site, and
- assess potential impacts on the environment down gradient of the site.

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1.0 Introduction

Transport Canada conducted a site investigation at the Resolute Bay Airport landfill in July 2000. The investigation included sampling various matrices (soil, water, sediment) at the landfill and down gradient of the landfill. The goals of the site investigation were to:

- obtain further analytical data from the landfill site,
- monitor the site for potential contaminant migration,
- obtain representative data down gradient of the site, and
- assess potential impacts on the environment down gradient of the site.

The purpose of this report is to review the analytical data collected to ensure that materials in the landfill are not adversely affecting the surrounding environment.

2.0 Site Description

2.1 Historical Information

Historically the Resolute Bay Airport landfill was used by TC and contractors for disposal of airport and construction wastes. Aerial photographs and historical records show the presence of wastes at the site from as early as 1969. From these records it appears as though development of the landfill started west of the landfill access road. The landfill was officially closed in November 1996; the site was leveled and capped with several meters of crushed rock.

2.2 Location

The Hamlet of Resolute Bay is located on the south shore of Cornwallis Island approximately 900 km south of the Arctic Circle. Resolute Bay operates as "a center for transportation, communication, and administration for the Arctic" (Environmental Baseline Study (EBS)-Dillon, 1996), as well as being the home for the Polar Continental Shelf Research Station. One of the most economically significant components of the local environment is domestic harvesting of marine species such as beluga whales, walruses, and seals. Domestic harvesting is an essential part of the Inuit lifestyle.

The Resolute Bay Airport landfill is located approximately 10 km from the Hamlet of Resolute Bay and roughly 3 km from the Resolute Bay Airport facilities. There are no developments within several hundred meters of the landfill. Refer to Appendix A for diagrams of the area.

2.3 Site Features

Resolute Bay's sewage disposal lagoons are located immediately adjacent to the landfill. The sewage lagoons are unlined and treatment of the wastewater is accomplished through overland flow to the west and down gradient of the landfill (ESI-Dillon, 1998). An abandoned asbestos burial site is also located on the landfill property. The local community does not use groundwater from this site or adjacent sites.

The approximate "thickness of waste material in the landfill is in the order of 10 m (30 ft)" (EBS-Dillon, 1996). The type of wastes present include (EBS-Dillon, 1996):

- construction debris / abandoned equipment,
- food,
- office waste,
- scrap metals / drums,
- asbestos materials,
- possible hazardous waste,
- contaminated soils, and
- wood scraps.

3.0 Methodology

3.1 Project Description

Transport Canada -Prairie and Northern Region implemented an environmental monitoring program at the Resolute Bay Airport landfill in July 2000. The purposes of the monitoring program are to:

- gather analytical data from the landfill and surrounding areas, and
- assess the data to ensure that the contents of the landfill are not migrating from the site, and that any discharges are within regulatory criteria and are not deleterious.

Monitoring activities consisted of a site investigation at the landfill, which included sampling at four locations. The following table provides information on the sampling locations, sampling matrix, and site characteristics.

Site	Matrix	Approximate Location	Site Characteristics
Site 1	soil	• 36 meters down slope of the landfill	• silt-clay soil • standing water in previous test hole had a light blue tint
Site 2	freshwater	• a stream 324 meters down slope of the landfill	• light blue tint in standing water
Site 3	sediment	• a stream 324 meters down slope of the landfill	• light blue tint in standing water
Site 4	saltwater	• a natural water discharge into the ocean directly west of the landfill	

- approximate elevation of the landfill is 60 m above sea level (ESI-Dillon, 1998).

3.2 Sampling Activities & Parameters

Standard environmental sampling procedures were used following ***The Inspector's Field Sampling Manual***, Environment Canada 1995. Timothy Johnson, Environmental Compliance Officer, TC-PNR conducted the sampling. A composite sample was collected at each site to represent the area. All samples were submitted to Norwest Labs, Edmonton for analysis. Norwest Labs is a Canadian Association for Environmental Analytical Laboratories (CAEAL) approved lab, refer to Appendix B for a copy of the lab results including Quality Control and Quality Assurance data.

Sampling parameters were selected based on regulatory criteria and for comparison to the Dillon 1998 ESI sampling data. Parameters selected for soil and sediment analysis included:

- benzene, toluene, ethylene, and xylene (BTEX),

- total purgeable hydrocarbons (TPH),
- total extractable hydrocarbons (TEH),
- metals,
- phenols, polychlorinated bi-phenols (PCB's),
- pesticide screen,
- microtox, and
- detailed salinity.

Parameters selected for the water analysis included:

- BTEX,
- TPH,
- TEH,
- metals,
- PCB's,
- pesticide screen,
- microtox,
- glycol's, and
- routine water.

3.3 Regulatory Criteria

For the purpose of this report the Canadian Council of the Ministers of the Environment (CCME), Commercial/Industrial guidelines are referenced. This selection is based on site characteristics and for comparison to the standards used in the Dillon 1998 ESI.

Soil : **Environmental Remediation Guidelines**, Government of the Northwest Territories 1998.
Interim Soil Quality Guidelines, Commercial/Industrial Criteria, Canadian Council of Ministers of the Environment, 1999.

Water: **Interim Water Quality Guidelines**, Freshwater Aquatic Life, Canadian Council of Ministers of the Environment, 1999.
Canadian Drinking Water Quality Guideline, 6th Edition, Health Canada 1996.

4.0 Results & Discussion

4.1 Mircotox and Hydrocarbon Analysis

A Microtox test is a screening tool used for a variety of toxicity testing applications. The Microtox test determines if the substance is deleterious, the results are expressed on a pass/fail basis. All the samples passed the Microtox test.

The samples were all below the CCME criteria for hydrocarbon analysis. This indicates that none of the samples pose an environmental risk for hydrocarbon contamination. The TEH level of the sediment sample was significantly higher than the soil sample. The higher value may be the result of localized contamination from a previous deposit of one of the many drums that was left in the area. Sediment samples will be collected in 2001 to confirm this value.

Table 1 shows the Microtox and hydrocarbon results for the soil and sediment samples and Table 2 shows results for the freshwater and salt water samples.

Table 1. Microtox and Hydrocarbon Analysis, Soil and Sediment Samples

Sampling Parameter	Interim Canadian Soil Quality Guidelines Commercial /Industrial (mg/kg), 1999	Site 1 Soil	Site 2 Sediment
Microtox	pass/fail	pass	pass
Benzene	5	<0.02	<0.02
Toluene	0.8	<0.02	<0.02
Ethylbenzene	20	<0.02	<0.02
Xylene	17	<0.02	<0.02
TPH (C5-C10)	*	<0.1	<0.1
TEH (C10-C40+)	*	<10	**142**
Total Petroleum Hydrocarbons	2500	10.18	142.18

- results are expressed in ppm.

* no CCME criteria

Table 2. Microtox and Hydrocarbon Analysis, Freshwater and Saltwater Samples

Sampling Parameters	Canadian Environmental Quality Guidelines for the Protection of Aquatic Life, Freshwater (ug/l), 1999	Canadian Guidelines for Drinking Water Quality (mg/l), 1998	Site 2 Freshwater	Site 3 Saltwater
Microtox	pass/fail	pass/fail	pass	pass
Benzene	370	0.005	<0.001	<0.001
Toluene	2.0	0.1	<0.001	<0.001
Ethylbenzene	90	≤ 0.0024	<0.001	<0.001
Xylene	*	≤ 0.3	<0.001	<0.001
TPH (c5-c10)	*	*	<0.01	<0.01
TEH (c11-c40+)	*	*	<0.1	<0.1

- results are in ppm

* no regulatory criteria

4.2 Metal Concentration Analysis

Many metals are toxic to the environment and to humans therefore concentrations of these metals in the soil or water can present an environmental and / or human health risk. Metal concentrations for all the samples were under the CCME guidelines, indicating that metal contamination is not a problem at this site. Refer to Tables 3 and 4 for the metal concentration analysis.

Table 3. Metal Concentrations, Soil and Sediment Samples

Sampling Parameter	Interim Canadian Soil Quality Guidelines Commercial /Industrial (mg/kg), 1999	Site 1 Soil	Site 2 Sediment
Antimony	49	<0.3	0.35
Arsenic	12	1.1	0.99
Barium	2000	19.0	13.4
Cadium	8	0.12	0.10
Chromium	87	3.68	4.40
Cobalt	300	1.10	0.838
Copper	100	2.37	2.57
Lead	commercial 260 / industrial 600	2.37	2.57
Mercury	commercial 260 / industrial 30	<0.01	<0.01
Molybdenum	40	0.568	0.45
Nickel	500	3.32	2.83
Selenium	10	<0.2	<0.2
Thallium	1	<0.2	<0.2
Tin	300	1.2	1.1
Vanadium	130	5.38	5.18
Zinc	380	16.3	12.3

- results are expressed in ug/g

Table 4. Metal Concentrations, Freshwater and Saltwater Samples

Sampling Parameters	Canadian Environmental Quality Guidelines for the Protection of Aquatic Life, Freshwater (ug/l), 1999	Canadian Guidelines for Drinking Water Quality (mg/l), 1998	Site 2 Freshwater	Site 3 Saltwater
Aluminum (trace)	5-100	*	0.0214	0.022
Arsenic	5	0.025	<0.01	<0.01
Cadmium	0.017	0.005	0.00063	0.00019
Chromium (trace)	*	0.05	0.0014	<0.0009
Copper	2	0.01	0.007	<0.001
Iron	300	<0.3	0.094	0.027
Lead (trace)	1	0.010	0.0010	0.0004
Mercury	0.1	0.0001	0.00002	<0.00001
Nickel	25-150	*	0.004	0.003
Selenium	1	0.01	<0.000	<0.0002
Silver	0.1	*	0.00010	0.00010
Zinc	30	≤ 5.0	0.0169	<0.0007

- results in mg/L

* no CCME criteria

4.3 Polychlorinated Bi-Phenols (PCB), Phenols , pH and EC Analysis

The sediment and soil samples were analyzed for PCB's, phenols, pH, and EC. These results are provided in Table 5. The freshwater and saltwater samples were analyzed for PCB's, pH and EC; see Table 6. Results from all these analysis are within the CCME guidelines.

Table 5. PCB's, Phenols, pH, and EC, Soil and Sediment Samples

Sampling Parameter	Interim Canadian Soil Quality Guidelines Commercial /Industrial (mg/kg), 1999	Site 1 Soil	Site 2 Sediment
PCB's (ppm)	33	<0.1	<0.1
Phenols (mg/kg)	3.8	0.09	0.080
EC (conductivity) (dS/m)	maximum 4	0.37	0.96
pH	6-8	7.7	7.14

Table 6. PCB's, pH, and EC, Freshwater and Saltwater Samples

Sampling Parameters	Canadian Environmental Quality Guidelines for the Protection of Aquatic Life, Freshwater (ug/l), 1999	Canadian Guidelines for Drinking Water Quality (mg/l), 1998	Site 2 Freshwater	Site 3 Saltwater
PCB's (ppm)	*	*	<0.1	<0.1
pH	6.5-9	6.5-8.5	7.82	8.1
EC (conductivity) (us/m)	*	*	311	4690

* no CCME criteria

4.4 Pesticide Screen Analysis

Lastly, all the samples were screened for pesticides. Pesticides can be toxic to birds, animals and humans. Pesticide levels in the samples were at the lowest detectable limits, indicating that pesticides are not leaching from the soil. Refer to Tables 7 and 8 for the pesticide parameters and results.

Table 7. Pesticide Screen, Soil and Sediment Samples

Sampling Parameter	Site 1 Soil	Site 2 Sediment
Atrazine	<0.005	<0.005
Bromacil	<0.02	<0.02
Chlorotoluron	<0.02	<0.02
Cyanazine	<0.02	<0.02
Diuron	<0.02	<0.02
Fenuron	<0.02	<0.02
Isoproturon	<0.02	<0.02
Linuron	<0.02	<0.02
Methabenzthiazuron	<0.02	<0.02
Metobromuron	<0.02	<0.02
Metoxuron	<0.02	<0.02
Simazine	<0.02	<0.02
Tebuthiuron	<0.005	<0.005

- results in ppm

Table 8. Pesticide Screen, Freshwater and Saltwater Samples

Sampling Parameters	Canadian Environmental Quality Guidelines for the Protection of Aquatic Life, Freshwater (ug/l), 1999	Canadian Guidelines for Drinking Water Quality (mg/l), 1998	Site 2 Freshwater	Site 3 Saltwater
Atrazine	1.8	0.005	<1	<1
Bromacil	5.0	*	<1	<1
Chlorotoluron	*	*	<1	<1
Cyanazine	2.0	0.01	<1	<1
Diuron	*	0.2	<1	<1
Fenuron	*	*	<1	<1
Isoproturon	*	*	<1	<1
Linuron	7.0	*	<1	<1
Methabenznthiazuron	*	*	<1	<1
Metobromuron	*	*	<1	<1
Metoxuron	*	*	<1	<1
Simazine	10.0	0.01	<1	<1
Tebuthiuron	1.6		<1	<1

- results in ppb

* no CCME criteria

4.5 Glycol Analysis

The water samples were analyzed for glycol's which are present in de-icing fluids used on aircraft. Glycol levels were found to be at the lowest detectable limit, suggesting that glycol contamination is not a concern at this site. Table 9 shows the glycol results for the freshwater and saltwater samples.

Table 9. Glycol Results

Sampling Parameters	Canadian Environmental Quality Guidelines for the Protection of Aquatic Life, Freshwater (ug/l), 1999	Site 2 Freshwater	Site 3 Saltwater
Ethylene glycol	192 000	<10	<10
Propylene glycol	*	<10	<10
Diethylene glycol	500 000	<10	<10
Triethylene glycol	*	<10	<10
Tetrathylene glycol	*	<10	<10

* no CCME criteria

5.0 Conclusions

In July 2000 a site investigation was conducted at the Resolute Bay Airport landfill. The site was sampled to determine if there was contaminant migration from the landfill site, to ensure that any discharges are within regulatory criteria, and to ensure that discharges are not deleterious. The laboratory results indicated that any leachate discharge occurring at the site is not deleterious; as determined by the microtox results. Lab results for other contaminants found in the samples are significantly lower then the levels set by federal and territorial regulatory standards and the CCME guidelines. The site will be monitored to ensure the local environment remains unaffected.

Appendix A

Diagrams of Resolute Bay Airport Landfill
(all diagrams were taken from the Dillon 1998 ESI)

Resolute Bay, NWT

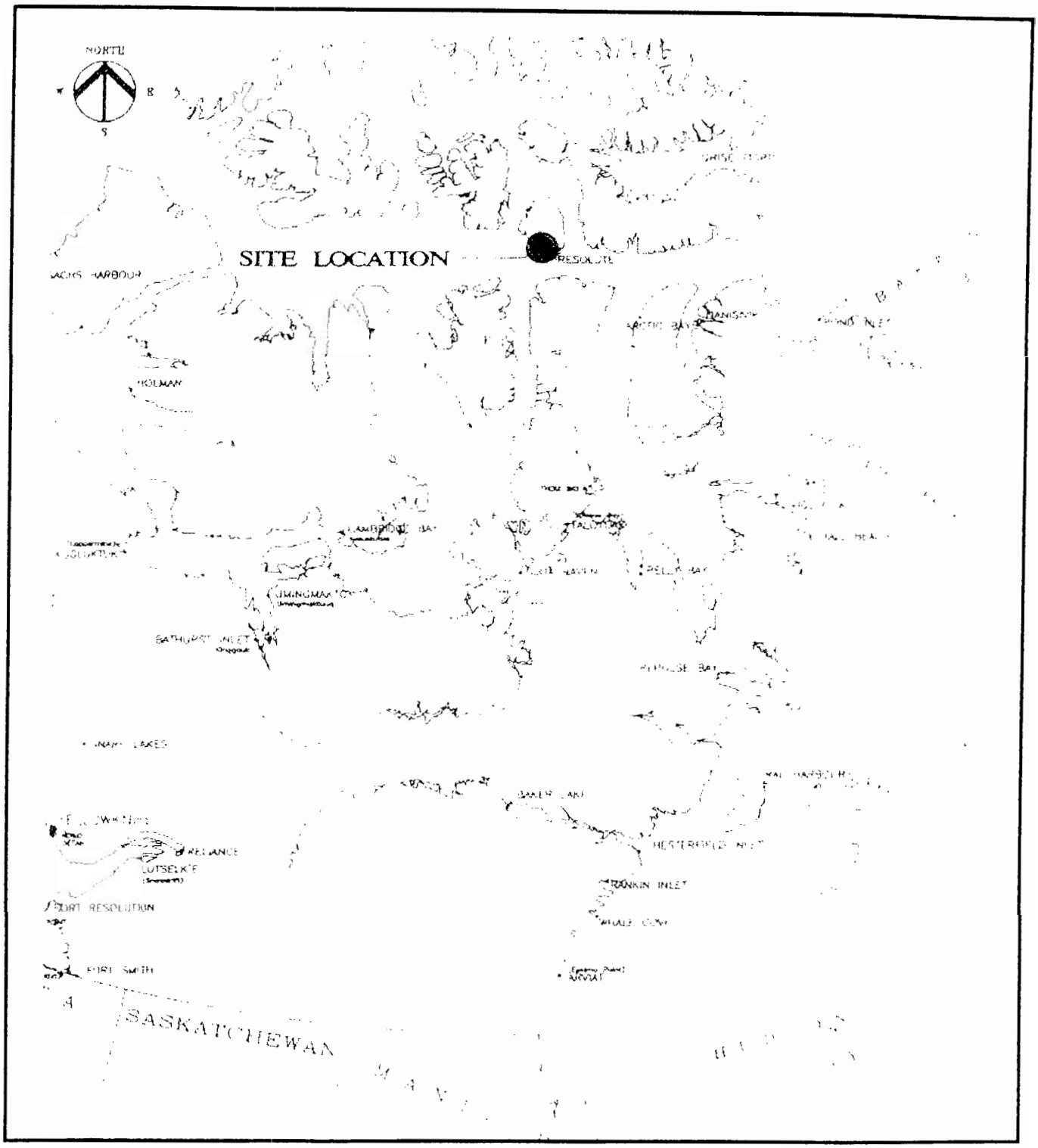

Figure was adapted from the Dillon 1998 ESI

Resolute Bay Airport Landfill

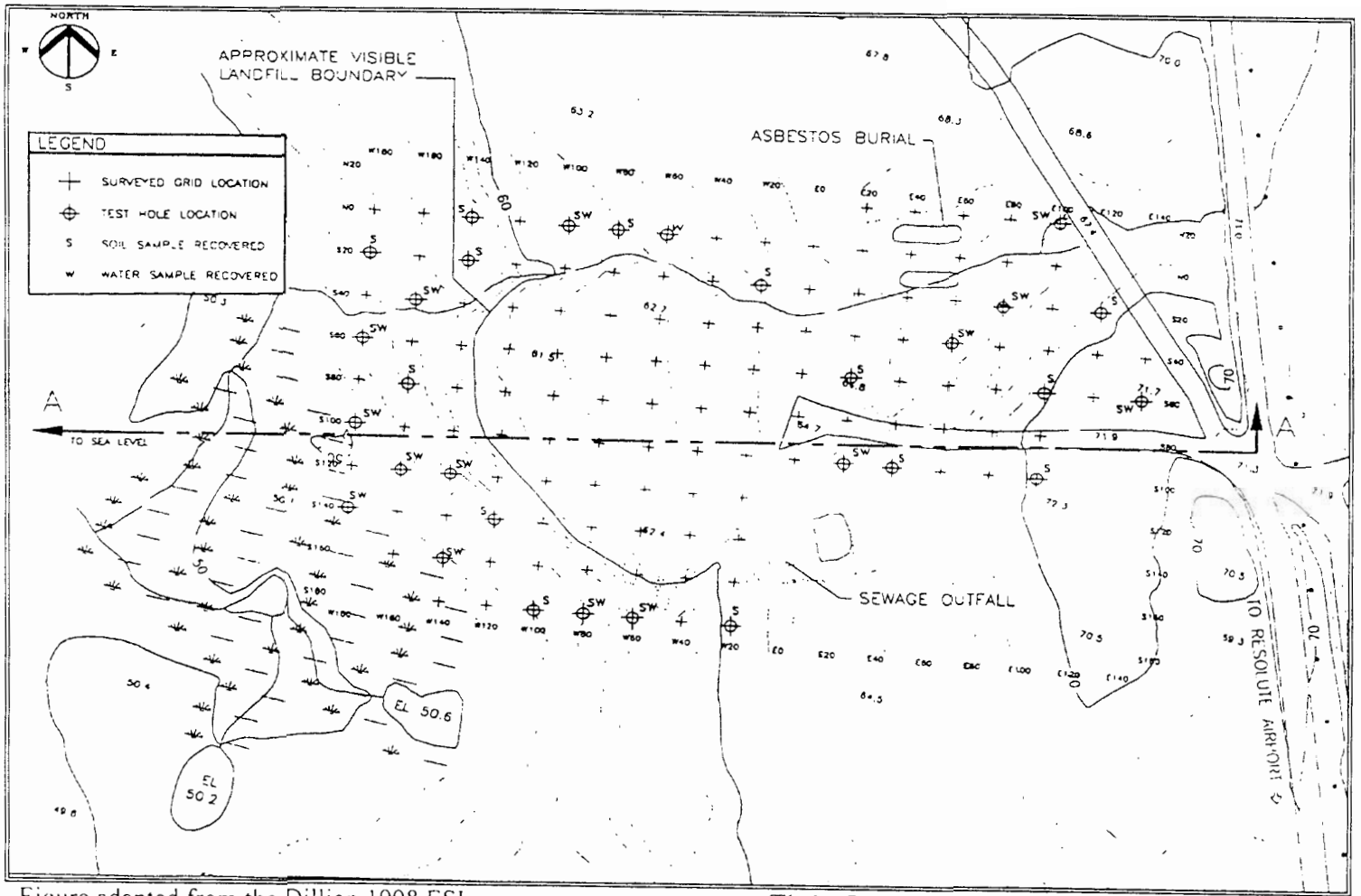

Figure adapted from the Dillion 1998 ESI

Tittle: Resolute Bay Landfill
Project: Resolute Bay Airport, Resolute NWT

Resolute Bay Landfill, Cross Section

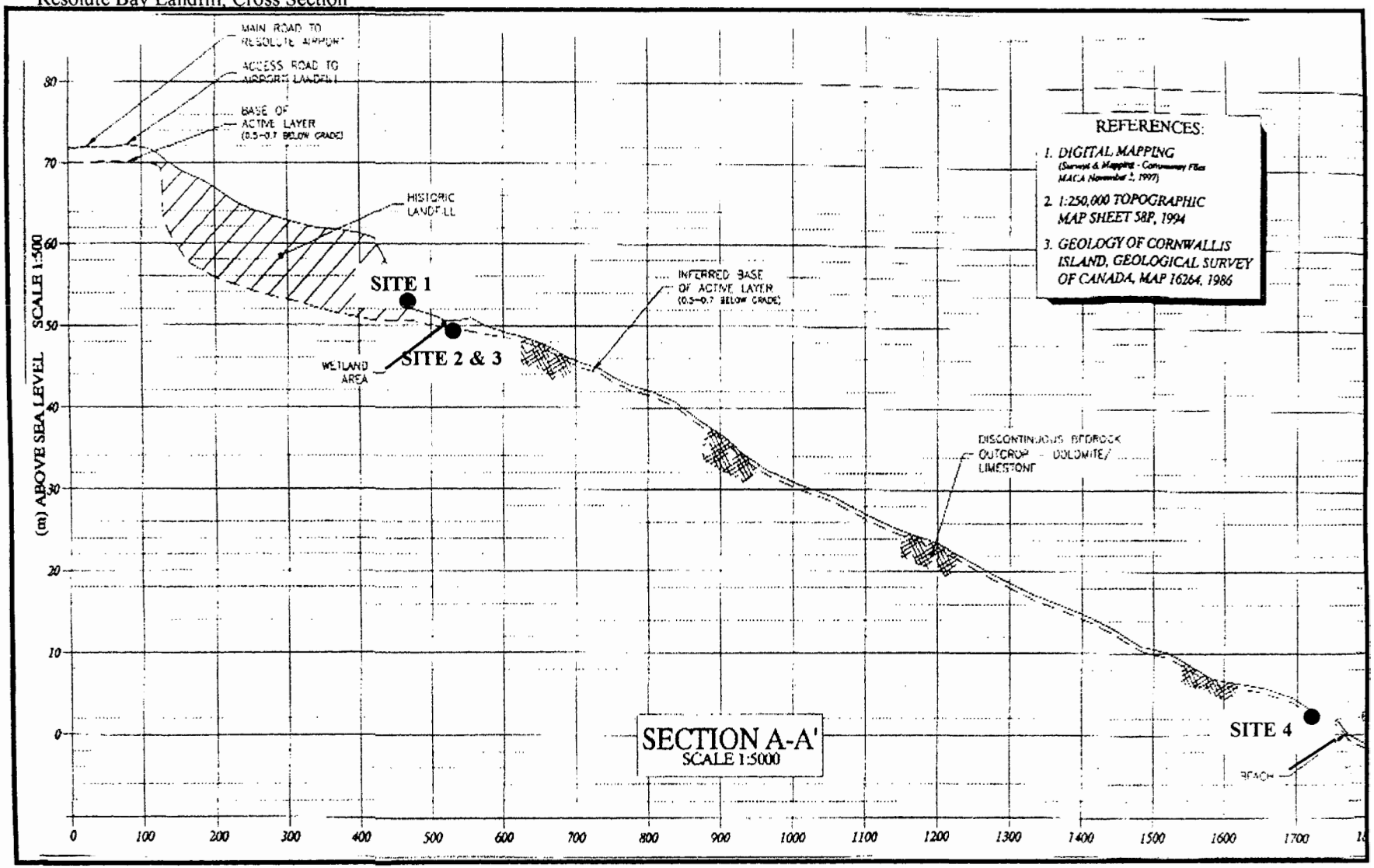

Figure adapted from the Dillon 1998 ESI

Appendix B

Norwest Laboratory Results

NORWEST LABS

Agri-Food & Environmental Group
Calgary Edmonton Winnipeg Lethbridge Surrey

9938-67 Avenue
Edmonton, AB. T6E 0P5
Phone: (780) 438-5522
Fax: (780) 438-0396

Sample Custody

Bill to: Transport Canada
Report to: Transport Canada
Environmental Services
1100, 9700 Jasper Avenue
Edmonton, AB, Canada
T5J 4E6
Attn: Tim Johnson

Sampled By:

Project ID:
Name: Resolute Bay Landfill
Location: Resolute Bay
LSD:
P.O.:
Acct. Code:

NWL Lot ID: 72290
Control Number: E45118
Date Received: Jul 21, 2000
Date Reported: Jul 28, 2000
Report Number: 91862

Sample Disposal Date: Aug 20, 2000

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the upper right of this page.

_____ **Extend Sample Storage Until** _____ **(MM/DD/YY)**

The following charges apply to extended sample storage:

Storage for 1 to 5 samples per month	$ 10.00
Storage for 6 to 20 samples per month	$ 15.00
Storage for 21 to 50 samples per month	$ 30.00
Storage for 51 to 200 samples per month	$ 60.00
Storage for more than 200 samples per month	$ 110.00

_____ **Return Sample, collect, to the address below via:**

_____ Greyhound
_____ Loomis
_____ Purolator
_____ Other (Specify) _____

Name: _____
Company: _____
Address: _____
_____
Phone: _____
Fax: _____
Signature: _____

If no other arrangements have been made, samples will be disposed of on Aug 20, 2000.

NORWEST LABS

Agri-Food & Environmental Group
Calgary Edmonton Winnipeg Lethbridge Surrey

Analytical Report

9938-67 Avenue
Edmonton, AB. T6E 0P5
Phone: (780) 438-5522
Fax: (780) 438-0396

Bill to: Transport Canada
Report to: Transport Canada
Environmental Services
1100, 9700 Jasper Avenue
Edmonton, AB, Canada
T5J 4E6
Attn Tim Johnson
Sampled By:

Project ID.
Name: Resolute Bay Landfill
Location. Resolute Bay
LSD:
P.O.:
Acct. Code.

NWL Lot ID: 72290
Control Number: E45118
Date Received. Jul 21, 2000
Date Reported: Jul 28, 2000
Report Number: 91862

	NWL Number:	72290-1	72290-2	72290-3	
	Sample Date:				
	Sample Description.	Soil 04074-1	Freshwater 04074-2	Saltwater 04074-3	
Analyte	**Units**	**Results**	**Results**	**Results**	**Detection Limit**
Microtox					
Microtox Model 500 unit #		330	174	330	
Sample Type		Soil ltol	Water	Water	
Turbidity	As Received	High	None	None	
Colour	As Received	Dark Brown	Clear	Clear	
Clarification		Yes	Yes	Yes	
Centrifugation		Yes	No	No	
Turbidity	As Tested	None	None	None	
Colour	As Tested	Clear	Clear	Clear	
pH	Clarified Sample- Initial	8.3	7.8	8.1	0.1
pH	Clarified Sample- Final	Not Adjusted	Not Adjusted	Not Adjusted	
Osmotic Adjustment		Yes	Yes	Yes	
Lab Treatment		None	None	None	
EC50	5 minutes	% Sample >100	>100	>100	
95% Confidence Factor	(EC50 - 5 Minutes)	N/A	N/A	N/A	0.1
EC20	5 minutes	% Sample >100	>100	>100	
95% Confidence Factor	(EC20 - 5 Minutes)	N/A	N/A	N/A	0.1
EC50	15 minutes	% Sample >100	>100	>100	
95% Confidence Factor	(EC50 - 15 Minutes)	N/A	N/A	N/A	0.1
EC20	15 minutes	% Sample >100	>100	>100	
95% Confidence Factor	(EC20 - 15 Minutes)	N/A	N/A	N/A	0.1
Colour Corrected Data		No	No	No	
Interpretation (AEUB, G-50)		Pass	Pass	Pass	

NORWEST LABS
Agri-Food & Environmental Group
Calgary Edmonton Winnipeg Lethbridge Surrey

9938-67 Avenue
Edmonton, AB. T6E 0P5
Phone: (780) 438-5522
Fax: (780) 438-0396

Analytical Report

Bill to: Transport Canada
Report to: Transport Canada
Environmental Services
1100, 9700 Jasper Avenue
Edmonton, AB, Canada
T5J 4E6
Attn: Tim Johnson
Sampled By:

Project ID:
Name: Resolute Bay Landfill
Location: Resolute Bay
LSD:
P.O.:
Acct. Code:

NWL Lot ID: 72290
Control Number: E 45118
Date Received: Jul 21, 2000
Date Reported: Jul 28, 2000
Report Number: 91862

			NWL Number:	72290-4	72290-5		
			Sample Date:				
			Sample Description:	Sediment 4074-4	Freshwater #2		
Analyte		**Units**		**Results**	**Results**	**Results**	**Detection Limit**
Microtox							
Microtox Model 500 unit #				330	174		
Sample Type				Soil 1to1	Water		
Turbidity	As Received			High	None		
Colour	As Received			Dark Brown	Blue		
Clarification				Yes	Yes		
Centrifugation				Yes	Yes		
Turbidity	As Tested			None	None		
Colour	As Tested			Clear	Blue		
pH	Clarified Sample- Initial			8.1	8.9		0.1
pH	Clarified Sample- Final			Not Adjusted	8.8		0.1
Osmotic Adjustment				Yes	Yes		
Lab Treatment				None	None		
EC50	5 minutes	% Sample		>100	>100		
95% Confidence Factor	(EC50 - 5 Minutes)			N/A	N/A		0.1
EC20	5 minutes	% Sample		>100	>100		
95% Confidence Factor	(EC20 - 5 Minutes)			N/A	N/A		0.1
EC50	15 minutes	% Sample		>100	>100		
95% Confidence Factor	(EC50 - 15 Minutes)			N/A	N/A		0.1
EC20	15 minutes	% Sample		>100	>100		
95% Confidence Factor	(EC20 - 15 Minutes)			N/A	N/A		0.1
Colour Corrected Data				No	No		
Interpretation (AEUB, G-50)				Pass	Pass		

Approved by. _____

NORWEST LABS

Agri-Food & Environmental Group
Calgary Edmonton Winnipeg Lethbridge Surrey

Analytical Report

9938-67 Avenue
Edmonton, AB. T6E 0P5
Phone: (780) 438-5522
Fax: (780) 438-0396

Bill to: Transport Canada
Report to: Transport Canada
Environmental Services
1100, 9700 Jasper Avenue
Edmonton, AB, Canada
T5J 4E6
Attn: Tim Johnson
Sampled By.

Project ID:
Name: Resolute Bay Landfill
Location: Resolute Bay
LSD:
P.O..
Acct. Code:

NWL Lot ID: 72290
Control Number: E45118
Date Received: Jul 21, 2000
Date Reported: Jul 28, 2000
Report Number: 91862

	NWL Number:	72290-1	72290-4		
	Sample Date:				
	Sample Description:	Soil 04074-1	Sediment 4074-4		
Analyte		**Units**	**Results**	**Results**	**Results**	**Detection Limit**
Aggregate Organic Constituents						
Phenol	Total	mg/kg	0.09	0.08		0.01
Metals Strong Acid Extractable						
Mercury	Strong Acid Extractable	ug/g	<0.01	<0.01		0.01
Antimony	Strong Acid Extractable	ug/g	<0.3	0.35		0.3
Arsenic	Strong Acid Extractable	ug/g	1.1	0.99		0.5
Barium	Strong Acid Extractable	ug/g	19.0	13.4		0.01
Beryllium	Strong Acid Extractable	ug/g	0.12	0.10		0.03
Cadmium	Strong Acid Extractable	ug/g	0.11	0.13		0.03
Chromium	Strong Acid Extractable	ug/g	3.68	4.40		0.04
Cobalt	Strong Acid Extractable	ug/g	1.10	0.838		0.07
Copper	Strong Acid Extractable	ug/g	2.37	2.57		0.05
Lead	Strong Acid Extractable	ug/g	3.50	3.61		0.1
Molybdenum	Strong Acid Extractable	ug/g	0.568	0.45		0.05
Nickel	Strong Acid Extractable	ug/g	3.32	2.83		0.05
Selenium	Strong Acid Extractable	ug/g	<0.2	<0.2		0.2
Silver	Strong Acid Extractable	ug/g	<0.05	<0.05		0.05
Thallium	Strong Acid Extractable	ug/g	<0.2	<0.2		0.2
Tin	Strong Acid Extractable	ug/g	1.2	1.1		0.2
Vanadium	Strong Acid Extractable	ug/g	5.38	5.18		0.05
Zinc	Strong Acid Extractable	ug/g	16.3	12.3		0.03
Salinity						
pH	Saturated Paste	pH	7.7	7.4		0.1
Conductivity		dS/m	0.37	0.96		0.01
SAR			0.5	0.6		
% Saturation		%	27	35		1
Calcium		meq/L	2.41	6.58		1
Calcium		mg/kg	13.9	45.5		1
Magnesium		meq/L	0.8	2.1		0.1
Magnesium		mg/kg	2.7	9.4		0.5
Sodium		meq/L	0.1	1.3		1
Sodium		mg/kg	4.2	10.1		1
Potassium		meq/L	0.1	0.5		0.03
Potassium		mg/kg	1.6	6.97		0.5

NORWEST LABS

Agri-Food & Environmental Group
Calgary Edmonton Winnipeg Lethbridge Surrey

Analytical Report

9938-67 Avenue
Edmonton, AB. T6E 0P5
Phone: (780) 438-5522
Fax: (780) 438-0396

Bill to: Transport Canada
Report to: Transport Canada
Environmental Services
1100, 9700 Jasper Avenue
Edmonton, AB, Canada
T5J 4E6
Attn: Tim Johnson
Sampled By:

Project ID:
Name: Resolute Bay Landfill
Location: Resolute Bay
LSD:
P.O.:
Acct. Code:

NWL Lot ID: 72290
Control Number: E 45118
Date Received: Jul 21, 2000
Date Reported: Jul 28, 2000
Report Number: 91862

	NWL Number:	72290-1	72290-4		
	Sample Date:				
	Sample Description:	Soil 04074-1	Sediment 4074-4		

Analyte		Units	Results	Results	Results	Detection Limit
Salinity - Continued						
Chloride		meq/L	0.6	5.2		1
Chloride		mg/kg	6.1	63.3		1
Sulphate-S		meq/L	0.7	8.0		1
Sulphate-S		mg/kg	2.9	44.2		1
Nitrate - N	Saturated Paste	meq/L	<0.06	<0.06		
Nitrate - N	Saturated Paste	mg/kg	<0.02	<0.03		
Nitrite - N	Saturated Paste	meq/L	<0.01	<0.01		
Nitrite - N	Saturated Paste	mg/kg	<0.01	<0.01		
TGR		T/ac	<0.1	<0.1		0.1

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NWL Lot ID: 72290
Control Number. E45118
Date Received. Jul 21, 2000
Date Reported: Jul 28, 2000
Report Number: 91862

			NWL Number:	72290-2	72290-3		
			Sample Date:				
			Sample Description.	Freshwater 04074-2	Saltwater 04074-3		
Analyte		**Units**		**Results**	**Results**	**Results**	**Detection Limit**
Metals Total							
Arsenic	Total	mg/L		<0.01	0.01		0.01
Chromium	Total	mg/L		0.0014	<0.0009		0.0009
Copper	Total	mg/L		0.007	<0.001		0.001
Iron	Total	mg/L		0.094	0.027		0.003
Nickel	Total	mg/L		0.004	0.003		0.001
Zinc	Total	mg/L		0.0169	<0.0007		0.0007
Mercury	Total	mg/L		0.00002	<0.00001		5
Metals Total (Trace)							
Aluminum	Total	mg/L		0.0214	0.0220		0.0009
Cadmium	Total	mg/L		0.00063	0.00019		7e-005
Lead	Total	mg/L		0.0010	0.0004		0.0003
Silver	Total	mg/L		0.00010	0.00010		6e-005
Metals Total by AA							
Selenium	Hydride Total	mg/L		<0.0002	<0.0002		0.0002
Routine Water							
pH				7.82	8.10		0.01
Conductivity		uS/cm		311	4690		0.1

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Methodology and Notes

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Control Number: E 45118
Date Received. Jul 21, 2000
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Method of Analysis:

Test	Reference	Method	Date of Analysis	Location	Analyst
Alkalinity, pH, and EC in water	APHA	Electrometric Method, 4500-H+ B	Jul 24, 2000	Norwest Edmonton	Matt Cummings
		Laboratory Method, 2510 B	Jul 24, 2000	Norwest Edmonton	Matt Cummings
Mercury in Soil	SW-846	Microwave Ass Acid Digest of Sed., Sludges, Soils and Oils, EPA 3051	Jul 24, 2000	Norwest Edmonton	To Thong
Mercury Low Level (Total) in water	APHA	Cold Vapour Atomic Absorption Spectrometric Method, 3112 B	Jul 28, 2000	Norwest Edmonton	Stef Pavlyshyn
Metals Hydride (Total) in water	APHA	Continuous Hydride Generation / Atomic Absorption Spectromet, 3114 C	Jul 27, 2000	Norwest Edmonton	Stef Pavlyshyn
Metals Trace (Total) in water	APHA	Inductively Coupled Plasma (ICP) Method, 3120 B	Jul 25, 2000	Norwest Edmonton	Jodi Johnston
Metals Trace in soil	APHA	Inductively Coupled Plasma (ICP) Method, 3120 B	Jul 24, 2000	Norwest Edmonton	Jodi Johnston
Metals UltraTrace (Total) in water	APHA	Inductively Coupled Plasma (ICP) Method, 3120 B	Jul 24, 2000	Norwest Edmonton	To Thong
Microtox - 15 Minute Multiple Concentration, Acute, Static, EC50 Bioassay	Environment Canada	Biological Test Method: Toxicity Test Luminescent Bacteria, 1/RM/24	Jul 24, 2000	Norwest Edmonton	Michelle Tessier
Saturated Paste in General Soil	McKeague	Soluble Salts in Saturation Extract, 3.21	Jul 25, 2000	Norwest Edmonton	Jesse Dang

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References:

APHA	Standard Methods for the Examination of Water and Wastewater
Environment Canada	Toxicity Test Using Luminescent Bacteria
McKeague	Manual on Soil Sampling and Methods of Analysis
SW-846	Test Methods for Evaluating Solid Waste

Comments:

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Winnipeg, MB	Phone (204) 982-8630	Fax (204) 275-6019

TO:	Transport Canada - Environmental Services	**DATE SAMPLED:**	
		DATE RECEIVED:	22-Jul-00
ATTN:	Tim Johnson	**DATE REPORTED:**	31-Jul-00
		LAB FILE#:	72290
		PROJECT:	Resolute Bay Landfill Resolute Bay

SAMPLE CUSTODY

General Soil Sample Disposal Date: August 30, 2000

General soil samples will be stored for 30 days unless we receive instructions prior to disposal date.

Please indicate your preference below:

_____ We are aware that there is a charge for long term storage of samples past 30 days (refer to page 117 of NWL price schedule). Please retain the samples until _____ and invoice us accordingly.

_____ Please ship the sample to us collect by:

_____ Greyhound

_____ Loomis

_____ Purolator

_____ Other (specify) _____

Signature _____

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ATTN:	Tim Johnson	**DATE REPORTED:**	31-Jul-00
		LAB FILE#:	72290
		PROJECT:	Resolute Bay Landfill Resolute Bay

HYDROCARBON ASSESSMENT - SOIL

LAB # CLIENT #	1 Soil	4 Sediment	Detection Limit
[1]Non-Halogenated Aromatics:			
Benzene	<0.02	<0.02	0.02
Toluene	<0.02	<0.02	0.02
Ethylbenzene	<0.02	<0.02	0.02
Total Xylenes (o, m & p)	<0.02	<0.02	0.02
[1]Total Purgeables (C_5-C_{10})	<0.1	<0.1	0.1
[2]Total Extractables (C_{11}-C_{40+})	<10	142	10

C. Swyngedouw Ph.D.
Assistant Lab Manager

Results expressed in mg/kg dry wt. (ppm)

[1]Assessment as per US EPA Method 8020/8015

[2]Assessment as per Alta. Env. Method A108.0

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Winnipeg, MB	Phone (204) 982-8630	Fax (204) 275-6019

TO: Transport Canada - Environmental Services
ATTN: Tim Johnson

DATE SAMPLED:
DATE RECEIVED: 22-Jul-00
DATE REPORTED: 31-Jul-00
LAB FILE#: 72290
PROJECT: Resolute Bay Landfill
Resolute Bay

HYDROCARBON ASSESSMENT - WATER

LAB # / CLIENT #	2 Freshwater	3 Saltwater	Detection Limit
[1]Non-Halogenated Aromatics:			
Benzene	<0.001	<0.001	0.001
Toluene	<0.001	<0.001	0.001
Ethylbenzene	<0.001	<0.001	0.001
Total Xylenes (o, m & p)	<0.001	<0.001	0.001
[1]Total Purgeables (C_5 - C_{10})	<0.01	<0.01	0.01
[2]Total Extractables (C_{11} - C_{40}+)	<0.1	<0.1	0.1

C. Swyngedouw Ph.D.
Assistant Lab Manager

Results expressed in mg/L (ppm)
[1]Assessment as per US EPA Method 8020/8015
[2]Assessment as per Alta. Env. Method A108.0

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TO:	Transport Canada - Environmental Services	**DATE SAMPLED:**	
		DATE RECEIVED:	22-Jul-00
ATTN:	Tim Johnson	**DATE REPORTED:**	31-Jul-00
		LAB FILE#:	72290
		PROJECT:	Resolute Bay Landfill Resolute Bay

BTEX
QUALITY ASSURANCE DATA

(This QA/QC data is representative of the lab based quality assurance program and is not to be utilized as field data.)

Calibration - Check (CC)

	Expected Amt. (ng)	Detected Amt. (ng)	% Rec.	Acceptable Range
Benzene	50.0	53.4	107	80-120
Toluene	50.0	50.7	101	80-120
Ethyl Benzene	50.0	50.1	100	80-120
M & P Xylenes	100.0	100.4	100	80-120
O-Xylene	50.0	49.9	100	80-120

$$\text{Accuracy} = \frac{\text{Ave \% Rec. MS + Ave \% Rec. MSD}}{2} = 110 \text{ \% Accuracy}$$

$$\text{\% RSD} = \frac{\text{Ave \% Rec. MS - Ave \% Rec. MSD}}{\text{\% Accuracy}} = 7.0 \text{ \% RSD}$$

The calculated values are based on matrix spike and duplicate recovery data performed at the time of analysis.

Date Acquired: 00-07-24 Analyst: Tim Servage

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TO: Transport Canada - Environmental Services
ATTN: Tim Johnson

DATE SAMPLED:
DATE RECEIVED: 22-Jul-00
DATE REPORTED: 31-Jul-00
LAB FILE#: 72290
PROJECT: Resolute Bay Landfill
Resolute Bay

TOTAL EXTRACTABLE HYDROCARBONS
QUALITY ASSURANCE DATA

(This QA/QC data is representative of the lab based quality assurance program and is not to be utilized as field data.)

Calibration Check (CC)

	Actual Amt. (ng)	Detected Amt. (ng)	% Rec.
Diesel	6562	6778	103

$$\text{Accuracy} = \frac{\text{Ave \% Rec. MS + Ave \% Rec. MSD}}{2} = 116 \text{ \% Accuracy}$$

$$\text{\% RSD} = \frac{\text{Ave \% Rec. MS - Ave \% Rec. MSD}}{\text{\% Accuracy}} = 7.8 \text{ \% RSD}$$

The calculated values are based on matrix spike and duplicate recovery data performed at the time of analysis.

Date Acquired: 00-07-24 Analyst: TIm Servage

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TO: Transport Canada

ATTN: Tim Johnson

DATE SAMPLED: na
DATE RECEIVED: 22-Jul-00
DATE REPORTED: 31-Jul-00
LAB FILE#: 72290
PROJECT#: Resolute Bay Landfill

POLYCHLORINATED BIPHENYLS IN SOIL

LAB #	1	4	Method	
CLIENT #	Soil	Sediment	Blank	Detection Limit
			26-Jul-00	
PCB Content	<0.1	<0.1	<0.1	0.1
Aroclor Type	-----	-----	-----	

QUALITY ASSURANCE DATA

(This QA/QC data is representative of the lab based quality assurance program and is not to be utilized as field data.)

Surrogate Recovery %			
Decachlorobiphenyl	93	81	87

Results expressed in mg/kg (ppm) dry weight basis.
Reference Methods-based on EPA 3580A,EPA 8082

Chris Swyngedouw
Lab Manager

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Winnipeg, MB	Phone (204) 982-8630	Fax (204) 275-6019

TO:	Transport Canada	**DATE SAMPLED:**	na
		DATE RECEIVED:	22-Jul-00
ATTN:	Tim Johnson	**DATE REPORTED:**	31-Jul-00
		LAB FILE#:	72290
		PROJECT#:	Resolute Bay Landfill

POLYCHLORINATED BIPHENYLS
QUALITY ASSURANCE DATA

(This QA/QC data is representative of the lab based quality assurance program and is not to be utilized as field data.)

Calibration Check (CC)

Date Acquired: 26-Jul-00

	Actual Amt. (ng/ul)	Detected Amt. (ng/ul)	% Rec.
Aroclor 1254	1.00	1.00	100

QA/QC Sample

Date Acquired: 18-Jul-00

	Actual Amt. (ug/g)	Recovered	% Rec.
Aroclor 1242/1254/1260	1.0	0.998	100

Accuracy = $\frac{\text{Ave \% Rec. MS + Ave \% Rec. MSD}}{2}$ = 101 % Accuracy

% RSD = $\frac{\text{Ave \% Rec. MS - Ave \% Rec. MSD}}{\text{\% Accuracy}}$ = 0.1 % RSD

The calculated values are based on matrix spike and duplicate recovery data performed on your samples at the time of analysis.

Date Acquired: 18-Jul-00 Analyst: Inna Kazakov

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Langley, B.C.	Phone (604) 530-4344	Fax (604) 534-9996
Winnipeg, MB	Phone (204) 982-8630	

TO: Transport Canada

ATTN: Tim Johnson

DATE SAMPLED: na
DATE RECEIVED: 22-Jul-00
DATE REPORTED: 31-Jul-00
LAB FILE#: 72290
PROJECT#: Resolute Bay Landfill

POLYCHLORINATED BIPHENYLS IN WATER

LAB # / CLIENT #	2 Freshwater	3 Saltwater	Method *Blank* 26-Jul-00	*Detection* Limit
PCB Content	<0.1	<0.1	<0.1	0.1
Aroclor Type	-----	-----	-----	

QUALITY ASSURANCE DATA

(This QA/QC data is representative of the lab based quality assurance program and is not to be utilized as field data.)

Surrogate Recovery %			
Decachlorobiphenyl	104	78	90

Results expressed in ug/L (ppb)

Chris Swyngedouw
Lab Manager

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TO:	Transport Canada	**DATE SAMPLED:**	na
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ATTN:	Tim Johnson	**DATE REPORTED:**	31-Jul-00
		LAB FILE#:	72290
		PROJECT#:	Resolute Bay Landfill

POLYCHLORINATED BIPHENYLS
QUALITY ASSURANCE DATA

(This QA/QC data is representative of the lab based quality assurance program and is not to be utilized as field data.)

Calibration Check (CC)

Date Acquired: 26-Jul-00

	Actual Amt. (ng/ul)	Detected Amt. (ng/ul)	% Rec.
Aroclor 1254	1.00	1.00	100

QA/QC Sample

Date Acquired: 18-Jul-00

	Actual Amt. (ug/g)	Recovered	% Rec.
Aroclor 1242/1254/1260	1.0	0.998	100

$$\text{Accuracy} = \frac{\text{Ave \% Rec. MS + Ave \% Rec. MSD}}{2} = 101 \text{ \% Accuracy}$$

$$\text{\% RSD} = \frac{\text{Ave \% Rec. MS - Ave \% Rec. MSD}}{\text{\% Accuracy}} = 0.1 \text{ \% RSD}$$

The calculated values are based on matrix spike and duplicate recovery data performed on your samples at the time of analysis.

Date Acquired: 18-Jul-00 Analyst: Inna Kazakov

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TO:	Transport Canada	**DATE SAMPLED:**	Not Available
		DATE RECEIVED:	22-Jul-00
ATTN:	Tim Johnson	**DATE REPORTED:**	27-Jul-00
		LAB FILE#:	72290
		PROJECT:	Resolute Bay Landfill

GLYCOL SCREEN IN WATER

Date Analyzed	26-Jul-00	26-Jul-00	
LAB #	**2**	**3**	**Detection**
CLIENT#	**Freshwater**	**Saltwater**	**Limit**
Ethylene Glycol	<10	<10	10
Propylene Glycol	<10	<10	10
Diethylene Glycol	<10	<10	10
Triethylene Glycol	<10	<10	10
Tetraethylene Glycol	<10	<10	10

C. Swyngedouw

Chris Swyngedouw
Assistant Lab Manager

Results expressed in mg/L (ppm)

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TO:	Transport Canada	**DATE SAMPLED:**	Not Available
		DATE RECEIVED:	22-Jul-00
ATTN:	Tim Johnson	**DATE REPORTED:**	27-Jul-00
		LAB FILE#:	72290
		PROJECT:	Resolute Bay Landfill

GLYCOLS
QUALITY ASSURANCE DATA

(This QA/QC data is representative of the lab based quality assurance program and is not to be utilized as field data.)

Calibration - Check (CC)

	Expected Amt. (mg/L)	Detected Amt. (mg/L)	% Rec.	Acceptable Range
Ethylene Glycol	100	105	105	80-120
Propylene Glycol	102	104	102	80-120
Diethylene Glycol	100	103	103	80-120
Triethylene Glycol	100	103	103	80-120
Tetraethylene Glycol	101	100	99	80-120

$$\text{Accuracy} = \frac{\text{Ave \% Rec. MS + Ave \% Rec. MSD}}{2} = 105 \text{ \% Accuracy}$$

$$\text{\% RSD} = \frac{\text{Ave \% Rec. MS - Ave \% Rec. MSD}}{\text{\% Accuracy}} = 3.5 \text{ \% RSD}$$

The calculated values are based on matrix spike and duplicate recovery.

Date Acquired: July 26, 2000 Analyst: Erhard Schneider

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TO: Transport Canada

ATTN: Tim Johnson

DATE SAMPLED:
DATE RECEIVED: 21-Jul-00
DATE REPORTED: 31-Jul-00
LAB FILE#: 72290
PROJECT: Resolute Bay Landfill

EPA 8260 VOLATILES SCREEN - WATER

Date Analyzed:	28-Jul-00	28-Jul-00	28-Jul-00	
Lab #	2	3	Method	Detection
CLIENT #	Freshwater	Saltwater	Blank	Limit
Acetone	<50	<50	<50	50
Acetonitrile	<25	<25	<25	25
Acrylonitrile	<25	<25	<25	25
Allyl Chloride	<1	<1	<1	1
Benzene	<1	<1	<1	1
Bromobenzene	<1	<1	<1	1
Bromochloromethane	<1	<1	<1	1
Bromodichloromethane	<1	<1	<1	1
Bromoform	<1	<1	<1	1
Bromomethane	<10	<10	<10	10
2-Butanone (MEK)	<50	<50	<50	50
n-Butylbenzene	<1	<1	<1	1
sec-Butylbenzene	<1	<1	<1	1
tert-Butylbenzene	<1	<1	<1	1
Carbon Tetrachloride	<1	<1	<1	1
Chlorobenzene	<1	<1	<1	1
Chloroethane	<10	<10	<10	10
2-Chloroethyl vinyl ether	<1	<1	<1	1
Chloroform	<1	<1	<1	1
Chloromethane	<10	<10	<10	10
2-Chlorotoluene	<1	<1	<1	1
4-Chlorotoluene	<1	<1	<1	1
Dibromochloromethane	<1	<1	<1	1
1,2-Dibromo-3-Chloropropane	<1	<1	<1	1
1,2-Dibromoethane	<1	<1	<1	1
Dibromomethane	<1	<1	<1	1
1,4-Dichloro-2-Butene(cis)	<50	<50	<50	50
1,4-Dichloro-2-Butene(trans)	<50	<50	<50	50
1,2-Dichlorobenzene	<1	<1	<1	1
1,3-Dichlorobenzene	<1	<1	<1	1
1,4-Dichlorobenzene	<1	<1	<1	1

Results expressed in ug/L (ppb)

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TO:	Transport Canada	**DATE SAMPLED:**	
		DATE RECEIVED:	21-Jul-00
ATTN:	Tim Johnson	**DATE REPORTED:**	31-Jul-00
		LAB FILE#:	72290
		PROJECT:	Resolute Bay Landfill

EPA 8260 VOLATILES SCREEN - WATER

Lab # / CLIENT #	2 Freshwater	3 Saltwater	Method Blank	Detection Limit
1,1-Dichloroethane	<1	<1	<1	1
1,2-Dichloroethane	<1	<1	<1	1
1,1-Dichloroethene	<1	<1	<1	1
1,2-Dichloroethene(cis)	<1	<1	<1	1
1,2-Dichloroethene(trans)	<1	<1	<1	1
Dichlorodifluoromethane	<10	<10	<10	10
1,2-Dichloropropane	<1	<1	<1	1
1,3-Dichloropropane	<1	<1	<1	1
2,2-Dichloropropane	<10	<10	<10	10
1,1-Dichloropropene	<1	<1	<1	1
1,3-Dichloropropene(cis)	<1	<1	<1	1
1,3-Dichloropropene(trans)	<1	<1	<1	1
Ethylbenzene	<1	<1	<1	1
Ethyl Methacrylate	<1	<1	<1	1
Hexachlorobutadiene	<1	<1	<1	1
Hexachloroethane	<1	<1	<1	1
2-Hexanone	<25	<25	<25	25
Iodomethane	<1	<1	<1	1
p-Isopropyltoluene	<1	<1	<1	1
Methacrylonitrile	<25	<25	<25	25
Methylene Chloride	<25	<25	<25	25
Methyl Methacrylate	<1	<1	<1	1
4-Methyl-2-Pentanone (MIBK)	<25	<25	<25	25
Naphthalene	<5	<5	<5	5
Pentachloroethane	<1	<1	<1	1
Propionitrile	<25	<25	<25	25
iso-Propylbenzene	<1	<1	<1	1
n-Propylbenzene	<1	<1	<1	1
Styrene	<1	<1	<1	1
1,1,1,2-Tetrachloroethane	<1	<1	<1	1
1,1,2,2-Tetrachloroethane	<1	<1	<1	1

Results expressed in ug/L (ppb)

NORWEST LABS

Calgary, AB	Phone (403) 291-2022	Fax (403) 291-2021
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Lethbridge, AB	Phone (403) 329-9266	Fax (403) 327-8527
Surrey, B.C.	Phone (604) 514-3322	Fax (604) 514-3323
Winnipeg, MB	Phone (204) 982-8630	Fax (204) 275-6019

TO: Transport Canada

ATTN: Tim Johnson

DATE SAMPLED:
DATE RECEIVED: 21-Jul-00
DATE REPORTED: 31-Jul-00
LAB FILE#: 72290
PROJECT: Resolute Bay Landfill

EPA 8260 VOLATILES SCREEN - WATER

Lab # / CLIENT #	2 Freshwater	3 Saltwater	Method Blank	Detection Limit
Tetrachloroethene	<1	<1	<1	1
Toluene	<1	<1	<1	1
1,2,3-Trichlorobenzene	<1	<1	<1	1
1,2,4-Trichlorobenzene	<1	<1	<1	1
1,1,1-Trichloroethane	<1	<1	<1	1
1,1,2-Trichloroethane	<1	<1	<1	1
Trichloroethene	<1	<1	<1	1
Trichlorofluoromethane	<1	<1	<1	1
1,2,3-Trichloropropane	<1	<1	<1	1
1,2,4-Trimethylbenzene	<1	<1	<1	1
1,3,5-Trimethylbenzene	<1	<1	<1	1
Vinyl Chloride	<10	<10	<10	10
Total Xylenes	<1	<1	<1	1

Results expressed in ug/L (ppb)

Surrogate:	% Recovery			Recovery Range
Dibromofluoromethane	98	96	97	86-118
Toluene-d8	98	99	99	88-110
Bromofluorobenzene	100	100	100	86-115

C. Swyngedouw Ph.D.
Assistant Lab Manager

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EPA 8260 VOLATILES SCREEN
QAQC
Calibration Checks

Component	Total nanograms Actual	Recovered	28-Jul-00 %-Recovery
Chloroform	50	47	94
1,1-Dichloroethene	50	45	90
1,2-Dichloropropane	50	46	92
Ethyl Benzene	50	48	96
Toluene	50	48	96
Vinyl Chloride	50	59	118

Duplicate Analysis

Component	Run 1	Run 2	28-Jul-00 %-Difference*
Chloroform	117	117	0.0
Bromodichloromethane	24	24	0.0
Chlorodibromomethane	6	6	0.0

* - this is the difference between the duplicate samples, divided by the average of the two results.

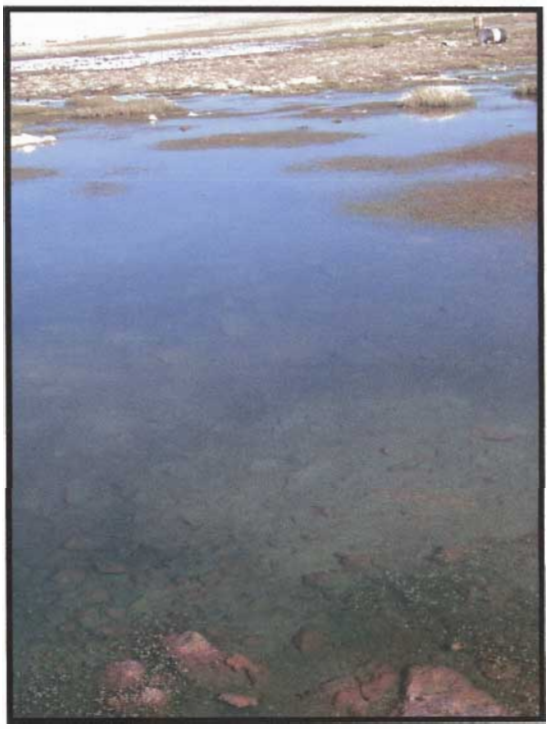
Appendix C

Site Photographs

Picture 1. Resolute Bay Airport Landfill

Picture 2. Resolute Bay Airport Landfill

Picture 3. Freshwater Sampling



Picture 4. Standing water with a noticeable blue colour

Picture 5. Soil Sampling