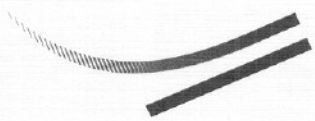
Sewage Lift Station Spill Contingency Plan

City of Iqaluit, Department of Public Works

April 1, 2003



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City of Iqaluit, Department of Public Works

Iqaluit NU
Final
03-1338-2000

Submitted by

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April 1, 2003

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Attention: Steve Burden, P.Eng.

Re: **Sewage Lift Station Spill Contingency Plan**

Dear Mr. Burden;

Please find enclosed four (4) hard copies of the final draft of the above-captioned report.

Thank you for the opportunity to be of service on this project. We look forward to working with you again in the future. Should you have any questions, please do not hesitate to contact me at (867) 920-4555.

Yours Sincerely,

DILLON CONSULTING LIMITED

Gary Strong, P.Eng.
Project Manager

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CITY OF IQALUIT
SEWAGE LIFT STATION SPILL CONTINGENCY PLAN

1.0 INTRODUCTION

The purpose of this spill contingency plan is to outline a formal practical response system which can be implemented immediately in the event of spills of deleterious material, such as sewage, to the natural environment. These may result from the City's activities within its jurisdiction or from the failure of a system component in the City's infrastructure. This plan is intended to promote the safe handling of potentially hazardous materials to minimize health hazards, environmental damage and clean up costs. The plan is written so it can be easily understood and be reasonably comprehensive in providing access to all information needed in dealing with a spill.

The enclosed maps show the existing layout of all building and waste handling/disposal facilities in the City. Figure 1 (Appendix A) is a general layout of the City. Figure 2 (Appendix B) is a more detailed layout of the City showing the location of liftstations and dump stations.

It is the City's policy to:

i. Comply with existing regulations;
ii. Provide such protection of the environment as is technically and economically feasible;
iii. Take appropriate action with the necessary resources to remedy a spill situation as soon as it becomes evident;
iv. Cooperate with other groups to protect the environment;
v. Ensure an on-going preventative maintenance program is implemented for all City facilities and to upgrade infrastructure when appropriate; and
vi. Keep employees, government officials and the public informed.

2.0 REPORTING PROCEDURES

The Department of Public Works and Engineering personnel with the City of Iqaluit have access to vehicular mobile radios and in some cases, cellular phones; they are therefore able to communicate immediately with other personnel who in turn can telephone for a response team.

All spills are reported immediately to the NWT 24-hour Spill Report Line (Call collect 867-920-8130) to ensure that in investigation may be undertaken by the appropriate government authority.

The following are contact numbers for response personnel:

City of Iqaluit

	Telephone	Cell
FIRE DEPARTMENT	979-4422	
RCMP	979-1111	
AMBULANCE	979-4422	
TOWN DISPATCH	979-5650	

Ian Fremantle	Chief Administrative Officer (CAO)	979-5666
Brad Sokach	Director of Engineering	975-8501
Mark Hall	Director of Public Works	975-8509
Geoff Baker	Manager, Capital Projects	975-8502
Paul Barrieau	Roads Foreman	979-5638
Chris Freda	Utilidor Foreman	979-5648
Jokeypah Kippomee	Public Works Clerk	979-5649
Robert Kavanaugh	By-Law Supervisor	979-5670
Leo Tobin	Fire Chief	979-5657
	Deputy Fire Chief	979-5662

Contractors

Baffin Building Systems (BBS)	979-6949
Kudlik Construction Ltd.	979-1166
Nunavut Construction Ltd.	979-7711
RL Hanson	979-6004
Tower Arctic Ltd.	979-6465

Additional Information or Assistance

Environmental Protection, Government of Nunavut	975-5900
Indian and Northern Affairs Canada, Nunavut District Manager	975-4295
Indian and Northern Affairs Canada, Baffin Sub-District	975-4295
Environment Canada, Iqaluit	975-4636
Department of Fisheries and Oceans, Iqaluit	979-8000
Regional Public Health Officer, Government of Nunavut	979-7652

The effectiveness of this spill contingency plan will be greatly dependant upon the following factors:

- The proper distribution of the plan to those personnel most likely to encounter a spill or release of deleterious substance during the course of their normal work.
- Training of these same personnel as to the objectives and contents of this plan and how they should react upon encountering a spill or system failure that may result in a subsequent release of deleterious substances.
- Training of the response personnel as to what action they are required to take in the event of the plan being put into action.
- Training of the response personnel as to the techniques and materials to be used in containment and clean up activities.

Training in these areas will be achieved as follows:

1. The personnel most likely to be involved in the implementation of this contingency plan will be trained as to the objectives, methods and responsibilities set out in the plan. This session will provide the opportunity to review the plan in detail.

2. The personnel most likely to encounter a spill or release of deleterious material will receive training as to how they should react at the time of the initial discovery. They will be provided with an understanding of the importance of and what their responsibilities are, in reporting the discovery as soon as possible.

2.1 First Person Response

i. Be alert and consider your personal safety first.

ii. Assess the hazard to persons in the vicinity of the spill and where possible take action to control danger to human life. If possible, identify the material or products involved in this particular incident.

iii. If safe and practical, try to take appropriate action to stop the release of material.

iv. Contact the Town Dispatch and report the spill

v. Contact the Utility Foreman and report the spill.

2.2 Utility Foreman's Response

i. Proceed to the spill location.

ii. Assess the situation and make arrangements for first aid and removal of injured personnel. Take the necessary action where possible to secure the site to protect human safety.

iii. If not already done and if it is safe to do so, take the appropriate action to stop the flow or release of material. If at all possible, take the necessary action to contain or prevent the spread of the spilled material. The Utility Foreman should ensure that appropriate protective apparel is worn by workers when in the vicinity of the spill.

iv. Gather information on the status of the situation.

v. If required, contact the other Response Team On-Site Coordinator.

vi. Fill out, as completely as possible, a spill form (attached in Appendix C) and then contact the 24 Hour Spill Line at 867-920-8130.

vii. Contact the city CAO at 979-5666.

2.3 Response Team Organization

2.3.1 On-Site Coordinator

- Normally the Director of Public Works or his/her representative and/or the Fire Chief or his/her deputy.
- Has complete authority over the clean up personnel and the spill scene.
- Evaluate the initial situation and assess the magnitude of the problem.
- Activate the response plan and call out the key personnel in the response team, as deemed appropriate, to meet the situation.
- Develops the overall plan of action for containment and clean up of the specific incident and delegates the responsibility of implementing the plan.
- Ensure that the assigned responsibilities are carried out and that co-ordination exists between supervisory team members.
- Assess the requirements for labour, equipment, materials and tools to contain the spill in light of what resources are immediately available. The urgency will depend on the nature and magnitude of the spill.
- Report the spill if the Utility Foreman has not already done so by calling the 24-Hour Spill Line at 867-920-8130.

2.3.2 Response Team Leader

- Depending on the type of spill, would normally be the Utility Foreman
- Responsible for all field operations in response to the spill
- Ensures appropriate protective apparel is worn by all spill clean-up personnel
- Directs the Spill Response Team in containment, recovery, clean up and disposal operations, including operational support
- Ensures adequate decontamination procedures are followed for spill clean-up personnel and equipment. Equipment should be washed following use.
- Provides advice and guidance to the On-Site Coordinator

2.3.3 Chief Administrative Officer (CAO)

- Acts as the spokesperson with the public, media and government agencies.
- Ensure that all relevant City staff receive adequate training in order to fulfill their responsibilities as part of the Spill Response Team.

3.0 SITE INFORMATION AND FAILURE PREVENTION

3.1 Sewage Spills

It is the purpose of this section to outline possible failures of the waste handling/treatment system and control measures to prevent such failures. The location of the liftstations and dump stations are shown in Figure 2 (Appendix B). This drawing also serves to indicate the probable direction of flow should any facility fail.

3.1.1 Sewage Lift Stations

Upon shut down, all sewage liftstations will eventually overflow to a designated low lying area or body of water to prevent a public health hazard through contact with raw sewage. The following is a list of the liftstations and the body of water or liftstation that will receive sewage overflows (Appendix D contains relevant drawings for individual liftstations):

Liftstation No. 1: Koojesse Inlet
Liftstation No. 2: Koojesse Inlet

In the event of an overflow, sewage flows directly into Koojesse Inlet, from the liftstations. Locations of the liftstations are available in Figure 2 (Appendix B).

Each lift station has the following main components

- A wet-well that receives the raw sewage.
- Two self-priming centrifugal pumps.
- Float levels in the wet-well that control the pumps
- Monitoring for high level of sewage in the wet-wells.
- Building low temperature alarms.
- Motor starters, domestic electrical (lighting) and electric heat.
- Alarms result in activation of the autodialer that will notify Town Dispatch of the alarm at the lift station.

Rating of the lift station pumps are as follows;

	Sewage Lift Station 1	Sewage Lift Station 2
Manufacturer	Gorman Rupp	Gorman Rupp
Model	T6A3 – B	T3A3 – B
Size	150 mm	75 mm
Impeller Diameter	314.3 mm	215.9 mm
RPM	1250	1350
Motor	30 Hp	7.5 Hp
Design Discharge	44 l/s	12.6 l/s
Head	17.7 m	11.6 m

All liftstations are checked once per day, Monday to Friday. Daily records are kept, indicating that the liftstations were checked. Should items require maintenance or replacement beyond the ability or scope of present staff, then "As and When" mechanical and electrical contractors can be called upon at any time, including emergency situations, to carry out the work.

4.0 RESPONSE TEAM, ACTION AND EQUIPMENT

An organizational chart for the Department of Public Works and Engineering is attached as Appendix F. Key personnel for emergency spills are the Municipal Services Foreman, Roads Foreman, Utility Foreman, Director of Public Services and the Director of Public Works and Engineering.

Should a spill become apparent at Liftstation No. 1, the Utility Foreman would:

- Ensure public safety at all times and if required, the Town Dispatch and Fire Department would be notified.
- Contact the NWT 24-Hour Spill Report Line
- Mobilize staff to determine the cause of the problem, whether in the liftstation or dump station and repair if possible with staff and outside resources, where required.
- Contact Town Dispatch for after-hours on-call personnel (979-5650) OR the appropriate foreman, for sewage pumper trucks (Municipal Services Foreman) and heavy equipment (Roads Foreman), as required. Sewage would be taken from the wet well and hauled to the lagoon.
- Mobilize equipment, including loaders, backhoes and dump trucks, to construct a temporary berm to prevent sewage from entering Koojesse Inlet.
- Clean up contaminated areas and haul material to the lagoon for disposal.

A similar response would be undertaken with other liftstations with the exception of berm construction which is site specific.

The City has had to respond to liftstation sewage overflows in the past. The response team and measures taken to date have proven effective. The City seeks to improve its contingency planning with input from the regulating authorities and other parties.

5.0 SYSTEM COMPONENT FAILURE RESPONSE ACTION

5.1 Sewage Lift Station

Any person finding a discharge from or a malfunction of the liftstation should immediately report the incident to the Utility Foreman. Action must be taken as soon as possible to ensure that the sewage released is contained and any material is prevented from reaching a water body. If necessary, the Utility Foreman is to call out the members of the response team, as described in Section 4.0.

Use the reporting procedures to notify proper authorities.

6.0 GENERAL SPILLS

The measures outlines in this section are intended to minimize the extent of contamination following a hazardous materials spill. For all spills, the initial response will be to immediately prevent any direct danger to human life and the environment. People not associated with the containment and clean up will be required to leave the area.

6.1 Containment on Open Water

For spills in open water, containment procedures will vary depending on whether the material floats or sinks, and whether the water is flowing or standing.

For floating materials, a surface boom shall be deployed. In flowing water, the boom should be stretched across the flow downstream from the spill. In standing water, the boom can contain the spill close to shore. Failing a boom, a dyke may be constructed, especially in shallow areas.

For sinking material, a dyke should be constructed, if possible. This will contain the dispersion of the material in standing water. In small amounts of flowing water, divert the flow around the material by dyking and ditching if possible.

The On-Scene Coordinator will have to judge whether the impact of the spill will be most reduced by carrying out a containment procedure or by immediately attempting to remove any containers from the water. This will depend on the equipment available and how long it will take for additional equipment to arrive. Removed containers should be placed on an impermeable contained surface (example – poly liner in a depression) to prevent further seepage.

6.2 Containment on Ice

Spills on ice will be affected by the strength of the ice and the floating or sinking characteristics of the materials. The safe bearing capacity of ice has to be carefully assessed. For good ice the following thickness table can be used to estimate the load capacity:

Thickness (inches)	Load (tons)
3	0.2
6	1.0
9	2.0
15	6.0
20	10.0
30	20.0
40	40.0

Rules about ice strength include:

i. "White" ice is only ½ as strong as "Blue" ice.
ii. Reduce load by ½ if cracks parallel to travel.
iii. Reduce load by ¾ of cracks both parallel and normal to travel.
iv. Use extreme care if weather is extremely cold after a warm period or warm after a cold period.
v. Control speed in shallow water to avoid wave build up.

If the spill does not penetrate the ice, and the ice is safe to work on, containment will take the same form as containment on land.

If the spill penetrates the ice, then the situation is analogous to spills in open water. If the material floats then the ice will be broken to install a containment boom. The ice between the spill and the boom will be collected and disposed of with the spilled materials. In standing water under ice, the primary effort must be to recover the material.

6.3 Containment on Snow

Snow is one of the best absorbents, as spill materials migrate into snow until they become immobile. Use it as much as possible when it is available. Snow provides protection against fire spreading if the spill is burnable and is located where burning is practical. Snow also provides flotation of spilled materials after the snow melts during burning. Contaminated, saturated snow facilitates removal of the contaminant to a recovery or disposal site. Care should be exercised when using snow since increased migration of waste could result.

Methods to prevent a spill on snow from spreading include:

- Compact the snow around the outside perimeter of the spill area. This is easily done with a snowmobile.
- Construct and compact snow dams.
- Locate the low point of the spill area, then clear channels in the snow to allow material not absorbed to flow into the low area.
- Once collected, the spilled material contained in the low area can either be shovelled into containers or picked up using mobile heavy equipment and then transported to an approved disposal site.

6.4 Containment on Land

In all cases of liquid spills, the initial containment step is to prevent further dispersion. This is done by dyking as needed around the spill utilizing mobile heavy equipment. If necessary, adsorbents (example – Zorbal, Hazorb Pillows, peat moss, sawdust) or gelling agents (example – Chemgel) should be used to prevent further spread or seepage.

6.5 Fire or Explosion

When fire is associated with a spill of hazardous material, extinguishing the fire is a necessary step. The fire may prevent efforts to stop or minimize the spillage. In all cases, the first step is to clear people from the surrounding area.

Dykes are to be constructed down slope from liquid spills, to minimize spreading of the fire and contain unburned fluid. Foam, CO_2, or water will then be used as is appropriate for the fire. Particular care must be taken to prevent inhalation of vapours that are the products of combustion.

The Iqaluit Fire Department crews are trained and equipped to combat fires which generate toxic fumes, including measures requiring self-contained breathing apparatus and full protective clothing. When the

Fire is extinguished, proceed to stop further spillage, contain the spill and initiate appropriate clean up measures.

6.6 Material Removal

Loose material should be scooped up (using equipment appropriate to the spill size) and transferred into containers. Any soil beneath the spill which may have been contaminated should also be removed, where possible, and disposed of with the recovered material.

Final disposal of the recovered material will be determined in consultation with the regulatory officials and the advice of the manufacturer.

7.0 SPILL EQUIPMENT INVENTORY

7.1 Spill Equipment Inventory

The City of Iqaluit currently owns the following spill containment equipment:

1 MEP55S OIL SELECT SPILL KIT
contents:

1 0526, Come in a 55 Gal. Poly DOT, approved open head drum with quick lock ring.
4 OD-510, Hydrocarbon select containment boom 5” x 10’ ea.
20 OD-1002, Hydrocarbon select absorbent pads 17” x 19” x 3/8” ea.
1 OD-150SR, Roll hydrocarbon select absorbent blanket 19” x 144’ x 3/8”.
1 SP-GLO, pair chemical resistant splash gloves (175)
1 SP-SUIT, protective Tyvek poly splash suit (5-515).
1 SP-GOG, pair splash goggles.
1 NDC-36, Neoprene drain cover 36” x 36”.
2 HAZDISP, 6 mil. Polyethylene disposal bags with ties.
1 P2D, 10 oz. plug and patch (PnD) patty.
1 CAUTAPE, Roll “Caution” barrier tape 1000 ft.
1 Set of Instructions.
1 List of Contents.

The following is a list of equipment available for spill containment and clean up, at the Department of Public Works:

1 – 4” Gorman Rupp pump on trailer with Lister Diesel Engine

1 – 4” Gorman Rupp pump on trailer, with Deutz Diesel Engine

2 – 2” Stow Submersible Pumps (115 V)

1 Wacker Plate Type Compactor (gas-powered)

1 – 2” Gorman Rupp Trash Handling Pump gas-powered)

Heavy Equipment:

2 Cat 950 Loaders
1 Rubber Tired Backhoe
2 Dump Trucks
1 Cat 814 Wheel Dozer
2 Road Graders
1 Cat M322 Excavator with hammer
4 Sewage Trucks
5 Water Trucks
1 Cat 966 Loader

7.2 Resource Contacts

	Telephone	Resource Equipment
Baffin Building Systems (BBS)	979-6949	
Kudlik Construction Ltd	979-1166	
Nunavut Construction Ltd (NCL)	979-7711	
R.L. Hanson	979-6004	
Tower Arctic Ltd	979-6465	
Environment Protection Division	979-5910	
Environment Canada	975-4636	
Fire Department	979-4422	Manpower, ambulance, fire and rescue equipment
Town Dispatch	979-5650	After-hours on-call personnel
By-law Department	979-5670	Traffic control and public safety

APPENDIX B

Location Plan of Sewer Facilities

APPENDIX C

Spill Report Form

APPENDIX D

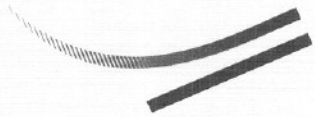
Detailed Drawings of all Liftstations

APPENDIX E

Liftstation Pumping Capacities

APPENDIX F

Organizational Chart for the City of Iqaluit



APPENDIX A

Location Plan of City