Environmental Assessment Screening
New Sewage Lagoon and Rehabilitation of Existing Sewage Lagoon for the Hamlet of Clyde River

Conducted in Compliance with the Canadian Environmental Assessment Act

Prepared for:
Department of Community Government and Services
Government of Nunavut

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Executive Summary

Trow Associates Inc. was retained by the Government of Nunavut (GN), Department of Community Government Services (CGS) to prepare an Environmental Assessment Screening under the Canadian Environmental Assessment Act in order to construct a new sewage lagoon, treatment wetland and rehabilitate the existing sewage lagoon for the Hamlet of Clyde River in Baffin Region, Nunavut, hereinafter referred to as the 'Site'.

The Government of Nunavut is the proponent of the project and as such triggers the requirement for a screening level environmental assessment for the project under section 5(1)a of the Canadian Environmental Assessment Act (CEAA). Due to the size and location of the proposed project(s) (leaving a footprint >25 m^2), it cannot be excluded under CEAA, and an environmental assessment as per CEAA must be completed prior to any physical work completed by the proponent. The Government of Nunavut is the Responsible Authority (RA).

Clyde River is a small, arctic community located on the west shore of Patricia Bay within Clyde Inlet. The average annual rainfall in Clyde River is 4.6 cm and the average annual snowfall is 203 cm (RWDI, 2008). Temperatures in the summer range between 0 and 8^{o}C and in winter between -22.5^{o}C and -30^{o}C. It is generally quite windy with an average wind speed of 14.4 km/h (Dillon, 2003). Permafrost is present in the soil, it recedes to approximately 1 m below the surface in the summer time. The subsurface stratigraphy at the Site is within the continuous permafrost zone and is comprised of glacial till with lacustrine deposits of unconsolidated sand and gravel.

The existing lagoon located approximately 800m north of Patricia Bay. The proposed location of the new lagoon is adjacent to the existing lagoon (Figure 1). It is next to a scrap metal dump which is located to the north and the community landfill to the east. There is a small watercourse to the west of the lagoon which runs south to Patricia Bay.

The justification for the project is based on the need of the Hamlet of Clyde River to operate a new sewage lagoon that is structurally sound and has the necessary capacity to accommodate the projected growth of the community over the next 20 years. In addition, it is necessary to rehabilitate the existing sewage lagoon the berms of which are failing.

Alternatives to the project include the option to do nothing or rehabilitate the existing sewage lagoon only. The option to do nothing would most likely result in increased structural damage to the berms of the lagoon from permafrost and increased leaking of raw sewage into the surrounding natural environment. The option to rehabilitate the existing lagoon would not accommodate the growth of the Hamlet and increasing demand for storage capacity, resulting in insufficient treatment of the raw sewage before release. Construction of the new sewage lagoon with filter strip treatment wetland will have positive effects on the Community. The project will not have long term negative effects on the environment or wildlife. Most effects are related to construction activities and are short term and all effects can be mitigated by applying suitable mitigation measures.

1.0 Project Identification

Project Title/Type	The Government of Nunavut, Department of Community Government Services, Regional Office, Pond Inlet Project Component 1: Design of new sewage lagoon Project Component 2: Construction of Filter Strip Wetland Project Component 3: Rehabilitation of existing sewage lagoon Project Component 4: Decommissioning of existing sewage lagoon		
Project Location:	Hamlet of Clyde River, Baffin Region, Nunavut	**Estimated Cost:**	NA
EA Start Date:	August 1, 2007	**NOC Posting Date**	NA

NA= not applicable

2.0 Contacts

Government of Nunavut/Department of Community Government Services	Timoon Toonoo Regional Director, Baffin Region	Tel: (867)899-4125 Fax:
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Proponent:	Timoon Toonoo Regional Director, Baffin Region, Government of Nunavut/Department of Community Government Services:	Tel: (867)899-4125 Fax: e-mail:

3.0 CEAA Trigger

GN/CGS
☒ is the proponent of the project;
☐ proposes to fund all or part of a project;
☐ proposes to sell, lease or otherwise dispose of land for the project.
☐ proposes to issue a permit, approval or other authorization on the CEAA Law List Regulations

Federal departments notified in accordance with Federal Co-ordination Regulations:
Yes ☐ None identified ☒

Other Federal Involvement? Yes ☐ not applicable ☒

4.0 Project Description

Trow Associates Inc. was retained by the Government of Nunavut (GN), Department of Community Government Services (CGS) to prepare an Environmental Assessment Screening under the Canadian Environmental Assessment Act in order to construct a new sewage lagoon, treatment wetland and rehabilitate the existing sewage lagoon for the Hamlet of Clyde River in Baffin Region, Nunavut, hereinafter referred to as the 'Site'.

The Government of Nunavut is the proponent of the project and as such triggers the requirement for a screening level environmental assessment for the project under section 5(1)a of the Canadian Environmental Assessment Act (CEAA). Due to the size and location of the proposed project(s) (leaving a footprint >25 m^2), it cannot be excluded under CEAA, and an environmental assessment as per CEAA must be completed prior to any physical work completed by the proponent. The Government of Nunavut is the Responsible Authority (RA).

The existing sewage lagoon is located approximately 1.2 km west of the Clyde River community on the west shore of Patricia Bay (Figure 1).

Construction of a new sewage lagoon is needed because the existing lagoon is too small for the Hamlet and the berms are failing. Trow is planning to incorporate a constructed treatment wetland as additional treatment step using existing vegetation.

Stakeholders are the Hamlet of Clyde River, the Government of Nunavut and the Nunavut water Board.

4.1 Project Scheduling

- Estimated Project Completion Date: 2009
- Estimated Project Start Date: 2008
- Estimated Transfer Date (if applicable): N/A

4.2 Project Justification – Need/Alternatives to the Project

The justification for the project is based on the need of the Hamlet of Clyde River to operate a new sewage lagoon that is structurally sound and has the necessary capacity to accommodate the projected growth of the community over the next 20 years. In addition, it is necessary to rehabilitate the existing sewage lagoon the berms of which are failing.

Alternatives to the project include the option to do nothing or rehabilitate the existing sewage lagoon only. The option to do nothing would most likely result in increased structural damage to the berms of the lagoon from permafrost and increased leaking of raw sewage into the surrounding natural environment. The option to rehabilitate the existing lagoon would not accommodate the growth of the Hamlet and increasing demand for storage capacity, resulting in insufficient treatment of the raw sewage before release.

5.0 Scope of Project

The project phases of construction, operation and modification and decommissioning and the relevant project components are shown in Table 1. A more detailed description of the project components and various activities associated with the three phases are shown in Table 2.

Table 1: Project Component Identification

Project Phase	Project Components	
	Core Project Components	***Ancillary Works Other Projects and Activities***
Construction	• Construction of new sewage lagoon • Construction of treatment wetland • Rehabilitation of existing lagoon	• Construction of fence around sewage lagoons • Construction of berms and trenches for constructed treatment wetland • Re-enforcement of berms on existing sewage lagoon
Operation/ Modification	• Sewage trucks importing sewage from holding tanks • Effluent drainage from lagoon through constructed treatment wetland to Patricia Bay	
Decommissioning/ Abandonment	• Decommissioning of the existing sewage lagoon	

Table 2: Project Component Description

Project Components	Physical Works and Activities	Description
1. Rehabilitate existing sewage lagoon	• Repair existing berms • Move vehicle turning point from existing location to decrease incidents of vehicle damage to berms	• Re-enforce berms with gravel • Fill and re-grade
2. Construct a new sewage lagoon	• Site Preparation • Excavation and berm construction	• Grading • Building berms with gravel
3. Construct a new treatment wetland	• Trench and berm construction	• Construct trench such that even distribution of pre-treated sewage in the wetland area occurs; construct berm to protect watercourse

4. Decommission the existing sewage lagoon	• Drainage of the existing lagoon • Backfill the emptied sewage lagoon	• Contents of the existing sewage lagoon will be pumped out and moved to the new sewage lagoon • The empty sewage lagoon will be backfilled with local material

5.1 Scope of Assessment

Natural environment components such as surface water, groundwater, soil, vegetation, wildlife, etc are included in the scope of assessment. Refer to Table 3.

There are no temporal or spatial boundaries that guide the assessment. All components will be installed within a relatively short time frame and the site itself is relatively small.

Table 3: Project-Environment Interaction Matrix

Component	Surface water	Ground water	Soils and sediments	Air Quality and Climate Change	Noise/ Vibration	Terrain and Topography	Vegetation and Wetlands	Fish and Fish Habitat	Wildlife/ Habitat	Migratory Birds	Species at Risk	Socio-Economic Conditions[1]	Heritage/ Archaeology[1]	Land Use[1]	Land use by First Nations	Human Health[1]	Transportation[1] and Navigation
Construction Activities																	
Construction of new sewage lagoon	M	M	M	M	M	M	+	+	M	o	o	+	o	+	+	M	o
Construction of wetland	M	M	M	M	M	M	+	+	M	o	o	+	o	+	+	M	o
Rehabilitation of existing sewage lagoon	M	M	M	M	M	M	+	+	M	o	o	+	o	+	+	M	o
Operational Activities																	
Importing sewage (truck capacity of 3000 – 4000 litres)	o	o	M	M	M	o	o	M	o	o	o	+	o	+	+	M	o
Effluent drainage	M	o	M	o	o	o	M	M	o	o	o	M	o	+	+	M	o
Decommissioning																	
Removal of existing sewage lagoon	M	M	M	M	M	M	M	M	M	o	o	M	o	o	o	M	o

+ = positive effect **M**= negative effect which can be mitigated **o** = no interaction

[1] The indirect effects on these Environmental Components resulting from a project impact on the environment must be considered. Direct effects on these Environmental Components may also be considered at the discretion of the RA.

6.0 Description of Existing Environment

6.1 Description of Biophysical Environment

Clyde River is a small, arctic community located on the west shore of Patricia Bay within Clyde Inlet. The average annual rainfall in Clyde River is 4.6 cm and the average annual snowfall is 203 cm (RWDI, 2008). Temperatures in the summer range between 0 and 8^{o}C and in winter between -22.5^{o}C and -30^{o}C. It is generally quite windy with an average wind speed of 14.4 km/h (Dillon, 2003). Permafrost is present in the soil, it recedes to approximately 1 m below the surface in the summer time.

The subsurface stratigraphy at the Site is within the continuous permafrost zone and is comprised of glacial till with lacustrine deposits of unconsolidated sand and gravel.

The existing lagoon located approximately 800m north of Patricia Bay. The proposed location of the new lagoon is adjacent to the existing lagoon (Figure 1). It is next to a scrap metal dump which is located to the north and the community landfill to the east. There is a small watercourse to the west of the lagoon which runs south to Patricia Bay.

6.1.1 Vegetation Community

The area between the lagoon and Patricia Bay is vegetated with arctic tundra and arctic wetland vegetation. The total area of the proposed filter strip wetland is 23.5 hectares, 58 acres in size (approximately 720 m long and 325 m wide) with a slope of 6 to 7 %.

A vegetation survey was carried out during the site visit in August 2007 to assess the suitability of the species present for the treatment of pre-treated sewage from the lagoon. The plant species list is shown in Table 4. It should be noted that this list is not complete as it reflects only a summer season survey.

Table 4: Plant Species-Proposed Filter Strip Wetland Location

Scientific Name	Common Name
	Lichen
Caloplaca sp.	lichen
Cladonia sp.	lichen
Masonhalea richardsonii	antler lichen
Rhizocarpon geographicum	map lichen
Thamnolia subuliformis	worm lichen
Umbilicaria sp.	rock tripe
Xanthoria sp.	jewel lichen
	Mosses
Lycopodium annotium	club moss
Sphagnum sp.	moss
Graminae	**Grasses**
Poa sp.	blue grass
Poa spp.	grasses
Cyperaceae	**Sedge Family**
Eriophorum spp.	Arctic cotton
Carex spp.	sedges
Salicaceae	**Willow Family**
Salix reticulata	net-veined willow
Salix sp.	willow
Betulaceae	**Birch Family**
Betula glandulosa	dwarf birch
Polygonaceae	**Buckwheat Family**
Oxyria digyna	mountain sorrel

Caryophyllaceae	**Pink Family**
Cerastium sp.	mouse-ear chickweed
Melandrium apetalum	purple bladder-campion
Silene acaulis	moss-campion
Ranunculaceae	**Buttercup Family**
Anemone richardsonii	Richardson's anemone
Ranunculus sp.	buttercup
Anemone sp.	anemone
Papaveraceae	**Poppy Family**
Papaver radicatum	Arctic poppy
Rosaceae	**Rose Family**
Dryas integrifolia	mountain avens
Saxifragaceae	**Saxifrage Family**
Saxifraga nivalis	Alpine saxifrage
Saxifraga oppositifolia	purple mountain saxifrage
Saxifraga sp.	saxifrage
Empetraceae	**Crowberry Family**
Empetrum nigrum	crowberry
Ericaceae	**Heath Family**
Cassiope tetragona	white arctic heather

The native vegetation is highly adapted to the extreme conditions of the high arctic region. The composition of the vegetation community was found to be suitable for the proposed filter strip wetland treatment process.

6.1.2 Wildlife

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2008) was consulted on occurrence and status of wildlife species in Nunavut (Table 5).

Table 5: Wildlife species recorded in Nunavut

Scientific Name	Common Name	COSEWIC Status
Rangifer tarandus pearyi	peary caribou	END
Rangifer tarandus groenlandicus	barren-ground caribou	SC
Ursus arctos	grizzly bear	SC
Ursus maritimus	polar bear	SC
Ursus americanus	American black bear	NAR
Gulo gulo	wolverine	SC
Lynx canadensis	Canada lynx	NAR
Canis lupus occidentalis	Northern grey wolf	NAR
Canis lupus arctos	Arctic grey wolf	DD
Delphinapterus leucas	Beluga whale (Eastern Hudson Bay population)	END
Delphinapterus leucas	Beluga whale (Eastern High Arctic – Baffin Bay population)	SC
Odobenus rosmarus rosmarus	Atlantic walrus	SC
Phoca vitulina concolor	harbour seal (Atlantic subspecies)	DD
Erignathus barbatus	bearded seal	DD
Numenius borealis	Eskimo curlew	END
Pagophila eburnea	ivory gull	END
Calidris canutus rufa	red knot (*rufa* subspecies)	END
Calidris canutus islandica	red knot (*islandica* subspecies)	SC
Rhodostethia rosea	Ross's gull	THR
Euphagus carolinus	rusty blackbird	SC
Histrionicus histrionicus	harlequin duck	SC
Falco peregrinus anatum/tundrius	Peregrine falcon	SC
Asio flammeus	short-eared owl	SC
Fulica americana	American coot	NAR
Haliaeetus leucocephalus	bald eagle	NAR

Aquila chrysaetos	golden eagle	NAR
Accipiter gentilis atricapillus	Northern goshawk (*atricapillus* subspecies)	NAR
Podiceps grisegena	red-necked grebe	NAR
Falco rusticolus	gyrfalcon	NAR
Falco columbarius	merlin	NAR
Circus cyaneus	Northern harrier	NAR
Buteo jamaicensis	red-tailed hawk	NAR
Buteo lagopus	rough-legged hawk	NAR
Accipiter striatus	sharp-shinned hawk	NAR
Gavia immer	common loon	NAR
Gavia adamsii	yellow-billed loon	NAR
Aegolius funereus	boreal owl	NAR
Bubo scandiaca	snowy owl	NAR
Myyoxocephalus quadricornis	fourhorn sculpin	DD
The following plants species are also listed by COSEWIC:		
Salix silicicola	felt-leaf willow	SC
Salix tyrrellii	Tyrrell's willow	NAR
Mielichhoferia macrocarpa	Porsild's bryum	THR

Legend:
COSEWIC – Committee on the Status of Endangered Wildlife in Canada
DD – Data Deficient
END – Endangered
END-R – Endangered (Regulated)
THR – Threatened
SC – Special Concern
EXP – Extirpated
NAR – Not At Risk

There were no rare, threatened or endangered species encountered during Trow's site visit.

6.2 Description of Socio-Economic and Cultural Environment

Clyde River is a small Hamlet with a population of approximately 900 people. The community has a school, nurses station, churches, a Post office, RCMP station, 2 stores, a visitor centre, a radio station, a Hamlet office and a gravel airstrip with small airport

building. The people in the Hamlet live on hunting, fishing, trapping, carving, silk-screening and tourism or are employed by the strores, the Government or the Hamlet.

Access to the Hamlet is by plane, sealift in the summer and snowmobile from other communities in the winter.

7.0 Environmental Effects and Mitigation

The effects of the proposed project components on Valued Ecosystem Components is shown in Sections 7.1 to 7.5.

7.1 Construction

Effect	Component	Recommended Mitigation	Likelihood of Residual Effect	Significance of Residual Effect
Construction of the new sewage lagoon and wetland and/or rehabilitation of the existing sewage lagoon may affect the water quality through fuel/sewage spills and run off	Surface Water	Ensure that no run off from construction/rehabilitation activities enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Construction of the new sewage lagoon and wetland and/or rehabilitation of the existing sewage lagoon may affect the water quality through fuel/sewage spills and run off	Ground Water	Ensure that no run off from construction/rehabilitation activities enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Impact of excavating activities on soil through fuel/sewage spills and run off.	Soils and Sediments	All equipment fuelling and maintenance has to be carried out in designated locations; emergency clean-up protocols will be developed and implemented in the event of an accidental spill; fuels, oils and other hazardous substances have to be stored in designated, secure locations.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Release of emissions from engines and equipment during construction and/or rehabilitation of sewage lagoons/wetland.	Air Quality and Climate Change	Vehicles, machinery and equipment should be in good repair, equipped with emission controls, as applicable. All work shall be carried out in compliance with all applicable air-emissions regulations and by laws.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Noise/vibration from engines and equipment during construction and rehabilitation activities.	Noise and/or Vibration	Vehicles, machinery and equipment should be in good repair. All work shall be carried out in compliance with all applicable noise regulations and by laws.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant

Construction of the new sewage lagoon and wetland will include the construction of berms as well as rehabilitation of the existing lagoon/berms which may influence the terrain and topography in regards to natural overland flow.	Terrain and Topography	Ensure proper monitoring of function of sewage lagoon and filter strip wetland.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Construction/rehabilitation activities can interrupt present wildlife/habitat conditions.	Wildlife and/or Habitat	Ensure proper monitoring of function of sewage lagoon and filter strip wetland.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Release of emissions and noise from engines and equipment during lagoon/wetland construction and lagoon rehabilitation and use of heavy equipment.	Human Health	Follow all applicable health and safety guidelines and proper use of personal safety devices (i.e. hard hats, steel toed boots, safety glasses etc).	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant

7.2 Operation and Maintenance

Effect	Component	Recommended Mitigation	Likelihood of Residual Effect	Significance of Residual Effect
Importing raw sewage in trucks to the lagoons may affect the water quality through fuel and sewage spills	Surface Water	Ensure that no run off from operational activities enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Drainage from the sewage lagoon overland to the Baffin Sea.		Ensure proper function of sewage lagoon and filter strip treatment wetland through monitoring program.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Importing raw sewage or effluent drainage/ overland flow may affect the soils and sediments through equipment fuel/sewage spills	Soils and Sediments	All equipment fuelling and maintenance has to be carried out in designated locations; emergency clean-up protocols will be developed and implemented in the event of an accidental spill; fuels, oils and other hazardous substances have to be stored in designated, secure locations.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Release of emissions from engines and heavy equipment during importing of sewage.	Air Quality and Climate Change	Vehicles, machinery and equipment should be in good repair, equipped with emission controls, as applicable. All work shall be carried out in compliance with all applicable air-emissions regulations and by laws.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Noise from engines and heavy equipment during importing of sewage.	Noise and/or Vibration	Vehicles, machinery and equipment should be in good repair. All work shall be carried out in compliance with all applicable noise regulations and by laws.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant

Effluent that does not meet criteria can negatively impact vegetation and wetlands.	Vegetation and Wetlands	Ensure proper function of lagoon through monitoring program.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Importing raw sewage in trucks to the lagoons may affect the water quality through fuel and sewage spills which can negatively impact fish and fish habitat.	Fish and Fish Habitat	Ensure that no run off from operational activities enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Effluent that does not meet criteria can negatively impact fish and fish habitat.		Ensure proper function of lagoon and filter strip treatment wetland through monitoring program.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Effluent that does not meet criteria can negatively impact socio-economic conditions.	Socio-Economic Conditions	Ensure proper function of lagoon through monitoring program.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Release of emissions and noise from engines and equipment during lagoon/wetland construction and lagoon rehabilitation and use of heavy equipment.	Human Health	Follow all applicable health and safety guidelines and proper use of personal safety devices (i.e. hard hats, steel toed boots, safety glasses etc).	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant

7.3 Decommissioning and Abandonment

Effect	Component	Recommended Mitigation	Likelihood of Residual Effect	Significance of Residual Effect
Decommissioning of the existing sewage lagoon may affect the water quality through fuel/sewage spills and run off during drainage of the lagoon or backfilling/re-grading.	Surface Water	Ensure that no run off from decommissioning activities enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Decommissioning of the existing sewage lagoon may affect the water quality through fuel/sewage spills and run off during drainage of the lagoon or backfilling/re-grading.	Ground Water	Ensure that no run off from decommissioning activities enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Decommissioning of the existing sewage lagoon may affect the soils and sediments through fuel/sewage spills and run off during drainage of the lagoon or backfilling/re-grading.	Soils and Sediments	All equipment fuelling and maintenance has to be carried out in designated locations away from open drainage systems and surface water; emergency clean-up protocols will be developed and implemented in the event of an accidental spill; fuels, oils and other hazardous substances have to be stored in designated, secure locations.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Release of emissions from engines and equipment during decommissioning of sewage lagoon.	Air Quality and Climate Change	Vehicles, machinery and equipment should be in good repair, equipped with emission controls, as applicable. All work shall be carried out in compliance with all applicable air-emissions regulations and by laws.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant

Noise/vibration from engines and equipment during decommissioning activities.	Noise and/or Vibration	Vehicles, machinery and equipment should be in good repair. All work shall be carried out in compliance with all applicable noise regulations and by laws.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Decommissioning of the existing sewage lagoon may influence the terrain and topography in regards to natural overland flow by removal of berms and backfilling of the lagoon.	Terrain and Topography	Ensure proper monitoring of function of sewage lagoon and filter strip wetland.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Decommissioning of the existing sewage lagoon will remove the vegetation that is associated with the current conditions.	Vegetation and Wetlands	Once re-graded plant native vegetation.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Removal of the sewage in the existing lagoon may affect the water quality through fuel and sewage spills which can negatively impact fish and fish habitat.	Fish and Fish Habitat	Ensure that no run off from decommissioning activities enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Re-grading/backfilling of the existing lagoon may affect water quality through run off which can negatively impact fish and fish habitat.		Ensure that no run off from decommissioning activities enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Decommissioning activities can interrupt wildlife/habitat	Wildlife and/or Habitat	The construction of the new sewage lagoon should counteract any negative effects.	Minimal potential due to the small magnitude, limited geographical	Not significant

conditions that were created by the presence of the existing sewage lagoon.			extent and duration of project activities.	
Removal of the sewage lagoon would negatively affect socio-economic conditions.	Socio-Economic Conditions	The construction of the new sewage lagoon should counteract any negative effects.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant
Release of emissions and noise from engines and equipment during decommissioning activities and use of heavy equipment.	Human Health	Follow all applicable health and safety guidelines and proper use of personal safety devices (i.e. hard hats, steel toed boots, safety glasses etc).	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not significant

7.4 Accidents and Malfunctions

Effect	Component	Recommended Mitigation	Likelihood of Residual Effect	Significance of Residual Effect
Spills can affect surface and groundwater water quality as well as fish and fish habitat and soil and sediment.	Fuel/Oil/Other Hazardous Substance Spills	All equipment fuelling and maintenance has to be carried out in designated locations away from open drainage systems and surface water; emergency clean-up protocols will be developed and implemented in the event of an accidental spill; fuels, oils and other hazardous substances have to be stored in designated, secure locations.	Minimal potential due to the small magnitude, limited geographical extent and duration of project activities.	Not Significant

7.5 Effects of the Environment on the Project

Effect	Component	Recommended Mitigation	Likelihood of Residual Effect	Significance of Residual Effect
A drastic rise in the Clyde River/Baffin Sea elevation overflowing into the project area may cause contamination, soil and sediment and sewage to enter the Sea through receding waters.	Water level fluctuations	Silt fencing to prevent soils, sediments and contaminated runoff from entering the watercourse/ocean.	Minimal potential due to the small magnitude and limited geographical extent.	Not Significant
Extended periods of permafrost may influence infiltration rates reducing filtering time for effluent or impacted volume rates increasing amount of untreated overflow.	Permafrost	Silt fencing to prevent untreated/under treated effluent from entering surface water watercourse/ocean).	Minimal potential due to the small magnitude and limited geographical extent.	Not Significant
No effect	Snow/Wind	The snow and wind study shows that there is no negative effect expected on the operation and maintenance of the lagoon and filter strip wetland	None	None

7.6 Cumulative Effects

Cumulative effects resulting from this project are not expected.

7.7 Any Other Matter

No other matter was identified during the screening.

8.0 Environmental Effects Summary Checklist

Table 6 shows a summary of the potential environmental effects, potential mitigation and residual effects.

Table 6: Environmental Effects Checklist

Environmental Component	Potential Project Effects						Residual Effects	
	Potential Adverse Effect?			Can Be It Be Mitigated?			Is it Significant?	
	Yes	*No*	*Uncertain*	*Yes*	*No*	*Uncertain*	*Yes*	*No*
Topography	X			X				X
Species/Habitat of Special Status		X						
Vegetation	X			X				X
Wildlife / Habitat	X			X				X
Fish and Fish Habitat	X			X				X
Marine Resources	X			X				X
Soils	X			X				X
DrinkingWater		X						
Groundwater	X			X				X
Surface Water / Hydrology	X			X				X
Wetlands	X			X				X
Sediments	X			X				X
Climate and Air Quality	X			X				X
Noise	X			X				X
Vibration	X			X				X
Transportation and Navigation		X						
Land Use		X						
Human Health[1]	X			X				X
Socio-economic Conditions[1]	X			X				X
Physical/Cultural Heritage[1]		X						
Aboriginal Use of Traditional Lands/Resources[1]		X						
Structures/Sites of Significance[1]		X						
Other		X						

Other Factors

Accidents and Malfunctions	X			X				X
Effects of Environment on the Project	X			X				X

Cumulative Effects

Project 1		X						
Project 2		X						
Project 3		X						

Other

Other		N/A						

Mitigation measures that are required as result of the environmental assessment are summarized in Table 7.

Table 7: Mitigation Table

Environmental Component Potentially Affected	Proposed Mitigation	Responsible to ensure implementation
Surface Water	• Ensure that no run off enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies. • Ensure proper function of lagoon through monitoring program.	Government of Nunavut
Ground Water	• Ensure that no run off from decommissioning activities enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies. • Ensure proper function of lagoon through monitoring program.	Government of Nunavut

Environmental Component Potentially Affected	Proposed Mitigation	Responsible to ensure implementation
Soils and Sediments	All equipment fuelling and maintenance has to be carried out in designated locations away from open drainage systems and surface water; emergency clean-up protocols will be developed and implemented in the event of an accidental spill; fuels, oils and other hazardous substances have to be stored in designated, secure locations.	Government of Nunavut
Noise/Vibration	Vehicles, machinery and equipment should be in good repair and operated within regulatory noise requirements.	Government of Nunavut
Air Quality and Climate Change	Vehicles, machinery and equipment should be in good repair, equipped with emission controls, as applicable. All work shall be carried out in compliance with all applicable air-emissions regulations and by laws.	Government of Nunavut
Terrain and Topography	Ensure that grading takes place according to design specifications.	Government of Nunavut
Vegetation and Wetlands	Ensure that no run off enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies. Ensure proper function of lagoon and filter strip wetland through monitoring program.	Government of Nunavut

Fish and Fish Habitat	Ensure that no run off enters water courses or Baffin Sea; a spill response kit to be on site in the event of a spill; immediately contain and clean up any spills in accordance with regulatory requirements. All equipment fuelling and maintenance has to be carried out at a safe distance from water courses and ocean to ensure that no deleterious substances enter the surface water bodies. Ensure proper function of lagoon and filter strip wetland through monitoring program.	Government of Nunavut
Wildlife and Habitat	Ensure that grading takes place according to design specifications. Ensure spill prevention measures are in place. Ensure proper monitoring of function of sewage lagoon and filter strip wetland.	Government of Nunavut
Socio-economic	Ensure proper function of lagoon through monitoring program.	Government of Nunavut
Human Health	Follow all applicable health and safety guidelines and proper use of personal safety devices (i.e. hard hats, steel toed boots, safety glasses etc).	Government of Nunavut
Accidents and Malfunctions	All equipment fuelling and maintenance has to be carried out in designated locations away from open drainage systems and surface water; emergency clean-up protocols will be developed and implemented in the event of an accidental spill; fuels, oils and other hazardous substances have to be stored in designated, secure locations.	Government of Nunavut
Water Level Fluctuations	Silt fencing to prevent loose soils, sediments and debris from entering surface water bodies.	Government of Nunavut

9.0 Consultation

9.1 Public Participation under Subsection 18(3)

Is the public participation deemed necessary under Subsection 18(3): Yes ☐ No ☒
Scope of factors posted on the CEAR: Yes ☐ Not applicable ☒

Notice of public input posted on the CEAR: Yes ☐ Not applicable ☒

Public participation was not considered because the project has no negative effect on the public and is confined to the site.

9.2 Consultation with the Public/Aboriginal People

Public consultation or public open houses did not take place.

9.3 Consultation with other Federal Departments or Agencies

A request for information was sent to Fisheries and Oceans of Canada (DFO) and Indian and Northern Affairs Canada (INAC). Upon receipt of any relevant material from DFO and INAC an addendum will be issued.

9.4 Consultation with other Jurisdictions

Consultation with other jurisdictions was not undertaken.

10.0 Summary

Construction of the new sewage lagoon with filter strip treatment wetland will have positive effects on the Community. The project will not have long term negative effects on the environment or wildlife. Most effects are related to construction activities and are short term and all effects can be mitigated by applying suitable mitigation measures.

Trow Associates Inc.

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11.0 References

CEAA (2004) Screenings under the Canadian Environmental Assessment Act. Manual. Canadian Environmental Assessment Agency.

COSEWIC (2008) Species Database Search. Committee on the Status of Endangered Wildlife in Canada. http://www.cosewic.gc.ca

Dillon (2003) Clyde River Sewage Management – Planning Study. Dillon Consulting Limited

RWDI (2008) Snowdrift assessment proposed wastewater lagoon Clyde River, Nunavut. Rowan Williams Davies and Irwin Inc., February 2008.

Trow (2008) Design Brief New Sewage Lagoon and Rehabilitation of Existing Sewage Lagoon for the Hamlet of Clyde River. Trow Associates Inc. Report No. OTCD00019055A, January 2008.

Appendix A: Figures

Trow TROW ASSOCIATES INC. 428 MILLEN ROAD STONEY CREEK, ONTARIO L8E 3N9 Tel: (905) 664-3300 Fax: (905) 662-4144	**AIR PHOTOGRAPH** PROJ. NO.:HAEN00286314A	**Environmental Screening Report** **Clyde River, Nunavut**	SCALE: NTS DRAWN BY: KL CHECKED: BH	**Figure 1** Sept 2007