

Environmental Assessment Registration

Solids Composting Facility Stephenville



Prepared for:

Department of Environment
Environmental Assessment Division
P.O. Box 8700
St. John's, NL
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Prepared by:

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ATTACHED

Drawing C1 - Site Plan

1.0 NAME OF UNDERTAKING

Solids Composting Facility

2.0 PROPONENT

2.1 Name of Corporate Body

Town of Stephenville

2.2 Address

125 Carolina Avenue, P.O. Box 420
Stephenville, NL
Canada, A2N 2Z5

2.3 Contact

Name: Mr. Barry Coates
Official Title: Town Manager
Phone #: (709) 643-8375
Fax #: (709) 643-2770
Email: manager @town.stephenville.nf.ca

2.4 Principal Contact Person for Purposes of Environmental Registration

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3.0 THE UNDERTAKING

3.1 Nature of the Undertaking

It is proposed to develop a Solids Composting Facility in Stephenville, in the province of Newfoundland and Labrador. The development will consist of 6 sludge holding treatment cells, and one Kickuth Engineered Wetland Treatment bed. The facility will primarily be used for the treatment of solids from the new Stephenville wastewater treatment facility. The facility will be operated by ABYDOZ Environmental Ltd. on behalf of the owner the Town of Stephenville.

3.2 Need for the Undertaking

With Stephenville constructing a Waste Water Treatment facility that removes the primary solids from the waste stream, solid disposal is required. The Kickuth Waste Water treatment facility and head works are shown in the drawing below.

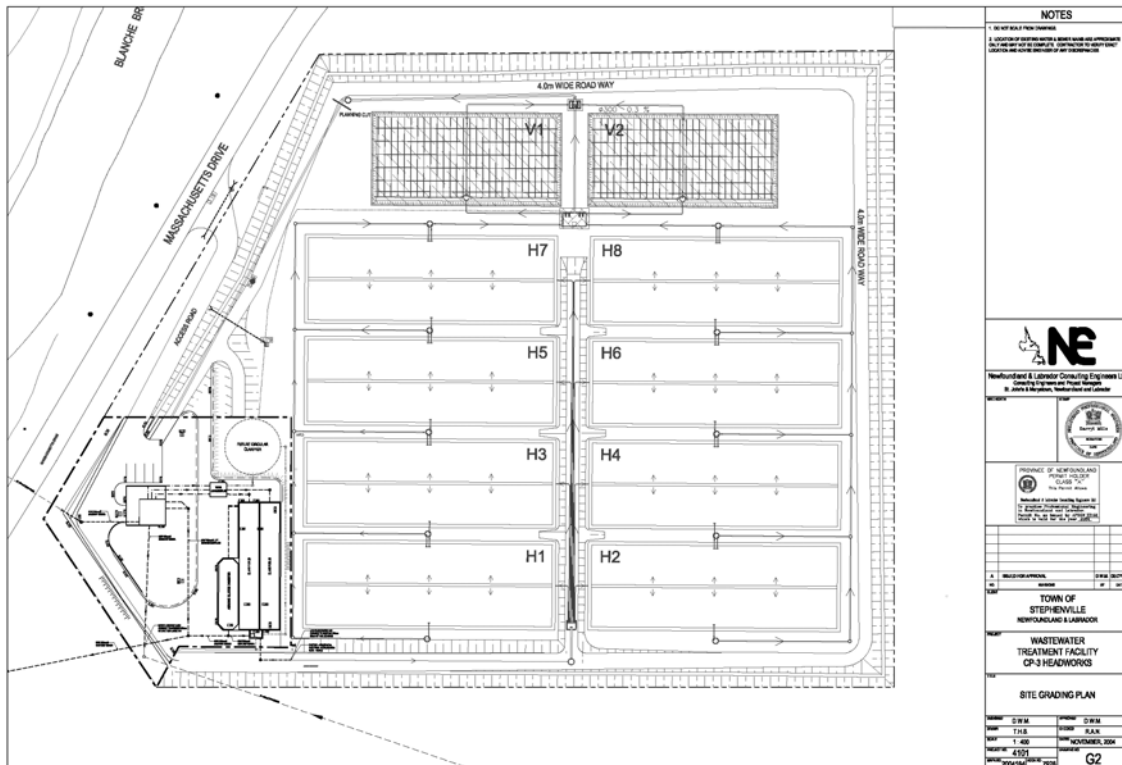


Figure 1
Drawing of Waste Water Secondary Treatment Facility being constructed in Stephenville to treat the towns waste water

With the Town of Stephenville looking to provide treatment of the solid waste in an environmentally friendly process, a solid composting facility to match the wetland treatment process was chosen, as the preferred method of treating the solids produced by the main treatment facility.

4.0 DESCRIPTION OF THE UNDERTAKING

4.1 Geographical Location

The composting facility will be constructed in an industrial zone of Stephenville between the Airport and the Pulp and Paper Mill on a closed section of road. On the West boundary of the proposed location is the Stephenville Airport. The North and East boundaries are adjacent to the closed section of roadway. The South boundary is adjacent to open land. This area is well suited for this type of activity, it is remote and its closest neighbours are industrial facilities located next to the pulp and paper mill.

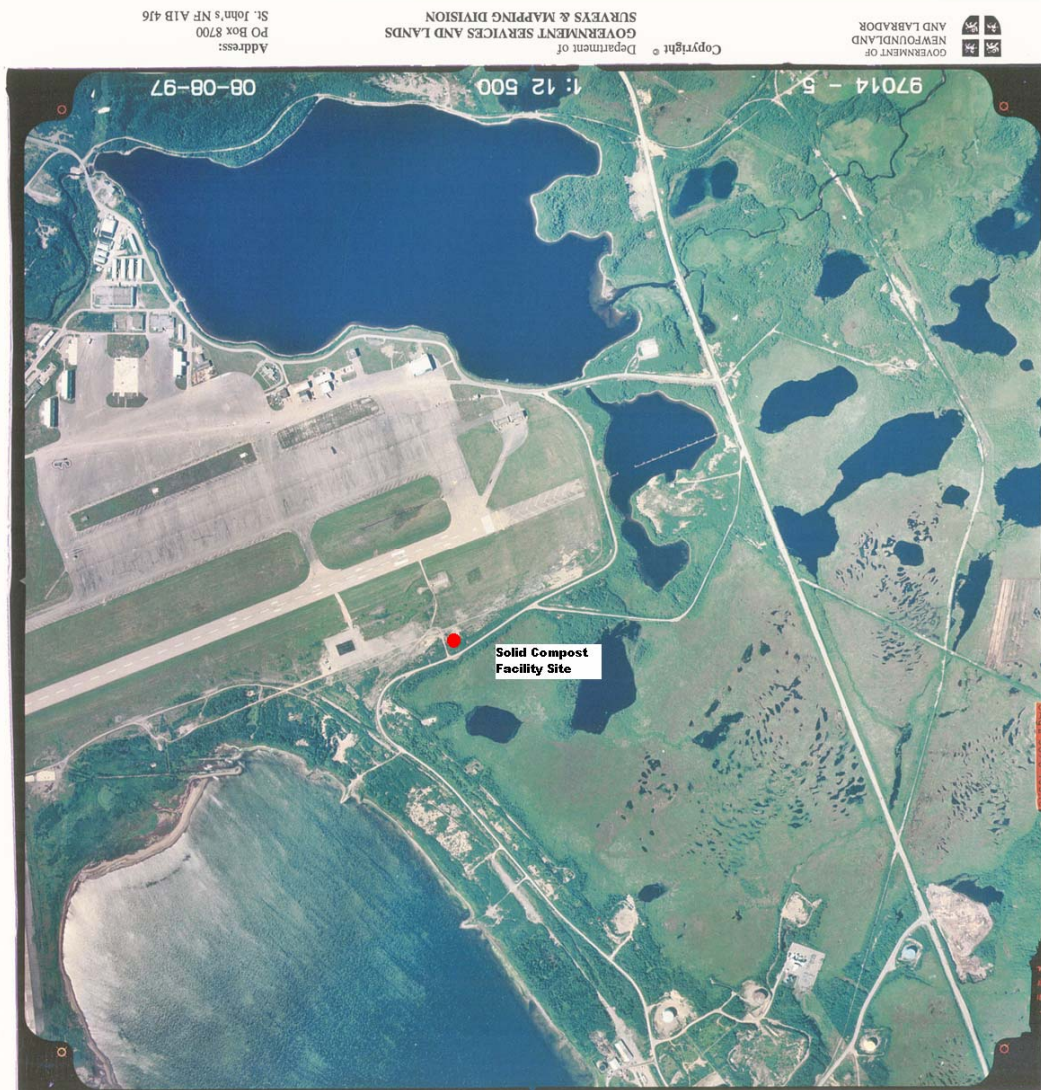


Figure 2
Location Aerial Picture

The closest structure is the fire training facility for the airport, which is on the airport property to the south west of the proposed facility. This fire training facility has only intermittent occupancy when training is in progress.
(See aerial photograph below).



Figure 3
Location Aerial Picture

4.2 Physical Features

The access to the proposed site will be via an existing access road which is currently closed. A gate and fencing will be placed around the property to restrict access. The site will comprise of 6 sludge holding cells and 1 Kickuth Engineered Wetland Treatment bed. The outfall from the treatment process will be discharged through a subsurface soak away.

There will be no buildings or structures on the facility, except for a small storage shed. The site will be approximately 400 m x 50 m or 20,000 m² with a parking and turning area. The existing power line on the access road may be extended to the site to provide power for lights and small tools in the future.

The existing topography is fairly level over the majority of the area, with a 5m grade over the southern portion of the site. The surrounding vegetation consists of alder covered, and barren areas. There are no water bodies, ponds or rivers located on the boundaries of the proposed site. The closest water body is on the south side which is the salt water of the Stephenville Harbour. Two ponds are located to the East of the facility but are at elevations above the proposed site.

The water table on the site appears to be significantly (3-5 m) below the surface. There will be no wildlife or fish displaced from the proposed site.

4.3 Overview of the proposed Sewage Treatment Process

The process is comprised of two parts. First, the Sludge Holding Reed cells and second, the Kickuth Engineered Wetland Treatment bed. The sludge holding reed cells receive the bio-solids and perform dewatering and biodegradation of the solids. The sludge holding cells will be designed to handle a volume of approximately 3000 m³ of bio-solids annually.

The process by which the sludge and sewage is treated is natural and environmentally friendly. No electrical or mechanical equipment will be required in the process. The liquid bio-solids will arrive in tanker trucks and will be applied into one of the proposed sludge holding reed cells. While the bio-solids dry by evaporation, evapotranspiration, and drainage, the growing reeds derive nourishment and moisture from the bio-solids, both stabilizing the bio-solids and reducing its volume. The sludge holding cells will produce a waste-water effluent which will be piped to a Kickuth BioReactor Wetland Treatment bed. The Kickuth Wetland Treatment bed accepts the removed liquid from the sludge holding reed cells and performs treatment on this liquid waste producing an acceptable effluent that can be discharged into the environment. This treatment bed will reduce the contaminants to acceptable levels for the Department of Environment's approval for discharge into the environment.



Figure 4
Typical Sludge Treatment Cell

Unlike ordinary sand-drying beds, sludge holding reed beds do not require removal of dried sludge on a continuous basis. The bio-solids will be biodegraded and reduced in volume, allowing new sludge to be continuously layered over the previous applications.

The reeds do not have to be harvested and will annually die back during the start of the plant's winter dormancy, and form a litter on the bed surface. The reeds will re-grow from their roots each spring and multiply in the confined areas of each bed producing an extensive growth within several years. The sludge accumulation in the sludge holding beds need only be removed after 7 to 10 years of continued application. At this point in time the treated solids can be used as landfill cover, or they can be screened and used as a soil additive for landscaping purposes, or as composting material for other engineered wetland projects.

4.4 Major Physical Features of the Undertaking

The proposed development consists of a security fence, access road, parking and turning area, 6 sludge holding reed cells, 1 Kickuth Engineered Wetland Treatment beds and a subsurface discharge location. No buildings are planned for erection on the site.

a) Access

A closed section of roadway will be used for access to the site. This roadway has a paved road surface. A parking and turn-around area will be created for sufficient space to accommodate several vehicles and pumper truck at one time, the surface of the internal roads and parking area will be Class A crushed stone. (See attached Drawings)

b) Utilities

1. Electrical; Power will not be connected initially. Possible future connection will be considered for lighting purposes.
2. Sewer; There are no requirements for sewer facilities on site at this time.
3. Water; There are no requirements for drinking water, or cleaning water on site at this time.

c) Sludge Holding Treatment cells

The 6 proposed sludge holding reed beds will have a combined area of 3000 m². These 6 beds are proposed to be 10 m x 50 m in size and will be similar as the existing facilities shown in the photo in Figure 4. The construction of these sludge holding reed beds will be somewhat similar to that of sand-drying sludge beds used throughout North America. These beds will be built with an impermeable liner to protect the ground water and surrounding environment from contamination. Above this liner a matrix will be installed with a collection pipe system, to collect the liquid. The walls of the bed will be constructed with existing site soil and a HDPE liner, and will provide a minimum of 1.6 m of freeboard above the matrix base to allow for long term sludge accumulation. Once the beds have been constructed, phragmites reeds will be planted in the sludge holding reed cells.

d) *Kickuth Wetland Treatment*

A 400 m² Kickuth Engineered Wetland Treatment bed will be constructed to treat the liquid effluent produced from the sludge holding reed cells. It will be the same design as existing Kickuth Engineered Wetland systems already constructed and successfully operating in the province. The Kickuth wetland treatment system is a patented, self-contained, engineered, subsurface wetland ecosystem. It is designed to optimize the microbiological, chemical and physical processes for wastewater purification.

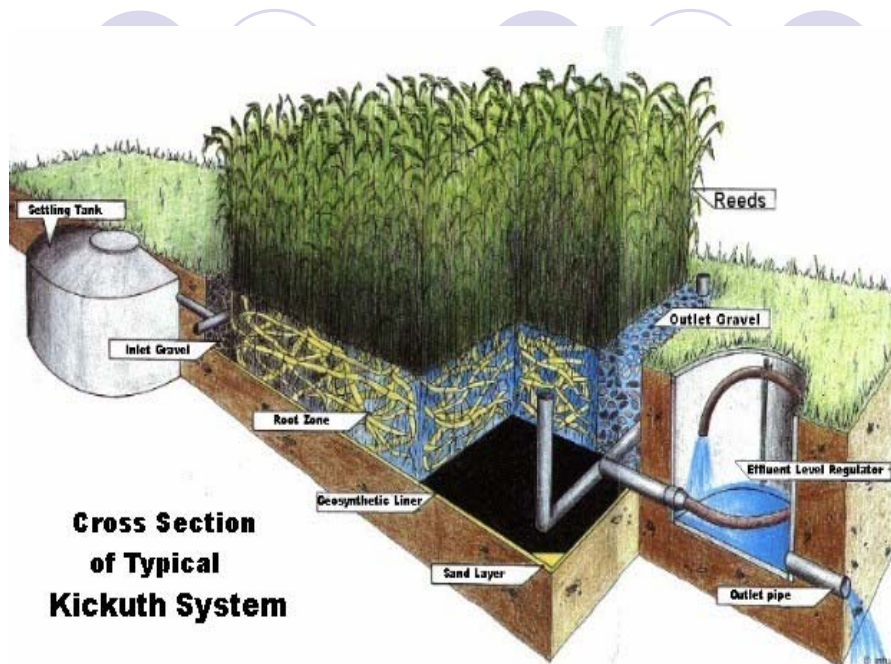


Figure 5
Cross Section of Typical Kickuth Wetland Treatment System

Fundamentally this process is achieved as the phragmites reeds transfer atmospheric oxygen down through their roots in order to survive in saturated conditions. This creates both aerobic and anaerobic soil conditions, allowing an extraordinary microbial species diversity to flourish. These bacteria and fungi use organic pollutants as a food source, breaking down a wide range of organic and chemical products.



Figure 6
Cross Section of Actual Kickuth Wetland Treatment System

e) *Discharge*

The discharge from the wetland treatment bed will meet all environmental requirements for discharge, and will be disposed below grade in a subsurface soak away on the south side of the property. (see attached Drawings)

f) Physical Features

The site is presently vacant and is comprised of exposed ground and alder covered areas. An existing roadway to the airport property projects through the proposed facility and will either be relocated to the North end of the facility, or maintained for the airport. No physical structures exist on the proposed land.

g) Drainage and Stormwater Management

Ditching and collection of stormwater will be managed around the facility to direct all waters away from the treatment facility and into surface soak aways if required. The water table is sufficiently below the surface that it is not expected to be encountered. If the water table is encountered, the site will be ditched and surface water will be drained away from the facility.

4.5 Construction

4.5.1 Construction Period

It is expected that construction and commissioning of all facilities will take in the order of 2- 3 months.

The proposed construction start date is September 2005 and is scheduled to be completed by November 2005.



Figure 7
Construction of Main Wetland Treatment System

4.5.2 Construction Activities Affecting Physical Environment

Construction of the Sludge Treatment Facility will involve grubbing, excavation, ditching, backfilling, infilling, stone placement, liner installation, and installation of a matrix and planting along with the installation of a subsurface soak away. None of these activities will be in a water body, in the water table or in a marine environment, and as such limited effect will be placed on the environment. However the proponent is none the less committed to keeping those impacts that do arise to a minimum. During the construction and operation of the Solids Composting Facility all efforts will be made to preserve and conserve the natural environment. Vegetation will be maintained to provide a natural buffer where possible.

4.5.3 Potential Source of Pollutants during Construction

The potential sources of pollutants are generally those associated with construction activities. Adherence to permit conditions and application of good construction practices will protect against the release of pollutants into the surrounding environment.

Strict monitoring and sound construction practices will control activities to minimize risks associated with:

- Silt and sedimentation;
- Dust;
- Construction debris;
- Sewage;
- Risk of fuel, lubricant and hydraulic fluid release;
- Airborne emissions from construction equipment;
- Noise pollution from construction activities;

4.5.4 Mitigation Measures

Mitigation measures to reduce the environmental concerns associated with construction activities include:

- Silt laden runoff from construction areas will not be permitted to discharge directly into any body of water or water course. Runoff will be diverted to settling basins to ensure silt is settled out prior to release into the water. Silt fence construction or filter fabric will be used where necessary to preclude release of construction water directly into any body of water.
- Efforts will be made to minimize dust generation during the construction phase of the project. Dust from construction activities will be controlled using the frequent application of water. Any application of calcium chloride will be in accordance

with applicable guidelines from the Department of Work, Services and Transportation.

- Solid waste disposal practices will be in compliance with the Environmental protection Act and associated regulations. Construction debris will not be permitted to be disposed of on site. It will be contained on site for disposal at a municipal solid waste disposal facility.
- The sewage generated during the construction phase will be collected using portable toilets, which will be cleaned out by a licensed operator on a regular basis. This practice will control any release of fecal matter into the local ecosystem.
- All fuel handling and storage will be in compliance with the Storage and Handling of Gasoline and Associated Products Regulation. Also, to minimize the risk of fuel, lubricant or hydraulic release, construction equipment will not be permitted to be refuelled within 100 m of a water body. No equipment will be allowed to cross or work in a body of water.
- Equipment exhaust systems will be maintained in proper order to provide emissions to the standard designed for by the equipment manufacturer.
- Exhaust systems will be properly maintained to ensure noise levels are within the design specifications of the machinery.

4.5.5 Potential Resources Conflicts

Fish and Fish Habitat

Construction activities are remote from any body of water and therefore do not affect any fish or fish habitat areas. The nearest body of water that may be affected by the facility is the saltwater of the Stephenville harbour inlet (Port Harmon), which is South of the property. It is located approx 500 m away. There are also 2 ponds that are approximately 300 m from the site but both are at elevations above the site location, and as such will not be affected by the subsurface discharge.

Wildlife

The location of the proposed Solids Composting Facility is inside the Municipality of Stephenville and its closest neighbours are the Pulp and Paper Mill, the Fertilizing Plant, and the Paving Plant. Wildlife is not suspected to be in this area. Therefore, no wildlife conflicts are expected.

Airport

Although the site is outside the airport fence it is within the airport planning zone. There are no structures or activities which are believed will impact the airport operations.



Figure 8
Existing site facing North

Forestry

The project site consists of grass, scrub growth with alders, with no forested areas. Therefore, forestry conflicts will not be encountered.

Construction Equipment

During construction operation, equipment will not be permitted to operate outside the construction zone in order to prevent damaging adjacent areas.

Human Activities

The existing access road is a closed roadway and there are no homes or cabins in the vicinity of the proposed project. The closest home is more than 1000 m from the proposed facility. The closest commercial establishment is the Paving Plant which is located at the other end of the access road and is over 1000 m from the proposed facility. The ownership of the adjacent property is the Town of Stephenville and the Newfoundland and Labrador Housing Corporation.

4.6 Operation

The proposed Solids Composting Facility will operate year round. The solid effluent and sewage will be discharged directly from the pumper truck into the assigned holding cell through gravity drainage. The bio-solids will self level through out the sludge cell. The application rate in each cell will be maintained as per the height requirements of the reed plants. Although the exothermic heat generated by the degradation of sewage will produce the required thermal units to maintain an active non frozen system throughout the winter, the sludge cells are designed such that if prolonged periods without additional septage are experienced, freezing may occur and will not harm the system.

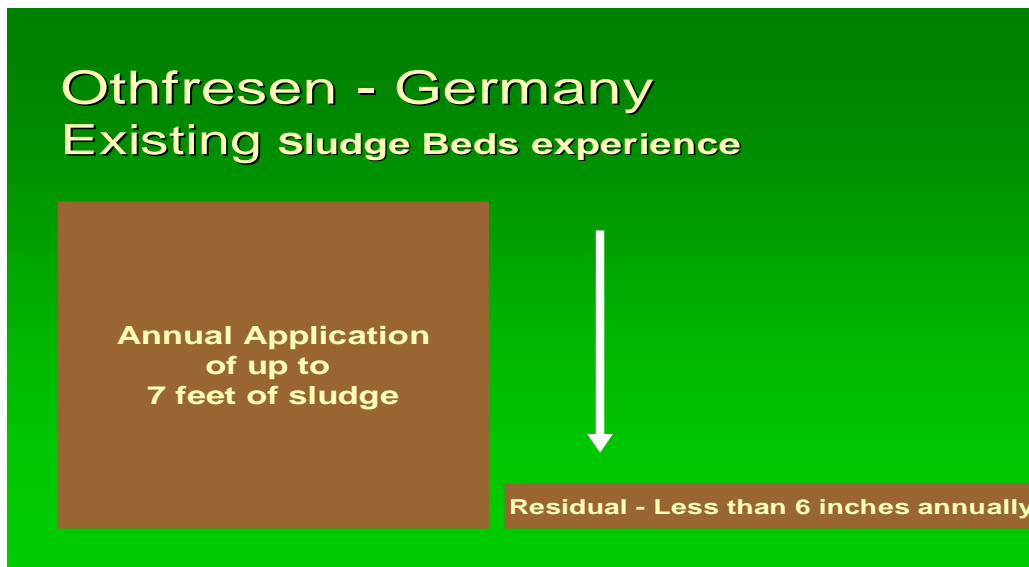


Figure 9
Representation of existing sludge reduction using sludge beds

The facility will be designed to receive approximately 3000 m³ per year of domestic/municipal bio-solids with a dry matter content expected of 4.0 - 5.0%. No petroleum waste products will be received by this facility. No electrical or potable water requirements are necessary for the operation of this facility.

4.6.1 Potential Sources of Pollutants during Operation

Potential sources of pollutants during operation are:

- Treated Effluent
- Dewatered and Biodegraded Solids
- Odours
- Noise Pollution
- Health and Safety
- Rainwater

4.6.2 Mitigation Measures during Operation

Mitigation measures to reduce the environmental concerns associated with operation activities include:

- The liquid waste runoff from the Sludge Holding Treatment cells will be captured and directed to the Kickuth Wetland Treatment bed. Treated effluent will be produced from the Kickuth Wetland treatment bed which will meet all of the Department of Environment Guidelines and Regulations for the Discharge of Municipal Wastewater. This effluent will be discharged below grade in a soak away, and will be designed based on the porosity of the soils. A septic tank will be installed as part of this portion of the project, and its sludge will be pumped back into the sludge treatment holding beds as part of the yearly maintenance.
- The dewatered and biodegraded solids that will be produced from the bio-solids that are received by this facility will only be removed on a 7 -10 year interval from the time they were received. The dewatered and biodegraded material will be stable and dry and can be disposed of as per the Environmental Protection Act and associated regulations and approvals, or can be mixed with soils to produce an enriched landscaping medium which has commercial value. The reeds in the system are not required to be harvested and will simply die back into the medium and be decomposed and form a litter on the surface of the beds. If the reed are harvested it will be for the use of generating new reed stock for similar projects.
- Odours produced by the facility will only occur during periods of application, and for a short duration there after, until the bio-solids form a crust on the surface of the newly applied material. The prevailing wind direction for the area is South West. With the remote nature of this proposed facility odour production is not considered a concern and as such, no preventative measures will be instigated to reduce odour.
- Limited noise pollution will be generated during the operation of the Sludge Treatment Facility as the facility itself has no machinery, and the noise pollution will only be created by the pumper trucks delivering bio-solids to the facility. Therefore noise pollution is not considered a concern.
- Workers health and safety will be addressed by all future employees being instructed on the dangers, preventative measures and, personal cleanliness required when dealing with human bio-solids.
- The sludge treatment holding cells are self contained, and are open to the elements. They will hold and trap all rainfall which lands on their surface area. The design of these cells includes the additional annual rainfall in their treatment calculations and in the volume of effluent which is directed from these beds to the Wetland Treatment bed. The wetland treatment bed which is also a self contained lined system has been designed to accommodate the annual rainfall and the excessive rainfall from a 100 year rainfall event, as part of its design for the effluent requirements.

4.6.3 Potential Causes of Resource Conflicts

Procedures will be established and monitored as required to minimize all potential resource conflicts.

Ground Water

The effluent from the proposed facility will meet or exceed the Department of Environment Guidelines for the Discharge of Municipal Wastewater. A sampling procedure of tests will be initiated with the Department of Environment to confirm that the effluent meets or exceeds the requirements for discharge into the environment. Initially this testing scheme is proposed to be conducted every three months for the first year of operation.

Fish and Fish Habitat

Operational activities are remote from any body of water and therefore do not affect any fish or fish habitat areas. The nearest body of water is the Stephenville Harbour Inlet (Port Harmon) on the south side of the property about 500 m away.

Wildlife

The location of the proposed Sludge Treatment Facility is inside the Municipality of Stephenville. Wildlife is not suspected to be in this area. Therefore, no wildlife conflicts are expected.

Forestry

The project area consists of grass, scrub growth, with no forested areas. Therefore, forestry conflicts will not be encountered.

Operational Equipment

The proposed Sludge Treatment Facility is a passive environmental system which has no requirements for electricity or mechanical equipment; therefore there will be no equipment operational concerns or conflicts.

Human Activities

Limited human activity is expected to occur in this industrial zone. Currently the access road is closed.

There are no homes or cabins in the vicinity of the proposed project. The closest home is more than 1000 m from the proposed facility. The closest commercial establishment is the Paving Plant which is located on the same access road and is over 1000 m from the proposed facility. With the remote location for the proposed Solids Composting Facility, operational activities are not expected to cause conflicts with other human activities.

5.0 OCCUPATIONS

5.1 Construction Phase

It is expected there will be approximately 5 to 8 people employed during the construction phase of the project. Construction will be co-ordinated by Abydoz Environmental Inc. providing engineering and construction supervision.

5.2 Operational Phase

It is expected that approximately 1 person will be employed part time during the operation of the facility. Abydoz Environmental Inc. will use their existing labour force to provide services as required at the facility. Abydoz Environmental Inc. will provide all maintenance support and consulting services as required to operate the facility.

6.0 APPROVAL REQUIRED FOR THE UNDERTAKING

The permits, approval and authorizations which may be necessary for the undertaking include;

PERMIT, APPROVAL OR AUTHORIZATION	ISSUING AGENCY
Certificate of Approval – Solids Composting Facility	Dept. of Environment and Conservation
Construction permit under the National Building Code of Canada	Dept. of Government Services and Lands
Airport Planning Zone	Transport Canada

7.0 PROJECT RELATED DOCUMENTS

7.1 Documents

Currently no other documents are related to this registration.

7.2 Drawings

C-1- Site Plan Stephenville Solids Composting Facility – Project # 511
(Drawing is attached)

8.0 SCHEDULE

The engineering for the proposed project will be completed as soon as approval is provided.

It is expected that construction and commissioning of all facilities will take in the order of 2- 3 months.

The proposed construction start date is September 2005 and is scheduled to be completed by November 2005.

Operations will commence after commissioning has been completed.



Figure 10
Completed solids treatment facility

9.0 FUNDING

Financing of the project will be from the town of Stephenville's capital works program and the Green Municipal Infrastructure Fund (GMIF).

Proponent

Town of Stephenville
Mr. Barry Coates, Town Manager

Date