



Environmental Assessment Registration

April 30th, 2004

Kickuth Engineered Sludge Treatment Facility Marystowm

Prepared for:
Department of Environment
Environmental Assessment Division
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1.0 NAME OF UNDERTAKING

Kickuth Engineered Sludge Treatment Facility

2.0 PROPOSER

2.1 Name of Corporate Body

Multi-Environmental Services Limited (to be incorporated)

2.2 Address

PO Box 575
Marysville, Newfoundland,
Canada, A0E 2M0

2.3 Contact

Name: Mr Jack Brenton
Official Title: President
Telephone #: 709-279-1260
Fax #: 709-279-2752
Email : jack.brenton@nf.aibn.com

2.4 Principal Contact Person for Purposes of Environmental Registration

Name: Mr Jack Brenton
Official Title: President
Telephone #: 709-279-1260
Fax #: 709-279-2752
Email : jack.brenton@nf.aibn.com

3.0 THE UNDERTAKING

3.1 Nature of the Undertaking

It is proposed to develop a Sludge treatment facility in Marystown, Newfoundland and Labrador. The development will consist of three sludge treatment beds, and a Kickuth BioReactor wetland treatment bed. This development is for the treatment of sludge generated from the cleaning of septic tanks in the surrounding communities.

3.2 Need for the Undertaking

Currently, there are no sludge treatment facilities on the Burin Peninsula. Sewage pump truck operators are required to dispose septicage and sludge at a provincial Department of Environment approved treatment facility or site. There are only two such sites in the province – one in Pasadena (now shut down), and one in Foxtrap. Due to the high trucking costs to these professional treatment facilities, the department has allowed temporary dumping in pits and Municipal Landfills as approved in their Certificate of Approval. The municipalities are now having trouble with such pit operations due to non treatment of this waste, and the future outlook may be to transport such waste off the Burin Peninsula for treatment. This cost would be economically unreasonable to pumbers, and consumers.

There are estimated 1100 sewage septic tanks on the Burin Peninsula. A portion of these will require pumping every year, and every 3-10 years the cycle will restart. This volume of pumped septicage & sewage sludge needs to be disposed of properly as the current method is contaminating the local ground water.

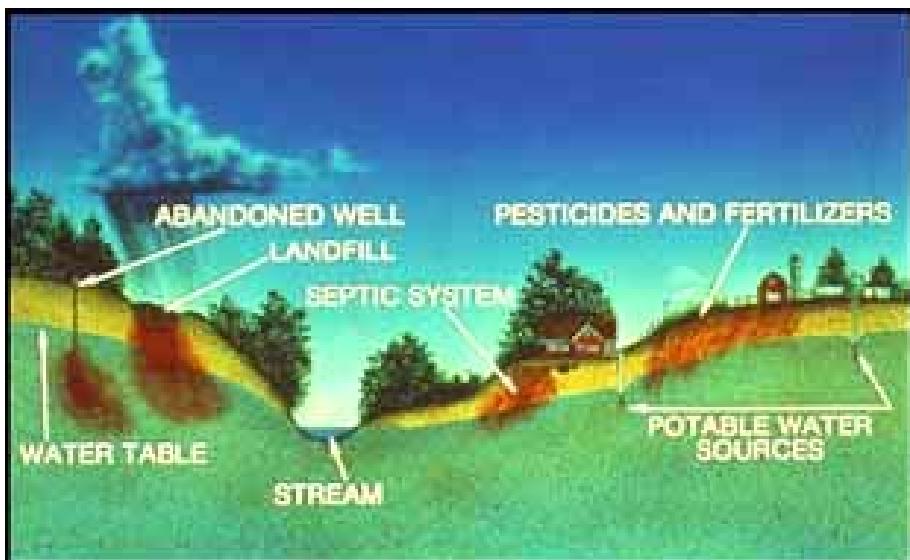


Figure 1 – Sources of Ground water contamination.

As stated in a letter to residents and operators on January 24, 1997, by Minister Kevin Aylward, a ban was placed on the disposal of septage and sewerage sludge from landfills within approximately two hours of an approved facility.

Currently a ban is in effect for all areas North of Swift Current on Route 220, and East of Shoal Harbour. All septage and sewerage produced in this region must go to an approved facility, of which there are currently two in the province- one in Pasadena (currently shut down) and one in Foxtrot.

In the last two paragraphs of Mr Aylward's notice, he states;

"I am pleased to be able to announce this initiative as it demonstrates both government's concern for the environment and local industries' ability to respond to the problem. Not only will septage and sewage sludge be removed from the landfills in the most populated areas of the Province, but material formerly seen as waste can now be considered a resource. The plans are to utilize it as a component of an overall composting program in which useful products for horticultural and landscaping industries can be produced. Bans will be considered in areas of the Province as conditions warrant."

This shows the provincial trend in the Province's concern for the environment, septage and sewage sludge. This proposed project and its services offered will satisfy client's needs as it will treat sludge in a Department of Environment Provincially approved and safe process and replace the current situation which is anything but acceptable.

4.0 DESCRIPTION OF THE UNDERTAKING

4.1 Geographical Location

The treatment facility will be constructed on Route 220, in an area between Burin & Marystow, on the outskirts of the municipal boundary of Marystow. This area is well suited for this type of activity, and is centrally located. (See aerial photograph below)

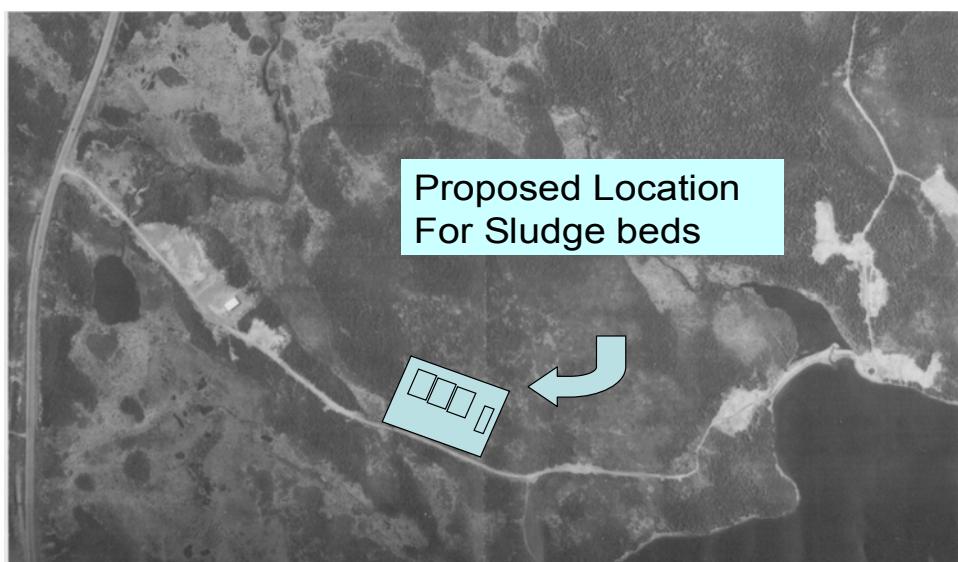


Figure 2 – Location only -Proposed Facility not to scale

(see actual drawings and maps in Appendix)

4.2 Physical Features

The access to the proposed site will be via an existing access road which will be upgraded. A gate and 20 ft of fencing will be placed at the entrance to the property to restrict access if required in the future. The site will comprise of three sludge treatment beds and one Kickuth BioReactor Wetland Treatment bed. The treated effluent from the treatment process will be discharged into the ground through a subsurface discharge. There will be no buildings or structures on the facility, except for a small storage shed. The site will be approximately 150m X 150 m with a parking and turning area. The existing power line on the access road at the entrance to the site may be extended to the site to provide power for lights and small tools in the future. The existing topography is fairly level with approximately 3 m of grade across the proposed site which will be levelled. The surrounding vegetation is small scrub woods with barren and marsh areas. There are no water bodies, no ponds or rivers located on the proposed site, although there is some surface run-off from the existing marshy land. The existing wet areas appear to be seasonal in nature with no continuous water course. The water table appears to be more than 2 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 Treatment Reed beds, and second; the Kickuth Wetland Treatment bed. The sludge treatment reed beds receive the bio-solids and performs dewatering and biodegradation of the solids. The sludge treatment beds will be designed to handle a volume of 900 m³ of bio-solids annually. The Kickuth Wetland Treatment bed accepts the removed liquid from the sludge treatment reed beds and treats the liquid waste producing an acceptable effluent that can be discharged into the environment.

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 treatment reed beds as they are collected from septic tanks in the area. 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 treatment beds will produce a waste-water effluent which will be piped to a Kickuth BioReactor Wetland Treatment bed. This treatment bed will reduce the contaminants to acceptable levels for discharge into the environment.



Figure 3 – Existing Sludge Treatment Beds

Unlike ordinary sand-drying beds, sludge treatment 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 treatment beds need only be removed after seven (7) to ten (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. Further research will be conducted into composting and commercial markets using this material.

4.4 Major Physical Features of the Undertaking

The proposed development consists of an access road upgrading, parking and turning area, three sludge treatment reed beds, a Kickuth Wetland treatment bed and a subsurface discharge location. No buildings are planned for erection on the site.

a) Access

The existing access road to the site will be upgraded to the site location, and the site will have all trees and overburden removed as required. The land will then be cleared and grubbed, in order to facilitate site preparation. A parking and turn-around area will be created for sufficient space to accommodate 4 vehicles and several pumper trucks at one time, the surface of the turn around and parking area will be crushed stone.

b) *Utilities*

1. Electrical; Newfoundland Power will be contacted to install the required electrical extension from the existing system, (approximately 350 m) to provide site power for future hook-up and lighting.
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 Treatment beds*

The three proposed sludge treatment reed beds will have a combined area of 720 m². These three beds are proposed to be 15m x 16 m in size and will be similar as the existing facilities in the photo in Figure 3. The construction of these sludge treatment 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 0.6 m of aggregate and sand, which will consist of three layers, will be installed with a collection pipe system to collect the liquid. The walls of the bed will be constructed with concrete and will provide 1.6m of freeboard above the aggregate base to allow for long-term sludge accumulation. Once the beds have been constructed, phragmites reeds will be planted in the sludge treatment reed beds.

It should be noted that the physical characteristics of sludge are such that rain water actually runs off the sludge rather than being absorbed by the sludge which eliminates the need for a roof or for the sludge to be continuously dewatered.



d) Kickuth Wetland Treatment

The size of the Kickuth wetland treatment bed needed to treat the effluent from the sludge treatment reed beds is 8m x 10m or 80 m². It will be the same design as the 11 systems (comprising of 14 total beds) already constructed and successfully operating in the province. The Kickuth wetland treatment system is a patented, self-contained, engineered, wetland ecosystem. It is designed to optimize the microbiological, chemical and physical processes for wastewater purification.

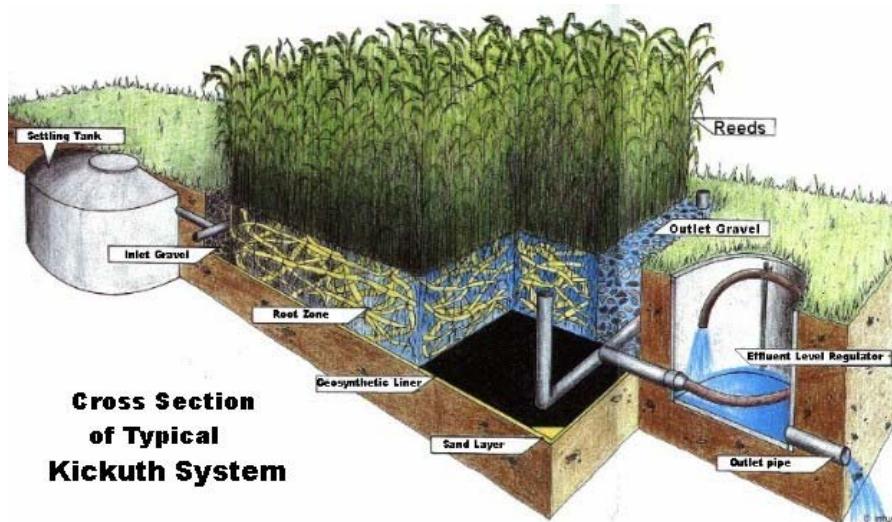


Figure 4 – Cross Section of Typical Kickuth Wetland Treatment System

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 chemical products.

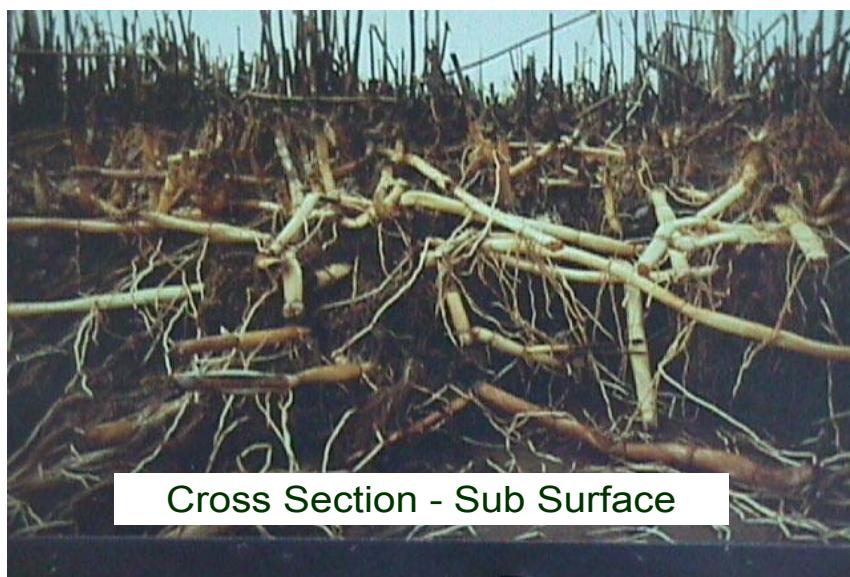


Figure 5 – Cross Section of Actual Kickuth Wetland Treatment System

Chemicals using the specialty soil matrix, are not simply stored in the reed bed, they are actually degraded into harmless components. Other contaminants, such as metals, are transformed from a toxic mobile state into a soil attached fixed situation via complex chemical reactions.

e) *Discharge*

The discharge from the wetland treatment beds will meet all environmental requirements for discharge, and will be disposed below grade in a subsurface soak away on the west side of the property.

f) *Physical Features*

The site is presently vacant and has had the majority of the existing overburden removed from previous excavation which was performed several years ago. The excavation was relatively minor and is assumed to have occurred during the construction of the access road which passes past the site location on the Northern side. The eastern portion of the site is covered in a combination of tree scrub and marshy areas which appear seasonal. The south portion of the site is elevated approx 2 meters consisting of a dry marsh peat overburden, underlined with bedrock rock and native soil and rock. The West side of the property is relatively level with tree cover, organic soils and overburden of 0.5m.

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. A design option will be to tie such ditching into the subsurface soak away located on the property if the percolation rates are appropriate. 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 3 months.

The proposed construction start date is June 2004 and is scheduled to be completed by July 2004.



Figure 7 – Construction of a Kickuth 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, concrete placement, liner installation, and installation of a soil 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 Sludge Treatment Facility all efforts will be made to preserve and conserve the natural environment. Vegetation will be maintained to provide a natural buffer where possible, and any exposed slopes will be stabilized with grass or tree cover.

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 100m 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 is the Southwest Arm of the Creston Inlet which is at least 300m from the facility.

Wildlife

The location of the proposed Sludge Treatment Facility is inside the Municipality of Marystown and its closest neighbour is the maintenance and school bus depot. 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.

Construction Equipment

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

Human Activities

The existing access road is only one access of several to the crown lands behind the construction area and will therefore not limit human access to the area. 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 school bus depot which is located on the same access road and is approx. 350 m from the proposed facility. The land in the area that has been acquired from the crown is owned by the proponent or by members of the proponent family.

4.6 Operation

The proposed Sludge Treatment Facility will operate year round. The sewage pumper trucks owned by the proponent will discharge directly from the pumper truck into the assigned treatment bed through the use of the pumper truck's pump. The bio-solids will self level through out the sludge bed. The application rate in each bed 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 beds are designed such that if prolonged periods without additional septage are experienced freezing may occur and will not harm the system.

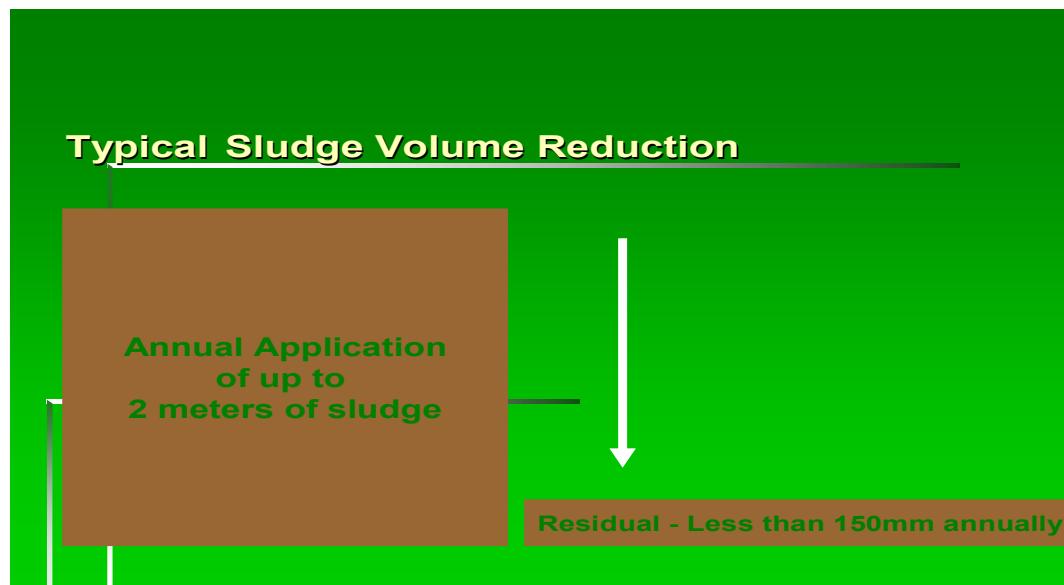


Figure 8 – Representation of existing sludge reduction using sludge beds

The facility will be designed to receive approximately 900 m³ per year of domestic and 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 Treatment beds 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 rock soak away, as detailed on the preliminary engineering drawings (Appendix A). 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 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 reeds are harvested it will be for the use of generating new reed stock for similar projects.
- Odours produced by the facility will be most noticeable during periods of application and for a short duration thereafter, until the bio-solids form a crust on the surface. The prevailing wind direction for the area is South West. Currently disposal of bio-solids at the Marystown Municipal Dump has no preventative odour control which due to its remote nature does not appear to be a factor. With the remote nature of this proposed facility no preventative measures will be instigated to reduce odour, and with the similar remote location odour production is not considered a concern.
- 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 the proponents policy that all employees are required to go through the proponents New Hire Company Safety program. Currently all drivers of the sewage pumper trucks owned by the proponent have been instructed on the dangers, preventative measures and, personal cleanliness required when dealing with human bio-solids, this will be expanded to include a section on the Sludge Treatment Facility.
- The sludge treatment beds are self contained cells which are open to the elements. They will hold and trap all rainfall which lands on their surface area. The design of these beds 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 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 Southwest Arm of the Creston Inlet which is at least 300m from the facility.

Wildlife

The location of the proposed Sludge Treatment Facility is inside the Municipality of Marystow and its closest neighbour is the maintenance and school bus depot. 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

Currently the access road has grown in and limited human activity is expected to occur in the area. The existing access road will be upgraded to provide a better road surface for the proponent's trucks delivering bio-solids to the facility. The road from the bus depot to the proposed facility will be maintained by the proponent. The access road will be gated and fenced, on both sides for approx. 20 ft to prevent access to the site by unauthorized vehicles.

The access road is only one access of several to the crown lands behind the proposed facility and will therefore not limit human access to the area. 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 school bus depot which is located on the same access road and is approx. 350 m from the proposed facility. With the proponent selecting a remote location for the proposed Sludge Treatment 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 up to 10 people employed during the construction phase of the project. Construction will be co-ordinated by the proponent with ABYDOZ Environment 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. The proponent will use his existing labour force of sludge handling and pumper truck operators to provide services as required at the facility. Abydoz Environmental will provide maintenance support and consulting services as required by the proponent 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 – Sludge Treatment Facility	Department of Environment and Labour
Approval to dispose treated solids in the local landfill	Department of Government Services and Lands
Crown Lands Applications/ Licenses	Department of Government Services and Lands
Construction permit under the National Building Code of Canada	Department of Government Services and Lands

7.0 PROJECT RELATED DOCUMENTS

7.1 Documents

Currently no other documents are related to this registration.

7.2 Drawings

C-1 Site Plan - Project Sludge beds Marystown –Project # 2003-16
C-2 Plan and Elevation – Project: Sludge Beds Marystown – Project # 2003-16
(both drawings are attached in Appendix A)

8.0 SCHEDULE

The engineering for the proposed project will be completed during the winter of 2003 and the spring of 2004.

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

The proposed construction start date is April 2004 and is scheduled to be completed by June 2004.

Operations will commence after commissioning has been completed.



Figure 9 – Sludge undergoing treatment

9.0 FUNDING

Financing of the project will be from the proponent and in conjunction with current applications with ACOA.

Jack Brenton
Proponent – Mr Jack Brenton

April 30 2004
Date

G. Sharp
Consultant – ABYDOZ Environmental
Glenn Sharp P.Eng

Nov 26, 2003
Date