

TECHNOLOGY ASSESSMENT • TECHNOLOGY ASSESSMENT

CERTIFICATE

OF TECHNOLOGY ASSESSMENT

**Bio-Desolve Applied to Municipal Wastewater
Treatment Lagoons
(MTS Environmental Products)**

Based on a review of the data and the information submitted in support of the technologies, the ministry concludes that Bio-Desolve, by MTS Environmental Products, may be applied to the treatment of municipal wastewater to reduce sludge accumulation, reduce odours and improve effluent quality in sewage lagoons, restaurants and sludge based municipal treatment systems. However the corresponding impacts on other operating and performance parameters need to be evaluated concurrently.

The specific applications of Bio-Desolve will require site-specific process or engineering design to ensure compliance with the intended performance requirements. The necessary environmental approvals under the Ontario Water Resources Act (OWRA) or the Environmental Protection Act (EPA) would be required on a case-by-case basis. For specific installations, it is necessary that a proponent follow the instructions identified in the Guide to apply for Municipal & Private Sewage Works and/or Industrial Sewage Works. A pre-submission consultation with the ministry's District Office is required to identify local environmental issues and requirements.



Dale Henry, Director
Standards Development Branch
Ontario Ministry of the Environment
(February 2010)

New Environmental Technology Evaluation Program

Promoting the development and application of new environmental technologies



Bio-Desolve for Municipal Wastewater Treatment Facilities (MTS Environmental Products)

Notable Aspects of the Product

Product Description

- ✓ Bio-Desolve for *Municipal Wastewater Treatment Facilities* is a bio-stimulant or natural sludge digestion accelerator consisting of activated carbon, humic acid and specific strains of naturally occurring marine microbes
- ✓ Bio-Desolve is manufactured by MTS Environmental Products and has the following properties identified in the Material Safety Data Sheet (MSDS):
 - Dark brown/black in appearance
 - Density of 1.1
 - pH of 9
 - Highly water soluble
 - Waste regulations should be followed as applicable to nonhazardous organic fertilizers or organic debris.

General Application of Bio-Desolve for Municipal Wastewater Lagoons

General application of the Bio-Desolve includes the following:

- ✓ Initial Assessment includes 30-40 solids depth probes and composite conventional effluent quality (e.g. BOD₅, TSS, TP, TAN, E. coli,) and solids analysis (e.g. solids depth, VSS)
- ✓ Initial (Shock) Application of Bio-Desolve at 10L per 455 m³
- ✓ Maintenance Application of Bio-Desolve of 1L per 100 population equivalent (PE) per week (e.g. a lagoon serving 3000 PE would use 30 L of Bio-Desolve per week).

Specific Lagoon Treatment Applications

- ✓ Exeter Municipal Wastewater Lagoon Study
 - ✓ Consists of 4-cell facultative and aerated seasonal discharge lagoon system rated at 7150 m³/d. The system is operated by dosing of chemical products (i.e. alum) to promote solids settling and phosphorous

- removal
- ✓ The sewage lagoon effluent, following 16-months of Bio-Desolve application, resulted in an average reduction of 72%, 64% and 62% of BOD₅, TSS and TP to 11, 14 and 0.3 mg/L, respectively (see Figure 1).
- ✓ Treatment using Bio-Desolve was initiated on June 2005 and included Initial Assessment, Initial Shock Application and Maintenance Application of Bio-Desolve
- ✓ Aeration in Cell No. 2 and alum addition was discontinued
- ✓ Figure 1 provides the monitored lagoon effluent quality, the E. coli running geometric mean and solids depth variation over the monitoring period between April 2006 to May 2009 based on 12 sampling events.

- ✓ Spencerville Municipal Wastewater Treatment Lagoons
 - ✓ Consists of 2-cell facultative annual discharge lagoon system rated at 318 m³/d. The system is operated with batch dosing of chemical products (i.e. alum) to promote solids settling and phosphorous removal
 - ✓ The sewage lagoon effluent, following 14-months of Bio-Desolve application, resulted in an average reduction of 33%, 28% and 19% of BOD₅, TSS and TP to 3, 8 and 0.1 mg/L, respectively (see Figure 2)
 - ✓ Weekly addition at the wet-wells sewage pumping stations upstream of the lagoons of Bio-Desolve at a dosage of approximately 10 L per week
 - ✓ Figure 2 provides the monitored lagoon effluent quality, the E. coli running geometric mean and solids depth variation over the monitoring period between September 2006 to April 2009, based on 9 sampling events.



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- ✓ Tara Municipal Wastewater Treatment Lagoons
 - ✓ Consists of 2-cell facultative seasonal discharge lagoon system rated at 650 m³/d. The system is operated by dosing of chemical products (i.e. alum) to promote solids settling and phosphorous removal
 - ✓ The sewage lagoon effluent, following 18-months of Bio-Desolve application, resulted in an average reduction of 18% of TSS to 20 mg/L and an average increase of 89% and 9% of BOD₅ and TP to 28 and 1.9 mg/L, respectively (see Figure 3)
 - ✓ Figure 3 provides the monitored lagoon effluent quality, the E. coli running geometric mean and solids depth variation over the monitoring period between October 2007 to April 2008, based on 8 sampling events.

 - ✓ Parkhill Municipal Wastewater Treatment Lagoons
 - ✓ Consists of 2-cell facultative seasonal discharge lagoon system rated at 1105 m³/d. The system is operated by batch dosing of chemical products (i.e. alum) to promote solids settling and phosphorous removal
 - ✓ The sewage lagoon effluent, over 8-months of Bio-Desolve application, resulted in an average reduction of 9%, of BOD₅ to 15 mg/L an average increase of 13% of TSS to 52 mg/L and no change in TP (see Table 1).
 - ✓ Table 1 provides the monitored lagoon effluent quality, the E. coli running geometric mean and solids depth variation over the monitoring period between October 2008 to May 2009, based on 3 sampling events.

Odour Control Applications in Restaurants

- ✓ Various restaurants located in Goderich, Beaverton, Exeter and Sturgeon Falls among other locations have used Bio-Desolve for odour control:
 - Dosing concentration and dosing frequency is site specific and subject to site assessment.

Review Qualifier

This letter is not to be considered an approval or implied approval of this product as applied to municipal wastewater treatment systems and it in no way removes or limits the obligation to obtain the necessary environmental approvals under the *Ontario Water Resources Act* or the *Environmental Protection Act* for surface water and groundwater discharges. Such approvals are required and take into account the site-specific considerations and environmental impact constraints on a case-by-case basis.



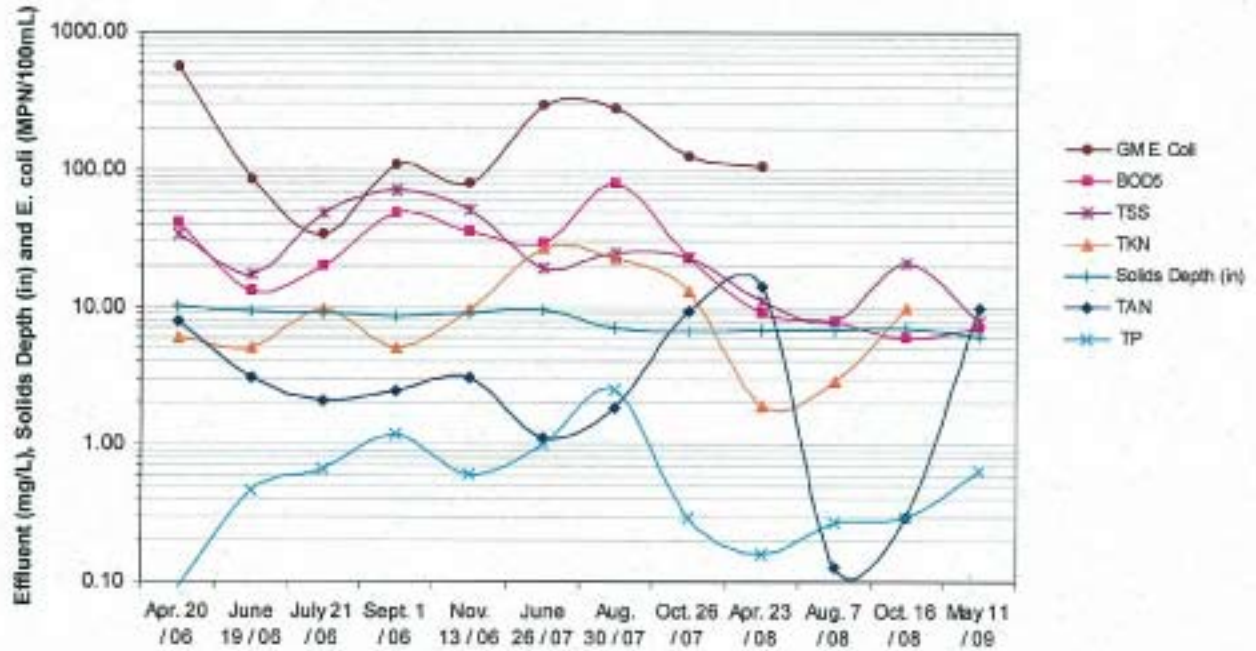


Figure 1. Exeter lagoon effluent quality and solids depth variation over the monitoring period from April 2006 to May 2009.

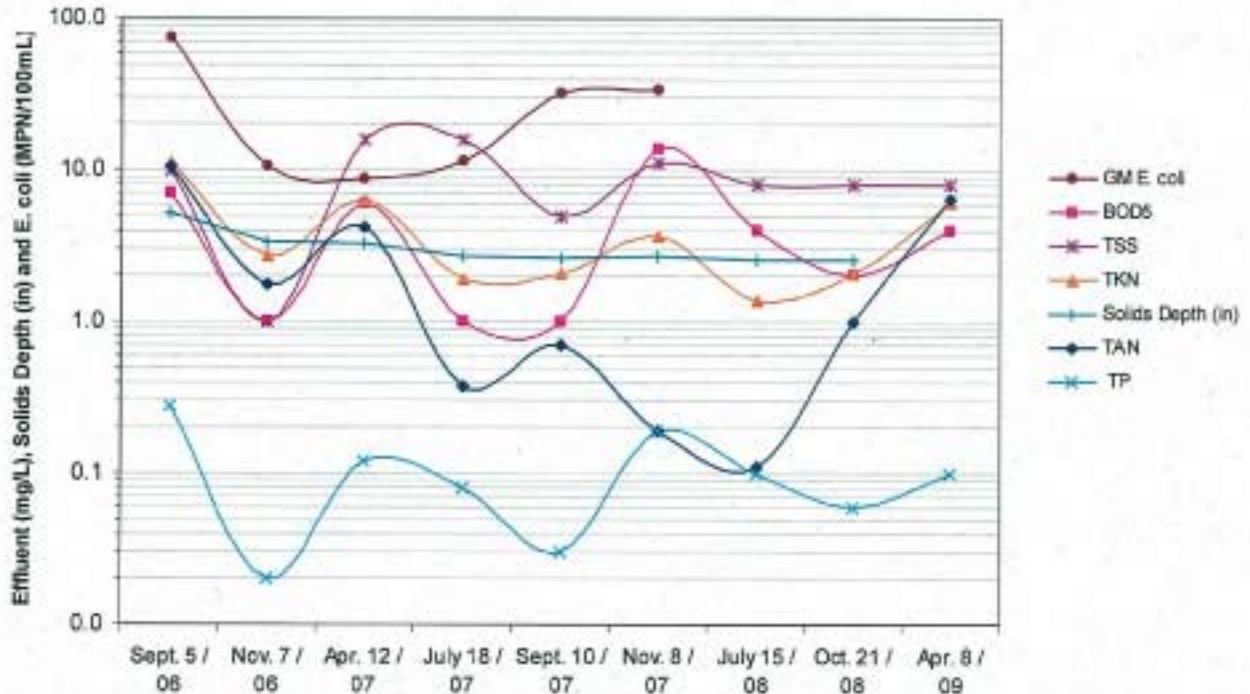


Figure 2. Spencerville lagoon effluent quality and solids depth variation over the monitoring period from September 2005 to April 2009.

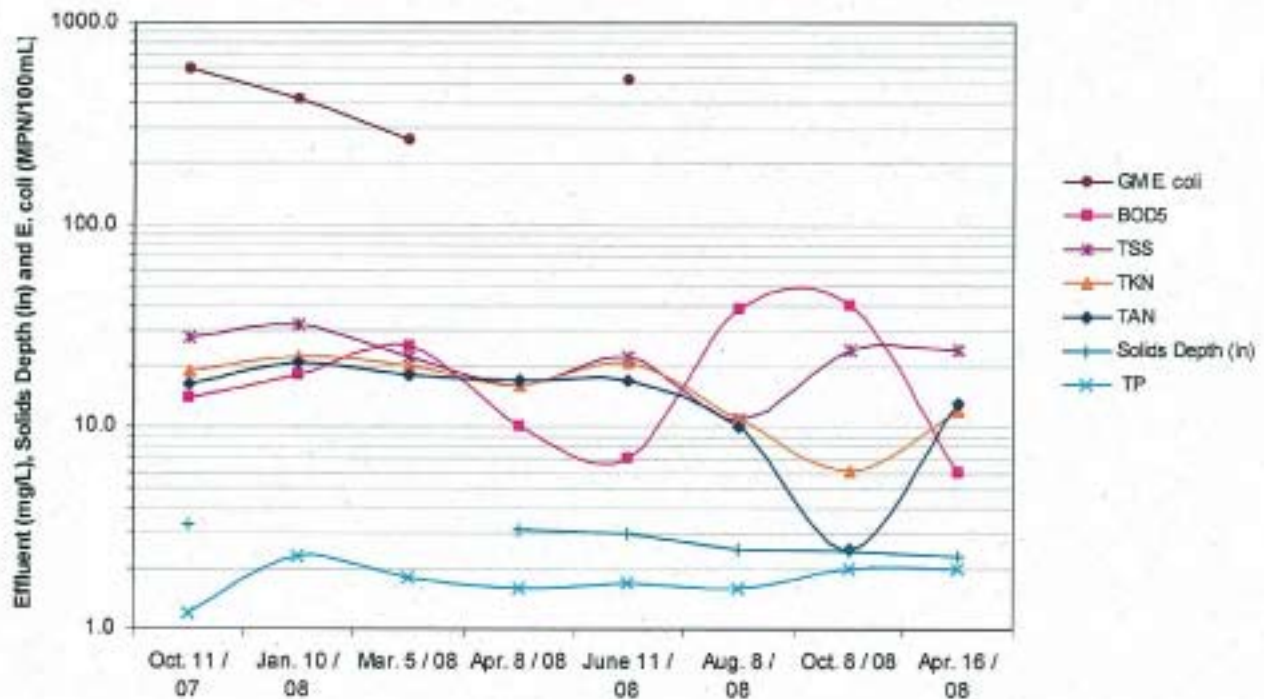


Figure 3. Tara lagoon effluent quality and solids depth variation over the monitoring period from October 2007 to April 2008.

Table 1. Parkhill municipal wastewater lagoon effluent quality during the monitoring period

Sampling Date	Ammonia (TAN)	BOD5	TKN	Total P	TSS	E. Coll	GM E.Coll	Solids Depth
Oct. 9 / 08	1.7	16	7.4	0.4	46.0	4,300		10.5
Mar. 24 / 09	8.9	17	12.0	1.3	46.0	8	185.5	7.5
May 21 / 09	0.21	12	5.4	0.8	64.0	8	65.0	6.8

Appendix

The submitted information and referenced information included:

- ✓ Application for a NETE Certificate.
- ✓ Reports and technical memos, including:
- ✓ Certificates of Approval:
 - MTS Environmental's 2009 Municipal Wastewater & Biosolid Treatment Information Report
 - Technical Memo – Bio-Desolve for Municipal Wastewater Treatment Facilities
 - Exeter Wastewater Lagoons
 - Parkhill Wastewater Lagoons
 - Tara Wastewater Lagoons
 - Spencerville Wastewater Lagoons
 - Material Safety Data Sheet (MSDS) for Bio-Desolve (Liquid Carbon / Humic Substances)
 - Technical Memo – Bio-Desolve Treatment Information

MOE referenced certificates and report included:

- ✓ Certificates of Approval:
 - The Corporation of the Municipality of Arran-Elderslie, Amended Certificate of Approval Number 9456-659N92
 - The Corporation of the Township of Edwardsburgh/Cardinal, Amended Certificate of Approval Number 3-1377-87-896 and Notice No. 1
 - The Corporation of the Town of Exeter, Amended Certificate of Approval Number 3-0387-81-826
- ✓ MOE Communal Sewage Inspection Report:
 - The Corporation of the Municipality of North Middlesex Number 3150-4Wak6A.

