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**Building Materials
Evaluation Commission**

**Commission d'évaluation
des matériaux
de construction**

Date of Authorization
BMEC Authorization Number
BMEC Application

July 26, 2001
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A 2006-15
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AUTHORIZATION REPORT – The Whitewater Area Bed System

1. Applicant

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2. Manufacturing

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Canwest Tanks & Ecological Systems.
11975 Old Yale Road Surrey
BC, V3W 3X4

3. Description

The Whitewater Area Bed System primarily consists of a pre-treatment tank, a tertiary treatment unit, an effluent filter and an area bed.

Delta Environmental Products Inc.'s tertiary treatment units permitted for use with this system are referenced in the Supplementary Guidelines to the Building Code, as amended, as meeting tertiary quality effluent criteria, and include models FD 50 FF, DF 60 FF, DF 75 FF, DF 100 FF, DF 150 FF and DF 150 x 2.

An effluent filter is required downstream of the treatment unit. The specification of the effluent filter may vary depending on the area bed system design, and the filter models permitted for use with this Area Bed are located in Section 4.1. of this authorization.

The area bed is comprised of two parts: the stone layer and the sand layer. The sand layer of an area bed is sized in consideration of the soil it rests on, and under certain conditions it may be required to be laterally extended. This lateral sand extension is known as the mantle.

The effluent is sent to the stone layer, either by gravity or by a pump, via a pipe. This pipe leads from the treatment unit and terminates at the distribution box or header. From the distribution box or header, the effluent is sent to a series of perforated distribution pipes that run through the stone layer.

4. Authorization Requested

The applicant seeks to have the Whitewater Area Bed System, which incorporates a treatment unit designed so that the effluent meets the tertiary effluent quality criteria referenced in Table 8.6.2.2.A. of the Building Code, authorized for use as a Class 4 System that is connected to an absorption system other than the leaching bed as referred to in Article 8.6.1.2. of the Building Code.

5. Assessment

Reports and assessment provided by the applicant demonstrate that if the Whitewater Area Bed System is constructed, installed, operated, maintained and monitored in accordance with the limitations of the manufacturer specifications and conditions stated in this authorization, a level of performance equivalent to that required of a class 4 sewage systems will be provided.

The following reports were submitted and reviewed are:

1. Whitewater Systems Owners Manual, Models DF 50, DF 60, DF 75, DF100 or DF 150.
2. Technical Background Information Memo relating to Canwest Tanks & Ecological Systems dated September 18, 2000.
3. CAN/CSA-B66-00 - Prefabricated Septic Tanks and Sewage Holding Tanks, Plumbing Products and Materials - a National Standard of Canada.
4. Operations, Specifications & Test Data on the Free Access Sand Filter - July 1999, including a February 16, 1998, NSF International Report on the Delta Environmental Products Inc. DF-40M and Free Access Sand Filter. Tested under the provisions of ANSI/NSF Standard 40.
5. The "Supplemental (Canadian Version) Owner's / Operator's Manual" dated September 1999, which incorporates a schedule of required maintenance to be conducted on the system every six (6), twelve (12) and twenty four (24) months.

6. NSF International Report on the evaluation of Delta products Inc., model DF 40- Wastewater Treatment System.
7. Whitewater Installation Operation and Maintenance Manuals.
8. Whitewater Service / Maintenance Agreement.
9. Whitewater Inspection Work Order.
10. Whitewater Treatment Units Pre-treatment Sizes, dated July 17, 2006.
11. Sample Drawings, Gunnell Engineering Ltd, dated July 7, 2006.

6. Authorization

- A. The Area Bed System is authorized as an equivalent to other Class 4 sewage systems as referenced to in Section 8.7. "Leaching Beds" of the Building Code; all other requirements pertaining to the design, installation and construction are subject to the regulations of the Building Code, and to the following terms and conditions.

1.0. Definitions

A word or phrase used in this Authorization has the following meaning for the purposes of this Authorization:

Area Bed means the part of a leaching bed comprised of a stone layer and the underlying unsaturated sand layer intended to further treat and distribute the effluent, and does not include the area referred to as the mantle.

Contact Area means the area of infiltrative surface, directly below the area bed, required to absorb the treated effluent into the underlying native soil, but does not include the area where the mantle, if required, comes into contact with the native soil.

Extended Contact Area means the area of the sand bed, as extended, and mantle, where required, to meet the necessary lateral extension such that the effluent is absorbed into the underlying soil

Infiltrative Surface means the area of interface where effluent migrates downward from the sand layer of the area bed and, if necessary, the mantle and passes into the native soil or leaching bed fill.

Mantle means the lateral extension of the area bed using imported leaching bed fill having a T time of 15 min/cm or less, but does not include the area referred to as the area bed, necessary to provide an area of hydraulic catchments in any direction in which the effluent entering the leaching bed fill will move horizontally such that effluent is treated and absorbed.

Raised or Partially Raised Area Bed means a sewage system in which any part of the area bed is above the natural ground elevation.

Uniform Distribution means the even dispersal of effluent throughout all areas of an area bed and adjoining mantle, if required, as it migrates down from the stone layer to the underlying sand layer to either the native soil or mantle comprised of imported soil.

Vertical Separation means the depth of unsaturated soil below a leaching bed as measured from the bottom of the absorption trench or the bottom of the stone layer to a limiting surface such as high ground water table, rock or soil with a percolation time greater than 50 min/cm.

2.0 Installation Requirements

- 2.1. This Authorization is valid only for Delta Environmental Products Inc.
- 2.2. Only Delta Environmental Products Inc. manufacturer trained and authorized agents or employees shall install, maintain and service the area bed system.
- 2.3. The Area Bed System shall be installed as per the manufacturer's installation instructions.
- 2.4. The Service and Maintenance Agreement prescribed by Sentence 8.9.2.3.(2) of the Building Code requires that the persons authorized by the manufacturer to service and maintain Area Bed System and who have entered into the agreement with the person operating the treatment unit, and shall:
 - 2.4.1. conduct and record at least once during every twelve month period, an inspection and servicing as specified by the manufacturer of the Delta treatment unit, and provide a copy to the person operating the Area Bed System;
 - 2.4.2. provide a copy of the Delta Environmental Products operation and maintenance manual revised, to the person operating the Area Bed System and to the authority having jurisdiction at the time of the permit application;
 - 2.4.3. conduct sampling and testing in accordance with the requirements of Clauses 8.9.2.4.(1)(a) and (b) of the Building Code;
 - 2.4.3.1. once during the first 12 months after the Area Bed is put into use, and
 - 2.4.3.2. thereafter, once during every 48 month period after the previous sampling has been completed.

- 2.4.4. promptly submit the sampling test results to the person operating the Area Bed System.
- 2.5. Delta Environmental Products Inc. shall retain records of the sampling test results for each Area Bed System received pursuant to the terms and conditions set out in 2.4. above, for a period of 10 years and shall promptly forward copies of those records to a chief building official upon request.

3.0 System Requirements

- 3.1. All pipe connections in the system (i.e. treatment units, accessory treatment units, tanks, pumps and filters) where incorporated, shall be flexible and watertight.
- 3.2. The Delta Environmental Products Inc. treatment units used in the system shall use the daily design flows as referenced in Table 3.2.1. "Daily Design Flow",

Table 3.2.1.
Daily Design Flow

Treatment Unit Models	Flow Range measured in Litres	Minimum Pre-treatment Tank Size measured in Litres
DF 50	850 to 1900	1140
DF 60	1900 to 2300	1140
DF 75	2300 to 2900	1360
DF 100	2900 to 3800	1810
DF 150	3800 to 5700	3400
DF 150 x 2	5700 to 10 000	6800
Column 1	Column 2	Column 3

4.0. Design

- 4.1. The Area Bed System treatment units shall be fitted with an a bottomless sand filter or a BK-2000 filter, except
 - 4.1.1. where the distribution of the effluent to the area bed is pressurized, GAG Sim/Tech 100 micron pressure filter, model number STF-100 and STF-100AZ, or a 100 micron Vortex filter shall be used.
- 4.2. An absorption system comprised of a stone layer overlying a sand layer and having a total minimum depth of 500 mm, and:

- 4.2.1. the stone layer shall be a minimum depth of 200 mm, and
- 4.2.2. the sand layer shall be a minimum depth of 250 mm and have a percolation time of 6 to 10 min/cm.
- 4.3. The stone layer required by 4.2. above, shall have a minimum area as specified by the manufacturer but not less than:
 - 4.3.1. where the total daily design sanitary sewage flow does not exceed 3000 L, the area shall be such that the loading on the surface of the stone layer does not exceed 75 L/m² per day, or
 - 4.3.2. where the total daily design sanitary sewage flow exceeds 3000 L, the area shall be such that the loading on the surface of the stone layer does not exceed 50 L/m² per day.
- 4.4. The stone layer shall be rectangular in shape, with the long dimension parallel to the site contours.
- 4.5. The stone layer required by the terms and conditions set out in 4.2. above, shall be protected with a permeable geo-textile fabric in such a manner so as to prevent soil or leaching bed fill from entering the stone.
- 4.6. The bottom of the stone layer shall be at all points vertically separated at least 600 mm from the high ground water table, rock or soil with a T time of 6 or less, or greater than 50 min/cm; except:
 - 4.6.1. where the underlying soil has a T time of between 6 and 50 min/cm, the bottom of the stone layer at all points may be reduced to 450 mm to rock, high water table, and soil having a T time of 50 min/cm.
- 4.7. The effluent shall be evenly distributed over the stone layer to within 600 mm of the perimeter edge of the stone layer using distribution pipes in accordance with the Building Code Appendix A-8.7.5.3.(2); or other means that achieves even distribution to within 600 mm of the perimeter edge of the stone layer.
- 4.8. The sand layer shall have a minimum area that is the greater of;
 - 4.8.1. the area of the stone layer required by the terms and conditions set out in 4.4. above,
 - 4.8.2. where the sand layer is installed in soil having a T time of 15 min/cm or less, the loading rate at the base of the area bed, shall be calculated using the formula $A = QT/850$ (L/m²/day), or

4.8.3. where the sand layer is installed in or on soil having a T time of greater than 15 min/cm, that the sand layer be extended using imported leaching bed fill having a T time of not more than 15 min/cm, the construction of the extended sand layer, including the area bed and mantle shall:

- 4.8.3.1. be of a depth of at least 250 mm,
- 4.8.3.2. extend at least 15 m beyond the perimeter of the treatment unit, or distribution pipes if utilized, in any direction that the effluent entering the soil will move horizontally,
- 4.8.3.3. be calculated using the formula $A = QT/400$ or by using the example calculations as they are provided, in Table 4.8.3.3. "Combined Area Bed and Mantle Loading Rates", and
- 4.8.3.4. be rectangular in shape.

Where:

- A is the area of contact in m² between the base of the sand layer and the underlying native soil,
- Q is the total daily design sanitary sewage flow in litres, and
- T is the percolation time of the underlying native soil in min/cm to a maximum of 50.

Table 4.8.3.3.

Combined Area Bed and Mantle Loading Rates Example Calculations

Loading Rate $A = QT/400$	
T of the native soil.	Loading rate (L/m ² /day)
≤ 15	27
20	20
30	13
40	10
≥50	8
Column 1	Column 2

- 4.9. Any Area Bed System that must be raised to meet the vertical separation distances required by the terms and conditions set out in 4.6. of this Authorization, shall meet the mantle requirements of the terms and conditions set out in 4.8., regardless of the T time of the native soil.

B.General Conditions

1. The use of the Area Bed System and as described in the specific terms and conditions set out in 6.A. must comply with the *Building Code Act, 1992* (the "Act") as amended or re-enacted from time to time and except as specifically authorized herein, with the Building Code.
2. A copy of this Authorization shall accompany each application for a building permit and shall be maintained on the site of the construction with the building permit.
3. The Applicant named in Part 1 hereof shall promptly notify the BMEC of:
 - (a) the failure of the Applicant, or of the material, system or building design that is the subject matter of this Authorization, to comply with any of the terms and conditions set out in 6.A. above; or
 - (b) the occurrence of any of the events described in conditions 6.B.4.(a) and (b)(ii) below.
4. The BMEC may amend or revoke this Authorization where it determines that:
 - (a) any change has been made to:
 - (i) the material, system or building design that is the subject matter of this Authorization;
 - (ii) the address of the applicant specified in Part 1 of this Authorization; or,
 - (iii) the ownership of the applicant specified in Part 1 of this Authorization.
 - (b) the use of the material, system or building design authorized herein;
 - (i) does not comply with the Act any relevant legislation as they may be amended or re-enacted from time to time; or
 - (ii) provides an unsatisfactory level of performance, in situ.

- (c) the Applicant, or the material, system or building design that is the subject matter of this Authorization, has failed to comply with any of the terms and conditions set out in this Authorization; or
 - (d) any Building Code provision relevant to this Authorization has been amended or remade.
5. Where the BMEC receives additional information concerning the material, system or building design authorized herein, the BMEC may review this Authorization and the BMEC may after the review amend or revoke this Authorization as in the opinion of the BMEC may be necessary.

Dated at Toronto this 27 day of July 2006.

BUILDING MATERIALS EVALUATION COMMISSION

Edward Link, P. Eng.
Vice-Chair, BMEC