

Appendix 1 – Liner Testing Report



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July 31, 2014

File No. 14-166-45

Village of Waskada
Box 40,
Waskada, MB
R0M 2E0

ATTENTION: Ms. Diane Woodworth, CAO

RE: Wastewater Treatment Lagoon Liner, Waskada, Manitoba

ENG-TECH Consulting Limited (ENG-TECH) received two Shelby tubes from your project labelled ST1 and ST2. We extracted both samples and a representative from Manitoba Conservation requested a hydraulic conductivity test on sample ST2. The hydraulic conductivity test data is outlined in Table 1, while the graphical representation of the hydraulic conductivity versus elapsed time is shown in Figure 1 attached.

ENG-TECH prepared the sample for hydraulic conductivity in accordance with ASTM D5084-03, *Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter*. The final hydraulic conductivity value (k_{90}) of 2.1×10^{-3} cm/sec was obtained for the sample identified as ST2.

ENG-TECH trusts the above is all the information you require. If you have any questions, please contact the undersigned.

Sincerely,
ENG-TECH Consulting Limited

Clark Hryhoruk, M.Sc., P.Eng.
President, Geotechnical Engineer

CO/Item

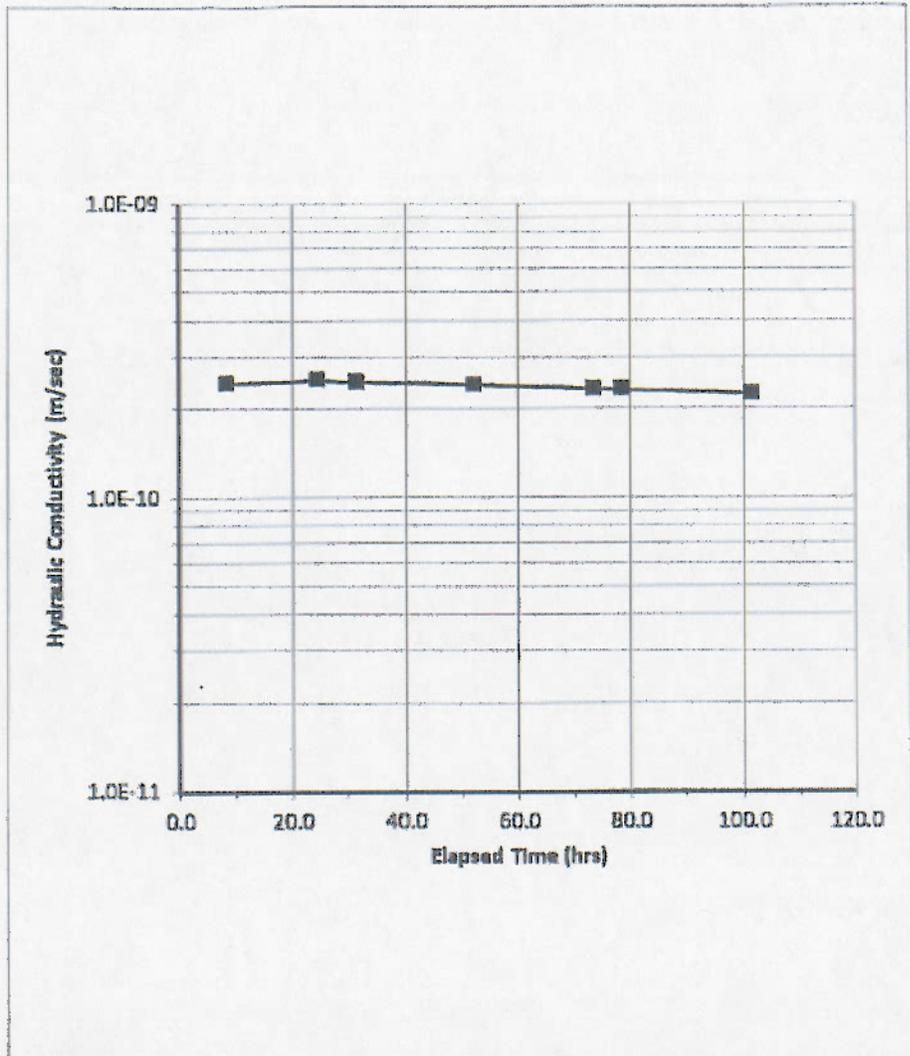
Attachment: Table 1 – Hydraulic Conductivity Test Data
Figure 1 – Hydraulic Conductivity Versus Elapsed Time (ST2)

cc: Bruce Webb – Manitoba Conservation (bruce.webb@gov.mb.ca)

**TABLE 1
HYDRAULIC CONDUCTIVITY TEST DATA
WASTEWATER TREATMENT LAGOON LINER, WASKADA, MANITOBA**

SAMPLE IDENTIFICATION	572
INITIAL VALUES	
ENG-TECH Reference No.	14-168-45-1
Length of Sample In Tube (cm)	33.0
Length (cm)	8.00
Diameter (cm)	7.16
Area (cm ²)	40.3
Volume (cm ³)	241.5
Water Content (%)	18.4
Bulk Dry Density (kg/m ³)	1766
Specific Gravity (G _s) (assumed)	2.70
Void Ratio	0.531
Degree of Saturation (%)	93.8
FINAL VALUES	
Length (cm)	9.97
Diameter (cm)	7.12
Area (cm ²)	39.9
Volume (cm ³)	237.3
Water Content (%)	18.8
Bulk Dry Density (kg/m ³)	1801
Specific Gravity (G _s) (assumed)	2.70
Void Ratio	0.506
Degree of Saturation (%)	~100
CONSOLIDATION PHASE	
Confining Pressure (kPa)	103.4
Pore Water Pressure (kPa)	82.7
Effective Stress (kPa)	20.7
PENMEATION PHASE	
Confining Pressure (kPa)	103.4
Pore Water Pressure (kPa)	82.7
Effective Stress (kPa)	20.7
Hydraulic Gradient	18.8
Permeant Fluid	Distilled Water
HYDRAULIC CONDUCTIVITY at TEST TEMPERATURE OF 24 °C (cm/sec)	2.3 x 10⁻³
HYDRAULIC CONDUCTIVITY at TEMPERATURE OF 20 °C (K₂₀) (cm/sec)	2.1 x 10⁻³

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 No. 858 North Street Memphis, TN 38122-9968 Phone: (901) 323-1855 Fax: (901) 323-1870	 Certificate of Authorization 2010-2014 Expiration: August No. 2479 Expiry: April 30, 2017	CLIENT VILLAGE OF WASKADA	PROJECT WASTEWATER TREATMENT LAGOON LINER, VILLAGE OF WASKADA, MS
		DATE JULY 2014	FILE NO. 14-188-46
OPERATOR EPDM		INSTR. NO. 1	ANALYST MGA
		TITLE HYDRAULIC CONDUCTIVITY VERSUS ELAPSED TIME (S17)	

**Water & Wastewater Facility Operators
Certification Program**



Application for Wastewater Treatment Facility Classification

also available online at <http://www.manitoba.ca/certification>

Please print clearly or type and follow the instructions on the application form.

NOTE: If using Adobe Reader text can be inserted into form and tab between fields.

This application is pursuant to the Water and Wastewater Facility Operators Regulation issued under The Environment Act.

Name of Facility: Wastewater Treatment Lagoon

Name of Facility Owner:
(Municipality/Commission/
Company/Individual/etc) Village of Waskada

Civic Address of Facility: N 1/2 6-2-25

Mailing Address of Owner: Box 40, WASKADA, MB

Postal Code: R0M 2E0

Telephone: (204) 673-2401

Contact Person: Diane Woodworth

Position: CAO

Cell or Pager: (204) 522-5129

Fax: (204) 673-2663

Email: waskadan@mymts.net

Is this a REAPPLICATION? Yes
 No

Please complete the following. The information provided will be used to classify the wastewater treatment facility under the Water and Wastewater Facility Operators Regulation. In some cases actual numbers or answers must be supplied, but in most cases it will only be necessary to check the appropriate criteria.

Forward the completed form to:

Director
Environmental Assessment &
Licensing Branch
Manitoba Conservation
160 - 123 Main Street
Winnipeg MB R3C 1A5

Please direct questions to:

Certification Program Coordinator
Phone: (204) 945-7065
Fax: (204) 945-5229

FOR MANITOBA CONSERVATION USE ONLY

Operation ID # _____
Stakeholder ID # _____
Approval ID # _____
EO/DWO

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PRELIMINARY TREATMENT <i>(choose all that apply)</i>			
1.	Facility pumping of main flow	<input type="checkbox"/>	3
2.	Screening or comminution	<input type="checkbox"/>	3
3.	Grit removal	<input type="checkbox"/>	3
4.	Equalization	<input type="checkbox"/>	1

PRIMARY TREATMENT <i>(choose all that apply)</i>			
1.	Clarifiers	<input type="checkbox"/>	5
2.	Anaerobic treatment with biogas flare	<input type="checkbox"/>	10
3.	Anaerobic treatment with biogas utilization facility	<input type="checkbox"/>	15

SECONDARY TREATMENT <i>(choose all that apply)</i>			
1.	Fixed-film reactor	<input type="checkbox"/>	10
2.	Activated sludge	<input type="checkbox"/>	15
3.	Stabilization ponds without aeration (ie: sewage lagoon)	<input checked="" type="checkbox"/>	5
4.	Stabilization ponds with aeration	<input type="checkbox"/>	8

TERTIARY TREATMENT <i>(choose all that apply)</i>			
1.	Polishing ponds for advanced waste treatment	<input type="checkbox"/>	2
2.	Chemical / physical advanced waste treatment without secondary treatment	<input type="checkbox"/>	15
3.	Chemical / physical advanced waste treatment following secondary treatment	<input type="checkbox"/>	10
4.	Biological or chemical / biological advanced waste treatment	<input type="checkbox"/>	12
5.	Nitrification by designed extended aeration only	<input type="checkbox"/>	5
6.	Ion exchange for advanced waste treatment	<input type="checkbox"/>	10
7.	Reverse osmosis, electrodialysis and other membrane filtration techniques	<input type="checkbox"/>	10
8.	Advanced waste treatment chemical recovery, carbon regeneration	<input type="checkbox"/>	4

Application for Wastewater Treatment Facility Classification

9.	Media filtration	<input type="checkbox"/>	5
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ADDITIONAL TREATMENT PROCESSES *(choose all that apply)*

1.	Chemical addition: <i>(Please list chemicals used, 2 pts per chemical to max. of 6)</i>	<input type="checkbox"/>	0 - 6
2.	Dissolved air floatation (other than for sludge thickening)	<input type="checkbox"/>	8
3.	Intermittent sand filter	<input type="checkbox"/>	2
4.	Recirculating intermittent sand filter	<input type="checkbox"/>	3
5.	Microscreens	<input type="checkbox"/>	5
6.	Generation of oxygen	<input type="checkbox"/>	5

SOLIDS HANDLING *(choose all that apply)*

1.	Storage (other than for stabilization)	<input type="checkbox"/>	2
2.	Stabilization by storage (including any storage afterwards)	<input type="checkbox"/>	4
3.	Gravity thickening	<input type="checkbox"/>	2
4.	Mechanical dewatering	<input type="checkbox"/>	8
5.	Anaerobic digestion of solids	<input type="checkbox"/>	10
6.	Utilization of digester gas for heating or cogeneration	<input type="checkbox"/>	5
7.	Aerobic digestion of solids	<input type="checkbox"/>	6
8.	Air-drying of sludge	<input type="checkbox"/>	2
9.	Solids reduction (including incineration and wet oxidation)	<input type="checkbox"/>	12
10.	Disposal in landfill	<input type="checkbox"/>	2
11.	Solids composting	<input type="checkbox"/>	10
12.	Land application of biosolids by contractor	<input type="checkbox"/>	2
13.	Land application of biosolids by facility personnel	<input type="checkbox"/>	10

Application for Wastewater Treatment Facility Classification

DISINFECTION (choose all that apply) (0 point minimum to 10 point maximum)			
1.	Chlorination	<input type="checkbox"/>	5
	Ultraviolet irradiation	<input type="checkbox"/>	
2.	Ozonization	<input type="checkbox"/>	10

EFFLUENT DISCHARGE (choose all that apply) (0 point minimum to 10 point maximum)			
1.	Discharge to surface water (ditch or lake or <u>Waskada Creek</u>)	<input checked="" type="checkbox"/>	0
2.	Mechanical post-aeration	<input type="checkbox"/>	2
3.	Direct recycling and reuse	<input type="checkbox"/>	6
4.	Land treatment and surface or subsurface disposal		4

INSTRUMENTATION (choose one) (0 point minimum to 6 point maximum)			
1.	SCADA or similar instrumentation systems are used to provide:		
	• Data with no process operation	<input type="radio"/>	0
	• Data with limited process operation	<input type="radio"/>	2
	• Data with moderate process operation	<input type="radio"/>	4
	• Data with extensive or total process operation	<input type="radio"/>	6

LABORATORY CONTROL ² (choose all that apply) (0 point minimum to 15 point maximum)			
1.	Bacteriological / Biological (0 point minimum to 5 point maximum)		
	• Lab work done outside the facility	<input checked="" type="checkbox"/>	0
	• Membrane filter procedures	<input type="checkbox"/>	3
	• Use of fermentation tubes or any dilution method of fecal coliform determination	<input type="checkbox"/>	5
2.	Chemical / Physical (0 point minimum to 10 point maximum)		
	• Lab work done outside the facility	<input type="checkbox"/>	0

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	<ul style="list-style-type: none"> • Push button or visual methods for simple tests such as pH or settleable solids <p>(List tests)</p>	<input type="checkbox"/>	3
	<ul style="list-style-type: none"> • Additional procedures such as DO, COD, BOD, gas analysis, titration, solids content or volatile content • BOD, TC and FC by mpn <p>(List tests)</p>	<input checked="" type="checkbox"/>	5
	<ul style="list-style-type: none"> • More advanced determinations such as specific constituents, nutrients, total oils or phenols <p>(List tests)</p>	<input type="checkbox"/>	7
	<ul style="list-style-type: none"> • Highly sophisticated instrumentation such as atomic absorption or gas chromatograph <p>(List tests)</p>	<input type="checkbox"/>	10

APPLICANT VERIFICATION	
I HEREBY DECLARE THAT ALL INFORMATION IN THIS APPLICATION IS TRUE.	
Name of Applicant ³ : (Print) Village of Waskada as per Diane Woodworth	
Title: CAO	
Telephone: (204) 673-2401	Fax: (204) 637-2663
Email: waskadan@mymts.net	
Signature of Authorized Representative: 	Date: 08/25/2014

¹The key concepts are frequency or intensity of deviation, or excessive variation from normal or typical fluctuations. The deviations in strength, toxicity, ratio of infiltration to inflow, or shock loads.

² The key concept is to credit laboratory analyses done on-site by facility personnel under the direction of an operator-in-charge with points from 0-15.

³ Applicant must be an authorized representative of the owner/operating authority (i.e. manager, P. Eng., or overall responsible operator).

Print Application Form

Wastewater Treatment Form Supplemental Information

This is supplemental information for completing the Application for Wastewater Treatment Facility Classification Form only.

For exact definitions and text refer to Manitoba Regulation 77/2003, Water and Wastewater Facility Operators Regulation and amendment M.R. 162/2005, under The Environment Act (C.C.S.M. c E125).

A copy of the regulation is available by following the link for Manitoba Regulations at: <http://www.gov.mb.ca/conservation/envapprovals/publs/index.html>

Facilities are classified as follows:

Small system class

A wastewater treatment facility that otherwise meets the criteria of a class 1 wastewater treatment facility shall be classified in the small system class if

- a) it treats wastewater from a population of no more than 500; and
- b) no mechanical treatment processes are employed at the facility.

Classes 1 to 4

Wastewater treatment facilities shall be classified in classes 1 to 4 in accordance with the following table, on the basis of the number of classification points assessed under the classification point system set out in the Water and Wastewater Facility Operators Regulation.

<u>Range of Classification Points</u>	<u>Classification</u>
0 to 30	Class 1
31 to 55	Class 2
56 to 75	Class 3
76 or more	Class 4

Size

Points for size: (2 point minimum to 20 point maximum)

Maximum population or part served, peak day (1 point minimum to 10 point maximum). Points are assigned at 1 point per 10,000 population or part.

Design flow average day or peak month's flow average day, whichever is larger (1 point minimum to 10 point maximum). Points are assigned at 1 point per 4.5 megalitres per day or part.

Authorized Representative

Signatures for the Applicant Verification section must be an individual recognized by the Owner of the facility as able to sign official documentation (i.e. P.Eng., Manager, CAO, etc).

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Certification Program**



Application for Wastewater Collection Facility Classification

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Telephone: (204) 673-2401

Contact Person: Diane Woodworth

Position: CAO

Cell or Pager: (204) 522-5129

Fax: (204) 673-2663

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Is this a REAPPLICATION? Yes
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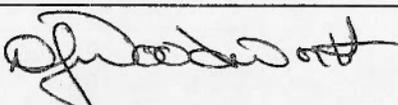
FOR MANITOBA CONSERVATION USE ONLY

Operation ID # _____
Stakeholder ID # _____
Approval ID # _____
EO/DWO _____

Application for Wastewater Collection Facility Classification

SYSTEM	
New or proposed facility seeking classification	<input type="checkbox"/>
Proposed start of operations (month/year) _____.	
Existing facility seeking classification (in operation prior to August 30, 2005)	<input checked="" type="checkbox"/>
Facility has been in operation since (approximate month/year) <u>~ July 1966</u> .	

SIZE (choose one)		
Population Served is LESS THAN or EQUAL TO 500 (small system)	<input checked="" type="radio"/>	
Population Served is 501 to 1,500 (class 1)	<input type="radio"/>	
Population Served is 1,501 to 15,000 (class 2)	<input type="radio"/>	
Population Served is 15,001 to 50,000 (class 3)	<input type="radio"/>	
Population Served is 50,001 or more (class 4)	<input type="radio"/>	

APPLICANT VERIFICATION	
I hereby declare that all information in this application is true.	
Name of Applicant ¹ (PRINT)	Village of Waskada as per Diane Woodworth
Title: CAO	
Telephone: (204) 673-2401	Fax: (204) 673-2663
Email waskadan@mymts.net	
Signature of Authorized Representative: 	Date: 08/25/2014

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