

FIELD EVALUATION SHEET

PRELIMINARY EVALUATION DATE 2015, FIELD EVALUATION DATE 7-30-16  
PROPERTY OWNER: Jerome + Beth Ryan PHONE 701 331 1570  
ADDRESS: 55241 201st Ave CITY, STATE, ZIP: West Concord MN 55985  
LEGAL DESCRIPTION: \_\_\_\_\_  
PIN# 19-0-047600 SEC     T     R     TWP NAME Logan  
FIRE#     LAKE/RIVER     LAKE CLASS     OHWL     FT.    

DESCRIPTION OF SOIL TREATMENT AREAS

	AREA #1	AREA #2	REFERENCE BM ELEV. _____ FT.
DISTURBED AREAS	YES <u>   </u> NO <u>X</u>	YES <u>   </u> NO <u>   </u>	REFERENCE BM DESCRIPTION _____
COMPACTED AREAS	YES <u>   </u> NO <u>X</u>	YES <u>   </u> NO <u>   </u>	_____
FLOODING	YES <u>   </u> NO <u>X</u>	YES <u>   </u> NO <u>   </u>	_____
RUN ON POTENTIAL	YES <u>   </u> NO <u>X</u>	YES <u>   </u> NO <u>   </u>	_____
SLOPE %	<u>0</u>	_____	_____
DIRECTION OF SLOPE	<u>NA</u>	_____	_____
LANDSCAPE POSITION	_____	_____	_____
VEGETATION TYPES	<u>Grass Hay</u>	_____	_____

DEPTH TO STANDING WATER OR MOTTLED SOIL: BORING# 1 6", 1A    , 2 6", 2A    

BOTTOM ELEVATION--FIRST TRENCH OR BOTTOM OF ROCK BED: #1     FT., #2     FT.

SOIL SIZING FACTOR: SITE #1 1.67, SITE #2    

CONSTRUCTION RELATED ISSUES: 36" sand base mound for proposed 4/br House

LIC# 211 SITE EVALUATOR SIGNATURE: Rod Kern

SITE EVALUATOR NAME: Rod Kern TELEPHONE# 839 4735

LUG REVIEW \_\_\_\_\_ DATE \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SOIL BORING LOGS ON REVERSE **APPROVED**

\_\_\_\_ ONSITE INSPECTION  
X NO ONSITE INSPECTION

SIGN [Signature] DATE 8/2/16



## SOILS CHARTS FOR BOTH PROPOSED AND ALTERNATE SITES

1 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-8"	Topsoil	
8-14"	Loam	10YR 6/2

2 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-8"	Topsoil	
8-14"	Loam	10YR 6/2

1 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR

2 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR

ADDITIONAL SOIL BORINGS MAY BE REQUIRED

## PUMP SELECTION PROCEDURE

### A. Determine pump capacity

#### Gravity distribution

1. Minimum is 10 GPM
2. Maximum is 45 GPM

#### Pressure Distribution

3. a. Select number of perforated laterals 3
- b. Select perforation spacing = 3 ft.
- c. Subtract 2 ft from rock layer length:  
50 - 2 = 48 feet (length of lateral)

#### ROCK LAYER LENGTH

- d. Determine the number of spaces between perforations:  
48 / 3 = 16 spaces  
(length of lateral) / (perforation spacing)
- e. 16 spaces + 1 = 17 perforations per lateral
- f. Multiply perforations per lateral by number of laterals to get total number of perforations:  
17 x 3 = 51  
(perforations/lateral) x (laterals) = (perforations)
- g. 51 x .74 = 37.7 GPM  
(Perforations) x (gpm/perforation)

SELECTED PUMP CAPACITY 37.7 GPM

### B. Determine head requirements:

1. Elevation difference between pump & point of discharge:  
8 feet
2. If pumping to a pressure distribution system, add 5 feet; for gravity add zero: 5 feet
3. Friction Loss

- a. Enter friction loss table with GPM and pipe diameter. Read friction loss in feet per 100 ft in table.  
F.L. = 2.64 ft/100 of pipe
- b. Determine total pipe length from pump to discharge point. Add 25% to pipe length for fitting loss.  
30 length x 1.25 = 37.25 feet
- c. Calculate total friction loss by multiplying friction loss in 100 ft. of pipe by equivalent pipe length (B):

Total friction loss = 2.64 x 37.25 / 100 = .99 feet

4. Total head required is the sum of the elevation difference, special head requirements and total friction loss:

$$\frac{8}{(1)} + \frac{5}{(2)} + \frac{.99}{(3)} \text{ TOTAL HEAD } \underline{13.99}$$

SELECT A PUMP TO DELIVER AT LEAST 37.7 GPM WITH AT LEAST 13.9 FEET OF TOTAL HEAD.

If laterals are connected to a header pipe in a pressure system, select the minimum size lateral diameter; enter the table with perforation spacing and the number of perforations per lateral.

Select minimum size of lateral 1 1/2

For a center manifold system the values will be 1/2 of above.

### Perforation Discharges in GPM

Head (feet)	Perforation diameter (inches)	
	7/32	1/4
1.0a	0.56	0.74
1.5	0.69	0.90
2.0b	0.80	1.04

- a. Use 1.0 feet single bottom
- b. Use 2.0 feet for anything else

### FRICTION LOSS IN PLASTIC PIPE

Flow Rate GPM	1.5"	2"	3"
20	2.47	0.73	0.11
25	3.73	1.11	0.16
30	5.23	1.55	0.23
35	6.96	2.06	0.30
40	8.91	2.64	0.39
45	11.07	3.28	0.48
50	13.46	3.99	0.58
55		4.76	0.70
60		5.60	0.82
65		6.48	0.95
70		7.44	1.09

### Max. No. of 1/4" perforations per lateral. (10% max)

Perforation spacing (feet)	1 1/4" perforations		
	1 1/4"	1 1/2"	2"
2.5 feet	14	18	28
3.0 feet	13	17	26
3.3 feet	12	16	25
4.0 feet	11	15	23
5.0 feet	10	14	22

# MINIMUM MOUND SIZE

1. Subtract rock layer width from absorption width to obtain minimum downslope berm toe

$$20 \text{ ft} - 10 \text{ ft} = 10 \text{ feet}$$

2. Determine depth of clean sand fill at upslope edge of rock layer:

$$\text{Separation } X = 0 \text{ ft} = 3 \text{ feet}$$

3. Add depth of clean sand for separation (2) at upslope edge, depth of rock layer (1 ft) to depth of cover (1 ft) to find the mound height at upslope edge of rock layer:

$$3 \text{ ft} + 1 \text{ ft} + 1 \text{ ft} = 5 \text{ feet}$$

4. Enter table with landslope and upslope berm ratio. Select berm multiplier 4

5. Multiply berm multiplier by upslope mound height to find upslope berm width:

$$4 \times 5 = 20 \text{ feet}$$

6. Multiply rock layer width (K) by landslope to determine drop in elevation:

$$5 \times 0 \% \div 100 = 0 \text{ feet}$$

7. Add depth of clean sand for slope difference (6) at downslope edge to the mound height at the upslope edge of rock layer (3) to find the downslope height:

$$5 \text{ ft} + 0 \text{ ft} = 5 \text{ feet}$$

8. Enter table with landslope and downslope berm ratio. Select berm multiplier of 4

9. Multiply berm multiplier by downslope mound height to get downslope berm width:

$$5 \times 4 = 20 \text{ feet}$$

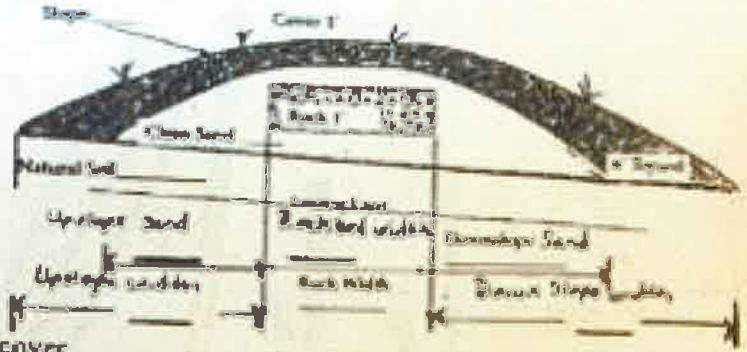
10. Compare the values of Step (1) 10 and Step(9) 20. Select the greater of the two values as the downslope berm width: 20 feet

11. Total mound width is the sum of upslope berm width (5) plus rock layer width (K) plus downslope berm width (9):

$$20 \text{ ft} + 10 \text{ ft} + 20 \text{ ft} = 50 \text{ feet}$$

12. Total mound length is the sum of upslope berm width (5) plus rock layer length (L) plus upslope berm width (5):

$$20 \text{ ft} + 50 \text{ ft} + 20 \text{ ft} = 90 \text{ feet}$$



BERM SLOPE MULTIPLIER

Land Slope, %	DOWNSLOPE berm multiplier for various berm slope ratios					UPSLOPE berm multiplier for various berm slope ratios				
	3:1	4:1	5:1	6:1	7:1	3:1	4:1	5:1	6:1	7:1
0	3.0	4.0	5.0	6.0	7.0	3.0	4.0	5.0	6.0	7.0
1	3.09	4.11	5.20	6.38	7.53	3.09	4.07	4.36	5.66	6.74
2	3.19	4.25	5.36	6.62	7.84	3.19	4.20	4.54	5.78	6.89
3	3.30	4.54	5.68	7.12	8.36	3.30	4.37	4.69	5.96	7.10
4	3.41	4.76	6.25	7.69	8.91	3.41	4.45	4.77	6.04	7.20
5	3.53	5.09	6.87	8.47	9.57	3.53	4.53	4.86	6.10	7.31
6	3.66	5.26	7.34	9.38	10.27	3.66	4.59	4.95	6.16	7.42
7	3.80	5.56	7.89	10.34	11.01	3.80	4.67	5.04	6.22	7.53
8	3.95	5.88	8.43	11.34	11.79	3.95	4.74	5.13	6.28	7.64
9	4.11	6.23	9.09	12.40	12.62	4.11	4.81	5.22	6.34	7.75
10	4.29	6.61	9.80	13.53	13.51	4.29	4.88	5.31	6.40	7.86
11	4.48	7.01	10.59	14.73	14.45	4.48	4.95	5.40	6.46	7.97
12	4.68	7.44	11.47	16.01	15.44	4.68	5.02	5.49	6.52	8.08

Note: The product of the multiplier and the height results in the horizontal distance in feet. The berm starts the original land slope. Example: Height at upper edge of rock layer is 5.0 feet, rock layer is 10 feet wide, land slope is 4% and berm slope ratio is 3:1. Upslope berm width is 5.27 x 5.0 = 26.35 ft. Height at lower edge of rock layer is 7.0 x 6.0 = 42.0 ft and downslope berm width is 5.26 x 42.0 = 220.9 ft.

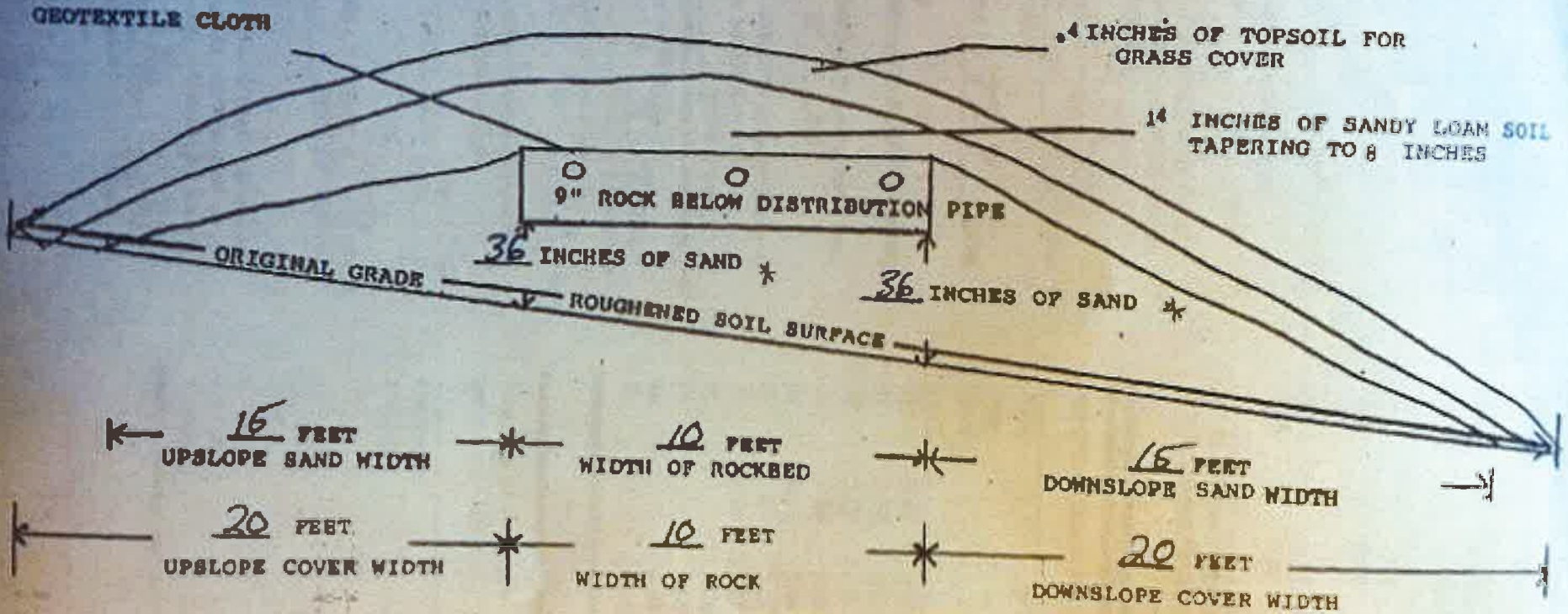
Final Cover Dimension

$$50 \times 90$$

ROUND CROSS-SECTION

0 PERCENT SLOPE OF ORIGINAL SOIL

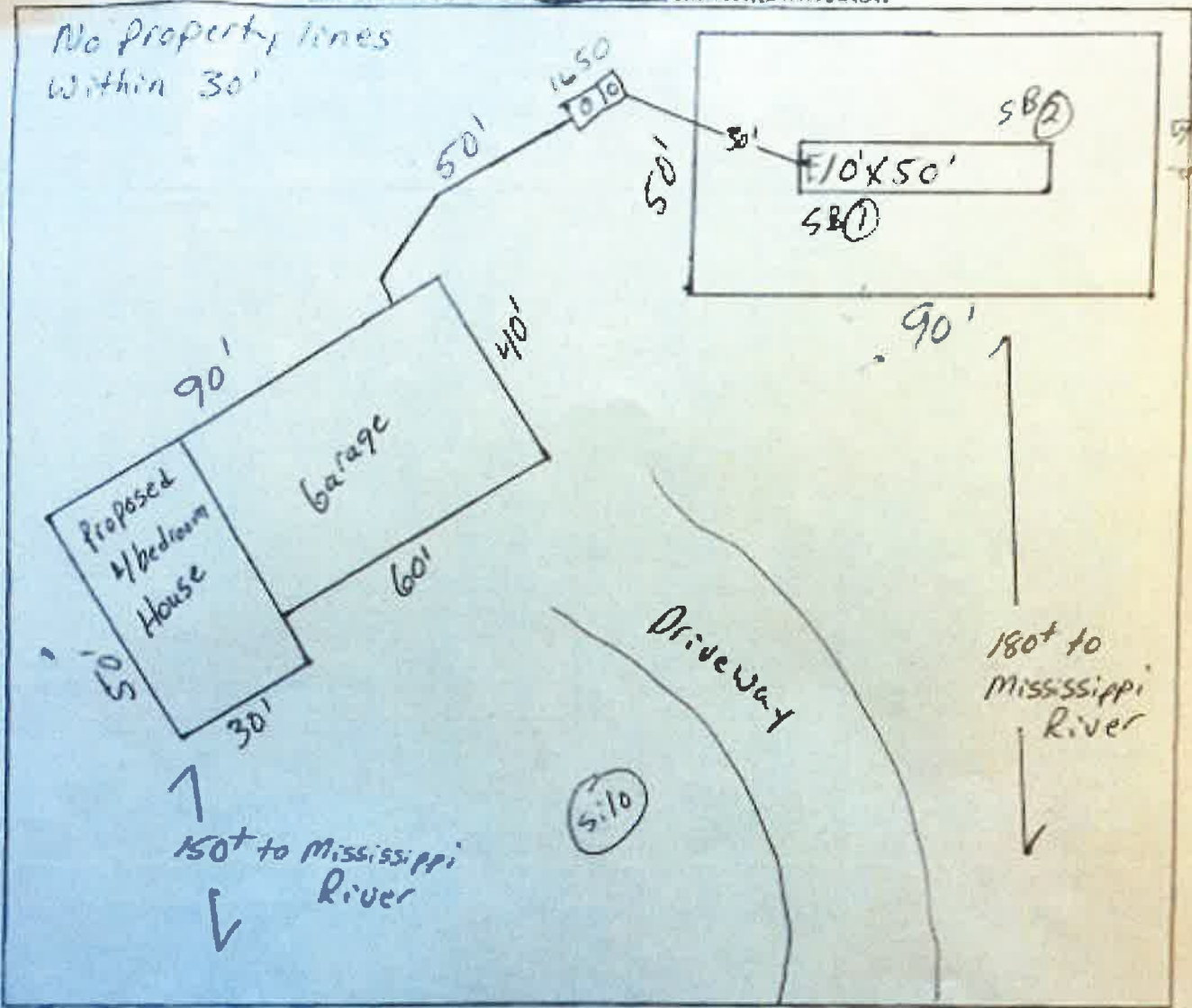
10 FT. x 50 FT. SIZE OF ROCKBED 40 FT. x 80 FT. SIZE OF SANDBASE



CLIENT: Ryan

DATE: 8-1-16

MAP DRAWN TO SCALE WITH A NORTH ARROW



**CHECK OFF LIST-HAVE ALL OF THE FOLLOWING BEEN DRAWN ON THE MAP??**

- SHOW EXISTING OR PROPOSED
- WATER WELLS WITHIN 100 FT OF TREATMENT AREAS
  - PRESSURE WATER LINES WITHIN 10 FT OF TREATMENT AREAS
  - STRUCTURES
  - ALL SOIL TREATMENT AREAS
  - HORIZONTAL AND VERTICAL REFERENCE
  - POINT OF SOIL BORINGS
  - LOT EASEMENTS
  - DISTURBED/COMPACTED AREAS
  - SITE PROTECTION-LATH AND RIBBON EVERY 15 FT
  - ACCESS ROUTE FOR TANK MAINTENANCE
- REQUIRED SETBACKS
- STRUCTURES
  - CHNL
  - LOT IMPROVEMENTS
  - ALL ISTS COMPONENTS
  - DIRECTION OF SLOPE
  - ALL LOT DIMENSIONS
  - PROPERTY LINES

**INDICATE ELEVATIONS**

- BENCHMARK
- ELEVATION OF SEWER LINE @ HOUSE 102
  - ELEVATION @ TANK INLET 101
  - ELEVATION @ BOTTOM OF ROCK LAYER 97
  - ELEVATION @ BOTTOM OF BORING OR RESTRICTIVE LAYER 100.5
  - ELEVATION OF PUMP 105
  - ELEVATION OF DISTRIBUTION DEVICE 96.35

DESIGNER SIGNATURE [Signature]  
LICENSE# 211

DATE 8-1-16

AITKIN COUNTY ENVIRONMENTAL SERVICES

APPLICATION for an  
OPERATING PERMIT FOR WASTEWATER TREATMENT AND DISPERSAL

PERMITTEE Jerome Ryan PARCEL NUMBER \_\_\_\_\_

ADDRESS ~~5027~~ 47391 Great River Road

LEGAL DESCRIPTION \_\_\_\_\_

TELEPHONE # 7013311570 GIS LOCATION \_\_\_\_\_

A. DESCRIPTION OF WASTEWATER TREATMENT AND DISPERSAL SYSTEM:  
(Attach ISTS site evaluation and design; estimated cost of system construction, operation, monitoring, service, component replacement, and management; anticipated system life, hydraulic and organic loading rates)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. MONITORING PLAN AND REPORTING FREQUENCY:

PARAMETER	COMPLIANCE LIMIT	SAMPLE LOCATION	SAMPLE FREQUENCY	SAMPLE TYPE	REPORTING FREQUENCY
FLOW	600	Event	Monthly	Record log	Annually
5-DAY BOD		Counter		120 gallons per event	
TOTAL NITROGEN					
TOTAL PHOSPHORUS					
TSS					
FATS, OILS AND GREASE					
FECAL COLIFORM					
SEPARATION DISTANCE	3ft				

\_\_\_\_\_  
\_\_\_\_\_

Rod Kern will perform the monitoring of this septic system.



MAINTENANCE PLANS

PARAMETER	LOCATION	FREQUENCY

D. MITIGATION PLAN:

IF Mound leaks, extend Slopes.

I hereby certify with my signature as the designer, that all data for the operating permit application is true and correct to the best of my knowledge. I agree to indemnify and hold Aitkin County harmless from loses, damages, costs and charges that may be incurred by the County because of the information submitted with this application.

Rod Kern  
Signature

211  
License Number

8-2-16  
Date

Rod Kern  
Name (please print)

\_\_\_\_\_  
Address

8394735-  
Telephone #

**MAINTENANCE SERVICE, MONITORING AND INSPECTION  
CONTRACT  
FOR INDIVIDUAL SEWAGE TREATMENT SYSTEM**

It is hereby agreed this 2 day of August, 2016 by and between  
Red Kern (Inspector) and Jerome Ryan (client)

(Client) Name & Address

Jerome Ryan

Street Address 47391 Great River Rd

City, State, Zip Palisade MN 56469

That in consideration of the payments provided herein, the Inspector shall provide services to perform Preventative Maintenance, Monitoring and Inspection of the Individual Sewage Treatment System (ISTS) located at the property described in the Aitkin County Operating Permit.

Each inspection includes an examination of the ISTS followed by a written report to the client. This inspection report shall contain recommendations for operation and maintenance for failure-preventative measures, if any are deemed appropriate by the inspector and a list of recommended corrective measures or replacement parts. The inspector is authorized to submit a copy of the report to the Aitkin County Environmental Services Department.

This contract does not assume any responsibilities or obligations, which are normally the responsibilities of the Client, as related to parts or labor and does not extend to cover any costs that may be associated with any recommendations made under this contract.

The Inspector can only contract or subcontract for parts or labor after authorization. Billings for service calls shall be made on a case by case basis. This contract only covers maintenance, monitoring and inspection services per current Aitkin County Operating Permit and does not cover alarm calls of any kind.

The Inspector shall be provided access to the site and the system in order to perform the following services:

**SEPTIC TANK AND LIFT STATIONS INSPECTION**

(check the boxes needed to fill the requirements of the Operating Permit)

Check septic tank and compartments for solids buildup and general appearance. If necessary, have tanks pumped (cost of pumping is the responsibility of the client).

Check effluent filter for buildup and clean, if applicable.

Check pumping system, including control panel and floats.

Record and date the readings of the elapsed time meter and cycle counter(s), if applicable.

Check dosing settings (in the control panel, if applicable).

Other: \_\_\_\_\_  
\_\_\_\_\_

\*\*If the septic tank or lift stations need pumping to be in compliance with the operating permit the cost of the pumping is the responsibility of the Client.

### TREATMENT DEVICE

Inspect pretreatment unit (aerobic tank, sand filter, etc.) per manufacturer's recommendations, if applicable.

Inspect and clean any parts per manufacturer's recommendations.

Inspect and clean laterals, if applicable.

Inspect the appearance of the wastewater inside the unit for color, turbidity and examination of odors.

Sample effluent per Operating Permit monitoring requirements.

(Cost of sampling and analysis is the responsibility of the Client)

Other: \_\_\_\_\_  
\_\_\_\_\_

### DISPERSAL FIELD

Inspect for visible signs of failure (surface discharge, soggy ground, wet spots, settling, etc.)

If liquid level monitors are installed, levels will be observed and recorded.

Flush filters and clean cartridges, if applicable.

Check field control unit solenoid operations or manual control, if applicable.

Other: \_\_\_\_\_  
\_\_\_\_\_

In no event shall the Inspector be responsible for special or consequential damages, including but not limited to, loss of time, injury to personal property or any other consequential damages or incidental or economic loss due to equipment failure or for any other reason. This contract does not assume any responsibilities or obligations, which are normally, the responsibility of the Client or as, related to parts or labor and does not extend to cover any costs that may be associated with any recommendations made under this contract.

This contract shall be effective: Beginning August, 2016  
and Ending August, 2017

Cost for Maintenance Service, Monitoring and Inspection Contract is:

\$ \_\_\_\_\_ /yr. For \_\_\_\_\_ years totaling \$ \_\_\_\_\_

The Inspector agrees to provide inspection, monitoring and routine maintenance service **only under** this contract. The Client remedies for breach of this contract shall be limited to refund of any of the amounts paid in advance for service. This contract may be renewed 30 days from the ending date.

Payment for all services shall be paid \_\_\_\_\_

**Client:**

**Inspector:**

Sign: \_\_\_\_\_

Sign: \_\_\_\_\_

Print: \_\_\_\_\_

Print: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_