Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Compliance Inspection Form

Existing Subsu[illegible] Sewage Treatment Systems (SSTS)

170185000

Inspection results based on Minnesota Pollution Control Agency (MPCA) requirements and attached forms – additional local requirements may also apply.

Submit completed form to Local Unit of Government (LUG) and system owner within 15 days

For local tracking purposes:

System Status

System status on date (mm/dd/yyyy): 8-11-16

☒ **Compliant – Certificate of Compliance**
(Valid for 3 years from report date, unless shorter time frame outlined in Local Ordinance.)

☐ **Noncompliant – Notice of Noncompliance**
(See Upgrade Requirements on page 3.)

Reason(s) for noncompliance *(check all applicable)*

- ☐ Impact on Public Health *(Compliance Component #1) – Imminent threat to public health and safety*
- ☐ Other Compliance Conditions *(Compliance Component #3) – Imminent threat to public health and safety*
- ☐ Tank Integrity *(Compliance Component #2) – Failing to protect groundwater*
- ☐ Other Compliance Conditions *(Compliance Component #3) – Failing to protect groundwater*
- ☐ Soil Separation *(Compliance Component #4) – Failing to protect groundwater*
- ☐ Operating permit/monitoring plan requirements *(Compliance Component #5) – Noncompliant*

Property Information

Parcel ID# or Sec/Twp/Range: 170185000

Property address: 13856 E. Big Cormorant Rd

Reason for inspection: County

Property owner: Chris Leach

Owner's phone: 218-234-6898

or

Owner's representative: _____

Representative phone: _____

Local regulatory authority: _____

Regulatory authority phone: _____

Brief system description: Concrete 2/c tank w/ lift to Drainfield

Comments or recommendations:

RECEIVED
AUG 24 2016
ZONING

Certification

I hereby certify that all the necessary information has been gathered to determine the compliance status of this system. No determination of future system performance has been nor can be made due to unknown conditions during system construction, possible abuse of the system, inadequate maintenance, or future water usage.

Inspector name: David Ohm

Certification number: 2228

Business name: Ohm Excavating

License number: 932

Inspector signature: [signature]

Phone number: 218-234-1256

Necessary or Locally Required Attachments

☒ Soil boring logs ☒ System/As-built drawing ☐ Forms per local ordinance

☐ Other information (list): _____

Property address: _____ Inspector initials/Date: 8-11-16 (mm/dd/yyyy)

1. Impact on Public Health – Compliance component #1 of 5

Compliance criteria:	
System discharges sewage to the ground surface.	☐ Yes ☒ No
System discharges sewage to drain tile or surface waters.	☐ Yes ☒ No
System causes sewage backup into dwelling or establishment.	☐ Yes ☑ No

Any "yes" answer above indicates the system is an imminent threat to public health and safety.

Comments/Explanation:

Verification method(s):

- ☒ Searched for surface outlet
- ☒ Searched for seeping in yard/backup in home
- ☐ Excessive ponding in soil system/D-boxes
- ☒ Homeowner testimony *(See Comments/Explanation)*
- ☐ "Black soil" above soil dispersal system
- ☐ System requires "emergency" pumping
- ☐ Performed dye test
- ☐ Unable to verify *(See Comments/Explanation)*
- ☐ Other methods not listed *(See Comments/Explanation)*

2. Tank Integrity – Compliance component #2 of 5

Compliance criteria:	
System consists of a seepage pit, cesspool, drywell, or leaching pit. *Seepage pits meeting 7080.2550 may be compliant if allowed in local ordinance.*	☐ Yes ☒ No
Sewage tank(s) leak below their designed operating depth. If yes, which sewage tank(s) leaks:	☐ Yes ☒ No

Any "yes" answer above indicates the system is failing to protect groundwater.

Comments/Explanation:

Verification method(s):

- ☑ Probed tank(s) bottom
- ☐ Examined construction records
- ☐ Examined Tank Integrity Form *(Attach)*
- ☐ Observed liquid level below operating depth
- ☐ Examined empty (pumped) tanks(s)
- ☒ Probed outside tank(s) for "black soil"
- ☐ Unable to verify *(See Comments/Explanation)*
- ☐ Other methods not listed *(See Comments/Explanation)*

3. Other Compliance Conditions – Compliance component #3 of 5

a. Maintenance hole covers are damaged, cracked, unsecured, or appear to be structurally unsound. ☐ Yes* ☑ No ☐ Unknown

b. Other issues *(electrical hazards, etc.)* to immediately and adversely impact public health or safety. ☐ Yes* ☒ No ☐ Unknown
System is an imminent threat to public health and safety.

Explain:

c. System is non-protective of ground water for other conditions as determined by inspector. ☐ Yes* ☒ No
System is failing to protect groundwater.

Explain:

Property address: _____ Inspector initials/Date: DD 8-11-16 (mm/dd/yyyy)

4. Soil Separation – Compliance component #4 of 5

Date of installation: 2001 (mm/dd/yyyy) ☐ Unknown

Shoreland/Wellhead protection/Food beverage lodging? ☒ Yes ☐ No

Compliance criteria:

For systems built prior to April 1, 1996, and not located in Shoreland or Wellhead Protection Area or not serving a food, beverage or lodging establishment: Drainfield has at least a two-foot vertical separation distance from periodically saturated soil or bedrock.	☐ Yes ☐ No
Non-performance systems built April 1, 1996, or later or for non-performance systems located in Shoreland or Wellhead Protection Areas or serving a food, beverage, or lodging establishment: Drainfield has a three-foot vertical separation distance from periodically saturated soil or bedrock.*	☒ Yes ☐ No
"Experimental", "Other", or "Performance" systems built under pre-2008 Rules; Type IV or V systems built under 2008 Rules (7080. 2350 or 7080.2400 (Advanced Inspector License required) Drainfield meets the designed vertical separation distance from periodically saturated soil or bedrock.	☐ Yes ☐ No

Any "no" answer above indicates the system is failing to protect groundwater.

Verification method(s):

Soil observation does not expire. Previous soil observations by two independent parties are sufficient, unless site conditions have been altered or local requirements differ.

☒ Conducted soil observation(s) *(Attach boring logs)*
☐ Two previous verifications (*Attach boring logs)*
☐ Not applicable *(Holding tank(s), no drainfield)*
☐ Unable to verify *(See Comments/Explanation)*
☐ Other *(See Comments/Explanation)*

Comments/Explanation:

0-4 Sandy loyr 3/3 Black
5-40 Sand loyr 5/4 Brown
41-66 Sand loyr 7/4
Damp Silt

Indicate depths or elevations

A. Bottom of distribution media	18"
B. Periodically saturated soil/bedrock	66"
C. System separation	48"
D. Required compliance separation*	36"

*May be reduced up to 15 percent if allowed by Local Ordinance.

5. Operating Permit and Nitrogen BMP* – Compliance component #5 of 5 ☒ Not applicable

Is the system operated under an Operating Permit? ☐ Yes ☐ No **If "yes", A below is required**

Is the system required to employ a Nitrogen BMP? ☐ Yes ☐ No **If "yes", B below is required**

BMP = Best Management Practice(s) specified in the system design

If the answer to both questions is "no", this section does not need to be completed.

Compliance criteria

a. Operating Permit number: _____ Have the Operating Permit requirements been met?	☐ Yes ☐ No
b. Is the required nitrogen BMP in place and properly functioning?	☐ Yes ☐ No

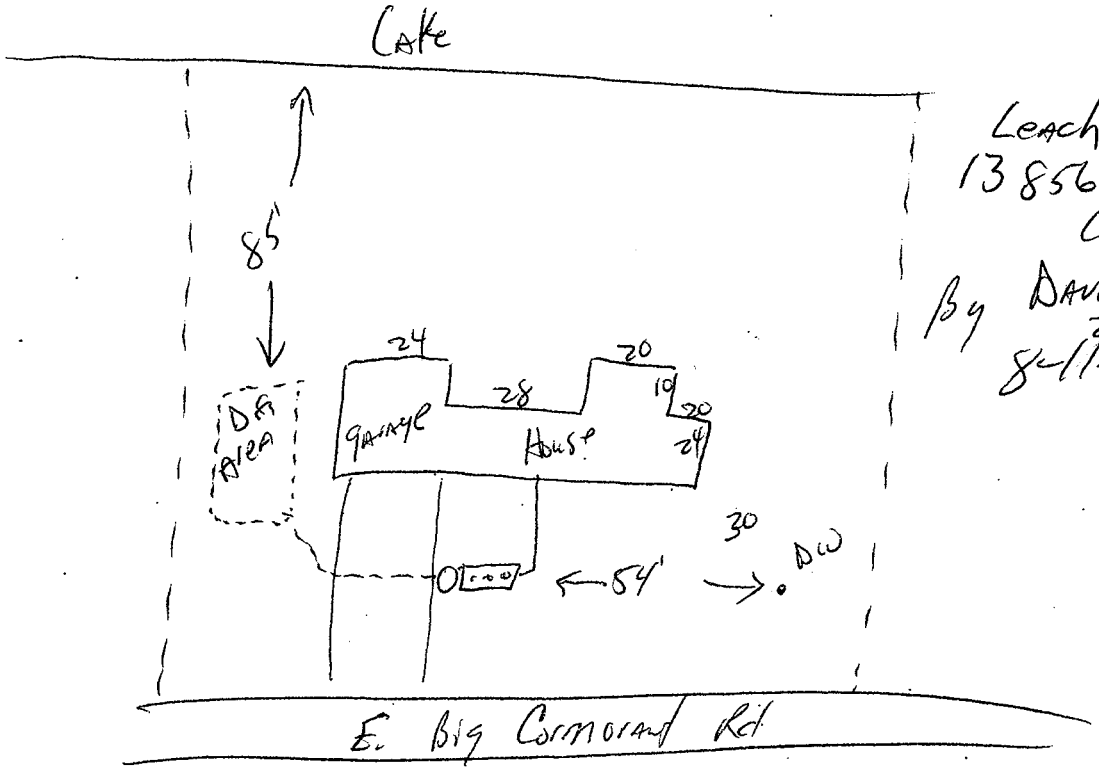
Any "no" answer indicates Noncompliance.

Upgrade Requirements *(Minn. Stat. § 115.55) An imminent threat to public health and safety (ITPHS) must be upgraded, replaced, or its use discontinued within ten months of receipt of this notice or within a shorter period if required by local ordinance. If the system is failing to protect ground water, the system must be upgraded, replaced, or its use discontinued within the time required by local ordinance. If an existing system is not failing as defined in law, and has at least two feet of design soil separation, then the system need not be upgraded, repaired, replaced, or its use discontinued, notwithstanding any local ordinance that is more strict. This provision does not apply to systems in shoreland areas, Wellhead Protection Areas, or those used in connection with food, beverage, and lodging establishments as defined in law.*

SKETCH OF PROPERTY

Please sketch all structures and septic systems on the property;
Include setbacks and wells within 100 feet of the property.

PARCEL	
APP	SEPTIC INSPECTION
YEAR	



Leach
13856 E. Big Corm. Rd
By David Oh-
2228
8-11-16

PERMIT MUST BE POSTED AT THE CONSTRUCTION SITE

Becker County Planning & Zoning
835 Lake Ave, P O Box 787
Detroit Lakes, MN 56502-0787
Phone (218)-846-7314; Fax (218)-846-7266

Onsite Septic System Site Evaluation/Design Tax Parcel Number 17.0185.000 911 Address EAST BIG CORMORANT Rd

Legal Description: .34ac - beg 221'S & 218'SE of NW Cor lot 2.... Section 18 TWP 138 Range 42

Lake Name B. CORMORANT Lake Classification RD Township Name LAKE EUNICE

Owner's Name CHRIS LEACH Address 1215 LONG AVE. # 303

City DETROIT LAKES, MN State/Zip 56501 Phone Number 846-9648

Number of Bedrooms 3
Design Flow 450 GPD

Well Casing Depth TO BE DRILLED
Depth of other Wells within 100 ft of system +50

Garbage Disposal (Yes) (No)
Grinder Pump/Lift Station In House (Yes) (No)

Type of Observation: Probe Pit (Boring)
Original Soil (Yes) (No) Compacted Soil (Yes) (No)
Depth to Restricting Layer 36"
Maximum of Depth of System
Perc Rate SAND Soil Sizing Factor .83

Proposed Design
( ) Replace Septic Tank
(X) Septic Tank/Drainfield
( ) Drainfield Only
( ) Holding Tank
(X) Lift Station

Type of Drainfield
( ) Standard (gravelless/chamber)
( ) Standard (rock depth _____)
( ) Standard Bed
(X) Mound ( ) At Grade
( ) Pressurized Bed

SOIL BORING LOG

DEPTH (INCHES)	TEXTURE	COLOR & MUNSELL NO.	STRUCTURE
0-36	SAND	MIXED	BLOCKY PLATY PRISMATIC NONE
36"	WATER		BLOCKY PLATY PRISMATIC NONE
			BLOCKY PLATY PRISMATIC NONE
			BLOCKY PLATY PRISMATIC NONE

SOIL BORING LOG

DEPTH (INCHES)	TEXTURE	COLOR & MUNSELL NO.	STRUCTURE
0-30	SAND	MIXED	BLOCKY PLATY PRISMATIC NONE
30+	WATER		BLOCKY PLATY PRISMATIC NONE
			BLOCKY PLATY PRISMATIC NONE
			BLOCKY PLATY PRISMATIC NONE

Type of alarm Device on lift Station or Holding tank
EXPC.

Attach perc test Information if Required

Name and Address of Designer GRANT Ohm, Audubon, MN Phone 439-6428

MPCA Number 932 Date of Site Evaluation 9-10-00 Signature of Designer Grant Ohm

Name of Installer (if different from Designer) _____ MPCA Number _____

FOR USE BY BECKER COUNTY ENVIRONMENTAL SERVICES DEPARTMENT ONLY

*** Any changes to the permit must first be approved by Becker County Planning & Zoning. No system shall be covered up without inspection by Becker County Planning & Zoning.

*** Inspections must be scheduled at least 24 hours prior to time requested.

Date Received 8/27/01 Application Fee 75.00 State Surcharge 0 Total 75.00

[ ] Application is hereby denied
[X] Application is hereby granted to Chris Leach to install an individual septic system according to the specifications of the site evaluation and design submitted to the Becker County Environmental Services Office. By Order of:

Nancy Young
Signature of Becker County Qualified Employee

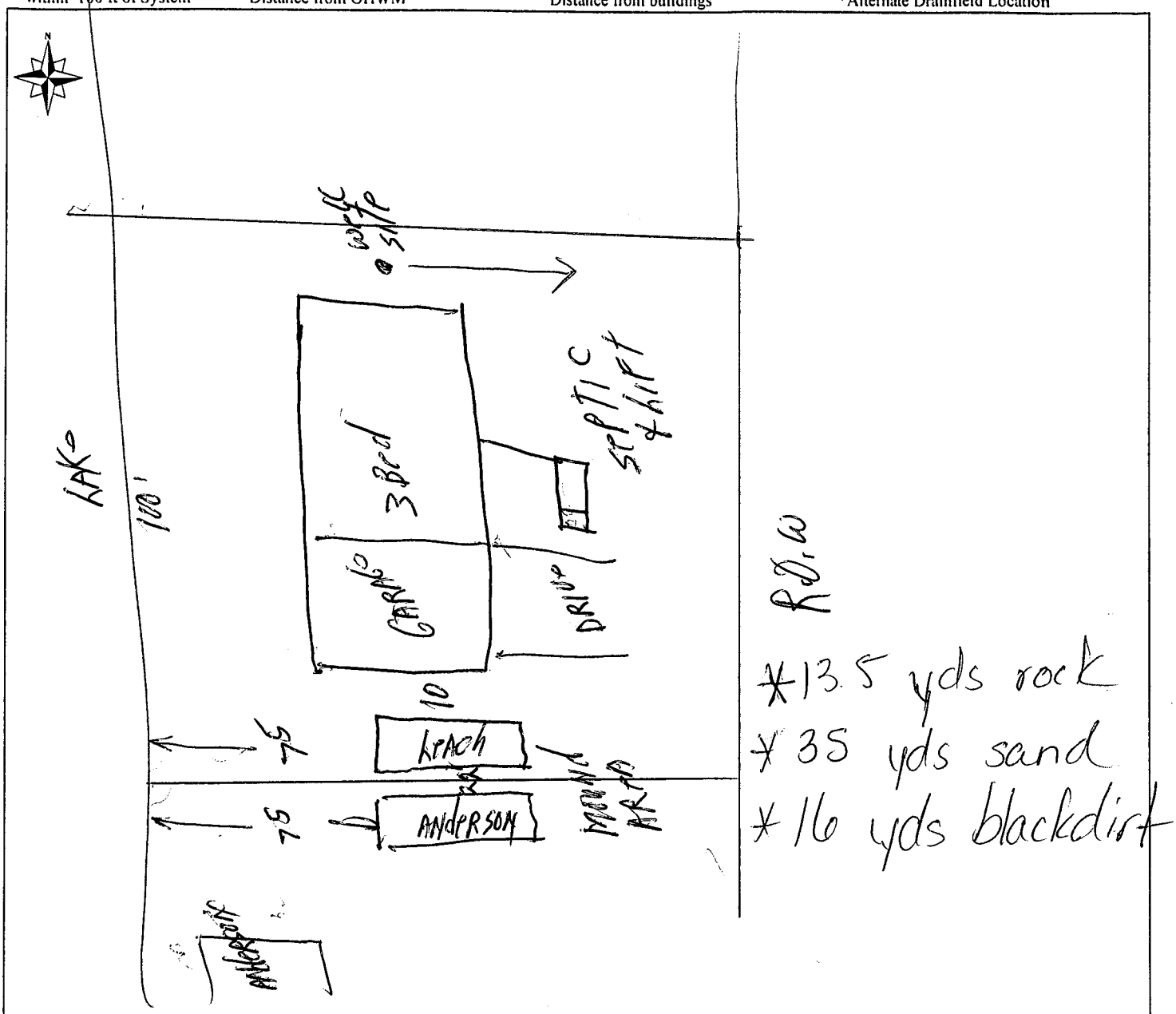
8/28/01
Date Permit Issued

16557a
Permit Number

This permit expires on 8/28/02

The site plan must be drawn to dimension or to scale:

*Dimensions of Lot
*Well & Water Line Locations within 100 ft of System
*Existing & Proposed Buildings
*Distance from Property Lines
*Distance from OHWM
*Easements & setbacks
*Tank Access Route
*Distance from buildings
*Scale - One inch = _____ ft.
*Location of any Unsuitable Soil
*Soil Borings & Per Test Locations
*Alternate Drainfield Location



	Tank (estimated)	Tank (actual)	Drainfield (estimated)	Drainfield (actual)
Distances to Well	50	51'	75	+50'
Distance to Building	10	+10'	10	10' from garage
Distance to Property Line	150	+10'	2	PLA
Distance to Pressure Line	5	+10'	1	+10'
Distance to Ordinary High Water	110	+75'	75	75'

Tank size 1000
Lift station size 500
Drainfield size 375
Pump HP N/A
Date Installed 8/27-8/28/01

FOR USE BY BECKER COUNTY ENVIRONMENTAL SERVICES DEPARTMENT ONLY

CERTIFICATE OF COMPLIANCE

( ) Certificate Is Hereby Denied

(✓) Certificate is Hereby Granted Based upon the Application, addendum from, plans, specifications and all other supporting data. With property maintenance, this system can be expected to function satisfactory, however, this is not a guarantee.

Nancy Young — Signature
Zoning Inspector — Title
8/28/01 — Date

(Certificate of Compliance is not valid unless signed by a Registered Qualified Employee)

PROPERTY LINE AGREEMENT

I Vondale A Anderson, give Chris Leach, permission to have their sewer system closer than the required 10 feet to the lot line.

SIGNED Vondale A Anderson

DATE 10 25 2000

PERMIT MUST BE POSTED AT THE CONSTRUCTION SITE

Becker County Planning & Zoning
835 Lake Ave, P O Box 787
Detroit Lakes, MN 56502-0787
Phone (218)-846-7314; Fax (218)-846-7266

Onsite Septic System Site Evaluation/Design Tax Parcel Number _____ 911 Address _____

Legal Description: _____ Section _____ TWP _____ Range _____

Lake Name _____ Lake Classification _____ Township Name _____

Owner's Name Chris Leach Address _____

City _____ State/Zip _____ Phone Number _____

Number of Bedrooms 3
Design Flow 450 GPD

Well Casing Depth NA
Depth of other Wells within 100 ft of system >50'

Garbage Disposal ~~(Yes)~~ (No)
Grinder Pump/Lift Station In House ~~(Yes)~~ (No)

Type of Observation: Probe Pit Boring
Original Soil (Yes) (No) Compacted Soil (Yes) (No)
Depth to Restricting Layer ~~3~~ >3'
Maximum of Depth of System NA
Perc Rate 18mpI Soil Sizing Factor _____

Proposed Design
( ) Replace Septic Tank
(X) Septic Tank/Drainfield
( ) Drainfield Only
( ) Holding Tank
(X) Lift Station

Type of Drainfield
( ) Standard (gravelless/chamber)
( ) Standard (rock depth _____)
( ) Standard Bed
(X) Mound ( ) At Grade
( ) Pressurized Bed

SOIL BORING LOG

DEPTH (INCHES)	TEXTURE	COLOR & MUNSELL NO.	STRUCTURE
0"-8"	loam		BLOCKY PLATY PRISMATIC NONE
8"-36"	sandy loam		BLOCKY PLATY PRISMATIC NONE
			BLOCKY PLATY PRISMATIC NONE
			BLOCKY PLATY PRISMATIC NONE

SOIL BORING LOG

DEPTH (INCHES)	TEXTURE	COLOR & MUNSELL NO.	STRUCTURE
			BLOCKY PLATY PRISMATIC NONE
			BLOCKY PLATY PRISMATIC NONE
			BLOCKY PLATY PRISMATIC NONE
			BLOCKY PLATY PRISMATIC NONE

Attach Perc Test Information If Required

Name and Address of Designer Tony Stemper Phone 846-1575

MPCA Number 388 Date of Site Evaluation 5-03-00 Signature of Designer _____

Name of Installer (if different from Designer) _____ MPCA Number _____

FOR USE BY BECKER COUNTY ENVIRONMENTAL SERVICES DEPARTMENT ONLY

*** Any changes to the permit must first be approved by Becker County Planning & Zoning. No system shall be covered up without inspection by Becker County Planning & Zoning.

*** Inspections must be scheduled at least 24 hours prior to time requested.

Date Received _____ Application Fee _____ State Surcharge _____ Total _____

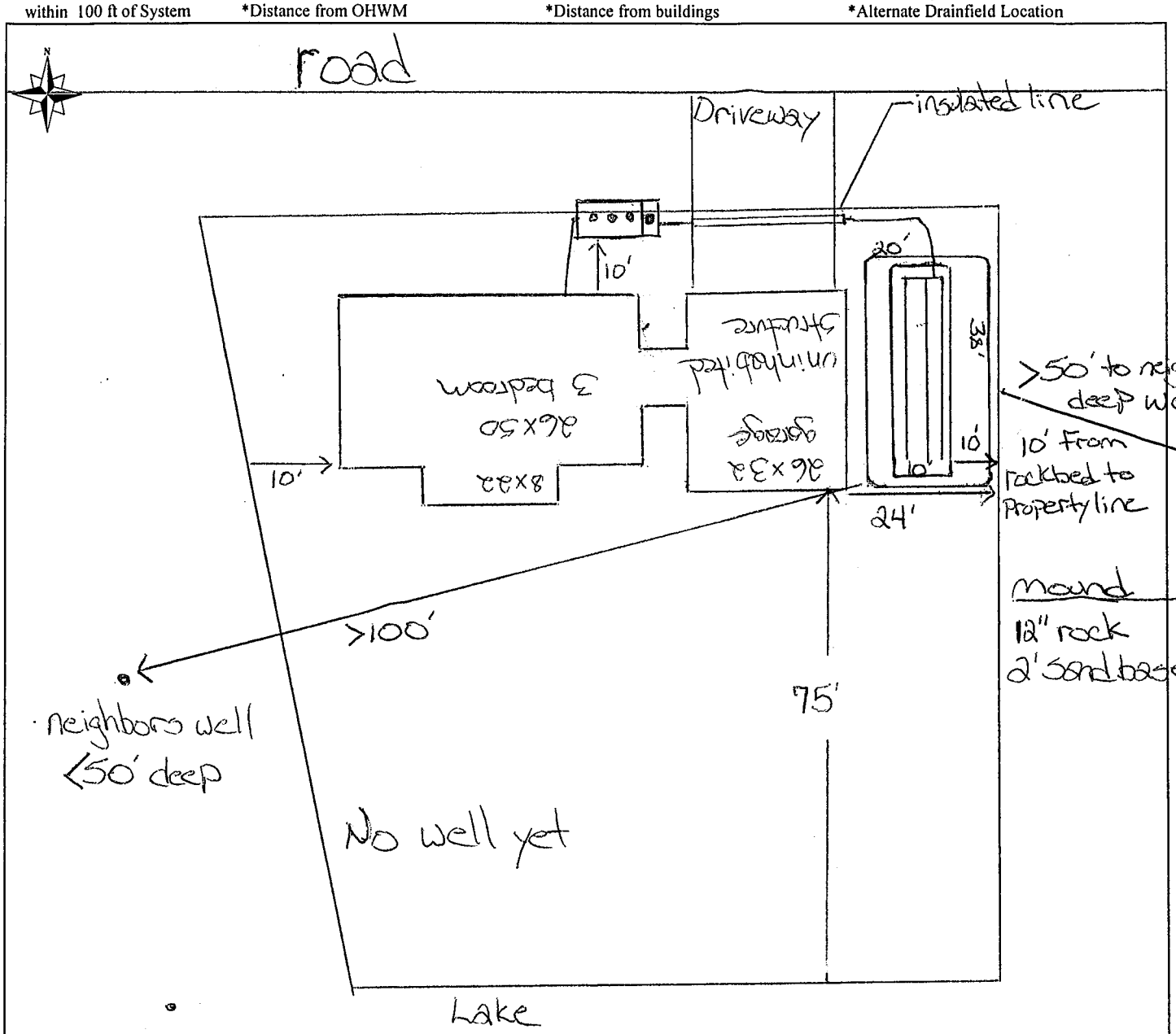
[ ] Application is hereby denied
[ ] Application is hereby granted to _____ to install an individual septic system according to the specifications of the site evaluation and design submitted to the Becker County Environmental Services Office. By Order of:

_____ _____ _____
Signature of Becker County Qualified Employee Date Permit Issued Permit Number

This permit expires on _____

The site plan must be drawn to dim n or to scale:

*Dimensions of Lot
*Well & Water Line Locations within 100 ft of System
*Existing & Proposed Buildings
*Distance from Property Lines
*Distance from OHWM
*Easements & setbacks
*Tank Access Route
*Distance from buildings
*Scale - One inch = _____ ft
*Location of any Unsuitable Soil
*Soil Borings & Per Test Locations
*Alternate Drainfield Location



	Tank (estimated)	Tank (actual)	Drainfield (estimated)	Drainfield (actual)
Distances to Well	—			
Distance to Building	10'		>20'	
Distance to Property Line			10'	
Distance to Pressure Line	>20		>20'	
Distance to Ordinary High Water	>100'		75'	

Tank size 1000
Lift station size 500
Drainfield size 780 FT2
Pump HP _____
Date Installed _____

FOR USE BY BECKER COUNTY ENVIRONMENTAL SERVICES DEPARTMENT ONLY

CERTIFICATE OF COMPLIANCE

( ) Certificate Is Hereby Denied

( ) Certificate is Hereby Granted Based upon the Application, addendum from, plans, specifications and all other supporting data. With property maintenance, this system can be expected to function satisfactory, however, this is not a guarantee.

Signature _____ Title _____ Date _____

(Certificate of Compliance is not valid unless signed by a Registered Qualified Employee)

BECKER COUNTY

829 LAKE AVENUE, P.O. BOX 787
DETROIT LAKES, MINNESOTA 56502-0787
(218) 846-7314

Fire No.
Application No.
Tax Parcel No.

SKETCH PLAN
FORM H

Please be as complete as possible. Include all of the items listed below where applicable.

GENERAL CHECKLIST

- [ ] scale
- [ ] north arrow
- [ ] lot dimensions
- [ ] structure location
- [ ] side lot setback
- [ ] road setback
- [ ] septic tank location
- [ ] drainfield location
- [ ] location of all wells within 100' of drainfield
- [ ] fill & grading limits
- [ ] vegetation alteration limits

WATER RESOURCE CHECKLIST

- [ ] location of ordinary high water level (OHWL)
- [ ] location of present water line
- [ ] setback from OHWL
- [ ] location of highest known water level
- [ ] existing local drainage
- [ ] location of wetland areas

Scale of Diagram: 1 inch = _____ feet

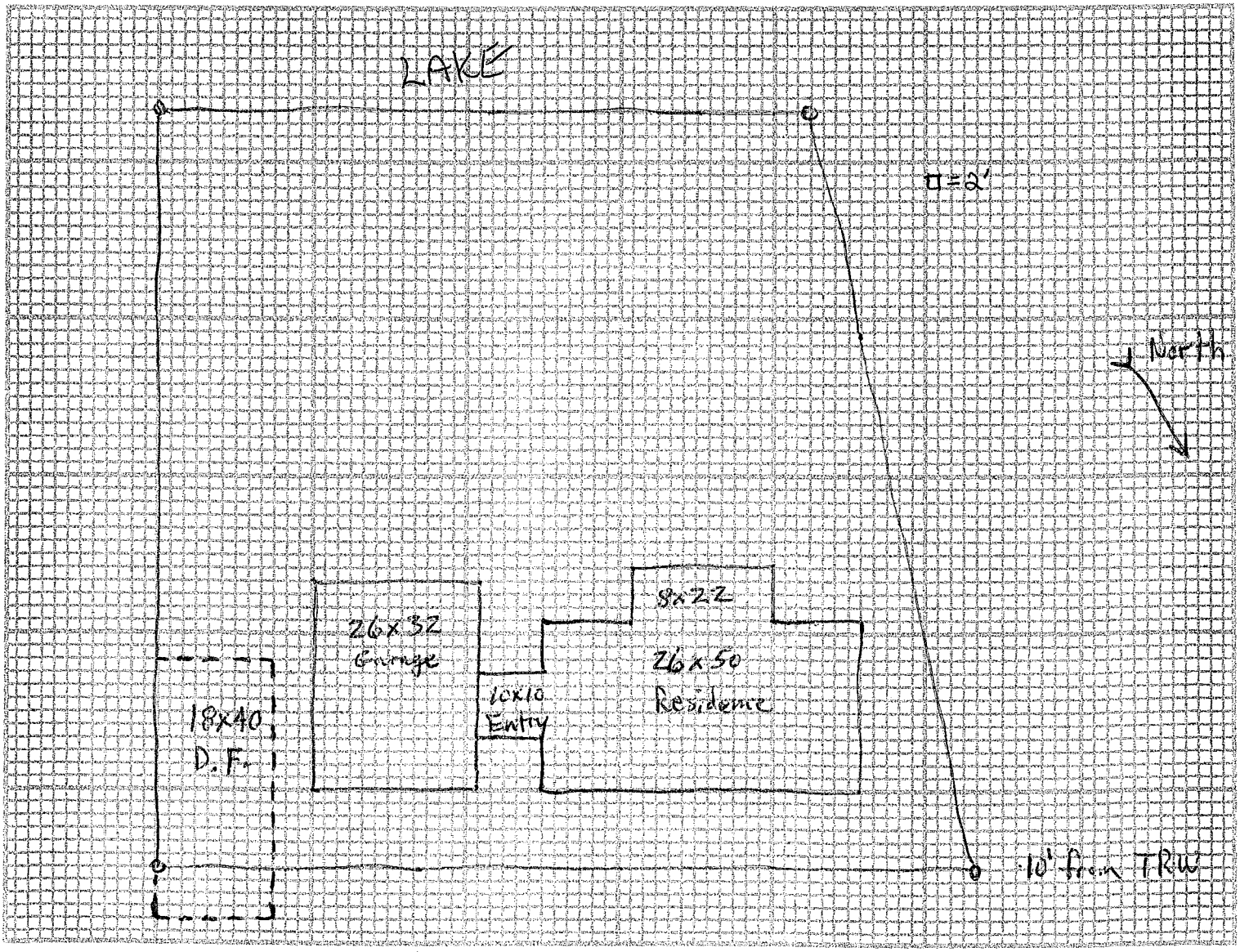
Drawing By: _____

Date of Drawing: _____

Remarks: _____

Signature _____

Option #2



(For Flows up to 1200 gpd)

A. FLOW
Estimated 450 gpd
or measured _____ x 1.5 = _____ gpd.

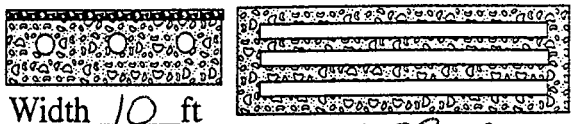
B. SEPTIC TANK LIQUID VOLUMES
1000 gallons

C. SOILS (refer to site evaluation)
1. Depth to restricting layer = _____ inches _____ feet
2. Depth of percolation tests = 10 inches
3. Texture loam / sandy loam Percolation rate _____ mpi
4. Land slope _____ %

Estimated Sewage Flows in Gallons per day (gpd)				
Number of Bedrooms	Type I	Type II	Type III	Type IV
2	300	225	180	60% of the values in Type I, II or III columns
3	450	300	218	
4	600	375	256	
5	750	450	294	
6	900	525	332	
7	1050	600	370	
8	1200	675	408	

Septic Tank Capacities (in gallons)		
Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal
2 or less	750	1125
3 or 4	1000	1500
5 or 6	1500	2250
7, 8 or 9	2000	3000

D. ROCK LAYER DIMENSIONS
1. Multiply flow rate by 0.83 to obtain required area of rock layer: A x 0.83 =
450 gpd x 0.83 sq. ft./gpd = 374 sq. ft.
2. Select width of rock layer (max 10' if <120 mpi max 5') = 10' ft.
3. Length of rock layer = area ÷ width =
374 sq. ft. ÷ 10 ft. = 38 ft.



Width 10 ft
<120mpi <10'
>120mpi <5'

Length 38 ft

E. ROCK VOLUME
1. Multiply rock area by rock depth to get cubic feet of rock; 374 sq. ft. x 1 ft. = 374 cu. ft.
2. Divide cu. ft. by 27 cu. ft./cu. yd. to get cubic yards;
374 cu. ft. ÷ 27 = 14 cu. yd.
3. Multiply cubic yards by 1.4 to get weight of rock in tons; 14 cu. yd. x 1.4 ton/cu. yd. = 19 tons.

F. ABSORPTION WIDTH
1. Percolation rate in top 12 inches of soil is 18 mpi
Texture sandy loam/loam
2. Select allowable soil loading rate from table;
.60 gpd/ft²
3. Calculate adsorption width ratio by dividing rock layer loading rate of 1.20 gpd/ft2 by allowable soil loading rate;
1.20 gpd/ft² ÷ ~~1.0~~ .60 gpd/ft² = 2.
4. Multiply adsorption width ratio by rock layer width to get required adsorption width;
2 x 10 ft = 20 ft

Absorption Width Sizing Table			
Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Gallons per day per square foot	Ratio of Absorption width to Rock Layer Width
Faster than 0.1	Coarse Sand	1.20	1.00
0.1 to 5	Sand	1.20	1.00
0.1 to 5	Fine Sand	0.60	2.00
6 to 15	Sandy Loam	0.79	1.52
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam	0.50	2.40
46 to 60	Clay Loam	0.45	2.67
60 to 120	Clay	0.24	5.00
Slower than 120	Clay	0.20	6.00

PRESSURE DISTRIBUTION SYSTEM

1. Select number of perforated laterals 3

2. Select perforation spacing = 3 feet.

3. Since perforations should not be placed closer than 1 ft. to the edge of the rock layer (see diagram), subtract 2 ft. from the rock layer length.

   38 (Rock layer length) − 2 ft. = 36 feet.

4. Determine the number of spaces between perforations. Divide the length above by perforation spacing and round down to nearest whole number.

   Length perf. spacing = 36 (3) ft. ÷ 3 (2) ft. = 12 spaces

5. Number of perforations is equal to one plus the number of perforation spaces .

   12 spaces + 1 = 13 perforations/lateral

6. Multiply perforations per lateral by number of laterals to get total number of perforations.

   3 (laterals) x 13 (perfs/lateral) = 39 perforations.

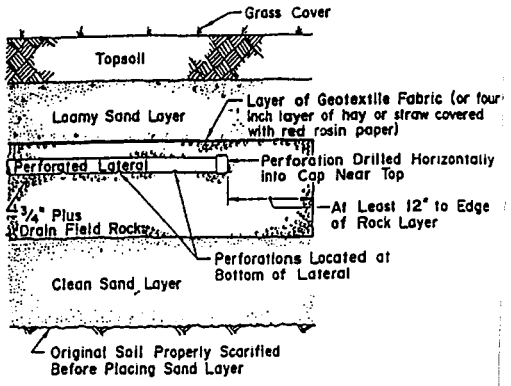
7. Determine required flow rate by multiplying number of perforations by flow per perforation

   39 (perfs) x .74 (gpm/perf) = 29 gpm.

8. If laterals are connected to header pipe as shown on upper example, to select minimum required lateral diameter; enter table with perforation spacing and number of perforations per lateral. Select minimum diameter for perforated lateral = _____ inches.

9. If perforated lateral system is attached to manifold pipe near the center, lower diagram, perforated lateral length and number of perforations per lateral will be approximately one half of that in step 8. Using these values, select minimum diameter for perforated lateral = _____ inches.

END PERFORATION OF A PERFORATED LATERAL

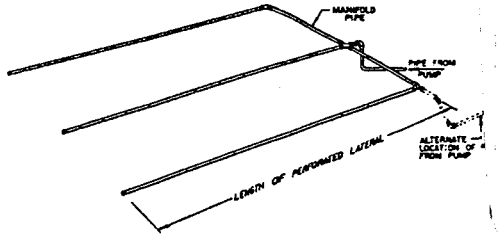


Required Perforation Discharge in gallons per minute (gpm)		
Discharge Head (feet)	7/32 inch perf	¼ inch perf
1.0a	0.56	0.74
2.0b	0.80	1.04

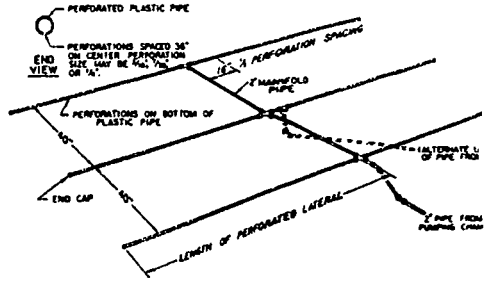
a. Use for single family homes
b. Use for all other applications

Maximum number of quarter inch perforations per lateral to guarantee < 10% discharge variation			
Perforation Spacing (feet)	1¼	1½	2
2.5	14	18	28
3.0	13	17	26
3.3	12	16	25
4.0	11	15	23
5.0	10	14	22

MANIFOLD LOCATED AT END OF PRESSURE DISTRIBUTION SYSTEM



LAYOUT OF PERFORATED PIPE LATERALS FOR PRESSURE DISTRIBUTION IN MOUND



PUMP SEI TION PROCEDURE

A. Determine pump capacity:

Gravity Distribution

1. Minimum suggested is 20 gpm
2. Maximum suggested is 45 gpm

Pressure Distibution

3. a. Select number of perforated laterals 3
   b. Select perforation spacing = 3 feet.
   c. Subtract 2 ft. from the rock layer length.
   Rock layer length - 2 ft. = 36 feet.
   d. Determine the number of spaces between perforations.
   Length perf. spacing = 36 ft. ÷ 3 ft. = 12 spaces
   e. 12 spaces + 1 = 13 perforations/lateral
   f. Multiply perforations per lateral by number of laterals to get total number of perforations. 3 laterals x 13 perfs/lateral = 39 perforations.
   g. 39 perfs x .74 gpm/perf = 29 gpm.

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 foot single homes.
b Use 2.0 feet for anything else.

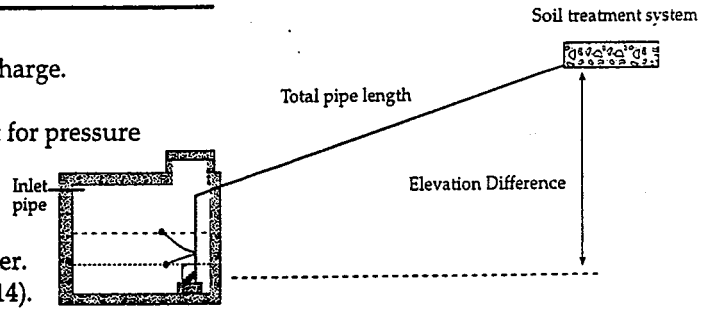
SELECTED PUMP CAPACITY 29 gpm

B. Determine head requirements:

1. Elevation difference between pump and point of discharge.
   7 feet
2. If pumping to a pressure distribution system, five feet for pressure required at manifold if gravity system, zero.
   5 feet
3. Friction loss
   a. Enter friction loss table with gpm and pipe diameter. Read friction loss in feet per 100 feet from table (F-14).
   F.L. = 5.23 ft./100 ft of pipe
   b. Determine total pipe length from pump to discharge point. Estimate by adding 25 percent to pipe length for fitting loss, or use a fitting loss chart (F-15 feet).
   Equivalent pipe length - 1.25 times pipe length =
   60 x 1.25 = 75 feet
   c. Calculate total friction loss by multiplying friction loss in ft/100 ft by equivalent pipe length.
   Total friction loss = 5.23 x 75 ÷100 = 4 feet
4. Total head required is the sum of elevation difference, special head requirements, and total friction loss.

   7 (1) + 5 (2) + 4 (3c)

TOTAL HEAD 16 feet



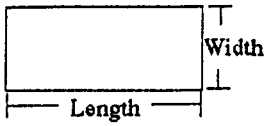
Friction Loss in Plastic Pipe			
	Nominal pipe dia.		
Flow Rate gpm	1.5"	2"	3"
20	2.47	0.73	0.11
25	3.73	1.11	0.16
30	5.23	1.55	0.23
35	6.96	2.06	0.30
40	8.91	2.64	0.39
45	11.07	3.28	0.48
50	13.46	3.99	0.58
55		4.76	0.70
60		5.60	0.82
65		6.48	0.95
70		7.44	1.09

C. Pump selection

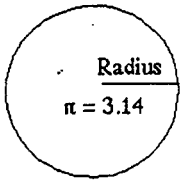
1. A pump must be selected to deliver at least 29 gpm (Step A) with at least 16 **feet of total head** (Step B).

Sizing of Dosing Chamber

1. Determine Surface Area
   Rectangle = Area = L x W
   _____ x _____ = _____ **square feet**



   Circle = Area = π x (Radius)²
   3.14 x _____ x _____ = _____ **square feet**



   Other = Get Surface Area from Manufacturer
   _____ **square feet**

2. Calculate Gallons Per Inch
   There are 7.5 gallons per cubic foot of volume, therefore you must multiply the area times the conversion factor and divide by 12 inches per foot to calculate gallons per inch
   Area x 7.5 ÷ 12
   _____ x 7.5 ÷ 12 = _____ **gallons/inch**

3. Calculate Gallons to Cover Pump (with 2 inches of water covering pump)
   (Height (in) + 2 inches) x gallons/inch
   (_____ +_____) x _____ = _____ **gallons**

Estimated Sewage Flows in Gallons per day (gpd)

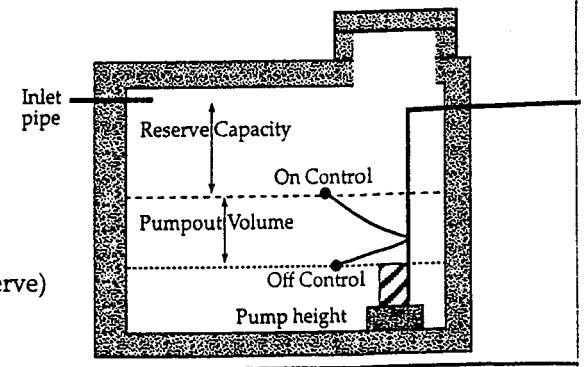
Number of Bedrooms	Type I	Type II	Type III	Type IV
2	300	225	180	60% of the values in Type I, II or III columns
3	450	300	218	
4	600	375	256	
5	750	450	294	
6	900	525	332	
7	1050	600	370	
8	1200	675	408	

4. Calculate Total Pumpout Volume
   A. To maximize pump life select sump size for 4 to 5 pump operations per day.
   _____ gpd ÷ 4 = _____ gallons per dose
   B. Calculate drainback
      a. Determine total pipe length, _____ feet.
      b. Determine liquid volume of pipe, _____ gallons per 100 feet. (see page F-13)
      c. Multiply length by volume: Drainback quantity =
      _____ feet x _____ gallons ÷ 100 ft. = _____ gallons.
   C. Total pump out volume equals dose volume + drainback
   _____gallons per dose + _____ gallons = _____ **Total gallons**

Pipe diameter (inches)	Gallons per 100 feet
1	4.49
1.25	7.77
1.5	10.58
2	17.43
2.5	24.87
3	38.4
4	66.1

5. Calculate Volume for Alarm (typically 2 to 3 inches)
   Depth (in) x gallons/inch =
   _____ x _____ = _____ **gallons**

6. Recommended:
   Calculate Reserve Capacity (75% the daily flow)
   Daily flow x .75 =
   _____ x .75 = _____ **gallons**



7. Calculate total gallons
   gallons over pump + gallons pumpout +gallons alarm + (gallons reserve)
   3 + 4 + 5 + 6
   _____ + _____ + _____ (+ _____)= _____ **gallons**

8. Total Depth (Total gallon divided by gallon per inch)
   Total Gallon÷ gallon/inch
   _____ ÷ _____ = _____ **inches**

9. Float Separation Distance (equal total pumpout volume)
   Total pumpout volume÷ gallons/inch
   _____÷_____= _____ **inches**

CERTIFICATE OF COMPLIANCE
SEWAGE SYSTEM

This certificate has been issued this _____ *day of* _____ *19*_____,

to certify compliance with regulations of Zoning Ordinance, Becker County, Minnesota.

The premises covered by this certificate are legally described as:

*Lake No.*_____ *Sec.*_____ *Twp.*_____ *Range*_____ *Twp. Name*_____

*Owner: Name*_____

*Address*_____

*Zip No.*_____

*Permit No. SP*_____

Signed by: Floyd Lienby

Zoning Administrator
Becker County, Minnesota

INSPECTOR'S CHECK LIST

Make all measurements and computations

	ACTUAL IS ↓	MINIMUM Shall Be ↓ Sq. Ft.
Building Set Back from High Water Mark	Ft.	Ft.
Building Set Back from State Highway	Ft.	Ft.
Side Yard	& Ft.	& Ft.
Rear Yard	Ft.	Ft.
Elevation at Building Line above High Water Mark	Ft.	Ft.

SEWAGE DISPOSAL SYSTEM STATISTICS

CATEGORY	SEPTIC TANK Actual		SEPTIC TANK Should be		SEEPAGE PIT Actual		SEEPAGE PIT Should be		DRAIN FIELD Actual		DRAIN FIELD Should be	
Capacity	1200	Gls.		Gls.		S F		S F		S F		S F
Distance from Nearest Well	54	F		F		F	75	F		F	50	F
Distance from Lake or Stream	75	F		F		F		F		F		F
Distance from Occupied Building	15	F	10	F		F	20	F		F	20	F
Distance from Property Line	20	F	10	F		F	10	F		F	10	F
Distance from Bottom to Water Table	--	F	--	F		F	4	F		F	4	F

Inspector's Comments: Holding tank only. Self made tank, Slip Came In to office 9-14-81)

INTERPRETATION OF ABBREVIATIONS

Gls — Gallons
SF — Square Feet
F — Linear Feet

Mark Kuehn
Inspector's Signature

Title

Inspected 9-14-81
Inspection

Slip Sent In

Dated 9-4 1981

Agency

Yellow — Owner
Pink — Assessor
Goldenrod — Inspector

BECKER COUNTY ZONING ADMINISTRATION

COUNTY COURT HOUSE — Phone 218-847-3938 — Detroit Lakes, Minn. 56501

Permit No. [illegible]

Date [illegible]

APPLICATION FOR BUILDING OR SEWAGE PERMIT AND CERTIFICATE OF OCCUPANCY

LEGAL DESCRIPTION AND LOCATION

[illegible]

Lake No. | Lake Name | Lake Class | Sec. | TWP. | Range | TWP. Name

IDENTIFICATION: Please Print All Information

	Last Name	First	Initial	Mailing Address — No., Street, City and State	Zip No.	Tel. No.
Owner	[illegible]			[illegible]		
Contractor	Name [illegible]			[illegible]		

TYPE OF IMPROVEMENT
( ) New Building ( ) Alteration
Other [illegible]

RESIDENTIAL PROPOSED USE
(X) One Family Dwelling
( ) Multiple Dwelling ____ Units

NON-RESIDENTIAL PROPOSED USE
Specify [illegible]
Size [illegible]

ESTIMATED COST OF IMPROVEMENT $ [illegible] **Construction Starting Date** [illegible]

PRINCIPAL TYPE OF FRAME
( ) Masonry
( ) Wood Frame
(X) Structural Steel
( ) Other — Specify [illegible]

TYPE OF SEWAGE DISPOSAL
( ) Public
(X) Individual Septic Tank, etc.

WATER SUPPLY
( ) Public
(X) Individual Well

DIMENSIONS
Basement ( ) Yes (X) No
Stories above basement [illegible]
Sq. feet (outside dimension) [illegible]
Bedrooms [illegible] Baths [illegible]

MECHANICAL EQUIPMENT
Elevator ( ) Yes (X) No
Air Conditioning (X) Yes ( ) No
( ) Central (X) Unit

HEATING
( ) Electric ( ) Gas ( ) Oil
( ) Coal (X) None
Other [illegible]

Type of Roof [illegible]

SEWAGE DISPOSAL SYSTEM DATA	SEPTIC TANK	SEEPAGE PIT	DRAIN FIELD
Capacity	[illegible] Gls	[illegible] Sq. Ft.	[illegible] Sq. Ft.
Distance from nearest well	[illegible] Ft.	[illegible] Ft.	[illegible] Ft.
Distance from lake or stream	[illegible] Ft.	[illegible] Ft.	[illegible] Ft.
Distance from occupied building	[illegible] Ft.	[illegible] Ft.	[illegible] Ft.
Distance from property line	[illegible] Ft.	[illegible] Ft.	[illegible] Ft.
Distance from bottom to Water Table	[illegible] Ft.	[illegible] Ft.	[illegible] Ft.

HOLDING TANK ONLY

All distances are shortest distance between nearest points

CHARACTERISTICS

Lot Area is [illegible] square feet. Water frontage is [illegible] feet.

Building set back from high water mark is [illegible] feet. (Building Line)

Land height above high water mark at building line is [illegible] feet.

Building set back from State highway is [illegible] feet — from road or street is [illegible] feet.

Side yard is [illegible] and [illegible] feet. Rear yard is [illegible] feet.

Building will be located [illegible] feet from septic tank. (Sewage System Permit must be obtained before installation)

Building will be located [illegible] feet from soil absorption system (Cesspool, Drainfield, etc.)

APPROVED
OCT 24 1980

Agreement: I hereby certify that the information contained herein is correct and agree to do the proposed work in accordance with the description above set forth and according to the provisions of the ordinances of Becker County, Minnesota. I further agree that any plans and specifications submitted herewith shall become a part of this permit application. I also understand that this permit is valid for a period of six (6) months. Applicant further agrees that no part of the sewage system shall be covered until it has been inspected and accepted. It shall be the responsibility of the applicant for the permit to notify the County Zoning Administrator 48 hours before the job is ready for inspection.

Dated [illegible]

Signature of Owner [illegible]

Permit: Permission is hereby granted to the above named applicant to perform the work described in the above statement. This permit is granted upon the express condition that the person to whom it is granted, and his agent, employees and workmen shall conform in all respects to the ordinances of Becker County, Minnesota. This permit may be revoked at any time upon violation of said ordinances.

Dated [illegible]

Becker County Zoning Administrator [illegible]

Permit Fee $ [illegible] State Surcharge $ [illegible]

Comments [illegible]

09

Yellow — Owner
Pink — Assessor
Goldenrod — Inspector

BECKER COUNTY ZONING ADMINISTRATION

COUNTY COU[illegible] HOUSE — Phone 218-847-3938—Detroit Lakes, [illegible]n. 56501

APPLICATION FOR BU[illegible]ING OR SEWAGE PERMIT AND CERTIFIC[illegible]E OF OCCUPANCY

Permit No. 12-10,239-34
Date 10-10-80

LEGAL DESCRIPTION AND LOCATION: Ulyndon Bay — Beg 222' S and 218' ~~305~~ SE of NW Cor Lot 2 Th SE 183' SW 120' to Lk NW 105' and NE'ly to Beg

Lake No.	Lake Name	Lake Classif.	Sec.	TWP	Range	TWP Name
	B-Cormorant RD		18	138	42	Lake Eunice

IDENTIFICATION: Please Print All Information

	Last Name / First / Initial	Mailing Address— No. Street, City and State	Zip No.	Tel. No.
Owner	LEACH, VERNE	Ulyndon Mn.	56547	
Contractor	Name Self			

TYPE OF IMPROVEMENT:
( ) New Building ( ) Alteration
Other Sewer system

RESIDENTIAL PROPOSED USE:
(X) One Family Dwelling
( ) Multiple Dwelling ______ Units

NON—RESIDENTIAL PROPOSED USE:
Specify:
Size:

ESTIMATED COST OF IMPROVEMENT $
Construction Starting Date:

PRINCIPAL TYPE OF FRAME:
( ) Masonry
( ) Wood Frame
( ) Structural Steel
( ) Other – Specify

Type of Roof:

TYPE OF SEWAGE DISPOSAL:
( ) Public
(X) Individual Septic Tank, etc.

WATER SUPPLY:
( ) Public
(X) Individual Well

MECHANICAL EQUIPMENT :
Elevator: ( ) Yes ( ) No
Air Conditioning: ( ) Yes ( ) No
( ) Central ( ) Unit

DIMENSIONS:
Basement: ( ) Yes ( ) No
Stories above basement:
Sq. feet (outside dimension)
Bedrooms 2 Baths 1

HEATING:
( ) Electric ( ) Gas ( ) Oil
( ) Coal ( ) None
Other: Bot

HOLDING TANK ONLY

SEWAGE DISPOSAL SYSTEM DATA:	SEPTIC TANK	SEEPAGE PIT	DRAIN FIELD
Capacity	1000 Gls.	~~300~~ Sq. Ft.	Sq. Ft.
Distance from nearest well	+50 Ft.	~~+50~~ Ft.	Ft.
Distance from lake or stream	+75 Ft.	~~+75~~ Ft.	Ft.
Distance from occupied building	+10 Ft.	~~+10~~ Ft.	Ft.
Distance from property line	+10 Ft.	~~+10~~ Ft.	Ft.
Distance from bottom to Water Table	Ft.	~~4~~ Ft.	Ft.

Holding TANK ONLY

All distances are shortest distance between nearest points

Maybe Lift pump

[CH]ARACTERISTICS:

Lot Area is 100 X square feet. Water frontage is 100 feet
Building set back from high water mark is Existing feet. (Building Line)
Land height above high water mark at building line is V 24 feet
Building set back from State highway is ———— feet — from road or street is .... feet
Side yard is +10 and +10 feet. Rear yard is .... feet.
Building will be located +10 feet from septic tank (Sewage System Permit must be obtained before installation).
Building will be located NONE feet from soil absorption system (Cesspool, Drainfield, etc.).

APPROVED
OCT 24 1980

[Statem]ent: I hereby certify that the information contained herein is correct and agree to do the proposed work in accordance with the description above set forth and [accordi]ng to the provisions of the ordinances of Becker County, Minnesota. I further agree that any plans and specifications submitted herewith shall become a part of [this pe]rmit application. I also understand that this permit is valid for a period of six (6) months. Applicant further agrees that no part of the sewage system shall be [covered] until it has been inspected and accepted. It shall be the responsibility of the applicant for the permit to notify the County Zoning Administrator, 48 hours before [it] is ready for inspection.

10-10-80 — + Verne Leach
Signature of Owner

[Permit]: Permission is hereby granted to the above named applicant to perform the work described in the above statement. This permit is granted upon the express [conditi]on that the person to whom it is granted, and his agent, employees and workmen shall conform in all respects to the ordinances of Becker County, Minnesota. [This pe]rmit may be revoked at any time upon violation of said ordinances.

10-15-80 — Floyd Swenby
Becker County Zoning Administrator

[F]ee $ 10.00 State Surcharge $ .50

[Commen]ts: