University of Minnesota Site Evaluation Form 5/16/2005

Property Owner(s) Fredrick & Deborah Neumann Phone Number 651-707-2925

Address 20240 501st. Ln.,McGregor,Mn.55760 3 bedroom pressure bed design

P.I.D. 29-0-019004 Section __ Township 49 N Range 23

Date 5/24/2016 Time 9:00 AM Weather conditions sunny & Clear

Location Information *(check all that apply)*
- x shoreland
- x dwelling
- x replacement system
- __ protection area
- __ other establishment
- __ new home construction

Homeowner Information

No. of bedrooms *(if applicable)* 3 bedrooms (includes possible additions)

No. of residents in home 2 adults __ children

Estimated flow 450 gpd

Well casing depth deep feet

Water using devices *(check)* — Discharge location if checked
- __ Garbage disposal
- __ Dishwasher
- __ Large bathtub
- __ Laundry/large tub on 2nd floor
- __ Water softener
- __ Sump pump
- __ High eff. furnace
- __ Jucuzzi/hottub

Water use concerns *(check)*
- __ Toilet/faucet leaks
- __ Max load laundry/day
- __ Long term prescription medications
- __ Home business
- __ Lint screen
- __ Antibact. soap
- __ Frequent parties or out of town guests

Soil Data

Soil texture classification: sandy loam

Unnatural soil *(check)*: __ Yes x No

Type of observation *(check)*: __ Probe x Pit __ Boring

Parent material *(check)*: x Till __ Outwash __ Loess __ Bedrock __ Alluvium

Vegetation type *(check)*: __ Wet __ x __ Unknown

Slope form *(check)*: x Summit __ Shoulder __ Back __ Foot __ Toe

Drainage *(check)*: x Good __ Fair __ Poor __ Ponding __ Flooding

Located in floodplain *(check)*: __ Yes x No

Site Summary Data

Standing water: none inches

Bedrock: greater than 72 inches

Saturated soil: greater than 72 inches

Maximum depth of system: 18" inches

Max elevation at system bottom: 98.5 feet

Soil sizing factor (SSF): 1.27 gpd/ft^2

Linear loading rate (LLR): 0.79 gpd/ft

Was a perc test done ? __ Yes _____ mpi

__ No

Soil Survey Data	Soil #1	Soil #2
Map unit sym & name		
Landscape position		
Flooding		
Slope		
Watertable depth		
Bedrock depth		
Possible system depth		
Texture at depth		
Permeability (P)		
Perc(MPI) = 60 / P		
NRCS onsite suitability		

Soil Boring Data

Boring 1 Elevation:		Location:		
Soil Horizons Depth (inches)	**Texture**	**Color**	**Structure**	**Consistence**
0-1"	top soil	10 yr 3/2	s.g.	loose
1-12"	coarse sand	10 yr 3/4	s.g.	loose
12-24"	med. Sand	10 yr 4/4	s.g.	loose
24-54"	coarse sand	10 yr 4/6		
	no mottles @ 54"			

Boring 2 Elevation:		Location:		
Soil Horizons Depth (inches)	**Texture**	**Color**	**Structure**	**Consistence**
0-1"	topsoil	10 yr 3/2	s.g.	loose
1-36"	med. Sand	10 yr 4/4	s.g.	loose
24-55"	coarse sand	10 yr 4/6	s.g.	loose
	no mottles @ 55"			

Brain H. Has done the Pre-onsite. KT 5-25-16

Site Evaluation Map

Elavation's

Bench Mark = 100.0
Outlet of house = 98.0
Inlet of New Tank = 97.0
Top of Pump = 94
Pipe in dispersion feild = 99

List any construction issues: _____

_____

Mapping Checklist

Map scale: _____ ___ indicate north ___ show slope _____% direction _____

Locate
- ___ lot dimensions/property lines
- ___ dwellings and other improvements
- ___ existing and/or proposed system(s)
- ___ replacement area
- ___ unsuitable area(s)
- ___ public water supply wells
- ___ pumping access
- ___ inner wellhead zone

Easements
- ___ phone
- ___ electric
- ___ gas

Elevations
- ___ borings
- ___ benchmark
- ___ perc tests
- ___ horiz&vert reference pts

Setbacks
- ___ building
- ___ all water wells within 100ft
- ___ pressure pipe
- ___ water suction pipe
- ___ streams, lakes, rivers
- ___ floodway and fringe

I hereby certify this work has been completed in accordance with all applicable ordinances, rules and laws.

_____ (signature) 5/24/2016 (date)

L-1919 (license #) 218-768-4201 (phone number)

KT 5-25-16

University of Minnesota Trench and Bed Worksheet

All boxed rectangles must be entered, the rest will be calculated.

1. Flow

A. Estimated Flow [450] gpd *(Fig. A-1)*

A-1 Estimated Sewage Flows in GPD				
Number of Bedrooms	Class I	II	III	IV
2	300	225	180	60% of
3	450	300	218	the
4	600	375	256	values
5	750	450	294	in the
6	900	525	332	Class I,
7	1050	600	370	II or II
8	1200	675	408	columns

Pump Tank Minimum Sizing
500 gallons or 100% of Average Design Flow (A-1) or dual alternating pump system

2. Minimum Septic Tank Capacity

B. Septic tank capacity *(Fig C-1)* [1000] gallons Number of tanks/compartments [ ]

C. Effluent filter (yes/no) [no]

C-1 Minimum Septic Tank Capacity in Gallons			
Number of Bedrooms	Minimum Capacity	Capacity with GD*	Capacity with GD and pump in basement **
2 or less	750	1125	1500
3 or 4	1000	1500	2000
5 or 6	1500	2250	3000
7, 8 or 9	2000	3000	4000

* GD = garbage disposal, Must have multiple tanks or compartments

** Must have multiple tanks, compartments or effluent screen

3. Pump Tank Specifications

D. Pump tank needed (yes/no) [yes] Minimum size if needed [500] gallons

4. SOILS *(Site evaluation data)*

E. Depth to restricting layer = [4.5] ft

F. Maximum depth of system Item E - 3 ft = 4.5 - 3 = 1.5 ft

G. Texture [sandy loam] Percolation Rate *if available* [ ] mpi

H. SSF [1.27] ft^2/gpd (see figure D-15)

I. % Slope [0] %

D-15 Soil Characteristics & SSF		
Perc Rate mpi	Soil Texture	Soil Sizing Factors ft^2/gpd
< 0.1 *	Coarse sand	0.83
0.1- 5	Medium sand Loamy sand	0.83
0.1- 5**	Fine sand	1.67
6 - 15	Sandy loam	1.27
16 - 30	Loam	1.67
31 - 45	Silt loam, silt	2.00
46 - 60	Clay loam, sandy clay or silty clay	2.20
61 - 120***	Clay, sandy or silty clay	4.20
>120****		

* No trench >25% of total system

** Soil with >50% fine sand particles

*** A mound must be used

**** An other or performance system

KC 5-25-16

5. System Type

x	Pressure Bed *(<6% slope)*
	Gravity Bed (<6% slope)
	Trenches

Distribution Media Type

x	Rock
	Chamber
	Gravelless
	Other: _____

Method of Distribution

x	Pressure
	Drop Boxes
	Dist. Box *(<3% slope)*
	Other: _____

6. TRENCH OR BED BOTTOM AREA

J. For trenches with 6 inches of wide wall beneath the pipe or 10" diameter gravelless pipe:
A x H = 450 gpd x 1.27 ft/gpd = NA ft^2

K. For trenches with 12 inches of sidewall:
A x H x 0.8= 450 gpd x 1.27 ft/gpd x 0.8 = NA ft^2

L. For trenches with 18 inches of sidewall:
A x H x 0.66= 450 gpd x 1.27 ft/gpd x 0.66 = NA ft^2

M. For trenches with 24 inches of sidewall:
A x H x 0.6= 450 gpd x 1.27 ft/gpd x 0.6 = NA ft^2

N. For gravity beds with 6 or 12 inches of rock below the pipe;
1.5 x A x H = 1.5 x 450 gpd x 1.27 ft/gpd = NA ft^2

O. For pressure beds with 6 or 12 inches of rock below the pipe;
A x H = 450 gpd x 1.27 ft/gpd = 571.5 ft^2

7. Trench and Bed Dimensions

P. Select required square feet of bottom area required based on depth of rock/gravelless pipe or height of chamber slats
571.5 ft^2
(must use 6" of rock square footage for beds)

Q Select width of trench or bed 11.0 ft
(use 3' for gravelless pipe, width of chamber or width of excavation for rock in trenches & beds can not be wider the 25')

R. For trenches or pressure beds the lineal feet required = required square footage / width of bottom of trench or bed
571.5 ft^2 / 11.0 ft = 52.0 lineal feet

S. For gravity beds the lineal feet required = required square footage / width of bed
571.5 ft^2 / 11.0 ft = _____ lineal feet

8. Rock Sizing and Volume

T. Depth of media below pipe 0.5 ft
Cubic feet of rock needed = Rock depth below distribution pipe plus 0.5 foot times bottom area:
(Rock depth + 0.5 foot) x Area (J, K, L, M)
(0.5 ft + 0.5 ft) x 571.5 ft^2 = 571.5 ft^3
Volume in cubic yards = volume in cubic feet divided by 27
571.5 / 27= 21.2 yd^3
Weight of rock in tons = cubic yards times 1.4
21.2 x 1.4= 29.6 tons
Add in 10% extra for constructability = 1.1 X 29.6 = 32.6 tons

9. Layout

Select an appropriate scale; one inch = 40 ft
Show pertinent property boundaries, rights-of-way, easements.
Show location of house, garage, driveway, and all other improvements, existing or proposed.
Show location and layout of sewage treatment system, well and dimensions of all elevations

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

_____ (signature) L-1919 (license #) 5/24/2016 (date)

Local Unit of Government Approval

_____ (signature) _____ (registration #) _____ (date)

KT 5-25-16

University of Minnesota Pressure Distribution System Design - 10/25/04

All boxed rectangles must be entered, the rest will be calculated.

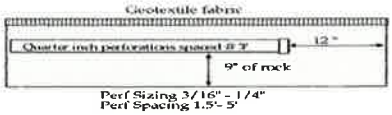
ONSITE SEWAGE TREATMENT PROGRAM

1. Select number of perforated laterals: [3]

2. Select perforation spacing = [2.5] ft

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

[52] - 2 ft = 50 ft



4. Determine the number of spaces between perforations.
Divide the length (3) by perforation spacing (2) and round down to nearest whole number.
Perforation spacing = 50 ft / 2.5 ft = 20

5. Select perforation size [.25] inch

6. Number of perforations is equal to one plus the number of perforation spaces (4).
** Check figure E-4 to assure the number of perforations per lateral guarantees < 10% discharge variation.*
20 spaces + 1 = 21 perforations/lateral

E-4 Maximum Number of 1/4 inch perforations per lateral to guarantee <10% discharge variation

Perforation Spacing ft	Pipe Diameter 1 inch	1.25 inch	1.5 inch	2.0 inch
2.5	8	14	18	28
3.0	8	13	17	26
3.3	7	12	16	25
4.0	7	11	15	23
5.0	6	10	14	22

E-5 Maximum Number of 3/16 inch perforations per lateral to guarantee <10% discharge variation

Perforation Spacing feet	Pipe Diameter 1 inch	1.25 inch	1.5 inch	2.0 inch
2.5	12	19	25	39
3	11	18	24	37
3.3	10	17	23	36
4	10	16	21	33
5	9	15	20	31

7. A. Total number of perforations = perforations per lateral (5) times number of laterals (1).
21 perfs/ lat x 3 laterals = 63 perforations

B. Calculate the square footage per perforation.
Recommended value is 6-10 sqft/perf. Does not apply to at-grades.
1. Rock bed area = rock width (ft) x rock length (ft)
[11] ft x 52 ft = 572 ft^2
2. Square foot per perforation=Rock Bed Area/number of perfs(6)
572.0 ft^2 / 63 perfs = 9.1 ft^2/ perf

8. Determine required flow rate by multiplying the total number of perforations(6A) by flow per perforations (see figure E-6)
63 perfs x [0.74] gpm / perfs = 46.6 gpm

E-6 Perforation Discharge in GPM

Head (feet)	Perforations diameter (inches) 3/16	7/32	1/4
1[a]	0.42	0.56	0.74
2[b]	0.59	0.80	1.04
5	0.94	1.26	1.65

a. Use 1.0 foot for single-family homes.
b. Use 2.0 feet for anything else

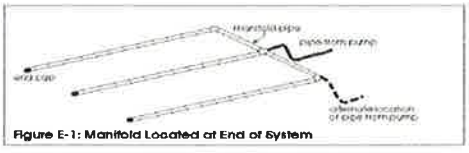


Figure E-1: Manifold Located at End of System

9. Determine Minimum Pipe Size

A. **Manifold on End.** If laterals are connected to header pipe as shown in Figure E-1, to select minimum required lateral diameter; enter figure E-4 or E-5 with perforation spacing and number of perforations per lateral. Select minimum diameter for perforated laterals = [17] inches

B. **Center Manifold.** If perforated lateral system is attached to manifold pipe near the center, like Figure E-2, perforated lateral length (3) and number of perforations per lateral (5) will be approximately one half of that in step A. Using these values, select minimum diameter for perforated lateral = [n/a] inches

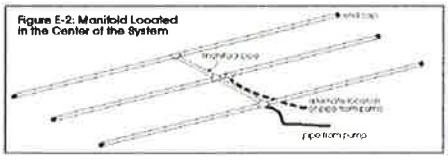


Figure E-2: Manifold Located in the Center of the System

I Hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

_____ (signature) L-1919 (license #) 5/24/2016 (date)

KT 5-25-16

University of Minnesota Pump Selection Procedure - 10/25/04

All boxed rectangles must be entered, the rest will be calculated.

ONSITE SEWAGE TREATMENT PROGRAM

1. **Determine pump capacity:**

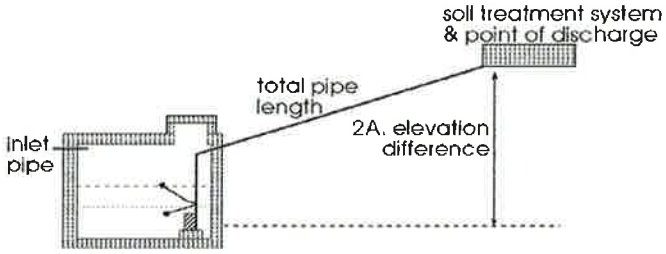
A. Gravity Distribution

1. Minimum required discharge is 10 gpm
2. Maximum suggested discharge is 45 gpm

For other establishments at least 10% greater than the water supply rate, but no faster than the rate at which effluent will flow out of the distribution device.

B. Pressure Distribution - see pressure design worksheet

Selected Pump Capacity: [46] **gpm**



2. **Determine Total Dynamic Head (TDH)**

A. Elevation difference between pump and point of discharge.

[5] feet

B. Special head requirement? *(See Figure - Special Head Requirements)*

[5] feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

C. Friction loss in supply pipe

1. Select pipe diameter [2] in
2. Enter Figure E-9 with gpm (1A or B) and pipe diameter (C1)

Read friction loss in feet per 100 feet from Figure E-9

Friction loss= [3.99] ft/ 100 ft of pipe

E-9 Friction Loss in Plastic Pipe per 100 ft			
Flow Rate (gpm)	nominal pipe diameter 1.5"	2.0"	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	0.3
40	8.91	2.64	0.39
45	11.07	3.28	0.48
50	13.46	3.99	0.58
55		4.76	0.7
60		5.6	0.82
65		6.48	0.95
70		7.44	1.09

3. Determine total pipe length from pump discharge to soil system discharge point. Estimate by adding 25 percent to pipe length for friction loss in fittings.

Pipe length times 1.25 = equivalent pipe length

[30] ft x 1.25 = 37.5 feet

4. Calculate total friction loss by multiplying friction loss (C2) by the equivalent pipe length (C3) and divide by 100.

Friction Loss = 3.99 ft/100ft X 37.5 ft / 100 = 1.5 feet

D. Total head requirement is the sum of elevation difference (A), special head requirements (B), and total friction loss (C4).

5 ft + 5 ft + 1.5 ft

Total Head: 11.5 feet

3. **Pump Selection**

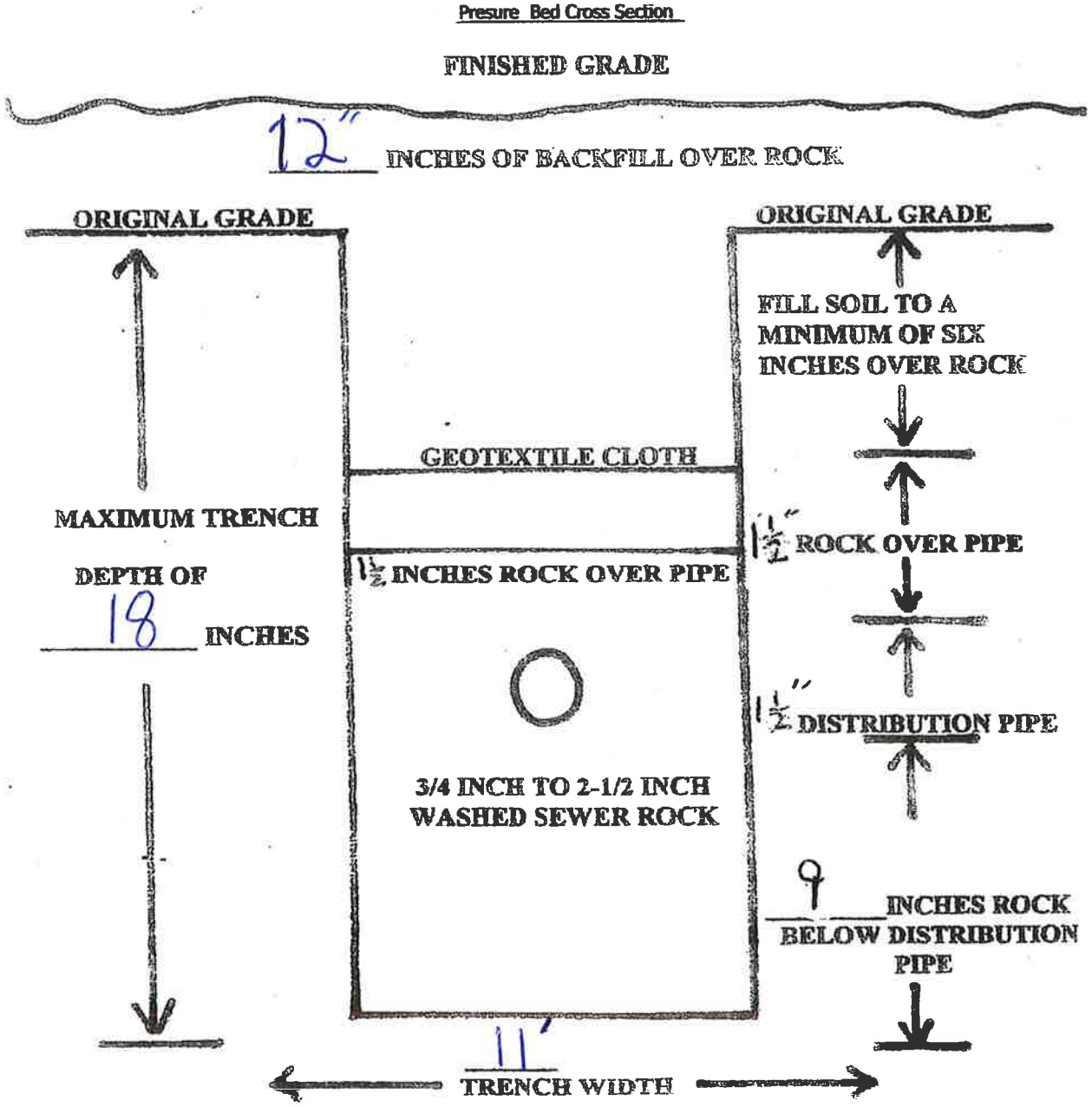
1. A pump must be selected to deliver at least 46 gpm (1A or B) with at least 11.5 feet of total head (2D).

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

[signature] (signature) L-1919 (license #) 5/24/2016

KT 5-25-16

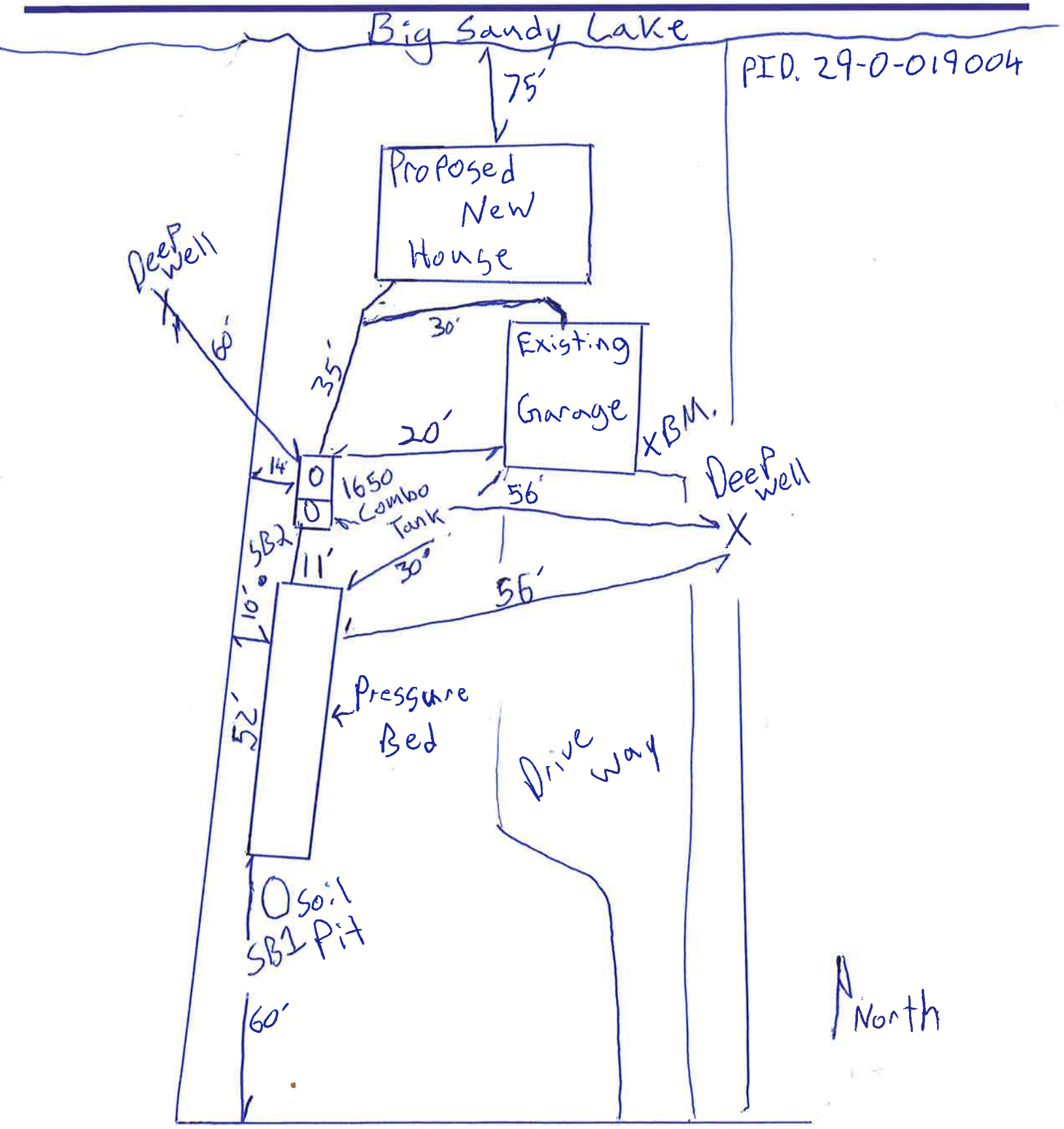
Presure Bed Cross Section



(KT) 5-25-16

Jarold FARLEY SEWER SYSTEMS

SEWER DESIGN & INSTALLATION
JAROLD R. FARLEY
P.O. Box 472
McGregor, MN 55760
Bus. Lic. No. L1919
Reg. No. 4744
218-839-4737 cell



KT 5-25-16

Subsurface Sewage Treatment System Management Plan

Property Owner: Fred + Debora | Neumann Phone: _____ Date: 5-24-16

Mailing Address: _____ City: _____ Zip: _____

Site Address: 20240 501st. LN. City: McGregor, MN Zip: 55760

This management plan will identify the operation and maintenance activities necessary to ensure long-term performance of your septic system. Some of these activities must be performed by you, the homeowner. Other tasks must be performed by a licensed septic service provider.

System Designer: check every 36 months.
Local Government: check every _____ months.
State Requirement: check every 36 months.
(State requirements are based on MN Rules Chapter 7080.2450, Subp. 2 & 3)

My System needs to be checked every 36 months.

Homeowner Management Tasks

Leaks – Check (look, listen) for leaks in toilets and dripping faucets. Repair leaks promptly.
Surfacing sewage – Regularly check for wet or spongy soil around your soil treatment area.
Effluent filter – *Inspect and clean twice a year or more.*
Alarms – Alarm signals when there is a problem. Contact a service provider any time an alarm signals.
Event counter or water meter – Record your water use.
-recommend meter readings be conducted (*circle one:* DAILY WEEKLY MONTHLY)

Professional Management Tasks

- [x] Check to make sure tank is not leaking
- [x] Check and clean the in-tank effluent filter
- [x] Check the sludge/scum layer levels in all septic tanks
- [x] Recommend if tank should be pumped
- [x] Check inlet and outlet baffles
- [x] Check the drainfield effluent levels in the rock layer
- [x] Check the pump and alarm system functions
- [x] Check wiring for corrosion and function
- [x] Check dissolved oxygen and effluent temperature in tank
- [x] Provide homeowner with list of results and any action to be taken
- [x] Flush and clean laterals if cleanouts exist

"I understand it is my responsibility to properly operate and maintain the sewage treatment system on this property, utilizing the Management Plan. If requirements in the Management Plan are not met, I will promptly notify the permitting authority and take necessary corrective actions. If I have a new system, I agree to adequately protect the reserve area for future use as a soil treatment system."

Property Owner Signature: X Fred Neumann Date: X 5-24-2016

Designer Signature: _____ Date: 5-24-16

See Reverse Side for Management Log

Maintenance Log

Activity	Date Accomplished									
Check frequently:										
Leaks: check for plumbing leaks										
Soil treatment area check for surfacing										
Lint filter: check, clean if needed										
Effluent screen: if owner-maintained										
Water usage rate (monitor frequency _____)										
Check annually:										
Caps: inspect, replace if needed										
Sludge & Scum/Pump										
Inlet & Outlet baffles										
Drainfield effluent leaks										
Pump, alarm, wiring										
Flush & clean laterals if cleanouts exists										
Other:_____										
Other:_____										

Notes:_____

_____

_____

_____

Mitigation/corrective action plan:_____

_____

_____

_____

_____