ZONING PERMIT APPLICATION

OFFICE USE ONLY
DATE 6-26-03 APPROVE DENY
PERMIT# 30675
PARCEL# 31-1-083600
RECEIPT# 5897
CONFORMING SEPTIC
YES P# NO NEW

FULL NAME Lowell S. Gillem TELE # 218 927-4974
BIRTHDATE & DL # 6/24/38 G450-551-777-482
MAIL ADDRESS 37704 Dove St Aitkin, MN 56431
911 ADDRESS (Jesse)
TOWNSHIP Spencer
LEGAL DESCRIPTION SE¼ SW¼
SECTION 33 TOWNSHIP 47 RANGE 26

(circle) RESIDENTIAL COMMERCIAL ACCESSORY NEW BUILDING ALTERATION
BUILDING CONTRACTOR AND LICENSE NUMBER: Lorew Larson
SIZE OF ALL BUILDINGS COVERED BY THIS APPLICATION 108x65 - Residence (4-Plex)
① - Bldg 6 Units 21-24
② Other septic 800 gal/day

COMMENTS: PUD approved

DATA FOR SEWER CONSTRUCTION: INSTALLER Mike Johnson #BEDROOMS/GPD 8/800

DO NOT WRITE BELOW THIS LINE

ZONING DISTRICT & FLOOD PLAIN

ZONING DISTRICT F/R
LAKE/STREAM/RIVER NAME
LAKE/RIVER ID NUMBER
LAKE/RIVER/STREAM CLASSIF.
PARCEL LOCATED IN FLOOD PLAIN? Y___ N X
10/100 YR FLOOD ELEVATION
LOWEST FLOOR ELEVATION
ELEV. CERTIFICATE REQUIRED Y___ N X
BEFORE CONSTRUCTION Y___ N X
AFTER CONSTRUCTION Y___ N X

STRUCTURE SETBACK DISTANCE REQUIREMENTS
(Measure from eaves or overhang)
OHW TO LAKE/RIVER/STREAM 100'
PROPERTY LINE SETBACK 20'
SETBACK TO ROAD R-O-W 30' TWSP 50' CO
SETBACK TO BLUFF 30'

SEPTIC SYSTEM SETBACK DISTANCES
SETBACK TO STRUCTURES 10 Tank 20' Drnfld
OHW TO LAKE/RIVER 100'
PROPERTY LINE SETBACK 10'
SETBACK TO ROAD R-O-W 10'

****ATTACH COPY OF ELEVATION CERTIFICATES****

SOIL BORINGS 3 SEPTIC DESIGN Other
PERK RATES 0.1 to 5 DEPTH TO RESTRICTING LAYER 13"
MIN.SIZE SEPTIC TANK 2000 MIN.SIZE PUMP TANK 800
GARBAGE DISP/HOT TUB YES___ NO X
DRAINFIELD: MINIMUM SQ.FT — WITH — INCHES ROCK BELOW PIPE
MOUND: MINIMUM ROCK BED SQ.FT WITH 9 INCHES ROCK BELOW PIPE
MIN.UPSLOPE SAND WIDTH MIN.DOWNSLOPE SAND WIDTH END SAND WIDTHS
RECOMMENDATIONS:

X [signature] 300+175
SIGNATURE APPLICANT/AGENT $ 475 FEE RPC RECEIVED BY 6-25-03 DATE

EXPIRES IN ONE YEAR

Aitkin County Zoning, Courthouse — AITKIN, MINNESOTA 56431 — Telephone 218/927-7342

WHITE - County PINK - Applicant Ver. 9/02

FIELD EVALUATION SHEET

NAME_____ PERMIT #_____
PARCEL #_____ TWP_____ SECTION_____

CHECK THE FOLLOWING PRIOR TO INSPECTION
_____ NAME OF SITE EVALUATOR
_____ NAME OF DESIGNER
_____ NAME OF INSTALLER

_____LOT OF RECORD BEFORE 1-21-92 (SL) IR 1-10-95 (NSL), IF NO, ALT.SITE?_____
_____SITE PLAN WITH SETBACK DISTANCES AND DIMENSIONS
_____ARE ISTS SITES PROTECTED FROM DAMAGE? IF NOT, WHEN_____
_____DESIGN_____ PERC TESTS_____ SOIL BORINGS, 2 PER SITE
_____NUMBER OF BEDROOMS (INCLUDE POTENTIAL)
_____CROSS SECTION SHEET _____ TRENCH DESIGN SHEET
_____MOUND DESIGN SHEET _____ OTHER OR PERFORM.
_____PRESSURE DISTRIBUTION SHEET _____ PUMP CALC. TEST
_____WATER USE CALCULATIONS_____
_____GARBAGE DISPOSAL _____HOT TUB
_____ EASEMENTS ON LOT, IS ROAD PUBLIC OR PRIVATE SEE DEED/PLAT
_____ NATURAL LANDSCAPE PROTECTION PLAN

STAKING: BUILDINGS_____, DRAINFIELD_____, BORINGS_____, WELL___
BUILDING SETBACKS: ROAD_____, SIDE_____, REAR_____, BLUFF_____,
LAKE/RIVER_____
COMPLETE DURING SITE EVALUATION
___BUILDINGS STAKED ____DRAINFIELD STAKED _____BORINGS STAKED
_____WELL STAKED

SETBACKS (MEASURE DISTANCE)

	DRAINFIELD	HOUSE
FLOOD PLAIN	YES/NO	YES/NO
WETLANDS	YES/NO	YES/NO
LAKE, RIVER, PROTECTED WATERS	N/A	N/A
ROAD RIGHT OF WAY	>50'	>50'
BLUFF	NO	NO
SIDE LOT LINE	>20'	>20'
REAR LOT LINE	OK	OK
HOUSE OR OTHER STRUCTURE	14'7" >20' DRIVE	
WELL	NONE	NONE
EASEMENTS		
NEIGHBORING WELL (S) TO ISTS	_____(1) _____(2)	_____(3) _____(4)
DRAINFIELD AREA DISTURBED		

CONFORMING SEPTIC SYSTEM: _____YES ___X___NO If no, list reasons below.
COMMENTS OR PROBEMS (drainage, swales, wetlands, need gutters, etc.) TO BE INSTALLED

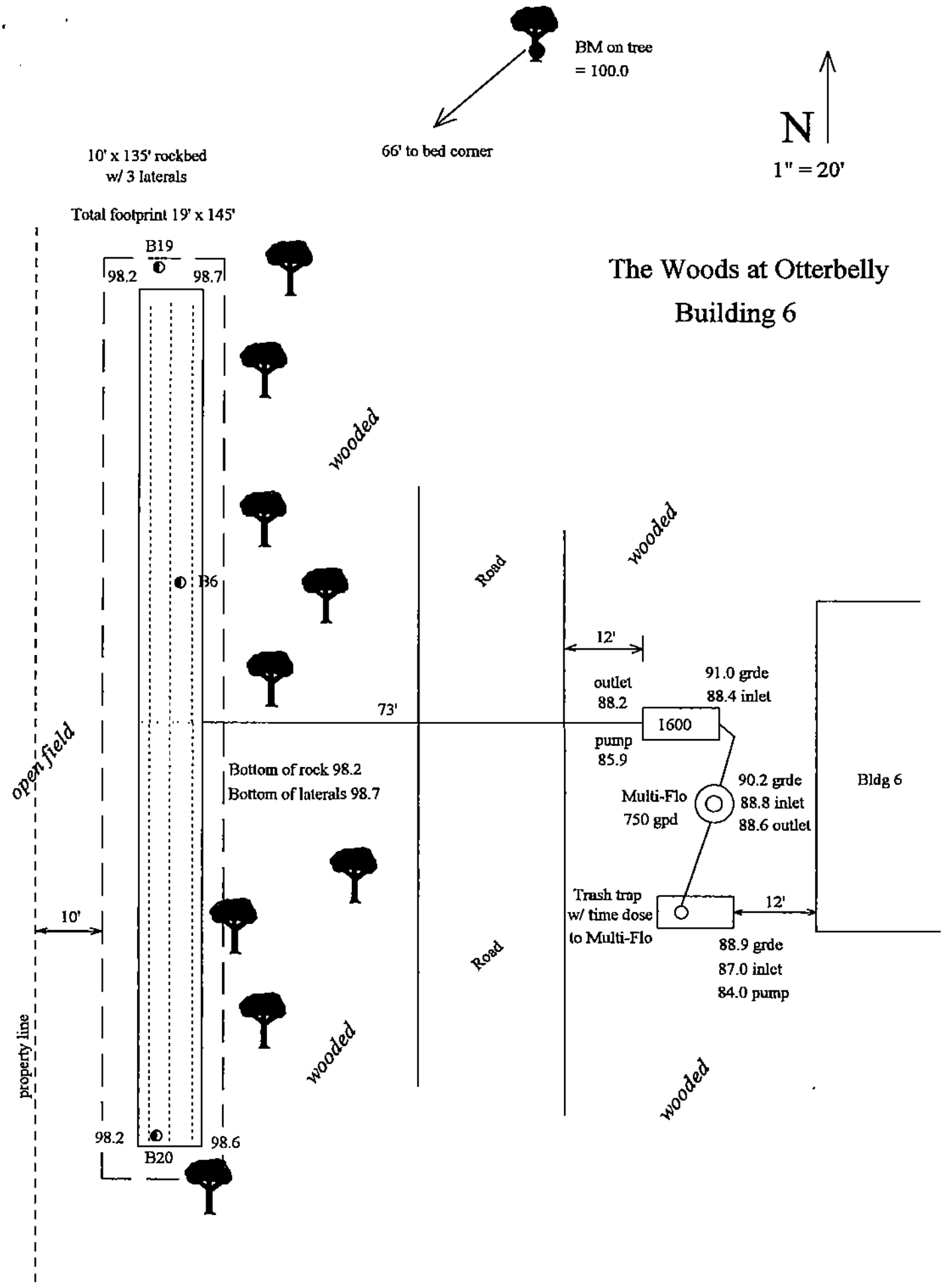
APPROVED: (YES) OR NO

INSPECTORS NAME M. Allen DATE 6-26-02 # PICTURES___

SOIL BORING LOGS AND SKETCH PLAN ON REVERSE SIDE

SOIL BORING LOG #1 DEPTH TEXTURE COLOR	SOIL BORING LOG #2 DEPTH TEXTURE COLOR
1-4" TOPSOIL 5"-36" SANDY, clay MOTTLES @ 25"	

IDENTIFY LOCATIONS OF: (BORINGS, NEIGHBORING STRUCTURES, WELLS, DRAINFIELDS, DRAINAGE PATTERNS, OR OTHER FEATURES THAT MAY IMPACT THE SITE).


BM on tree
= 100.0
66' to bed corner
N
1" = 20'
10' x 135' rockbed
w/ 3 laterals
Total footprint 19' x 145'
The Woods at Otterbelly
Building 6
B19
98.2
98.7
B6
B20
98.2
98.6
wooded
wooded
wooded
wooded
Road
Road
12'
outlet
88.2
91.0 grde
88.4 inlet
1600
pump
85.9
73'
Bottom of rock 98.2
Bottom of laterals 98.7
Multi-Flo
750 gpd
90.2 grde
88.8 inlet
88.6 outlet
Bldg 6
Trash trap
w/ time dose
to Multi-Flo
12'
88.9 grde
87.0 inlet
84.0 pump
10'
open field
property line

SUPPLEMENTAL DATA FOR LAND USE PERMITS

**** COMPLETE BOTH SIDES ****

A. PLANNING CHECKLIST *(required)*:

	YES	NO	???
1. **Are you aware of setback requirements and will your project meet them?** *Note: Setback distances are taken from any projection of the building (i.e. overhangs, eaves, decks, etc.)*	☒	☐	☐
2. **Have you taken in consideration locations for future buildings, septic systems, decks, driveways, etc?**	☒	☐	☐
3. **Are there any lowlands or wetlands on or near the site project?**	☒	☐	☐
4. **Is there a steep slope or bluff on or near the site?** **(If yes, complete Section D)**	☐	☒	☐
5. **Will the project involve the clearing of trees or shrubs within the Shore Impact Zone of a lake or river? (If yes, complete Section D)**	☐	☒	☐
6. **Will the project involve grading, filling or landscaping within the shoreland district of a lake or river? (If yes, complete Section D)**	☐	☒	☐
7. **Is your property in a floodplain?**	☐	☒	☐

If it is, the lowest floor(which includes basement or crawl space, regardless of a dirt floor) must be one foot (1') above the 100-year flood elevation. A benchmark established by a registered surveyor or licensed engineer may be required before granting a land use permit.

B. PRE-EVALUATION INSPECTION REQUEST *(required)*:

Defining and staking the property lines, road right-of-ways, septic sites, and wells are the responsibility of the property owner. In some cases, a registered survey may be required to verify setbacks before granting a permit.

ALL PROPOSED DEVELOPMENT REQUESTS MUST BE CLEARLY STAKED AT ALL FOUR CORNERS IF APPLICABLE, IF STAKES ARE NOT PRESENT OR VISIBLE IT MAY RESULT IN ADDITIONAL FEES OR A DELAY IN THE PERMIT PROCESS.

The undersigned hereby makes application for a pre-evaluation permit inspection, agreeing that all setback information and delineation of property lines, well location, road setbacks, and development corners have been properly marked in accordance with the standards and requirements of the Aitkin County Ordinances.

Telephone Number between the hours of 8:00 A.M. and 4:00 P.M. 927-4974

Landowner: Lowell Gillem **Date:** _____

Address: 37704 Dove St.
Aitkin, Mn. 56431

LANDOWNER SIGNATURE: X Lowell Gillem

If you have any questions please contact the Planning and Zoning office at (218) 927-7342
Ordinances and Publications are available FREE online at: www.co.aitkin.mn.us

WE LOOK FORWARD TO WORKING WITH YOU

*** *COMPLETE BOTH SIDES* ***

C. Directions to your Property *(required)*:

From a major intersection: _____

From Hwy 169 Take Hwy 47 East 3.5 miles To County Rd 17, Rt 1.4 miles to Property On Left

D. NATURAL LANDSCAPE PROTECTION PLAN:

*Complete this section only if you were directed to in Section A **OR** if you are working near a lake or stream.*

1. **Description of proposed construction:** _____

2. **Existing vegetative cover (e.g., forested, grass, shrub, lawn, etc.)?** _____

3. **Setback from the Ordinary High Water Level (OHW) for proposed construction?** _____

4. **How much excavation or fill work is being done inside the Shore Impact Zone (SIZ)?** _____
   (If excavation or fill work greater than 10 cu yds is being done , supply copy of Site review from SWCD)*
   (The SIZ: Mississippi River & NE Lakes =75 feet, RD & GD lakes =50 feet, other waters-see ordinance)

5. **How much excavation or fill work is being done outside the Shore Impact Zone (SIZ)?** _____
   (If excavation or fill work greater than 50 cu yds is being done , supply copy of Site review from SWCD)*

6. **What percent slope of the land currently exists on the construction site?** _____
   (If the percent slope is greater than 20% , supply copy of Site review from SWCD)*

7. **How much clearing of trees and shrubs will be done inside the Shore Impact Zone (SIZ)?** _____
   (If vegetation will be cleared in the SIZ, supply copy of Site review from SWCD)*

8. **How will erosion be controlled during construction?** _____

9. **What will be done after construction to control erosion?** _____

I have read the above and I understand the Natural Landscape Protection Plan as prepared. I hereby agree to implement this plan as part of the Land Use Permit.

X _____ _____

Landowner Signature **Date** **Zoning Official** **Date**

***The Aitkin County Soil and Water Conservation District (SWCD)**
130 Southgate Center, Aitkin MN 56431 - Telephone (218) 927-6565 or swcd@mlecmn.net

Septic Design Additional Information
Multi~Flo with Pressure Bed Distribution
Overview of Installation

The Woods at Otterbelly

The Woods at Otterbelly proposes 6 buildings with four 2 bedroom residences in each building. The site contains a variety of slopes and is mostly wooded. Predominant soils are Duluth series fine sandy loam.

Preliminary design of standard mound septic systems found that 125+ trees would be removed, many of them mature hardwoods. We selected pre-treatment with pressure beds for distribution to reduce the negative impact and save all but perhaps 5 trees.

This design utilizes pre-treatment with Multi-Flo Aerobic Treatment Plants and pressure beds to disperse effluent into the soil. Joint collection will be used for buildings 1 & 2, and also for 3 & 4. Effluent will flow by gravity to a 2000 gallon trash trap (pre-tank), and from there be time dosed to the treatment plants. Design flow is based on 100 gallons per day per bedroom for soil sizing. We will time dose at slightly under design flow for treatment. From the Multi-Flos it will gravity flow into pump tanks which will dose the beds. There are two beds for Bldgs 1 & 2 which will be dosed alternately. There will be one bed for Bldgs 3 & 4. Building 5 and Building 6 will have stand alone systems. For these two effluent will flow by gravity to1600 gallon trash traps, be time dosed to the Multi-Flos, and gravity flow to the pump tanks for dosing to the beds.

All dosing tanks will be outfitted with alternating pumps to assure continued operation in event of pump failure and to allow additional time for repair. Effluent pumps in trash traps shall be placed on 8" high blocks and protected by Orenco Effluent screens or equivalent to prevent clogging of pumps. Alternating pumps that feed a single force main shall be protected from back flow with check valves.

Design Notes

Use care when clearing sites to avoid compacting the soil. Compaction may lead to system failure. Use only tracked vehicles on sites.

Use washed sand to build pressure beds to level and grade. Bottom of rock elevations provide 18" minimum separation.

Overfill beds with a minimum of 6" loamy cover material and finish grade as necessary to minimize water retention on beds.

Design Notes Continued

Laterals will have 1/8" orifices to minimize pump size. Provide lateral flush capability by installing vertical ball valves (on sweeps or two 45's) at the end of each lateral. Protect in 10" or larger valve boxes to provide good working access.

Homeowner to verify all property lines.

Elevations are referenced to lath and flag Bench Marks on several trees throughout the site.

Installer to verify all elevations, dimensions, and ensure proper fall to pipes.

Pitch pump chamber outlets to assure complete drainback to pump chambers.

Insulate pipes that pass under roads or areas expected to be kept free of snow.

Establish turf to prevent erosion and freezing.

Each tank is to be pumped through maintenance cover when serviced. Do not pump through inspection pipes.

Seal existing well by east end of beds 1 & 2. Seal to Minnesota Department of Health specifications.

Do not pile snow on or around tanks.

Property Owners are responsible for recording water meter readings on a monthly basis.

Property Owners accept the responsibility of all costs involved for servicing, monitoring, maintenance and mitigation of this system.

All construction to be performed in accordance with MN Rule 7080.

Aitkin County Environmental Services

Application for an
Operating Permit for Wastewater Treatment And Dispersal

Permittee: Lowell & Kathleen Gillem
The Woods at Otterbelly
Address: 37704 Dove Street
Aitkin, MN 56431

Parcel Number: 31-0-066201

Legal Description: That Portion N of County Rd 17 in the SE 1/4 of SW1/4, Sec 33 T47 R26 Spencer Township

Telephone # 218-927-4974 **GIS Location** _____

A. Description of Wastewater Treatment and Dispersal System:

This Planned Community Development will utilize Multi-Flo Aerobic Treatment Plants to pretreat waste, pressure beds will be used for dispersal. Effluent will flow by gravity into trash traps (pretanks). From there it will be time dosed into the aerobic plants, then gravity flow to pump tanks and be dosed to the fields.

Number of Bedrooms = 48

Flow = 4800 gallons per day

Hydraulic Loading Rate = 0.6 gpd/sqft

Organic Loading Rate = .000025 BOD/sqft

Estimated Cost of:

System Construction = TBD
Operation = $50 per month
Monitoring & Servicing: first year No Charge, after first year $125/yr for 750 gpd units, $250/yr for 1500 gpd units. Total $750
Testing = $800 first year, then $400/yr 2 years

Anticipated System Life = 25 - 30 years

B. Performance Standard Requirements:

During the period beginning on the date of the Operating Permit and lasting until the Permit's expiration date, the Permittee is authorized to discharge from the wastewater treatment unit to subsurface dispersal. No surface discharge is permitted. The following parameters must be monitored and the results must be found within the compliance limits.

Parameter	Compliance Limit	Sample Location	Sample Frequency	Sample Type	Reporting Frequency
BOD5	75 mg/l	Distribution Box	Bi-annual 1st year		Annual
Fats, Oil and Greases	30 mg/l	Distribution Box	Bi-annual 1st year		Annual
Fecal Coliform	<2500 cfu/100ml	Distribution Box	Bi-annual 1st year		Annual
TSS	22 mg/l	Distribution Box	Bi-annual 1st year		Annual
Flow	4800 GPD	Water Meter(s)	Monthly (or weekly)	Record on log sheet	Annual

C. Maintenance Requirements:

Parameter	Location	Frequency
Daily Flow	Water Meters (various)	Monthly (record on log sheet)
Sludge and scum level	Septic Tank	Annually
Pump, Timer, Alarms, Floats, etc.	Tanks	Annually
Multi-Flo	Multi-Flo	Bi-annually
Surfacing effluent, landscaping etc.	Total system	Annually

D. Monitoring and Reporting Requirements:

Monitoring results obtained during each calendar year shall be submitted no later than December 31st of that year to:

Aitkin County Environmental Services
209 - 2nd Street NW
Aitkin, MN 56341

The monitoring reports shall be signed by the Permittee. Copies are to be retained by the Permittee.

The Permittee shall notify Aitkin County Environmental Services within thirty (30) days when monitoring results do not meet the monitoring plan requirements of this permit.

Monitoring plans may be modified as necessary and reapproved by Aitkin County Environmental Services.

Sampling and laboratory testing procedures shall be performed in accordance with Standard Methods and the testing shall be performed by a Minnesota Department of Health approved laboratory. All sampling and testing costs shall be the responsibility of the Permittee.

Monitoring will be done by:

Eric Larson, 6549 Keystone Road, Milaca, MN 56353 320-983-2447 Lic #1767

E. Mitigation Plan:

If surfacing occurs: reduce water use, increase absorption and distribution area.

Waste strength: if fecals exceed limit, add disinfection or increase separation. If BOD, TSS or FOG exceed limit, reduce influent strength.

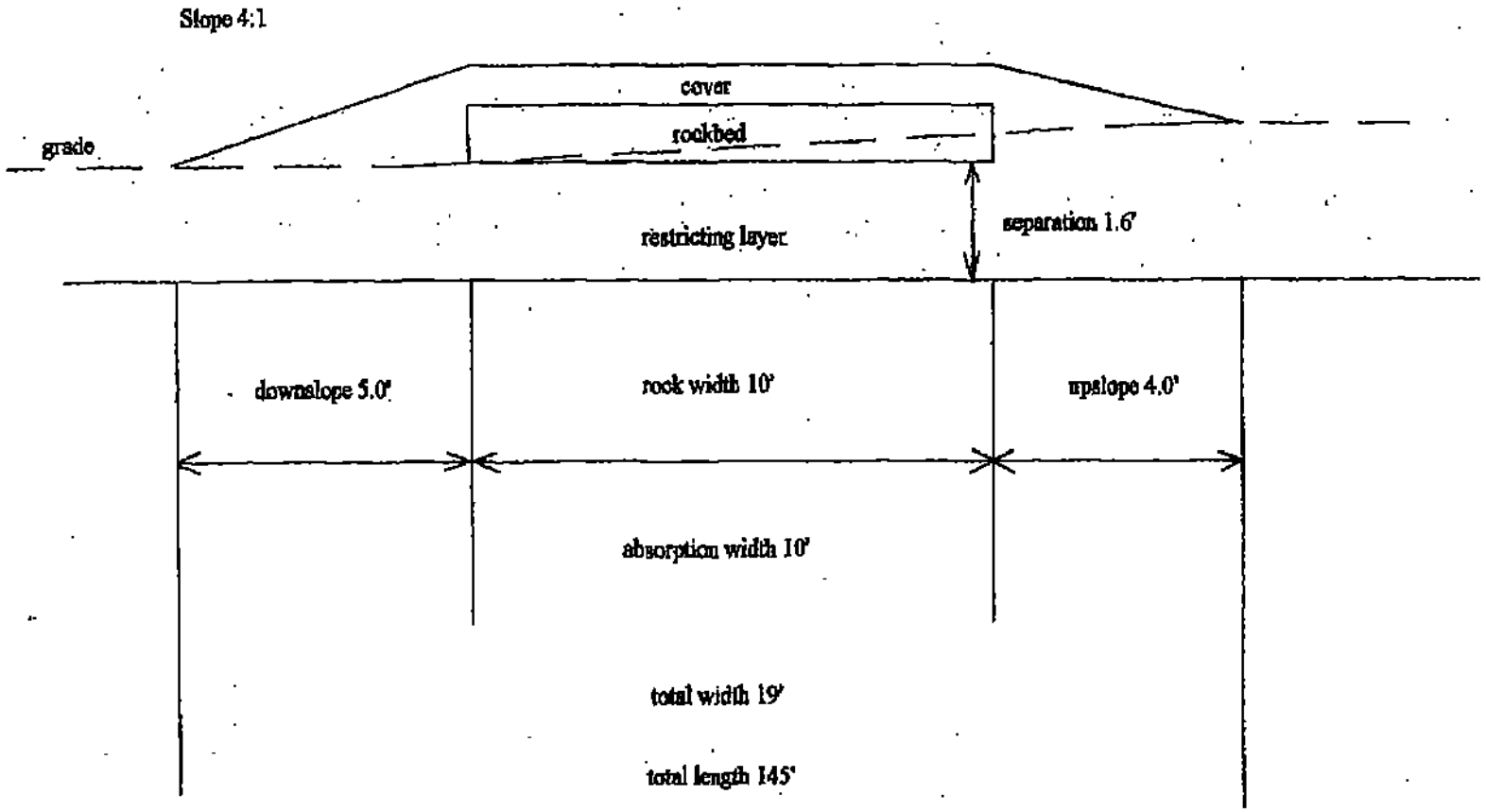
Reserve sites are available for replacement septic systems.

I hereby certify with my signature as the designer, that all data for the operating application is true and correct to the best of my knowledge.

License #1767 5-31-02

Eric Larson 6549 Keystone Rd, Milaca, MN 56353 320-983-2447

Building 6 cross section



harmony equipment
6549 KEYSTONE ROAD
MILACA, MN 56353

PHONE: (320) 983-2447
FAX: (320) 983-2151

FAX COVER SHEET

DATE: 6-25-02

PLEASE DIRECT THE FOLLOWING PAGES TO:

NAME: Rich Courtemanche

FIRM: Aitkin County Environmental Services

FAX #: 218-927-4372

FROM: ERIC LARSON

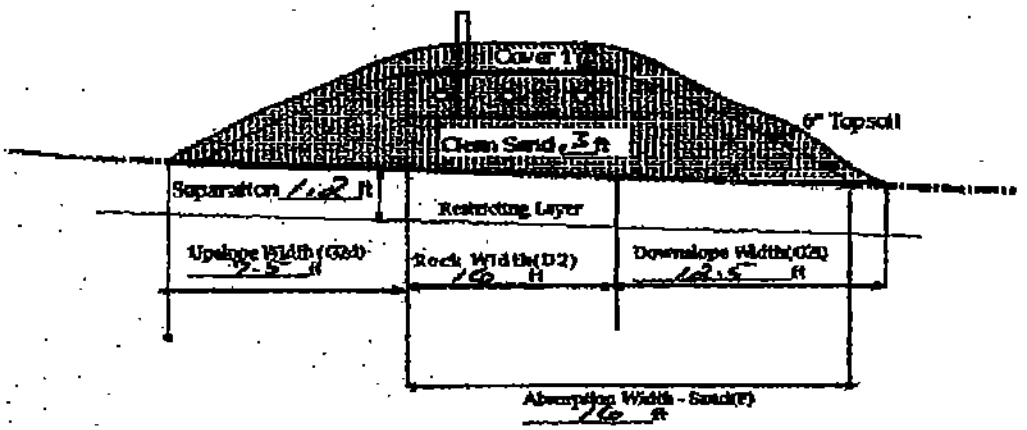
TOTAL NUMBER PAGES SENT INCLUDING COVER SHEET: 5

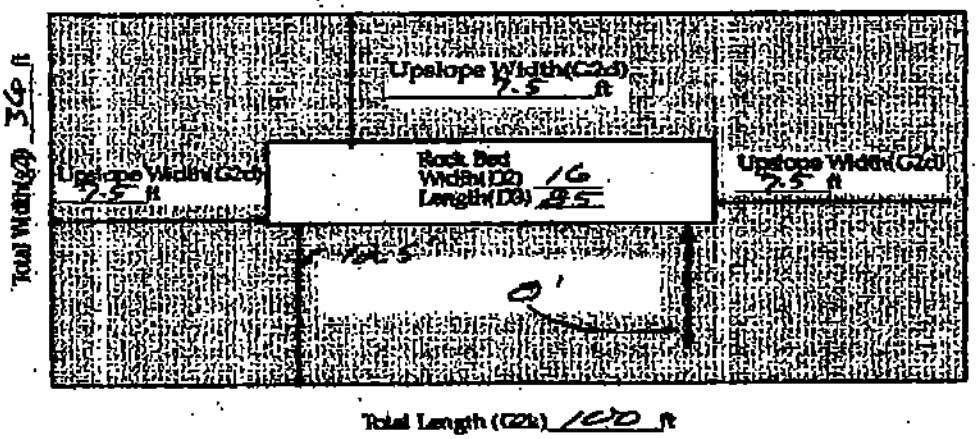
Cross sections follow for Otterbelly

[illegible]

Buildings 1+2

Landslope > 1% slope





Design Notes Specific to Buildings

Buildings 1 & 2

Provide upslope diversion to protect trash trap from run on.

Subsoil below approximately 18" is a silty clay loam with an estimated absorption rate of .45 gpd/ft2. Distance between the beds provides the additional area required for complete absorption to assure that linear loading rate is not exceeded.

Buildings 3 & 4

There is a long force main to the pressure bed. Field verify elevations and install tanks as shallow as possible due to wet soils. Assure complete drainback, however, and overfill as necessary to prevent freezing.

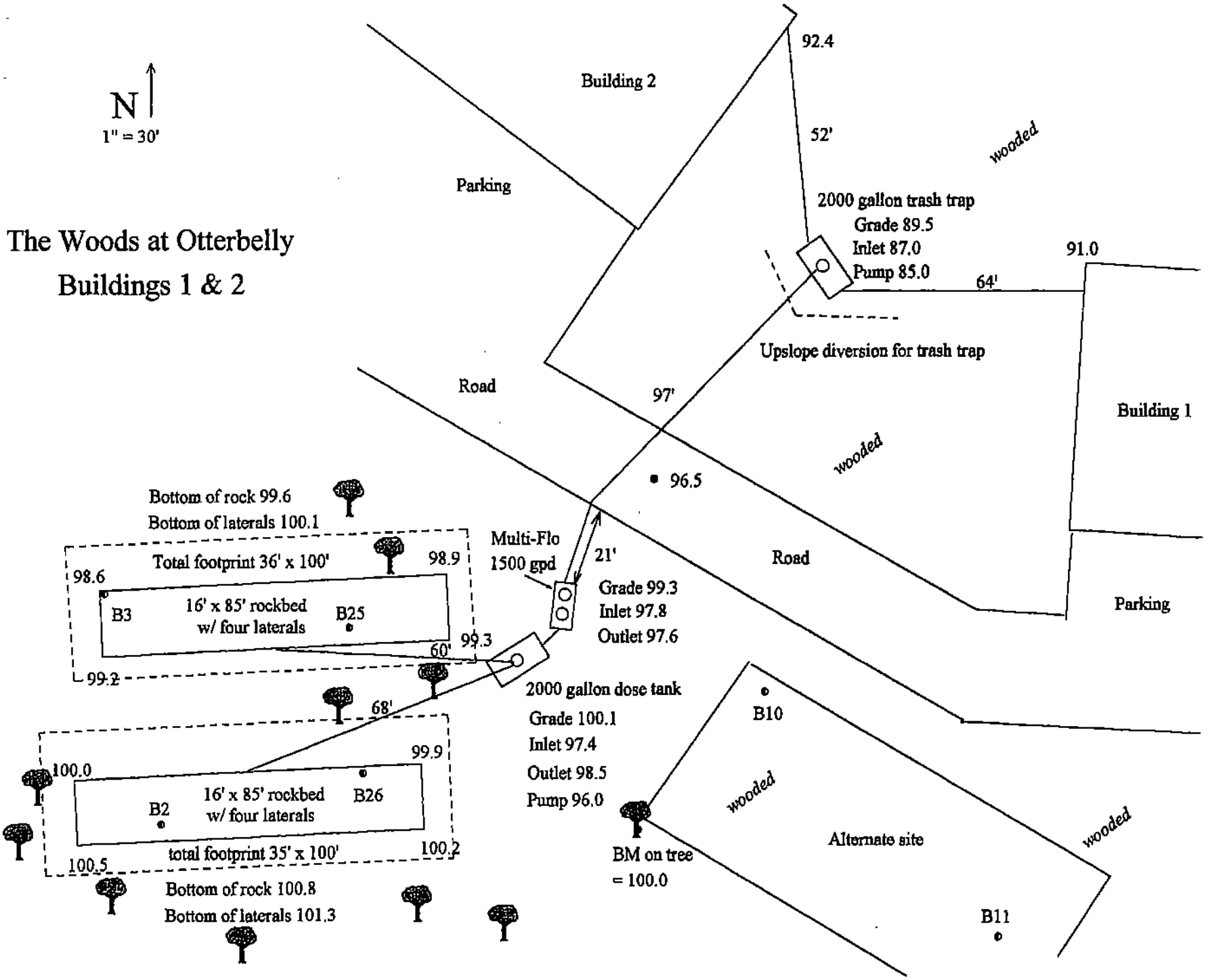
After site is cleared minor adjustment of bed to more closely follow contour may be possible. If so, toes may be more uniform.

Building 5

This bed is located in a patch of aspen saplings at the top of a rise. Grade falls away at the SE corner and will require extra washed sand fill to level.

Building 6

Bottom of rock is at grade with west edge of bed. Overfill as indicated.


N
1" = 30'
The Woods at Otterbelly
Buildings 1 & 2
Building 2
Parking
92.4
52'
wooded
2000 gallon trash trap
Grade 89.5
Inlet 87.0
Pump 85.0
91.0
64'
Upslope diversion for trash trap
Road
97'
Building 1
wooded
96.5
Bottom of rock 99.6
Bottom of laterals 100.1
Total footprint 36' x 100'
98.9
98.6
B3
16' x 85' rockbed
w/ four laterals
B25
99.3
60'
99.2
Multi-Flo
1500 gpd
21'
Grade 99.3
Inlet 97.8
Outlet 97.6
Road
Parking
2000 gallon dose tank
Grade 100.1
Inlet 97.4
Outlet 98.5
Pump 96.0
68'
99.9
100.0
B2
16' x 85' rockbed
w/ four laterals
B26
total footprint 35' x 100'
100.5
100.2
Bottom of rock 100.8
Bottom of laterals 101.3
B10
wooded
Alternate site
wooded
BM on tree
= 100.0
B11

PUMP SELECTION PROCEDURE

Buildings 1 & 2 Dose to Multi-Flo

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

1. Determine pump capacity:

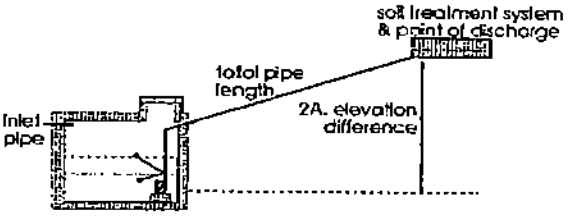
A. Gravity Distribution

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: [25] gpm



2. Determine head requirements:

A. Elevation difference between pump and point of discharge.

[13] feet

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

[0] feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

C. Friction loss

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= [1.11] ft/ 100 ft of pipe

E-9: Friction Loss in Plastic Pipe Per 100 feet			
	nominal pipe diameter		
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

3. Determine total pipe length from pump discharge to soil system discharge point

Estimate by adding 25 percent to pipe length for fitting loss.

Equivalent pipe length times 1.25 = total pipe length

[102] ft x 1.25 = [127.5] feet

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

FL= *1.11* ft/100ft X *127.5* ft / 100= *1.4* feet

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

13 ft + *0* ft + *1.4* ft

Total Head: *14.4* **feet**

3. Pump Selection

1. A pump must be selected to deliver at least *25* gpm (1A or B)
with at least *14.4* feet of total head (2D).

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

(signature) 1767 (license #) 6/18/02 (date)

PRETREATMENT WORK SHEET

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

1. FLOW — Buildings 1 & 2

A. Estimated [1600] gpd (see figure A-1)
measured [ ] x 1.5(safety factor): 0 gpd

B. SEPTIC TANK CAPACITY [2000] gallons *(see figure C-1)*

2. SOILS (Site evaluation data)

C. Depth to restricting layer= [1.2] feet

D. Texture [fine sand] Percolation rate [ ] MPI

E. SSF [1.67] ft²/gpd *(see downsizing or < 3ft figure)*

F. Land Slope [3] %

3. Pressure Distribution Trench Bottom Area

H. For trenches with 6" of rock below the pipe, Area = Flow (1A) divided by SSF (2E)=

1600 gpd x 1.67 ft²/gpd = 2700.0 ft²

I. For trenches with 12" of rock below the pipe, Area = Flow (1A) divided by SSF (2E) x 0.8

_____ gpd x _____ ft²/gpd x 0.8 = _____ ft²

4. ORGANIC LOADING

J. 1. Organic loading = flow (A) x estimated BOD in mg/L leaving the pretreatment unit x 8.35 / 1,000,000

1600 gpd x 5 mg/L x 8.35 / 1,000,000 = 0.0668 lbs BOD

2. System loading = organic loading(J1) / area (H or I)

0.0668 lbs BOD / 2700.0 ft² = 2E-05

3. Check system loading rate on chart. Should be less than value.

5. ROCK VOLUME

K. Rock depth below distribution pipe plus 0.5 foot times bottom area:

= (Rock depth + 0.5 foot) x Area (H, I, J, K, L)

(0.5 ft + 0.5 ft) x 2700.0 ft² = 2700 ft³

L. Volume in cubic yards = volume in cubic feet divided by 27

K / 27 = cubic yards 2700 / 27= 100 yd³

M. Weight of rock in tons = cubic yards times 1.4

L x 1.4 = tons 100 x 1.4= 140 tons

6. SYSTEM LENGTH **2 beds each 1350 sq ft, 16' x 85' dimension**

N. Select width = [16] ft alternating pumps

O. Divide bottom area by width: (H, I) divided by N = lineal feet

[1350.0] ft² / 16 ft = 85 lineal feet

7. LAYOUT

Select an appropriate scale; one inch = [ ] feet

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, setbacks and separation distances.

8. SYSTEM LLR

P. Draw a line downhill though soil treatment system drawn in layout.

How many trenches does it cross? Add their widths together.

width 1 + width 2 + width 3 + ...

[16] ft + [ ] ft + [ ] ft + _____ ft = 16 ft

Q. Divide total trench width (P) by SSF (F) = gallons per foot

16 ft / 1.67 ft²/gpd = 9.6 gal/ft *(Should be <12 gallons per foot)*

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

_____ (signature) 1767 (license #) 6/19/02 (date)

A-1: Estimated Sewage Flows in Gallons per Day

number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	150	60%
3	450	300	218	of the
4	600	375	255	values
5	750	450	294	in the
6	900	525	332	Class I,
7	1050	600	370	II, or III
8	1200	675	408	columns

C-1: Septic Tank Capacities (in gallons)

Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposable lilt inside
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

Downsizing Chart

Soil Characteristics and Required Areas for Pretreated Sewage (3' separation)

Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Square feet per gallon per day	Organic loading pound per day per foot
Faster than 0.1"	Coarse Sand	0.83	0.020
0.1 to 0.5	Medium Sand	0.83	0.015
	Loamy Sand		
0.1 to 5	Fine Sand **	0.83	0.0072
5 to 15	Sandy Loam	0.83	0.0051
16 to 30	Loam	0.83	0.0019
31 to 45	Silt Loam	1.00	0.0007
	Silt		
46 to 60	Clay Loam (CL)	1.10	0.0006
	Silty CL		
	Sandy CL		
60 to 120	Clay	2.50	0.0005
Over 120	Clay	3.25	0.0005

* Soil too coarse for sewage treatment. Use systems for rapidly permeable soils.
** Soil having 50% or more of fine sand plus very fine sand.

Less Than 3 feet of Separation Chart

D-15: Soil Characteristics and Required Areas for Sewage Treatment (<3' separation)

Percolation rate in minutes per inch (MPI)	Soil texture	square feet per gallon per day	gallons per day per square foot
Faster than 0.1"	Coarse sand	0.83	1.20
0.1 to 5	Medium sand	0.80	1.20
	Loamy sand		
0.1 to 5	fine sand**	1.67	0.60
5 to 15	sandy loam	1.27	0.79
16 to 30	loam	1.67	0.60
31 to 45	Silt loam	2.00	0.50
	silt		
46 to 60	Clay loam	2.20	0.45
	Sandy clay		
	Silty clay		
over 61***	Clay		
	Sandy clay		
	Silty clay		

*Soil too coarse for sewage treatment use systems for rapidly permeable soils.
**Soil having 50% or more fine sand plus very fine sand.
***Soil with too high a percentage of clay for installation of a standard trench system.

harmony equipment
6549 KEYSTONE ROAD
MILACA, MN 56353

PHONE: (320) 983-2447
FAX: (320) 983-2151

FAX COVER SHEET

DATE: 6-27-02

PLEASE DIRECT THE FOLLOWING PAGES TO:

NAME: Rich Courtemanche

FIRM: Aitkin County Zoning

FAX #: 218-927-4372

FROM: ERIC LARSON

TOTAL NUMBER PAGES SENT INCLUDING COVER SHEET: 8

Landscape calculations follow as requested. Thank you for requesting these, Rich. I increased the total footprint of Building 5 slightly.

Call with any questions.

Elevated Pressurized Bed Buildings 1 & 2 [illegible]

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

A-1: Estimated Sewage Flows in Gallons per Day				
number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	180	60%
3	450	300	218	of the
4	600	375	254	values
5	750	450	294	in the
6	900	525	332	Class I,
7	1050	600	370	II, or III
8	1200	675	408	columns.

A. FLOW

Estimated [800] gpd *(see figure A-1)* per bed

or measured [ ] x 1.5 (safety factor) = 0 gpd

B. SEPTIC TANK LIQUID VOLUMES

Septic tank capacity [see design] gallons *(see figure C-1)*

C. SOILS *(Site evaluation data)*

1. Depth to restricting layer= [1.2] feet
2. Depth of percolation tests = [ ] inches
3. Texture [fine sandy loam]
4. Soil loading rate *(see Figure D-33)* [0.6] gpd/ft²

   Percolation rate [ ] MPI
5. % Land Slope [3] %

C-1: Septic Tank Capacities (in gallons)			
Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposal & lift inside
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

D-33: Absorption Width Sizing Table			
Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Loading Rate Gallons per day per square foot	Absorption Ratio
Faster than 5	Coarse Sand, Medium Sand, Loamy Sand, Fine Sand	1.20	1.00
6 to 15	Sandy Loam	0.79	1.50
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam, Silt	0.50	2.40
46 to 60	Sandy Clay Loam, Silty Clay Loam, Clay Loam	0.45	2.67
61 to 120	Silty Clay, Sandy Clay, Clay	0.24	5.00
Slower than 120*			
*[illegible]			

D. ROCK LAYER DIMENSIONS

1. Multiply average design flow (A) by 0.83 to obtain required area of rock layer: Item A x 0.83=

   800 gpd x 1.67sqft/g. 1336.0 ft²

2. Determine rock layer width = 0.83 ft²/gpd x Linear Loading Rate (LLR) (see LLR chart)

   1.67sqft/gpd x [12] = 20.0 ft

LLR Chart	
Perk Rate	LLR
<120 MPI	<=12
>=120 MPI	<=8

3. Length of rock layer = area divided by width =

   1360 ft² / 20 feet = 65.0 feet

E. ROCK VOLUME

1. Multiply rock area by rock depth to get cubic feet of rock

   1360 X 0.75 ft = 1020.0 ft³

2. Divide ft³ by 27 ft³/yd³ to get cubic yards

   1020.0 ft³ / 27 = 37.8 yd³

3. Multiply cubic yards by 1.4 to get weight of rock in tons;

   37.8 yd³ X 1.4 ton/yd³ = 52.9 tons

F. ABSORPTION WIDTH

1. Absorption width equals absorption ratio (see Figure D-33) times rock layer width

   [1] x 16.0 ft = 16.0 ft

G. Elevated Bed Width & Length Bldgs. 1 + 2

1. Downslope absorption width = absorption width minus rock layer width

Building 1&2

16 feet - 16 feet = 0 feet

2. Calculate mound size

UPSLOPE

a. Determine depth of clean sand at upslope edge of rock layer = 3 feet minus distance to restricting layer(C1)

1.5 ft - 1.2 ft = 0.3 feet

b. Mound height at the upslope edge of rock layer = depth of clean sand for separation (G2a) at upslope edge plus depth of rock layer (1 foot) to depth of cover (1 foot)

0.3 ft +.75ft +.75ft 1.8 feet

c. Upslope berm multiplier based on land slope *(see figure D-34)*

Select berm multiplier of 3.57

d. Upslope width = berm multiplier(G2c) times upslope mound height(G2b):

3.57 x 1.8 ft = 6.4 feet

D-34: SLOPE MULTIPLIER TABLE

Land slope in %	UPSLOPE multipliers for various slope ratios						DOWNSLOPE multipliers for various slope ratios				
	2:1	4:1	5:1	6:1	7:1	8:1	3:1	4:1	5:1	6:1	7:1
0	3.0	4.0	5.0	6.0	7.0	8.0	3.0	4.0	5.0	6.0	7.0
1	2.97	3.88	4.78	5.68	6.58	7.48	3.09	4.17	5.26	6.38	7.83
2	2.93	3.78	4.64	5.56	6.34	6.98	3.19	4.35	5.59	6.82	8.14
3	2.75	3.67	4.59	5.68	5.79	6.83	3.36	4.64	5.85	7.33	8.99
4	2.68	3.48	4.17	4.84	5.46	6.06	3.61	4.76	6.25	7.89	9.72
5	2.61	3.38	4.08	4.62	5.19	5.71	3.83	5.09	6.67	8.97	10.77
6	2.54	3.25	3.89	4.31	4.93	5.43	3.98	5.29	7.38	9.38	12.07
7	2.48	3.12	3.76	4.23	4.70	5.19	3.98	5.58	7.69	10.14	13.73
8	2.43	3.03	3.67	4.06	4.49	4.88	3.95	5.98	8.33	11.54	15.91
9	2.36	2.94	3.65	3.99	4.38	4.65	4.11	6.29	9.09	13.04	18.02
10	2.31	2.86	3.56	3.75	4.12	4.44	4.29	6.67	10.00	15.00	20.33
11	2.26	2.78	3.23	3.61	3.90	4.26	4.45	7.16	11.11	17.65	30.83
12	2.21	2.70	3.12	3.49	3.89	4.08	4.59	7.69	12.50	21.43	43.75

DOWNSLOPE

e. Drop in elevation = rock layer width (D2) times percent landslope(C5) / 100

16 ft x 3 % / 100 = 0.5 feet

f. Downslope mound height = depth of clean sand for slope difference (G2e) at downslope rock edge plus the mound height at the upslope edge of rock layer (2b)

0.50 ft + 1.8 ft = 2.3 feet

g. Downslope berm multiplier based on percent land slope (see Figure D-34) 4.54

h. Downslope width = downslope multiplier(G2g) times downslope mound height(G2f)

4.54 x 2.3 = 10.4 feet

i. Select greater of G1 and G2h as the downslope width 10.4 feet

j. Total mound width is the sum of upslope (G2d) width plus rock layer width (D2) plus downslope width (G2i)

6.4 ft + 16.0 ft + 10.4 ft = 33.0 feet

k. Total mound length is the sum of upslope width (G2d) plus rock layer length (D3) plus upslope width (G2d)

6.4 ft + 85.0 ft + 6.4 ft = 98.0 ft

Final Dimensions	33.0 ft x 98.0 ft

Building 3 & 4

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

A. FLOW

Estimated [1600] gpd (see figure A-1) per bed
or measured [ ] x 1.5 (safety factor) = 0 gpd

B. SEPTIC TANK LIQUID VOLUMES

Septic tank capacity [see design] gallons (see figure C-1)

C. SOILS (Site evaluation data)

1. Depth to restricting layer= [1.2] feet
2. Depth of percolation tests = [ ] inches
3. Texture [fine sandy loam]
4. Soil loading rate (see Figure D-33) [0.6] gpd/ft²
   Percolation rate [ ] MPI
5. % Land Slope [4] %

A-1: Estimated Sewage Flows in Gallons per Day				
Number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	180	60% of the values in the Class 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	

C-1: Septic Tank Capacities (in gallons)			
Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposal & lift inside
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

D-33: Absorption Width Sizing Table			
Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Loading Rate Gallons per day per square foot	Absorption Ratio
Faster than 5	Coarse Sand, Medium Sand, Loamy Sand, Fine Sand	1.20	1.00
6 to 15	Sandy Loam	0.79	1.50
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam, Silt	0.50	2.40
46 to 60	Sandy Clay Loam, Silty Clay Loam, Clay Loam	0.45	2.67
61 to 120	Silty Clay, Sandy Clay, Clay	0.24	5.00
Slower than 120*			

*[illegible]

D. ROCK LAYER DIMENSIONS

1. Multiply average design flow (A) by 0.83 to obtain required area of rock layer: Item A x 0.83=
   1600 gpd x 1.67sqft/g 2672.0 ft²

2. Determine rock layer width = 0.83 ft²/gpd x Linear Loading Rate (LLR) (see LLR chart)
   1.67sqft/gpd x [12] = 20.0 ft

LLR Chart	
Perk Rate	LLR
<120 MPI	<=12
>=120 MPI	<=6

3. Length of rock layer = area divided by width =
   2700 ft² / 20 feet = 135.0 feet

E. ROCK VOLUME

1. Multiply rock area by rock depth to get cubic feet of rock
   2700 X 0.75 ft = 2025.0 ft³

2. Divide ft³ by 27 ft³/yd³ to get cubic yards
   2025.0 ft³ / 27 = 75.0 yd³

3. Multiply cubic yards by 1.4 to get weight of rock in tons;
   75.0 yd³ X 1.4 ton/yd³ = 105.0 tons

F. ABSORPTION WIDTH

1. Absorption width equals absorption ratio (see Figure D-33) times rock layer width
   [1] x 20.0 ft = 20.0 ft

G. Elevated Bed Width and Length Buildings 3 & 4

1 [illegible]

Building 3 & 4

1. Downslope absorption width – absorption width minus rock layer width
20 feet - 20 feet = 0 feet

2. Calculate mound size

UPSLOPE

a. Determine depth of clean sand at upslope edge of rock layer = 3 feet minus distance to restricting layer(C1)
1.5 ft - 1.1 ft = 0.4 feet

b. Mound height at the upslope edge of rock layer = depth of clean sand for separation (G2a) at upslope edge plus depth of rock layer (1 foot) to depth of cover (1 foot)
0.4 ft +.75ft +.75ft 1.9 feet

c. Upslope berm multiplier based on land slope *(see figure D-34)*
Select berm multiplier of 3.45

d. Upslope width = berm multiplier(G2c) times upslope mound height(G2b):
3.67 x 1.9 ft = 6.5 feet

D-34 SLOPE MULTIPLIER TABLE

Land Slope (in %)	UPSLOPE multiplier for various slope ratios						DOWNSLOPE multiplier for various slope ratios				
	3:1	4:1	5:1	6:1	7:1	8:1	3:1	4:1	5:1	6:1	7:1
0	3.0	4.0	5.0	6.0	7.0	8.0	3.0	4.0	5.0	6.0	7.0
1	2.91	3.85	4.76	5.66	6.54	7.41	3.09	4.17	5.26	6.38	7.53
2	2.83	3.70	4.54	5.36	6.14	6.90	3.19	4.35	5.56	6.82	8.14
3	2.75	3.57	4.35	5.08	5.79	6.45	3.30	4.55	5.88	7.32	8.86
4	2.68	3.45	4.17	4.84	5.48	6.06	3.41	4.76	6.25	7.89	9.72
5	2.61	3.33	4.00	4.62	5.19	5.71	3.53	5.00	6.67	8.57	10.77
6	2.54	3.23	3.85	4.41	4.93	5.41	3.66	5.26	7.14	9.38	12.07
7	2.48	3.13	3.70	4.23	4.70	5.13	3.80	5.56	7.69	10.34	13.73
8	2.42	3.03	3.57	4.05	4.48	4.88	3.95	5.88	8.33	11.54	15.91
9	2.36	2.94	3.45	3.90	4.29	4.65	4.11	6.25	9.09	13.04	18.92
10	2.31	2.86	3.33	3.75	4.12	4.44	4.29	6.67	10.00	15.00	23.33
11	2.26	2.78	3.23	3.61	3.95	4.26	4.48	7.14	11.11	17.65	30.43
12	2.21	2.70	3.13	3.49	3.80	4.08	4.69	7.69	12.50	21.43	43.75

DOWNSLOPE

e. Drop in elevation = rock layer width (D2) times percent landslope(C5) / 100
20 ft x 4 % / 100 = 0.8 feet

f. Downslope mound height = depth of clean sand for slope difference (G2a) at downslope rock edge plus the mound height at the upslope edge of rock layer (2b)
0.80 ft + 1.9 ft = 2.7 feet

g. Downslope berm multiplier based on percent land slope (see Figure D-34) 4.76

h. Downslope width = downslope multiplier(G2g) times downslope mound height(G2f)
4.76 x 2.7 = 12.8 feet

i. Select greater of G1 and G2h as the downslope width 12.8 feet

j. Total mound width is the sum of upslope (G2d) width plus rock layer width (D2) plus downslope width (G2i)
6.5 ft + 20.0 ft + 12.8 ft = 39.3 feet

k. Total mound length is the sum of upslope width (G2d) plus rock layer length (D3) plus upslope width (G2d)
6.5 ft + 135.0 ft + 6.5 ft = 148.0 ft

Final Dimensions	39.3 ft x 148.0 ft

Building 5

... must be entered, the rest will be calculated.

A. FLOW

Estimated [800] gpd *(see figure A-1)* per bed
or measured [ ] x 1.5 (safety factor) = 0 gpd

B. SEPTIC TANK LIQUID VOLUMES

Septic tank capacity [see design] gallons *(see figure C-1)*

C. SOILS *(Site evaluation data)*

1. Depth to restricting layer= [1.2] feet
2. Depth of percolation tests = [ ] inches
3. Texture [fine sandy loam]
4. Soil loading rate *(see Figure D-33)* [0.6] gpd/ ft^2
   Percolation rate [ ] MPI
5. % Land Slope [1] %

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

C-1: Septic Tank Capacities (in gallons)			
Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposal & lift inside
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

D-33: Absorption Width Sizing Table			
Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Loading Rate Gallons per day per square foot	Absorption Ratio
Faster than 5	Coarse Sand Medium Sand Loamy Sand Fine Sand	1.20	1.00
6 to 15	Sandy Loam	[illegible]	[illegible]
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam Silt	0.50	2.40
46 to 60	Sandy Clay Loam Silty Clay Loam Clay Loam	0.45	2.67
61 to 120	Silty Clay Sandy Clay Clay	[illegible]	5.00
Slower than 120*			

*[illegible]

D. ROCK LAYER DIMENSIONS

1. Multiply average design flow (A) by 0.83 to obtain required area of rock layer. Item A x 0.83=
   800 gpd x 1.67sqft/g 1336.0 ft^2
2. Determine rock layer width = 0.83 ft^2/gpd x Linear Loading Rate (LLR) (see LLR chart)
   1.67sqft/gpd x [12] = 20.0 ft

LLR Chart	
Perk Rate	LLR
<120 MPI	<=12
>=120 MPI	<=6

3. Length of rock layer = area divided by width =
   1340 ft^2 / 20 feet = 67.0 feet

E. ROCK VOLUME

1. Multiply rock area by rock depth to get cubic feet of rock
   1340 X 0.75 ft = 1005.0 ft^3
2. Divide ft^3 by 27 ft^3/yd^3 to get cubic yards
   1005.0 ft^3 / 27 = 37.2 yd^3
3. Multiply cubic yards by 1.4 to get weight of rock in tons;
   37.2 yd^3 X 1.4 ton/yd^3 = 52.1 tons

F. ABSORPTION WIDTH

1. Absorption width equals absorption ratio (see Figure D-33) times rock layer width
   [1] x 20.0 ft = 20.0 ft

G. Elevated Bed Width and Length Building 5

1. Downslope absorption width = absorption width minus rock layer width

Building 5

20 feet - 20 feet = 0 feet

2. Calculate mound size

UPSLOPE

a. Determine depth of clean sand at upslope edge of rock layer = 3 feet minus distance to restricting layer(C1)

1.5 ft - 1.3 ft = 0.2 feet

b. Mound height at the upslope edge of rock layer = depth of clean sand for separation (G2a) at upslope edge plus depth of rock layer (1 foot) to depth of cover (1 foot)

0.2 ft +.75ft +.75ft 1.7 feet

c. Upslope berm multiplier based on land slope *(see figure D-34)*

Select berm multiplier of 3.85

d. Upslope width = berm multiplier(G2c) times upslope mound height(G2b):

3.85 x 1.7 ft = 6.5 feet

D-34: SLOPE MULTIPLIER TABLE

Land Slope, in %	UPSLOPE multipliers for various slope ratios						DOWNSLOPE multipliers for various slope ratios				
	3:1	4:1	5:1	6:1	7:1	8:1	3:1	4:1	5:1	6:1	7:1
0	3.0	4.0	5.0	6.0	7.0	8.0	3.0	4.0	5.0	6.0	7.0
1	2.91	3.85	4.76	5.66	6.54	7.41	3.09	4.17	5.26	6.38	7.53
2	2.83	3.70	4.54	5.36	6.14	6.90	3.19	4.35	5.56	6.82	8.14
3	2.75	3.57	4.35	5.08	5.79	6.45	3.30	4.55	5.88	7.32	8.86
4	2.68	3.45	4.17	4.84	5.47	6.06	3.41	4.76	6.25	7.89	9.72
5	2.61	3.33	4.00	4.62	5.19	5.71	3.53	5.00	6.67	8.57	10.77
6	2.54	3.23	3.85	4.41	4.93	5.41	3.66	5.26	7.14	9.38	12.07
7	2.48	3.13	3.70	4.23	4.70	5.13	3.80	5.56	7.69	10.34	13.73
8	2.42	3.03	3.57	4.05	4.49	4.88	3.95	5.88	8.33	11.54	15.91
9	2.36	2.94	3.45	3.90	4.30	4.65	4.11	6.25	9.09	13.04	18.92
10	2.31	2.86	3.33	3.75	4.12	4.44	4.29	6.67	10.00	15.00	23.33
11	2.26	2.78	3.23	3.61	3.95	4.26	4.48	7.14	11.11	17.65	30.43
12	2.21	2.70	3.12	3.49	3.80	4.08	4.69	7.69	12.50	21.43	43.75

DOWNSLOPE

e. Drop in elevation = rock layer width (D2) times percent landslope(C5) / 100

20 ft x 1 % / 100 = 0.2 feet

f. Downslope mound height = depth of clean sand for slope difference (G2e) at downslope rock edge plus the mound height at the upslope edge of rock layer (2b)

0.20 ft + 1.7 ft = 1.9 feet

g. Downslope berm multiplier based on percent land slope (see Figure D-34) 4.17

h. Downslope width = downslope multiplier(G2g) times downslope mound height(G2f)

4.17 x 1.9 = 7.9 feet

i. Select greater of G1 and G2h as the downslope width 7.9 feet

j. Total mound width is the sum of upslope (G2d) width plus rock layer width (D2) plus downslope width (G2i)

6.5 ft + 20.0 ft + 7.9 ft = 39.1 feet

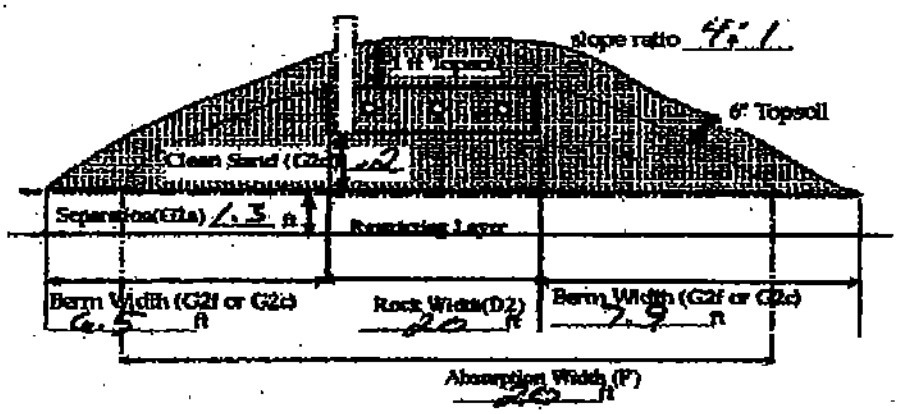
k. Total mound length is the sum of upslope width (G2d) plus rock layer length (D3) plus upslope width (G2d)

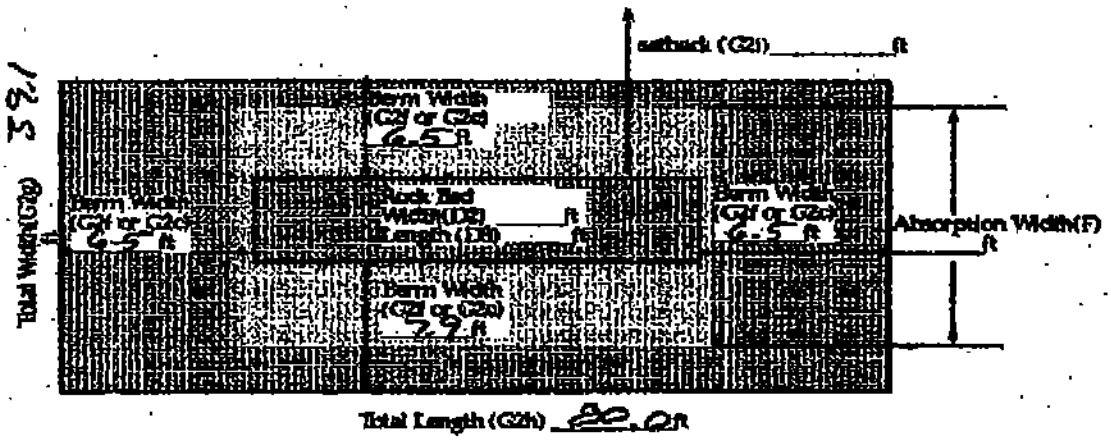
6.5 ft + 67.0 ft + 6.5 ft = 80.0 ft

Final Dimensions	39.1 ft	x	80.0 ft

Building 5 cross section

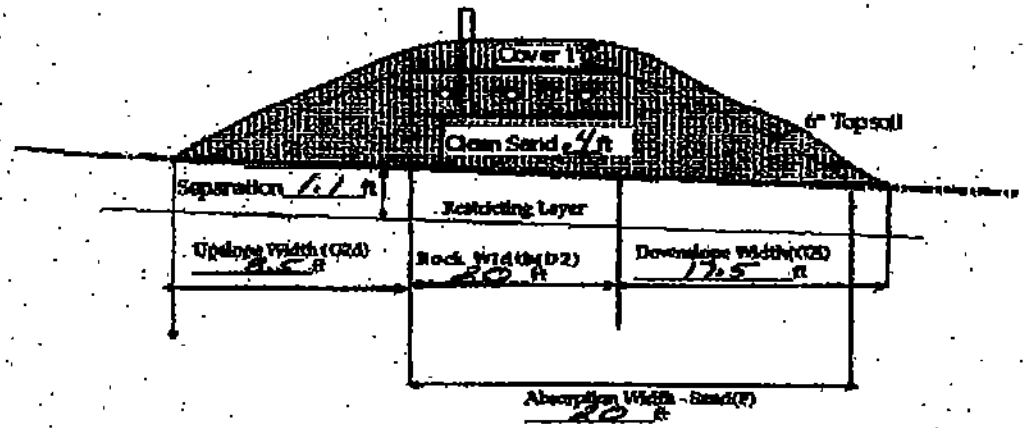
<=1% land slope

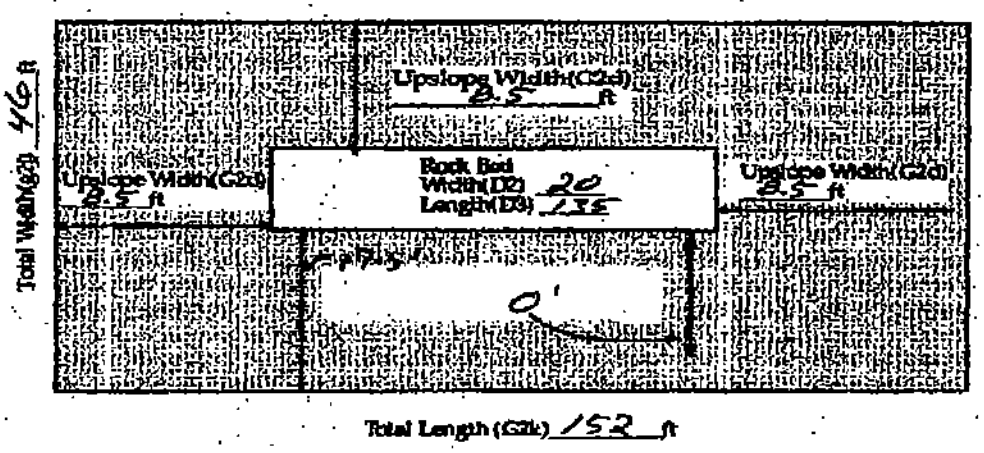




Buildings 3 & 4 cross section

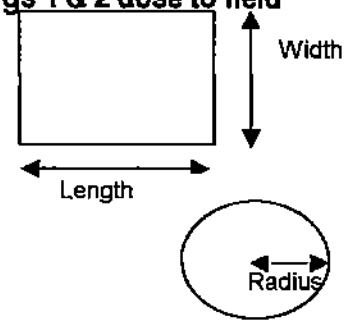
Landslope > 1% slope





DOSING CHAMBER SIZING Buildings 1 & 2 dose to field

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



1. Determine area
   A. Rectangle area = L x W
   [ ] ft x [ ] ft = 0 ft²
   B. Circle area = 3.14 x radius²
   3.14 x [ ]² ft = 0.0 ft²
   C. Get area from manufacture [ ] ft²

2. Calculate gallons per inch
   There are 7.5 gallons per cubic foot of volume, therefore multiply the area (1A, B or C) times the conversion factor and divide by 12 inches per foot to calculate gallon per inch.
   Surface area x 7.5 / 12 = 0 ft² x 7.5 / 12in/ft = 0 gallon per inch

46 gallons per inch 2000 gallon tank

Legal Tank:
500 gallons or
100% the daily flow
or Alternating Pumps

3. Calculate total tank volume
   A. Depth from bottom of inlet pipe to tank bottom = [ ] in
   B. Total tank volume = depth from bottom of inlet pipe to tank bottom(3A) x gal/in(2)
   = 0 in x 0 gal/in = 0.0 gallons

4. Calculate gallons to cover pump (with 2-3 inches of water covering pump)
   (Pump and block height + 2 inches) x gallon per inch
   ([14] + 2 in) x 46 gal/in = 736.0 gallons

A-1: Estimated Sewage Flows in Gallons per Day

number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	180	40%
3	450	300	218	of the
4	600	375	256	values
5	750	450	294	in the
6	900	525	332	Class I,
7	1050	600	370	II, or III
8	1200	675	408	columns.

5. Calculate total pumpout volume
   A. Select pump size for 4-5 doses per day. Gallon per dose = gpd *(see Figure A-1)* / doses per day =
   [1500] gpd / [8] doses/day = 187.5 gallons
   B. Calculate drainback
      1. Determine total pipe length [42.0] ft
      2. Determine liquid volume of pipe, [0.17] gal/ft *(see figure E-20)*
      3. Drainback quantity = 72.0 ft (5B1) x 0.17 gal/ft(5B2) 12.2 v
   C. Total pump out volume = dose volume(5A) + drainback (5B3)
   187.5 gallons + 12.2 gallons = 199.7

E-20: Volume of Liquid in Pipe

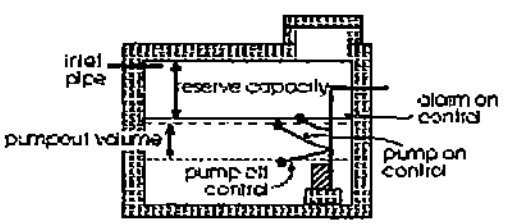
Pipe Diameter *inches*	Gallons per foot
1	0.045
1.25	0.078
1.5	0.11
2	0.17
2.5	0.25
3	0.38
4	0.66

6. Calculate float separation distance (using total pumpout volume)
   Total pumpout volume(5C) / gal/inch(2)
   199.7 gal / 46 gal/in = 4.3 inch

7. Calculate volume for alarm (typically 2 - 3 inches)
   Alarm depth (inch) x gallon/inch(2) = [3] in x 46 gal/in = 138 gal

8. Calculate total gallons = gallons over pump(4) + gallons pumpout(5C) + gallons alarm(7)
   736.0 gal + 199.7 gal + 138 gal = 1073.7 gal

9. Total tank depth = total gallons(8) / gallon/in(2)
   1073.7 gallons / 46 gal/in = 23.3



Recommended
Calculate reserve capacity (75% of the daily flow)
Daily flow x 0.75 = 1500 x 0.75 = 1125 gallons

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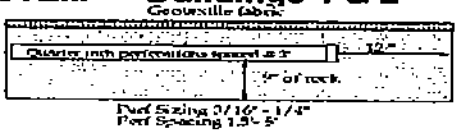
PRESSURE DISTRIBUTION SYSTEM Buildings 1 & 2



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

1. Select number of perforated laterals: [4]

2. Select perforation spacing = [2.5] ft

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

perforation spacing (feet)	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

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
   [85] - 2 ft = 83 ft
   rock layer length

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 = 83 ft / 2.5 ft = 33 spaces

5. 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.*
   33 spaces + 1 = 34 perforations/lateral

6. A. Total number of perforations = perforations per lateral (5) times number of laterals (1).
   34 perfs/ lat x 4 laterals = 136 perforations

   B. Calculate the square footage per perforation.
   Should be 6-10 sqft/perf. Does not apply to at-grades.
   1. Rock bed area = rock width (ft) x rock length (ft)
   [16] ft x 85 ft = 1360 ft^2
   2. Square foot per perforation = Rock Bed Area / number of perfs (6)
   1360.0 ft^2 / 136 perfs = 10.0 ft^2/ perf

E-6: Perforation Discharge in gpm

head (feet)	perforation diameter (inches) 1/8	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	0.74
2.0[b]	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

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

7. Determine required flow rate by multiplying the total number of perforations(6A) by flow per perforations (see figure E-6)
   136 perfs x [0.18] gpm / perfs = 24.5 gpm

8. If laterals are connected to header pipe as shown in Figure E-1, to select minimum required lateral diameter; enter figure E-4 with perforation spacing (2) and number of perforations per lateral (5).

   Select minimum diameter for perforated laterals = [xxx] inches

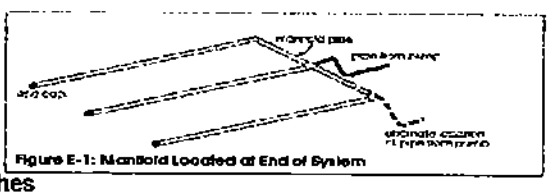


Figure E-1: Manifold Located at End of System

9. 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 8. Using these values, select minimum diameter for perforated lateral = [2] inches.

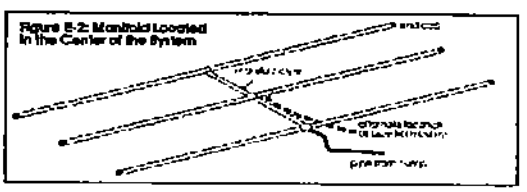


Figure E-2: Manifold Located in the Center of the System

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PUMP SELECTION PROCEDURE — Buildings 1 & 2 Dose to Field

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

1. Determine pump capacity:

A. Gravity Distribution

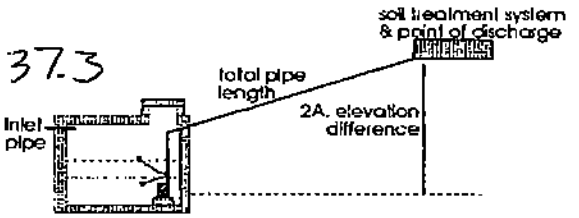
1. Minimum required discharge is 10 gpm
2. Maximum suggested discharge is 45 gpm

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: [25] gpm

37.3



2. Determine head requirements:

A. Elevation difference between pump and point of discharge.

[7] feet

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

[5] feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

C. Friction loss

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= [1.11] ft/ 100 ft of pipe

E-9: Friction Loss in Plastic Pipe Per 100 feet			
	nominal pipe diameter		
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	2.05	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

3. Determine total pipe length from pump discharge to soil system discharge point

Estimate by adding 25 percent to pipe length for fitting loss.

Equivalent pipe length times 1.25 = total pipe length

[70] ft x 1.25 = 87.5 feet

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

FL= 1.11 ft/100ft X 87.5 ft / 100: 1.0 feet

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

7 ft + 5 ft + 1.0 ft

Total Head: 13.0 **feet**

3. Pump Selection

1. A pump must be selected to deliver at least 25 gpm (1A or B)
with at least 13.0 feet of total head (2D).

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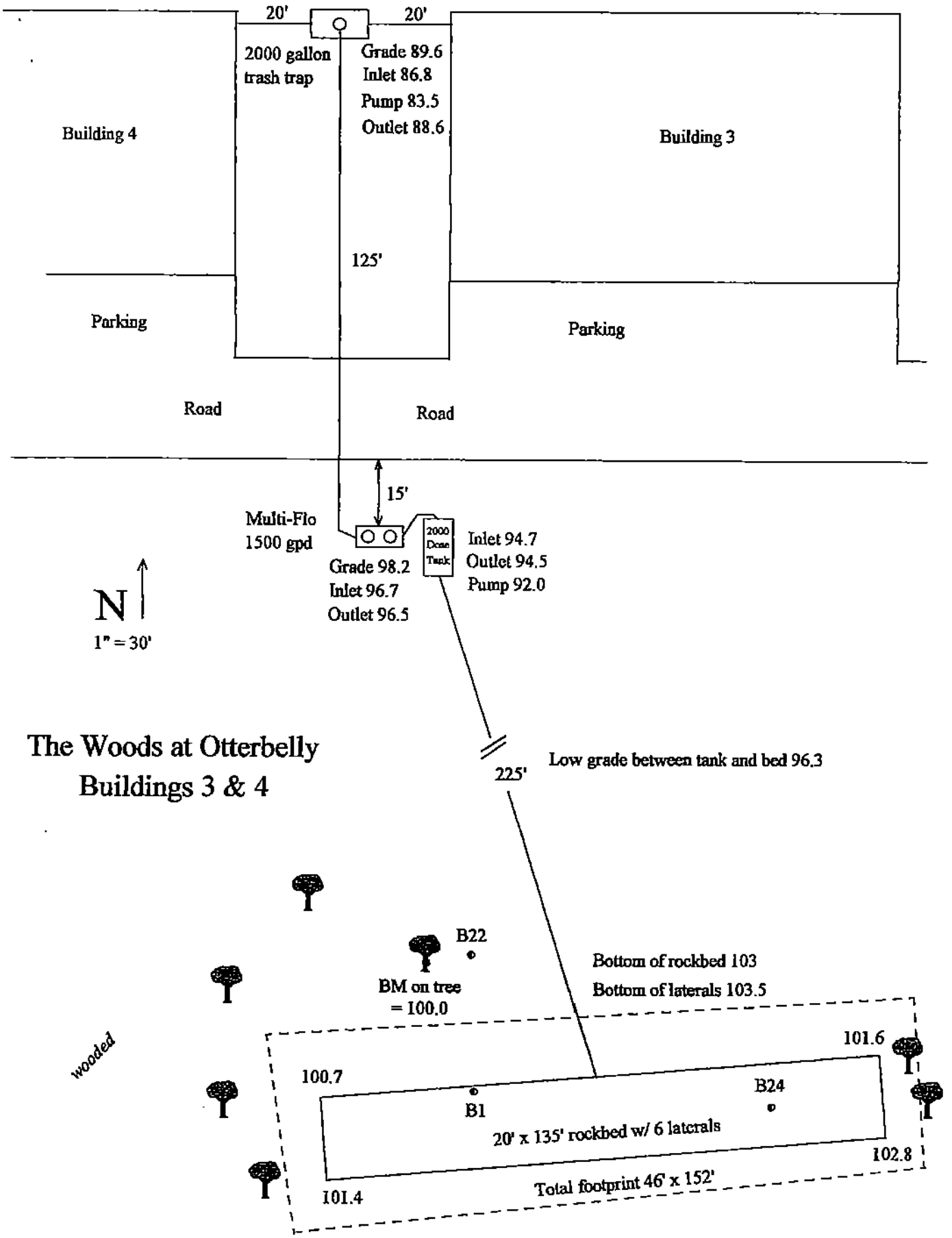

20'
20'
2000 gallon
trash trap
Grade 89.6
Inlet 86.8
Pump 83.5
Outlet 88.6
Building 4
Building 3
125'
Parking
Parking
Road
Road
15'
Multi-Flo
1500 gpd
2000
Dose
Tank
Inlet 94.7
Outlet 94.5
Pump 92.0
Grade 98.2
Inlet 96.7
Outlet 96.5
N
1" = 30'
The Woods at Otterbelly
Buildings 3 & 4
225'
Low grade between tank and bed 96.3
B22
BM on tree
= 100.0
Bottom of rockbed 103
Bottom of laterals 103.5
wooded
101.6
100.7
B1
B24
20' x 135' rockbed w/ 6 laterals
102.8
Total footprint 46' x 152'
101.4

PUMP SELECTION PROCEDURE

Buildings 3 & 4 Dose to Multi-Flo

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

1. Determine pump capacity:

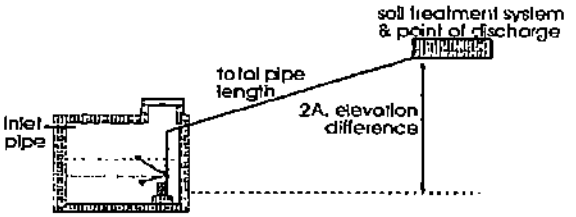
A. Gravity Distribution

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: [25] gpm



2. Determine head requirements:

A. Elevation difference between pump and point of discharge.

[13] feet

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

[0] feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

C. Friction loss

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= [1.11] ft/ 100 ft of pipe

E-9: Friction Loss in Plastic Pipe Per 100 feet			
	nominal pipe diameter		
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

3. Determine total pipe length from pump discharge to soil system discharge point

Estimate by adding 25 percent to pipe length for fitting loss.

Equivalent pipe length times 1.25 = total pipe length

[130] ft x 1.25 = [162.5] feet

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

FL= *1.11* ft/100ft X *162.5* ft / 100: *1.8* feet

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

13 ft + *0* ft + *1.8* ft

Total Head: *14.8* **feet**

3. Pump Selection

1. A pump must be selected to deliver at least *25* gpm (1A or B)
with at least *14.8* feet of total head (2D).

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PRETREATMENT WORK SHEET

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

1. FLOW — Buildings 3 & 4

A. Estimated [1600] gpd (see figure A-1)
measured [ ] x 1.5(safety factor): [0] gpd

B. SEPTIC TANK CAPACITY [2000] gallons *(see figure C-1)*

2. SOILS (Site evaluation data)

C. Depth to restricting layer= [1.1] feet

D. Texture [fine sand] Percolation rate [ ] MPI

E. SSF [1.67] ft²/gpd *(see downsizing or < 3ft figure)*

F. Land Slope [5] %

3. Pressure Distribution Trench Bottom Area

H. For trenches with 6" of rock below the pipe, Area = Flow (1A) divided by SSF (2E)=

1600 gpd x 1.67 ft²/gpd = 2700.0 ft²

I. For trenches with 12" of rock below the pipe, Area = Flow (1A) divided by SSF (2E) x 0.8

_____ gpd x _____ ft²/gpd x 0.8 = _____ ft²

4. ORGANIC LOADING

J. 1. Organic loading = flow (A) x estimated BOD in mg/L leaving the pretreatment unit x 8.35 / 1,000,000

1600 gpd x 5 mg/L x 8.35 / 1,000,000 = 0.0668 lbs BOD

2. System loading = organic loading(J1) / area (H or I)

0.0668 lbs BOD / 2700.0 ft² = 2E-05

3. Check system loading rate on chart. Should be less than value.

5. ROCK VOLUME

K. Rock depth below distribution pipe plus 0.5 foot times bottom area:
= (Rock depth + 0.5 foot) x Area (H, I, J, K, L)

(0.5 ft + 0.5 ft) x 2700.0 ft² = 2700 ft³

L. Volume in cubic yards = volume in cubic feet divided by 27

K / 27 = cubic yards 2700 / 27= 100 yd³

M. Weight of rock in tons = cubic yards times 1.4

L x 1.4 = tons 100 x 1.4= 140 tons

6. SYSTEM LENGTH

N. Select width = 20 ft

O. Divide bottom area by width: (H, I) divided by N = lineal feet

2700.0 ft² / 20 ft = 135 lineal feet

7. LAYOUT

Select an appropriate scale; one inch = [ ] feet

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, setbacks and separation distances.

8. SYSTEM LLR

P. Draw a line downhill though soil treatment system drawn in layout.
How many trenches does it cross? Add their widths together.
width 1 + width 2 + width 3 + ...

20 ft + [ ] ft + [ ] ft + _____ ft = 20 ft

Q. Divide total trench width (P) by SSF (F) = gallons per foot

20 ft / 1.67 ft²/gpd = 12.0 gal/ft *(Should be <12 gallons per foot)*

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A-1: Estimated Sewage Flows in Gallons per Day

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

C-1: Septic Tank Capacities (in gallons)

Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposal & lift inside
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

Downsizing Chart

Soil Characteristics and Required Areas for Pretreated Sewage (3' separation)

Percolation Rate in Minutes per Inch (MPI)	Soil Textures	Square feet per gallon per day	Organic loading pounds per day per foot
Faster than 0.1*	Coarse Sand	0.83	0.0020
0.1 to 5	Medium Sand Loamy Sand	0.83	0.0035
0.1 to 5	Fine Sand **	0.83	0.0021
6 to 15	Sandy Loam	0.83	0.0031
16 to 30	Loam	0.83	0.0010
31 to 45	Silt Loam Silt	1.00	0.0007
46 to 60	Clay Loam (CL) Silty CL Sandy CL	1.10	0.0006
60 to 120	Clay	2.50	0.0005
Over 120	Clay	3.25	0.0003

* Soil too coarse for sewage treatment. Use systems for rapidly permeable soils.
** Soil having 50% or more of fine sand plus very fine sand.

Less Than 3 feet of Separation Chart

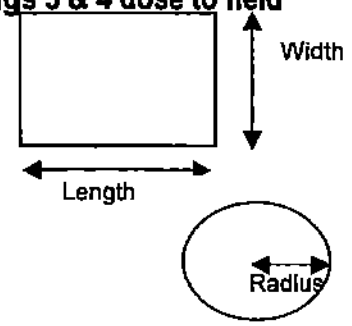
D-15: Soil Characteristics and Required Areas for Sewage Treatment (<3' separation)

percolation rate in minutes per inch (mpi)	Soil textures	square feet per gallon per day	gallons per day per square foot
faster than 0.1*	Coarse sand	0.83	1.20
0.1 to 5	Medium sand Loamy sand	0.83	1.20
0.1 to 5	fine sand**	1.67	0.60
6 to 15	sandy loam	1.27	0.79
16 to 30	loam	1.67	0.60
31 to 45	Silt loam Silt	2.00	0.50
46 to 60	Clay loam Sandy clay Silty clay	2.20	0.45
over 61***	Clay Sandy clay Silty clay		

*Soil too coarse for sewage treatment: use systems for rapidly permeable soils.
**Soil having 50% or more fine sand plus very fine sand.
***Soil with too high a percentage of clay for installation of a standard trench system.

DOSING CHAMBER SIZING Buildings 3 & 4 dose to field

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



1. Determine area
   A. Rectangle area = L x W
   [ ] ft x [ ] ft = 0 ft²
   B. Circle area = 3.14 x radius²
   3.14 x [ ]² ft = 0.0 ft²
   C. Get area from manufacture [ ] ft²

2. Calculate gallons per inch
   There are 7.5 gallons per cubic foot of volume, therefore multiply the area (1A, B or C) times the conversion factor and divide by 12 inches per foot to calculate gallon per inch.
   Surface area x 7.5 / 12 = 0 ft² x 7.5 / 12in/ft = 0 gallon per inch

46 gallons per inch 2000 gallon tank

Legal Tank:
500 gallons or
100% the daily flow
or Alternating Pumps

3. Calculate total tank volume
   A. Depth from bottom of inlet pipe to tank bottom = [ ] in
   B. Total tank volume = depth from bottom of inlet pipe to tank bottom(3A) x gal/in(2)
   = 0 in x 0 gal/in = 0.0 gallons

4. Calculate gallons to cover pump (with 2-3 inches of water covering pump)
   (Pump and block height + 2 inches) x gallon per inch
   ([14] + 2 in) x 46 gal/in = 736.0 gallons

5. Calculate total pumpout volume
   A. Select pump size for 4-5 doses per day. Gallon per dose = gpd *(see Figure A-1)* / doses per day =
   [1500] gpd / [6] doses/day = 250 gallons
   B. Calculate drainback
      1. Determine total pipe length [235.0] ft
      2. Determine liquid volume of pipe, [0.17] gal/ft *(see figure E-20)*
      3. Drainback quantity = 235.0 ft (5B1) x 0.17 gal/ft(5B2) 40.0 v
   C. Total pump out volume = dose volume(5A) + drainback (5B3)
   250 gallons + 40.0 gallons = 290.0

A-1: Estimated Sewage Flows in Gallons per Day

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

E-20: Volume of Liquid in Pipe

Pipe Diameter *inches*	Gallons per foot
1	0.045
1.25	0.078
1.5	0.11
2	0.17
2.5	0.25
3	0.38
4	0.66

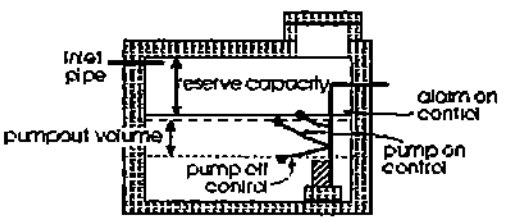
6. Calculate float separation distance (using total pumpout volume)
   Total pumpout volume(5C) / gal/inch(2)
   290.0 gal / 46 gal/in = 6.3 inch

7. Calculate volume for alarm (typically 2 - 3 inches)
   Alarm depth (inch) x gallon/inch(2) = [3] in x 46 gal/in = 138 gal

8. Calculate total gallons = gallons over pump(4) + gallons pumpout(5C) + gallons alarm(7)
   736.0 gal + 290.0 gal + 138 gal = 1164.0 gal

9. Total tank depth = total gallons(8) / gallon/in(2)
   1164.0 gallons / 46 gal/in = 25.3

Recommended
Calculate reserve capacity (75% of the daily flow)
Daily flow x 0.75 = 1500 x 0.75 = 1125 gallons



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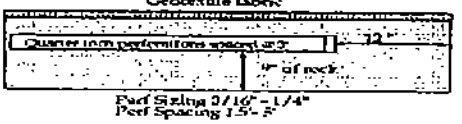
PRESSURE DISTRIBUTION SYSTEM Buildings 3 & 4

Cedarville Cabin



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

1. Select number of perforated laterals: [6]

2. Select perforation spacing = [3] ft

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

perforation spacing (feet)	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

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

   [135] - 2 ft = 133 ft
   rock layer length

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 = 133 ft / 3 ft = 44 spaces

5. 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.*
   44 spaces + 1 = 45 perforations/lateral

6. A. Total number of perforations = perforations per lateral (5) times number of laterals (1).
   45 perfs/ lat x 6 laterals = 270 perforations

   B. Calculate the square footage per perforation.
   Should be 6-10 sqft/perf. Does not apply to at-grades.
   1. Rock bed area = rock width (ft) x rock length (ft)
   [20] ft x 135 ft = 2700 ft^2
   2. Square foot per perforation = Rock Bed Area / number of perfs (6)
   2700.0 ft^2 / 270 perfs = 10.0 ft^2/ perf

E-6: Perforation Discharge in gpm

head (feet)	perforation diameter (inches) 1/8	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	0.74
2.0[b]	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

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

7. Determine required flow rate by multiplying the total number of perforations(6A) by flow per perforations (see figure E-6)
   270 perfs x [0.18] gpm / perfs = 48.6 gpm

8. If laterals are connected to header pipe as shown in Figure E-1, to select minimum required lateral diameter, enter figure E-4 with perforation spacing (2) and number of perforations per lateral (5).

   Select minimum diameter for perforated laterals = [xxx] inches

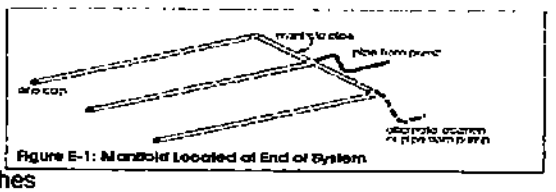


Figure E-1: Manifold Located at End of System

9. 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 8. Using these values, select minimum diameter for perforated lateral = [2] inches.

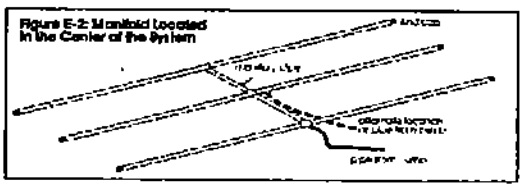


Figure E-2: Manifold located in the Center of the System

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PUMP SELECTION PROCEDURE

Buildings 3 & 4 Dose to Field

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

1. Determine pump capacity:

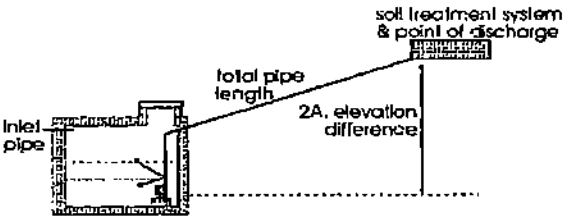
A. Gravity Distribution

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: [49] gpm



2. Determine head requirements:

A. Elevation difference between pump and point of discharge.

[12] feet

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

[5] feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

C. Friction loss

1. Select pipe diameter [3] 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= [0.58] ft/ 100 ft of pipe

3. Determine total pipe length from pump discharge to soil system discharge point
   Estimate by adding 25 percent to pipe length for fitting loss.
   Equivalent pipe length times 1.25 = total pipe length
   [232] ft x 1.25 = [290] feet

4. Calculate total friction loss by multiplying friction loss (C2) by the equivalent pipe length (C3) and divide by 100.
   FL= [0.58] ft/100ft X [290] ft / 100 [1.7] feet

E-9: Friction Loss in Plastic Pipe Per 100 feet

flow rate gpm	nominal pipe diameter 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	0.96
70		7.44	1.09

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

[12] ft + [5] ft + [1.7] ft

Total Head: [18.7] **feet**

3. Pump Selection

1. A pump must be selected to deliver at least 49 gpm (1A or B)
with at least 18.7 feet of total head (2D).

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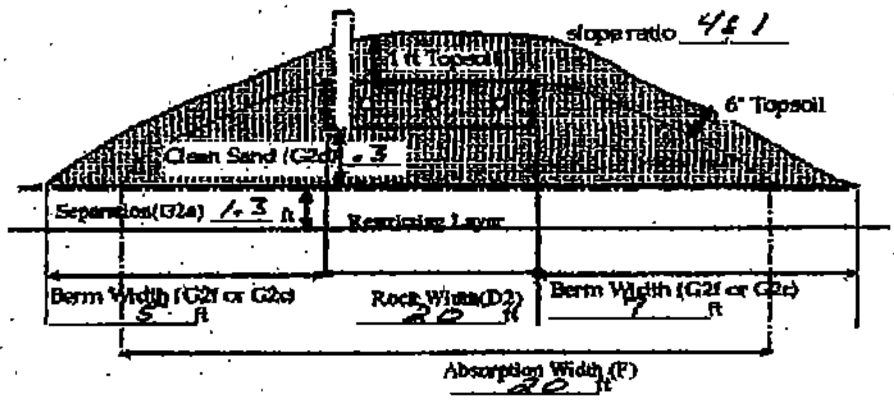
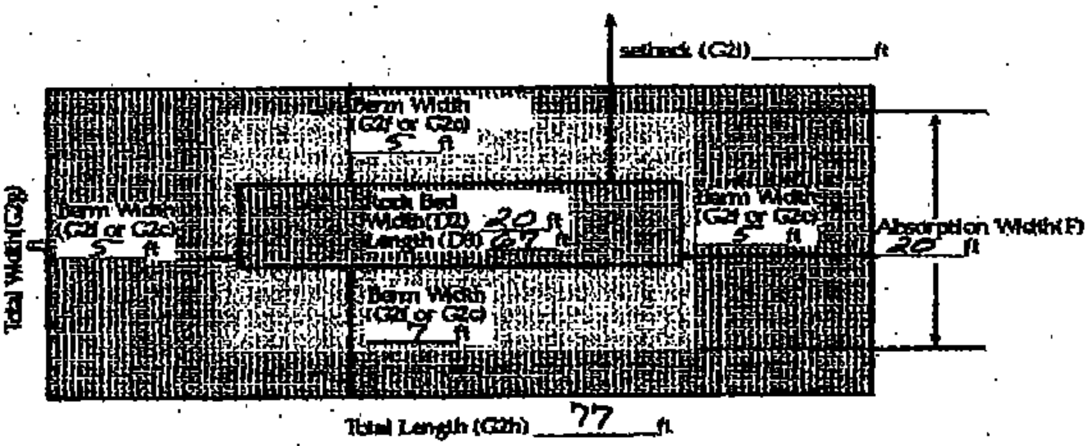
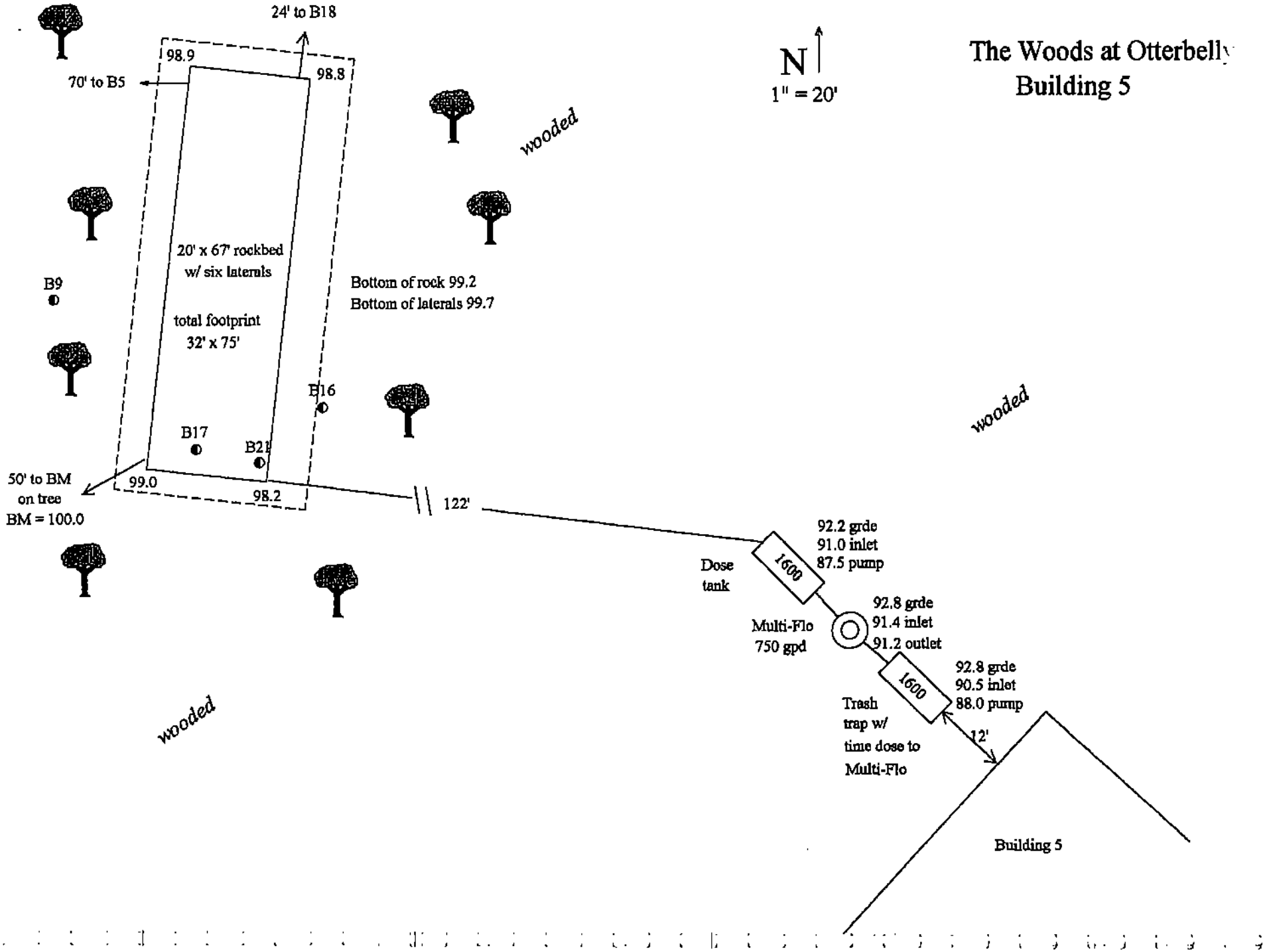
Building 5 cross section

<=1% land slope






The Woods at Otterbelly
Building 5
N
1" = 20'
24' to B18
98.9
98.8
70' to B5
wooded
20' x 67' rockbed
w/ six laterals
total footprint
32' x 75'
Bottom of rock 99.2
Bottom of laterals 99.7
B9
B16
B17
B21
50' to BM
on tree
BM = 100.0
99.0
98.2
122'
wooded
wooded
92.2 grde
91.0 inlet
87.5 pump
Dose
tank
1600
92.8 grde
91.4 inlet
91.2 outlet
Multi-Flo
750 gpd
1600
92.8 grde
90.5 inlet
88.0 pump
Trash
trap w/
time dose to
Multi-Flo
12'
Building 5

PUMP SELECTION PROCEDURE — Building 5 Dose to Multi-Flo

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

1. Determine pump capacity:

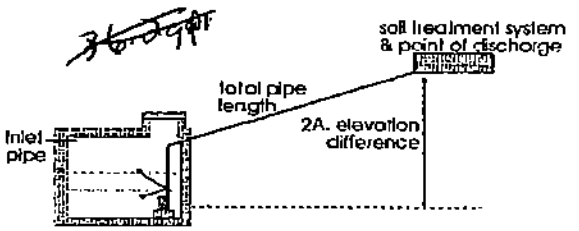
A. Gravity Distribution

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: [25] gpm



2. Determine head requirements:

A. Elevation difference between pump and point of discharge.

[5] feet

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

[0] feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

C. Friction loss

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= [1.11] ft/ 100 ft of pipe

E-9: Friction Loss in Plastic Pipe Per 100 feet			
	nominal pipe diameter		
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

3. Determine total pipe length from pump discharge to soil system discharge point

Estimate by adding 25 percent to pipe length for fitting loss.

Equivalent pipe length times 1.25 = total pipe length

[10] ft x 1.25 = [12.5] feet

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

FL= *1.11* ft/100ft X *12.5* ft / 100= *0.1* feet

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

5 ft + *0* ft + *0.1* ft

Total Head: *5.1* feet

3. Pump Selection

1. A pump must be selected to deliver at least *25* gpm (1A or B) with at least *5.1* feet of total head (2D).

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PRETREATMENT WORK SHEET

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

1. FLOW — Building 5

A. Estimated [800] gpd (see figure A-1)
measured [ ] x 1.5(safety factor)= *0* gpd

B. SEPTIC TANK CAPACITY [1600] gallons *(see figure C-1)*

2. SOILS (Site evaluation data)

C. Depth to restricting layer= [1.3] feet
D. Texture [fine sand] Percolation rate [ ] MPI
E. SSF [1.67] ft²/gpd *(see downsizing or < 3ft figure)*
F. Land Slope [1] %

3. Pressure Distribution Trench Bottom Area

H. For trenches with 6" of rock below the pipe, Area = Flow (1A) divided by SSF (2E)=

800 gpd x 1.67 ft²/gpd = *1336.0* ft²

I. For trenches with 12" of rock below the pipe, Area = Flow (1A) divided by SSF (2E) x 0.8

_____ gpd x _____ ft²/gpd x 0.8 = _____ ft²

4. ORGANIC LOADING

J. 1. Organic loading = flow (A) x estimated BOD in mg/L leaving the pretreatment unit x 8.35 / 1,000,000

800 gpd x [5] mg/L x 8.35 / 1,000,000 = 0.0334 lbs BOD

2. System loading = organic loading(J1) / area (H or I)

0.0334 lbs BOD / [1340.0] ft² = 2E-05

3. Check system loading rate on chart. Should be less than value.

5. ROCK VOLUME

K. Rock depth below distribution pipe plus 0.5 foot times bottom area:
= (Rock depth + 0.5 foot) x Area (H, I, J, K, L)

(*0.5* ft + 0.5 ft) x [*1340.0*] ft² = *1340* ft³

L. Volume in cubic yards = volume in cubic feet divided by 27

K / 27 = cubic yards *1340* / 27= *50* yd³

M. Weight of rock in tons = cubic yards times 1.4

L x 1.4 = tons *50* x 1.4= *69* tons

6. SYSTEM LENGTH

N. Select width = [20] ft

O. Divide bottom area by width: (H, I) divided by N = lineal feet

[1336.0] ft² / 20 ft = *67* lineal feet

7. LAYOUT

Select an appropriate scale; one inch = [ ] feet
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, setbacks and separation distances.

8. SYSTEM LLR

P. Draw a line downhill though soil treatment system drawn in layout.
How many trenches does it cross? Add their widths together.
width 1 + width 2 + width 3 + ...

[20] ft + [ ] ft + [ ] ft + _____ ft = 20 ft

Q. Divide total trench width (P) by SSF (F) = gallons per foot

20 ft / 1.67 ft²/gpd = 12.0 gal/ft *(Should be <12 gallons per foot)*

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A-1: Estimated Sewage Flows in Gallons per Day

number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	150	60%
3	450	300	218	of the
4	600	375	256	values
5	750	450	294	in the
6	900	525	332	Class I,
7	1050	600	370	II, or III
8	1200	675	408	columns.

C-1: Septic Tank Capacities (in gallons)

Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposable lift inside
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

Downsizing Chart

Soil Characteristics and Required Areas for Pretreated Sewage (6" separation)

Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Square feet per gallon per day	Organic loading pounds per day per foot
Faster than 0.1*	Coarse Sand	0.83	0.0020
0.1 to 5	Medium Sand	0.83	0.0015
	Loamy Sand		
0.1 to 5	Fine Sand **	0.83	0.0012
6 to 15	Sandy Loam	0.83	0.0031
16 to 30	Loam	0.83	0.0070
31 to 45	Silt Loam	1.00	0.0037
	Silt		
46 to 60	Clay Loam, C.L., Silty C.L., Sandy C.L.	1.10	0.0046
60 to 120	Clay	2.50	0.0005
Over 120	Clay	3.25	0.0003

* Soil too coarse for sewage treatment. Use systems for rapidly permeable soils.
** Soil having 50% or more of fine sand plus very fine sand.

Less Than 3 feet of Separation Chart

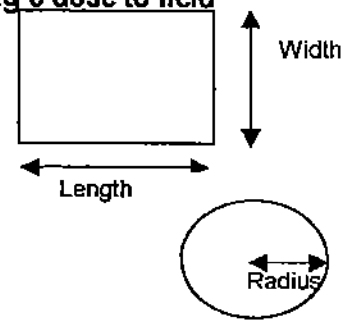
D-15: Soil Characteristics and Required Areas for Sewage Treatment (<3' separation)

percolation rate (in minutes per inch (mpi))	Soil texture	square feet per gallon per day	gallons per day per square foot
faster than 0.1*	Coarse sand	0.83	1.20
0.1 to 5	Medium sand	0.83	1.20
	Loamy sand		
0.1 to 5	fine sand **	1.67	0.60
6 to 15	sandy loam	1.27	0.79
16 to 30	loam	1.67	0.60
31 to 45	silt loam	2.00	0.50
	silt		
46 to 60	clay loam	2.20	0.45
	sandy clay		
	silty clay		
over 61***	clay		
	sandy clay		
	silty clay		

* Soil too coarse for sewage treatment; use systems for rapidly permeable soils.
** Soil having 50% or more silts sand plus very fine sand.
*** Soil with too high a percentage of clay for installation of a standard trench system.

DOSING CHAMBER SIZING Building 5 dose to field

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



1. Determine area
   A. Rectangle area = L x W
   [ ] ft x [ ] ft = 0 ft²
   B. Circle area = 3.14 x radius²
   3.14 x [ ]²ft = 0.0 ft²
   C. Get area from manufacture [ ] ft²

2. Calculate gallons per inch
   There are 7.5 gallons per cubic foot of volume, therefore multiply the area (1A, B or C) times the conversion factor and divide by 12 inches per foot to calculate gallon per inch.
   Surface area x 7.5 / 12 = 0 ft² x 7.5 / 12in/ft = 0 gallon per inch

35 gallons per inch 1600 gallon tank

Legal Tank:
500 gallons or
100% the daily flow
or Alternating Pumps

3. Calculate total tank volume
   A. Depth from bottom of inlet pipe to tank bottom = [ ] in
   B. Total tank volume = depth from bottom of inlet pipe to tank bottom(3A) x gal/in(2)
   = 0 in x 0 gal/in = 0.0 gallons

4. Calculate gallons to cover pump (with 2-3 inches of water covering pump)
   (Pump and block height + 2 inches) x gallon per inch
   ([14] + 2 in) x 35 gal/in = 560.0 gallons

A-1: Estimated Sewage Flows in Gallons per Day

number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	150	60%
3	450	300	218	of the
4	600	375	256	values
5	750	450	294	in the
6	900	525	332	Class I,
7	1050	600	370	II, or III
8	1200	675	409	columns

5. Calculate total pumpout volume
   A. Select pump size for 4-5 doses per day. Gallon per dose = gpd *(see Figure A-1)* / doses per day =
   [750] gpd / [6] doses/day = 125 gallons
   B. Calculate drainback
      1. Determine total pipe length [127.0] ft
      2. Determine liquid volume of pipe, [0.17] gal/ft *(see figure E-20)*
      3. Drainback quantity = 127.0 ft (5B1) x 0.17 gal/ft(5B2) 21.6 v
   C. Total pump out volume = dose volume(5A) + drainback (5B3)
   125 gallons + 21.6 gallons = *146.6*

E-20: Volume of Liquid in Pipe

Pipe Diameter *inches*	Gallons per foot
1	0.045
1.25	0.078
1.5	0.11
2	0.17
2.5	0.25
3	0.38
4	0.66

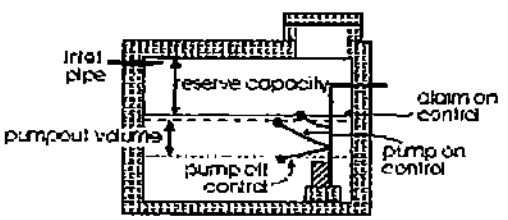
6. Calculate float separation distance (using total pumpout volume)
   Total pumpout volume(5C) / gal/inch(2)
   146.6 gal / 35 gal/in = 4.2 inch

7. Calculate volume for alarm (typically 2 - 3 inches)
   Alarm depth (inch) x gallon/inch(2) = [3] in x 35 gal/in = 105 gal

8. Calculate total gallons = gallons over pump(4) + gallons pumpout(5C) + gallons alarm(7)
   560.0 gal + 146.6 gal + 105 gal = 811.6 gal

9. Total tank depth = total gallons(8) / gallon/in(2)
   811.6 gallons / 35 gal/in = 23.2

Recommended
Calculate reserve capacity (75% of the daily flow)
Daily flow x 0.75 = 750 x 0.75 = 562.5 gallons



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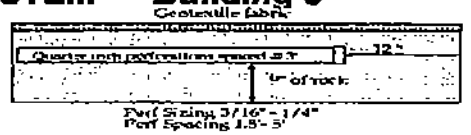
PRESSURE DISTRIBUTION SYSTEM Building 5



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

1. Select number of perforated laterals: [6]

2. Select perforation spacing = [3] 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
   [67] - 2 ft = 65 ft
   rock layer length

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

perforation spacing (feet)	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	13	22

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 = 67 ft / 3 ft = 22 spaces

5. 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.*
   22 spaces + 1 = 23 perforations/lateral

6. A. Total number of perforations = perforations per lateral (5) times number of laterals (1).
   23 perfs/ lat x 6 laterals = 138 perforations

   B. Calculate the square footage per perforation.
   Should be 6-10 sqft/perf. Does not apply to at-grades.
   1. Rock bed area = rock width (ft) x rock length (ft)
   [20] ft x 67 ft = 1340 ft^2
   2. Square foot per perforation = Rock Bed Area / number of perfs (6)
   1340.0 ft^2 / 138 perfs = 9.7 ft^2/ perf

E-6: Perforation Discharge in gpm

head (feet)	perforation diameter (inches) 1/8	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	0.74
2.0[b]	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

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

7. Determine required flow rate by multiplying the total number of perforations(6A) by flow per perforations (see figure E-6)
   138 perfs x [0.18] gpm / perfs = 24.8 gpm

8. If laterals are connected to header pipe as shown in Figure E-1, to select minimum required lateral diameter; enter figure E-4 with perforation spacing (2) and number of perforations per lateral (5).

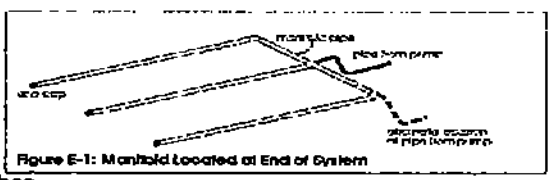


Figure E-1: Manifold Located at End of System

   Select minimum diameter for perforated laterals = [2] inches

9. 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 8. Using these values, select minimum diameter for perforated lateral = [1.25] inches.

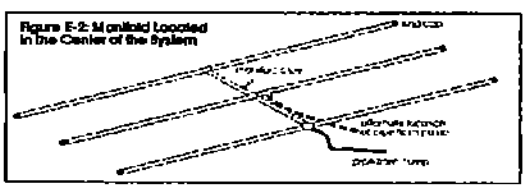


Figure E-2: Manifold Located in the Center of the System

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(signature) 1767 (license #) 6/19/02 (date)

PUMP SELECTION PROCEDURE — Building 5 Dose to Field

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

1. Determine pump capacity:

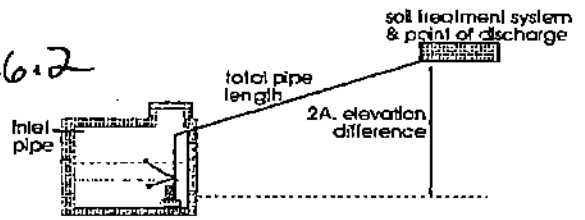
A. Gravity Distribution

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: [25] gpm 36.2



2. Determine head requirements:

A. Elevation difference between pump and point of discharge.

[13] feet

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

[5] feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

C. Friction loss

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= [1.11] ft/ 100 ft of pipe

3. Determine total pipe length from pump discharge to soil system discharge point

Estimate by adding 25 percent to pipe length for fitting loss.

Equivalent pipe length times 1.25 = total pipe length

[128] ft x 1.25 = [160] feet

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

FL= *1.11* ft/100ft X *160* ft / 100 = *1.8* feet

E-9: Friction Loss in Plastic Pipe Per 100 feet			
	nominal pipe diameter		
flow rate gpm	1.5"	2"	3"
20	2.47	0.79	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

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

13 ft + *5* ft + *1.8* ft

Total Head: *19.8* **feet**

3. Pump Selection

1. A pump must be selected to deliver at least *25* gpm (1A or B)
with at least *19.8* feet of total head (2D).

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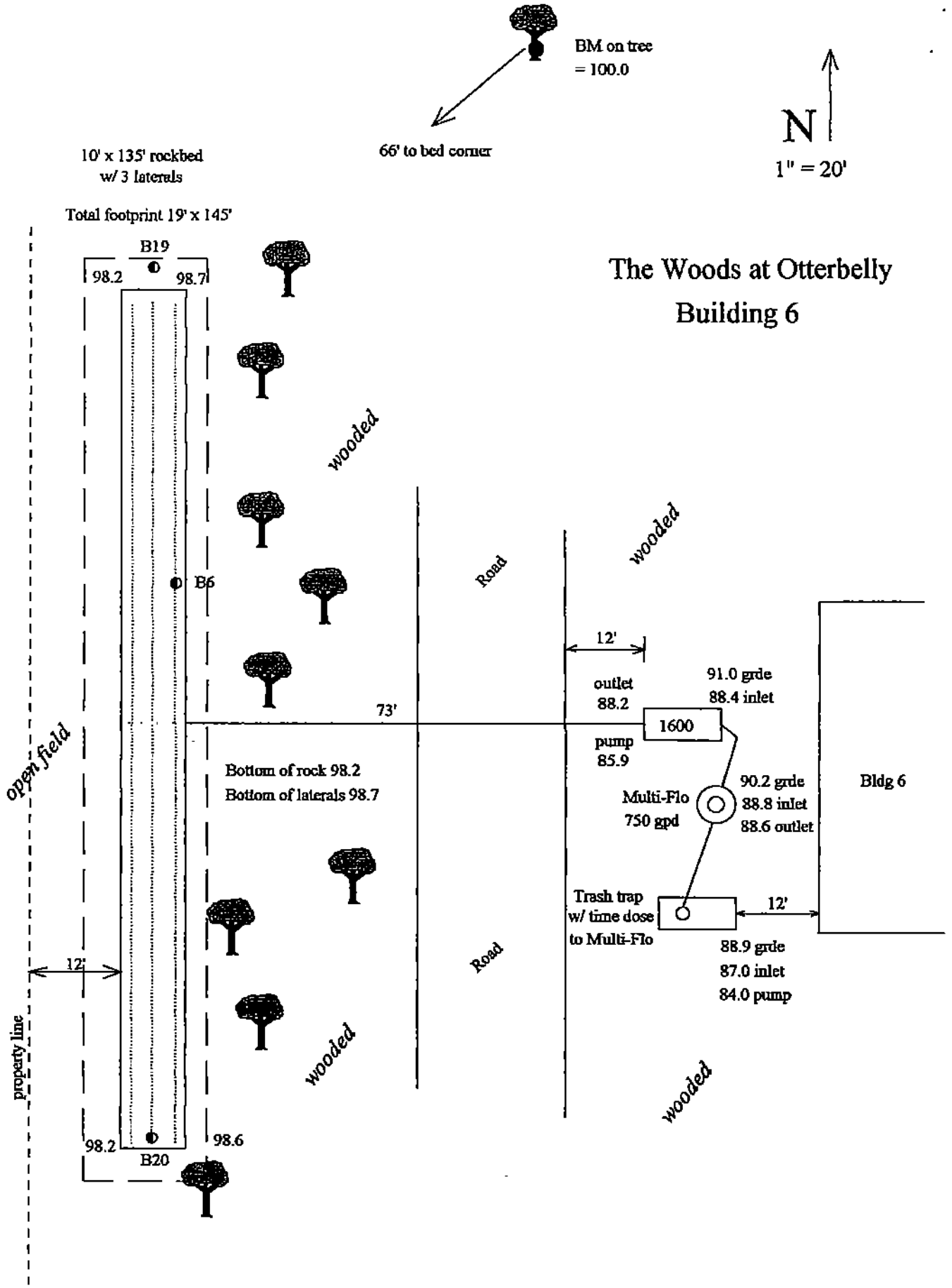

BM on tree
= 100.0
66' to bed corner
N
1" = 20'
10' x 135' rockbed
w/ 3 laterals
Total footprint 19' x 145'
The Woods at Otterbelly
Building 6
B19
98.2
98.7
B6
B20
98.2
98.6
wooded
wooded
wooded
wooded
Road
Road
open field
property line
12'
12'
73'
outlet
88.2
91.0 grde
88.4 inlet
1600
pump
85.9
Multi-Flo
750 gpd
90.2 grde
88.8 inlet
88.6 outlet
Bldg 6
Trash trap
w/ time dose
to Multi-Flo
88.9 grde
87.0 inlet
84.0 pump
Bottom of rock 98.2
Bottom of laterals 98.7

PUMP SELECTION PROCEDURE — Building 6 Dose to Multi-Flo

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

1. Determine pump capacity:

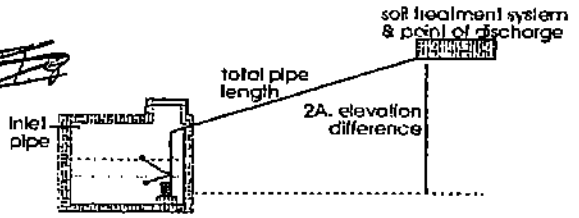
A. Gravity Distribution

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: [25] gpm



2. Determine head requirements:

A. Elevation difference between pump and point of discharge.

[5] feet

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

[0] feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

C. Friction loss

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= [1.11] ft/ 100 ft of pipe

E-9: Friction Loss in Plastic Pipe Per 100 feet	nominal pipe diameter		
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

3. Determine total pipe length from pump discharge to soil system discharge point
   Estimate by adding 25 percent to pipe length for fitting loss.
   Equivalent pipe length times 1.25 = total pipe length
   [25] ft x 1.25 = 31.25 feet

4. Calculate total friction loss by multiplying friction loss (C2) by the equivalent pipe length (C3) and divide by 100.
   FL= 1.11 ft/100ft X 31.25 ft / 100: 0.3 feet

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

5 ft + 0 ft + 0.3 ft

Total Head: 5.3 feet

3. Pump Selection

1. A pump must be selected to deliver at least 25 gpm (1A or B)
with at least 5.3 feet of total head (2D).

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PRETREATMENT WORK SHEET

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

1. FLOW — Building 6

A. Estimated [800] gpd (see figure A-1)
measured [ ] x 1.5(safety factor)= 0 gpd

B. SEPTIC TANK CAPACITY [1600] gallons *(see figure C-1)*

2. SOILS (Site evaluation data)

C. Depth to restricting layer= [2] feet

D. Texture [fine sand] Percolation rate [ ] MPI

E. SSF [1.67] ft²/gpd *(see downsizing or < 3ft figure)*

F. Land Slope [5] %

3. Pressure Distribution Trench Bottom Area

H. For trenches with 6" of rock below the pipe, Area = Flow (1A) divided by SSF (2E)=

800 gpd x 1.67 ft²/gpd = 1336.0 ft²

I. For trenches with 12" of rock below the pipe, Area = Flow (1A) divided by SSF (2E) x 0.8

_____ gpd x _____ ft²/gpd x 0.8 = _____ ft²

4. ORGANIC LOADING

J. 1. Organic loading = flow (A) x estimated BOD in mg/L leaving the pretreatment unit x 8.35 / 1,000,000

800 gpd x [5] mg/L x 8.35 / 1,000,000 = 0.0334 lbs BOD

2. System loading = organic loading(J1) / area (H or I)

0.0334 lbs BOD / [1350.0] ft² = 2E-05

3. Check system loading rate on chart. Should be less than value.

5. ROCK VOLUME

K. Rock depth below distribution pipe plus 0.5 foot times bottom area:
= (Rock depth + 0.5 foot) x Area (H, I, J, K, L)

([0.5] ft + 0.5 ft) x [1350.0] ft² = 1350 ft³

L. Volume in cubic yards = volume in cubic feet divided by 27

K / 27 = cubic yards 1350 / 27= 50 yd³

M. Weight of rock in tons = cubic yards times 1.4

L x 1.4 = tons 50 x 1.4= 70 tons

6. SYSTEM LENGTH

N. Select width = [10] ft

O. Divide bottom area by width: (H, I) divided by N = lineal feet

[1336.0] ft² / 10 ft = 135 lineal feet

7. LAYOUT

Select an appropriate scale; one inch = [ ] feet

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, setbacks and separation distances.

8. SYSTEM LLR

P. Draw a line downhill though soil treatment system drawn in layout.
How many trenches does it cross? Add their widths together.
width 1 + width 2 + width 3 + ...

[10] ft + [ ] ft + [ ] ft + _____ ft = 10 ft

Q. Divide total trench width (P) by SSF (F) = gallons per foot

10 ft / 1.67 ft²/gpd = 6.0 gal/ft *(Should be <12 gallons per foot)*

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A-1: Estimated Sewage Flows in Gallons per Day

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

C-1: Septic Tank Capacities (in gallons)

Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposal & lift inside
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

Downsizing Chart

Soil Characteristics and Required Areas for Pretreated Sewage (3' separation)

Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Square feet per gallon per day	Organic loading pound per day per foot
Faster than 0.1*	Coarse Sand	0.83	0.0020
0.1 to 5	Medium Sand Loamy Sand	0.83	0.0015
0.1 to 5	Fine Sand **	0.83	0.0013
6 to 15	Sandy Loam	0.83	0.0011
16 to 30	Loam	0.83	0.0010
31 to 45	Silt Loam Silt	1.00	0.0007
46 to 60	Clay Loam (CL) Silty CL Sandy CL	1.10	0.0006
60 to 120	Clay	2.50	0.0005
Over 120	Clay	3.33	0.0003

* Soil too coarse for sewage treatment. Use systems for rapidly permeable soils.
** Soil having 90% or more of fine sand plus very fine sand.

Less Than 3 feet of Separation Chart

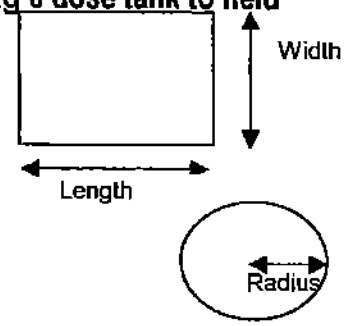
D-15: Soil Characteristics and Required Areas for Sewage Treatment (<3' separation)

percolation rate in minutes per inch (mpi)	Soil Texture	square feet per gallon per day	gallons per day per square foot
faster than 0.1"	Coarse sand	0.83	1.20
0.1 to 5	Medium sand Loamy sand	0.83	1.20
0.1 to 5	fine sand**	1.67	0.60
6 to 15	sandy loam	1.27	0.79
16 to 30	loam	1.67	0.60
31 to 45	silt loam silt	2.00	0.50
46 to 60	clay loam sandy clay silty clay	2.20	0.45
over 61***	Clay Sandy clay silty clay		

*Soil too coarse for sewage treatment use systems for rapidly permeable soils.
**Soil having 90% or more fine sand plus very fine sand.
*** Soil with too high a percentage of clay for installation of a standard inground system

DOSING CHAMBER SIZING — Building 6 dose tank to field

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



1. Determine area
   A. Rectangle area = L x W
   [ ] ft x [ ] ft = 0 ft²
   B. Circle area = 3.14 x radius²
   3.14 x [ ]² ft = 0.0 ft²
   C. Get area from manufacture [ ] ft²

2. Calculate gallons per inch
   There are 7.5 gallons per cubic foot of volume, therefore multiply the area (1A, B or C) times the conversion factor and divide by 12 inches per foot to calculate gallon per inch.
   Surface area x 7.5 / 12 = 0 ft² x 7.5 / 12in/ft = 0 gallon per inch

35 gallons per inch 1600 gallon tank

Legal Tank:
500 gallons or
100% the daily flow
or Alternating Pumps

3. Calculate total tank volume
   A. Depth from bottom of inlet pipe to tank bottom = [ ] in
   B. Total tank volume = depth from bottom of inlet pipe to tank bottom(3A) x gal/in(2)
   = 0 in x 0 gal/in = 0.0 gallons

4. Calculate gallons to cover pump (with 2-3 inches of water covering pump)
   (Pump and block height + 2 inches) x gallon per inch
   ([14] + 2 in) x 35 gal/in = 560.0 gallons

A-1: Estimated Sewage Flows in Gallons per Day

number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	180	60%
3	450	300	210	of the
4	600	375	255	values
5	750	450	295	in the
6	900	525	332	Class I,
7	1050	600	370	II, or III
8	1200	675	408	columns.

5. Calculate total pumpout volume
   A. Select pump size for 4-5 doses per day. Gallon per dose = gpd *(see Figure A-1)* / doses per day =
   [750] gpd / [6] doses/day = 125 gallons
   B. Calculate drainback
      1. Determine total pipe length [85.0] ft
      2. Determine liquid volume of pipe, [0.17] gal/ft *(see figure E-20)*
      3. Drainback quantity = 85.0 ft (5B1) x 0.17 gal/ft(5B2) 14.5 v
   C. Total pump out volume = dose volume(5A) + drainback (5B3)
   125 gallons + 14.5 gallons = 139.5

E-20: Volume of Liquid in Pipe

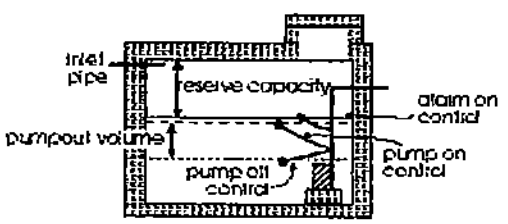
Pipe Diameter *inches*	Gallons per foot
1	0.045
1.25	0.078
1.5	0.11
2	0.17
2.5	0.25
3	0.38
4	0.66

6. Calculate float separation distance (using total pumpout volume)
   Total pumpout volume(5C) / gal/inch(2)
   139.5 gal / 35 gal/in = 4.0 inch

7. Calculate volume for alarm (typically 2 - 3 inches)
   Alarm depth (inch) x gallon/inch(2) = [3] in x 35 gal/in = 105 gal

8. Calculate total gallons = gallons over pump(4) + gallons pumpout(5C) + gallons alarm(7)
   560.0 gal + 139.5 gal + 105 gal = 804.5 gal

9. Total tank depth = total gallons(8) / gallon/in(2)
   804.5 gallons / 35 gal/in = 23.0



Recommended
Calculate reserve capacity (75% of the daily flow)
Daily flow x 0.75 = 750 x 0.75 = 562.5 gallons

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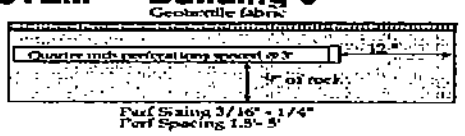
PRESSURE DISTRIBUTION SYSTEM Building 6



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

1. Select number of perforated laterals: [3]

2. Select perforation spacing = [3] 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
   [135] - 2 ft = 133 ft
   rock layer length

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

perforation spacing (feet)	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

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 = 133 ft / 3 ft = 44 spaces

5. 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.*
   44 spaces + 1 = 45 perforations/lateral

6. A. Total number of perforations = perforations per lateral (5) times number of laterals (1).
   45 perfs/ lat x 3 laterals = 135 perforations

   B. Calculate the square footage per perforation.
   Should be 6-10 sqft/perf. Does not apply to at-grades.
   1. Rock bed area = rock width (ft) x rock length (ft)
   [10] ft x 135 ft = 1350 ft^2
   2. Square foot per perforation = Rock Bed Area / number of perfs (6)
   1350.0 ft^2 / 135 perfs = 10.0 ft^2/ perf

E-6: Perforation Discharge in gpm

head (feet)	perforation diameter (inches) 1/8	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	0.74
2.0[b]	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

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

7. Determine required flow rate by multiplying the total number of perforations(6A) by flow per perforations (see figure E-6)
   135 perfs x [0.18] gpm / perfs = 24.3 gpm

8. If laterals are connected to header pipe as shown in Figure E-1, to select minimum required lateral diameter, enter figure E-4 with perforation spacing (2) and number of perforations per lateral (5).

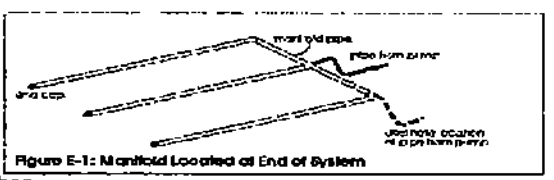


Figure E-1: Manifold Located at End of System

   Select minimum diameter for perforated laterals = [ ] inches

9. 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 8. Using these values, select minimum diameter for perforated lateral = [2] inches.

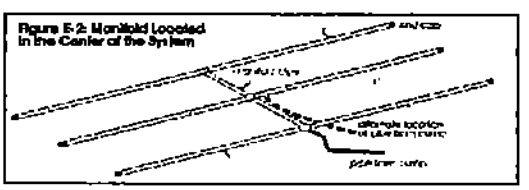


Figure E-2: Manifold Located in the Center of the System

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PUMP SELECTION PROCEDURE

Building 6 Dose to Field

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

1. Determine pump capacity:

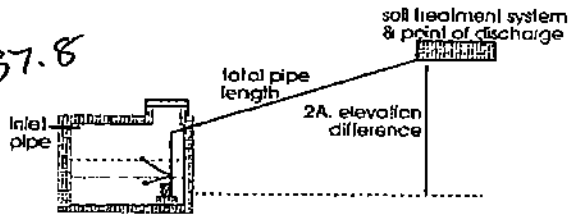
A. Gravity Distribution

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: 25 gpm 37.8



2. Determine head requirements:

A. Elevation difference between pump and point of discharge.

13 feet

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

5 feet

Special Head Requirements	
Gravity Distribution	0ft
Pressure Distribution	5ft

C. Friction loss

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= 1.11 ft/ 100 ft of pipe

3. Determine total pipe length from pump discharge to soil system discharge point

Estimate by adding 25 percent to pipe length for fitting loss.

Equivalent pipe length times 1.25 = total pipe length

80 ft x 1.25 = 100 feet

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

FL= 1.11 ft/100ft X 100 ft / 100= 1.1 feet

E-9: Friction Loss in Plastic Pipe Per 100 feet			
	nominal pipe diameter		
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

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

13 ft + 5 ft + 1.1 ft

Total Head: 19.1 feet 19.7

3. Pump Selection

1. A pump must be selected to deliver at least 25 gpm (1A or B) with at least 19.1 feet of total head (2D).

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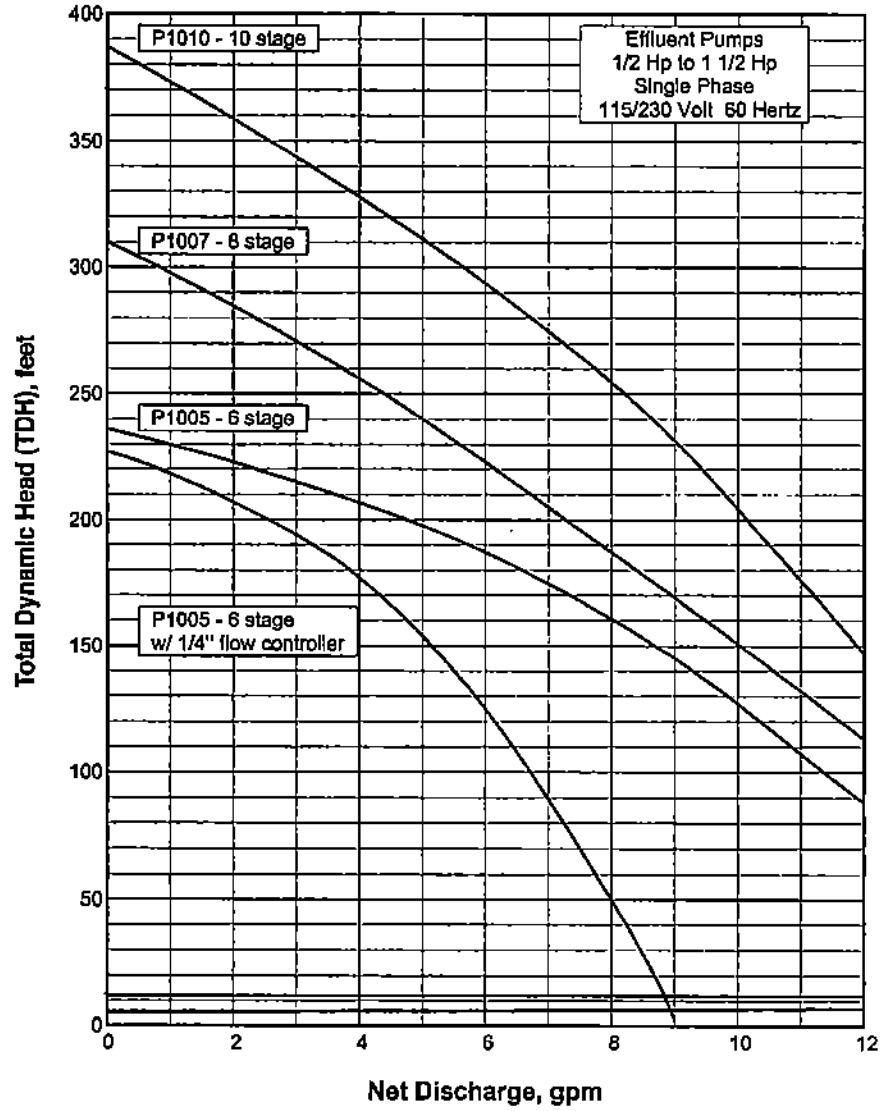
P mp Selection for a Pressurized System

I ut Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	2.0	feet
Orifice Spacing	2.5	feet
Number of Laterals per Cell	4	
Lateral Length	83.0	feet
Lateral Line Size	2.00	Inches
Lateral Pipe Class/Schedule	40	
Distributing Valve Model	None	
Manifold Length	14.0	feet
Manifold Line Size	2.00	Inches
Manifold Pipe Class/Schedule	40	
Lift to Manifold	5.3	feet
Transport Length	88.0	feet
Transport Line Size	2.00	Inches
Transport Pipe Class/Schedule	40	
Discharge Assembly Size	2.00	Inches
Flow Meter	None	Inches
'Add-on' Friction Losses	0.0	feet

C culations

Minimum Flow Rate per Orifice	0.27	gpm
Number of Orifices per Zone	136	
Total Actual Flow Rate	37.3	gpm
Number of Lines per Zone	4	
Flow Differential 1st and Last Orifice	1.3	%
Lift to Manifold	5.3	feet
Residual Head at Last Orifice	2.0	feet
Head Loss In Laterals	0.1	feet
lead Loss Through Distributing Valve	0.0	feet
Head Loss In Manifold	0.1	feet
Head Loss In Transport Pipe	1.6	feet
Head Loss Through Discharge	2.8	feet
Head Loss Through Flow Meter	0.0	feet
'Add-on' Friction Losses	0.0	feet
Total Flow Rate	**37.3**	**gpm**
TDH	**11.8**	**feet**



Orenco Systems®
Incorporated

814 AIRWAY AVENUE

SUTHERLIN, OREGON

97479-9012

TELEPHONE:

(541) 459-4449

FACSIMILE:

(541) 459-2884

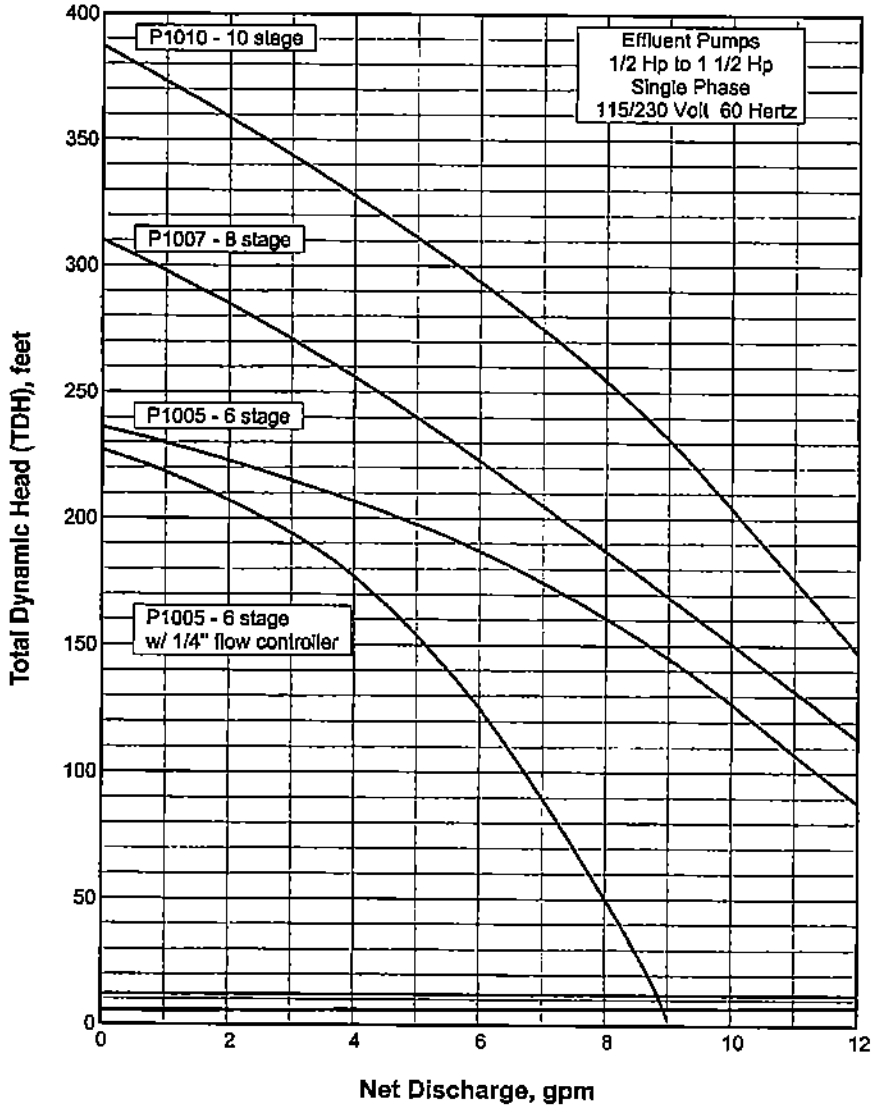
Pump Selection for a Pressurized System

Input Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	2.0	feet
Orifice Spacing	2.5	feet
Number of Laterals per Cell	4	
Lateral Length	83.0	feet
Lateral Line Size	2.00	Inches
Lateral Pipe Class/Schedule	40	
Distributing Valve Model	None	
Manifold Length	14.0	feet
Manifold Line Size	2.00	Inches
Manifold Pipe Class/Schedule	40	
Lift to Manifold	5.3	feet
Transport Length	68.0	feet
Transport Line Size	2.00	Inches
Transport Pipe Class/Schedule	40	
Discharge Assembly Size	2.00	Inches
Flow Meter	None	Inches
'Add-on' Friction Losses	0.0	feet

Calculations

Minimum Flow Rate per Orifice	0.27	gpm
Number of Orifices per Zone	136	
Total Actual Flow Rate	37.3	gpm
Number of Lines per Zone	4	
% Flow Differential 1st and Last Orifice	1.3	%
Lift to Manifold	5.3	feet
Residual Head at Last Orifice	2.0	feet
Head Loss in Laterals	0.1	feet
Head Loss Through Distributing Valve	0.0	feet
Head Loss in Manifold	0.1	feet
Head Loss in Transport Pipe	1.6	feet
Head Loss Through Discharge	2.8	feet
Head Loss Through Flow Meter	0.0	feet
'Add-on' Friction Losses	0.0	feet
Total Flow Rate	**37.3**	**gpm**
TDH	**11.8**	**feet**



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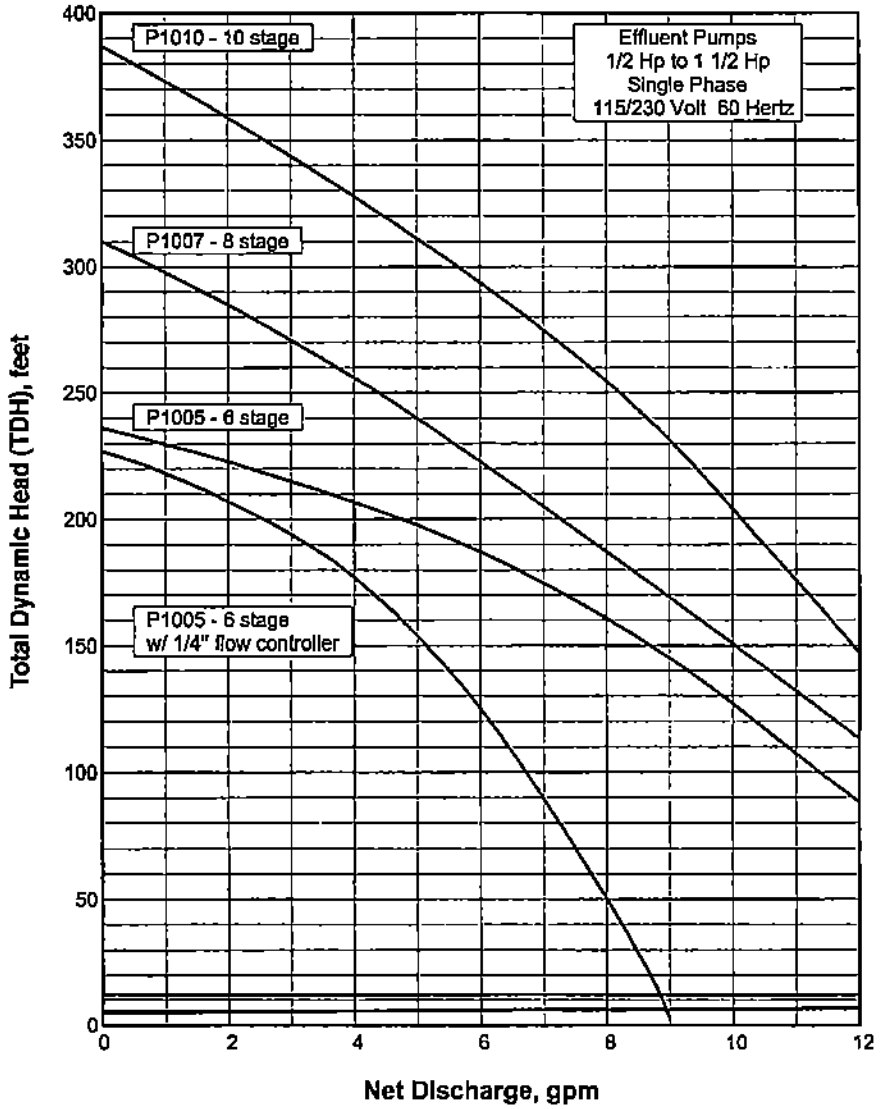
P. .mp Selection for a Pressurized System

I. .t Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	2.0	feet
Orifice Spacing	2.5	feet
Number of Laterals per Cell	4	
Lateral Length	83.0	feet
Lateral Line Size	2.00	Inches
Lateral Pipe Class/Schedule	40	
Distributing Valve Model	None	
Manifold Length	14.0	feet
Manifold Line Size	2.00	Inches
Manifold Pipe Class/Schedule	40	
Lift to Manifold	5.3	feet
Transport Length	68.0	feet
Transport Line Size	2.00	Inches
Transport Pipe Class/Schedule	40	
Discharge Assembly Size	2.00	inches
Flow Meter	None	Inches
'Add-on' Friction Losses	0.0	feet

C. culations

Minimum Flow Rate per Orifice	0.27	gpm
Number of Orifices per Zone	136	
Total Actual Flow Rate	37.3	gpm
Number of Lines per Zone	4	
Flow Differential 1st and Last Orifice	1.3	%
Lift to Manifold	5.3	feet
Residual Head at Last Orifice	2.0	feet
Head Loss In Laterals	0.1	feet
.ead Loss Through Distributing Valve	0.0	feet
Head Loss In Manifold	0.1	feet
Head Loss In Transport Pipe	1.6	feet
Head Loss Through Discharge	2.8	feet
Head Loss Through Flow Meter	0.0	feet
'Add-on' Friction Losses	0.0	feet
Total Flow Rate	**37.3**	**gpm**
TDH	**11.8**	**feet**



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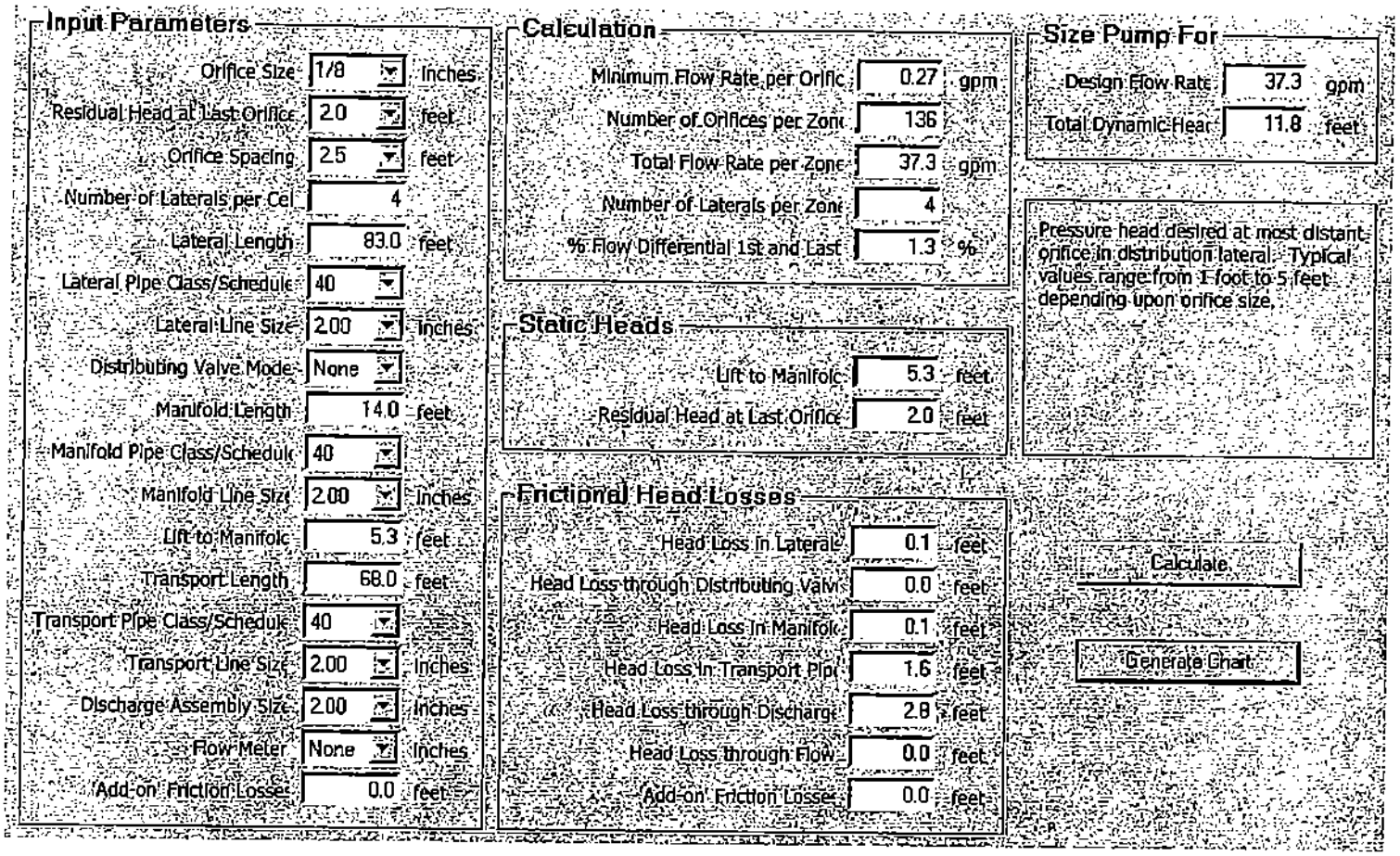

Input Parameters
Orifice Size 1/8 inches
Residual Head at Last Orifice 2.0 feet
Orifice Spacing 2.5 feet
Number of Laterals per Cel 4
Lateral Length 83.0 feet
Lateral Pipe Class/Schedule 40
Lateral Line Size 2.00 inches
Distributing Valve Mode None
Manifold Length 14.0 feet
Manifold Pipe Class/Schedul 40
Manifold Line Size 2.00 inches
Lift to Manifold 5.3 feet
Transport Length 68.0 feet
Transport Pipe Class/Schedule 40
Transport Line Size 2.00 inches
Discharge Assembly Size 2.00 inches
Flow Meter None inches
Add-on Friction Losses 0.0 feet
Calculation
Minimum Flow Rate per Orific 0.27 gpm
Number of Orifices per Zon 136
Total Flow Rate per Zone 37.3 gpm
Number of Laterals per Zon 4
% Flow Differential 1st and Last 1.3 %
Static Heads
Lift to Manifold 5.3 feet
Residual Head at Last Orifice 2.0 feet
Frictional Head Losses
Head Loss in Lateral 0.1 feet
Head Loss through Distributing Valv 0.0 feet
Head Loss in Manifold 0.1 feet
Head Loss in Transport Pip 1.6 feet
Head Loss through Discharg 2.8 feet
Head Loss through Flow 0.0 feet
Add-on Friction Losses 0.0 feet
Size Pump For
Design Flow Rate 37.3 gpm
Total Dynamic Hear 11.8 feet
Pressure head desired at most distant orifice in distribution lateral. Typical values range from 1 foot to 5 feet depending upon orifice size.
Calculate
Generate Chart

Soil Boring Log
The Woods at Otterbelly

Buildings 1 & 2 Primary Sites

B3	0-4"	loam	10YR 3/2	
	4-13	sandy loam	10YR 4/3	
	13-16	sandy loam	10YR 5/3	Mottled at 15"
B25	0-9	loam	10YR 3/2	
	9-18	sandy loam	10YR 5/3	Mottled at 14"
B2	0-5	sandy loam	10YR 3/2	
	5-15	sandy loam	10YR 5/4	
		strong, medium, blocky, friable		
	15-19	sandy loam	10YR 5/4	Mottled at 15"
	19-27	silt loam	10YR 6/2	

Buildings 3 & 4 Primary Site

B1	0-8	loam	10YR 3/2	
	8-16	sandy loam	10YR 5/4	Mottled at 15"
	16-20	sandy clay loam	10YR 5/4	
		strong, medium, sub. blocky, firm		
	20-28	clay loam	10YR 5/4	
		moderate, medium,blocky, very firm		
	28-32	sandy clay loam	10YR 5/4	
		moderate, medium,blocky, firm		
B24	0-11	loam	10YR 3/2	
	11-18	sandy loam	10YR 5/4	Mottled at 13"

Building 5 Primary Site

B17	0-4	sandy loam	10YR 3/2	
	4-24	sandy loam	10YR 5/4	Mottled at 16"
B21	0-10	sandy loam	10YR 3/2	
	10-16	sandy loam	10YR 5/4	Mottled at 12"
B18	0-5	sandy loam	10YR 3/2	
	5-18	sandy loam	10YR 5/4	Mottled at 15"
B9	0-4	sandy loam	10YR 3/2	
	4-21	sandy loam	10YR 4/3	Faint mott at 16"

Building 6 Primary Site

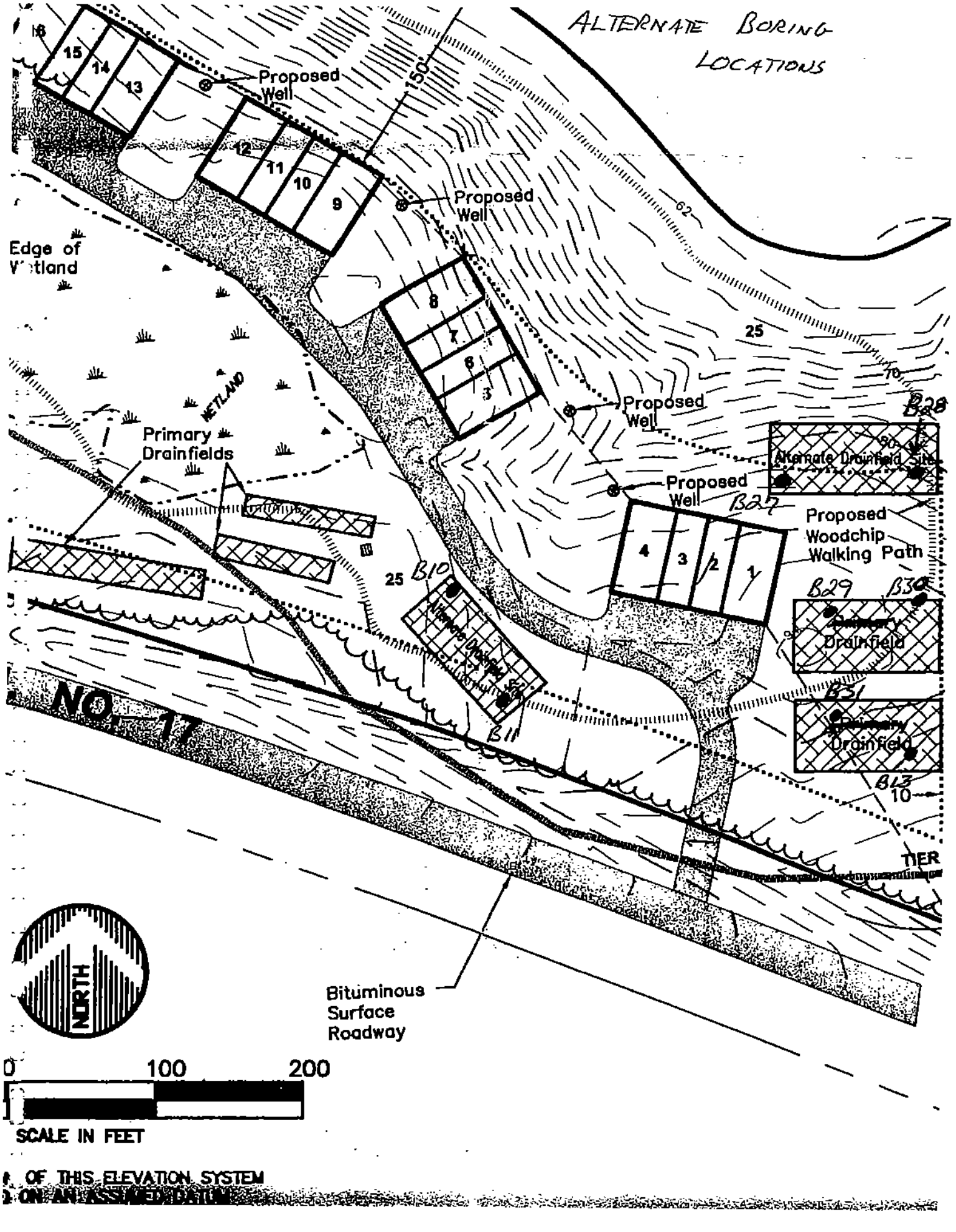
B19	0-11	sandy loam	10YR 3/3	
	11-18	sandy loam	10YR 4/4	
	18-24	sandy loam	10YR 5/4	
	24-30	silty clay loam	10YR 5/4	Rust at 24"
	30-32	clay loam	10YR 5/4	
B6	0-13	sandy loam	10YR 3/2	
	13-24	sandy loam	10YR 4/4	
	24-30	sandy loam	10YR 5/3	Mottled at 25"
B20	0-4	sandy loam	10YR 3/2	
	4-16	sandy loam	10YR 3/3	
	16-48	sandy loam	10YR 4/4	Mottled at 32"
	48-54	silty clay loam	10YR 5/4	

Soil Boring Log
Alternate Septic Sites Buildings 1-4

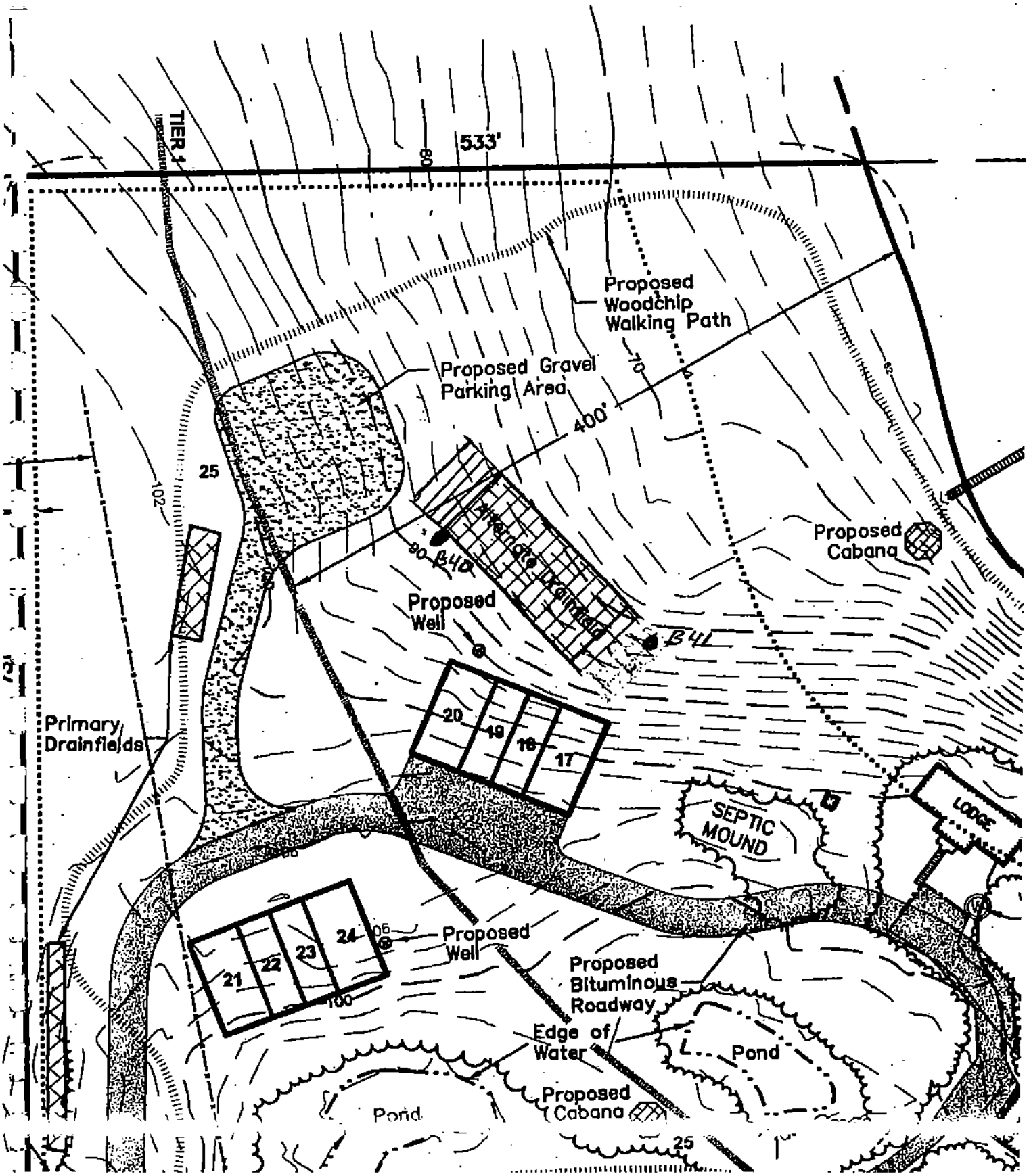
B27	0-8"	loam	10YR 3/1	
	8-15	sandy loam	10YR 5/3	Mottled at 12"
	15-20	silt loam	10YR 5/3	
B28	0-8	sandy loam	10YR 3/2	
	8-11	sandy loam	10YR 4/3	
	11-18	silt loam	10YR 5/3	Mottled at 12"
	18-28	clay loam	7.5YR 4/4	
B29	0-11	loam	10YR 3/2	
	11-18	silt loam	10YR 5/4	Mottled at 12"
B30	0-7	sandy loam	10YR 3/2	
	7-28	sandy loam	10YR 4/3	
	28-32	clay loam	7.5YR 4/4	Mottled at 28"
B31	0-7	sandy loam	10YR 3/2	
	7-14	silt loam	10YR 5/4	
	14-24	sandy loam	10YR 5/4	
	24-32	sand		
B13	0-6	loam	10YR 3/2	
	6-18	sandy loam	10YR 4/3	Mottled at 16"
B10	0-4	sandy loam	10YR 3/2	
	4-18	sandy loam	10YR 4/3	Mottled at 15"
B11	0-6	sandy loam	10YR 3/2	
	6-12	sandy loam	10YR 4/3	
	12-16	sandy loam	10YR 5/3	Mottled at 13"

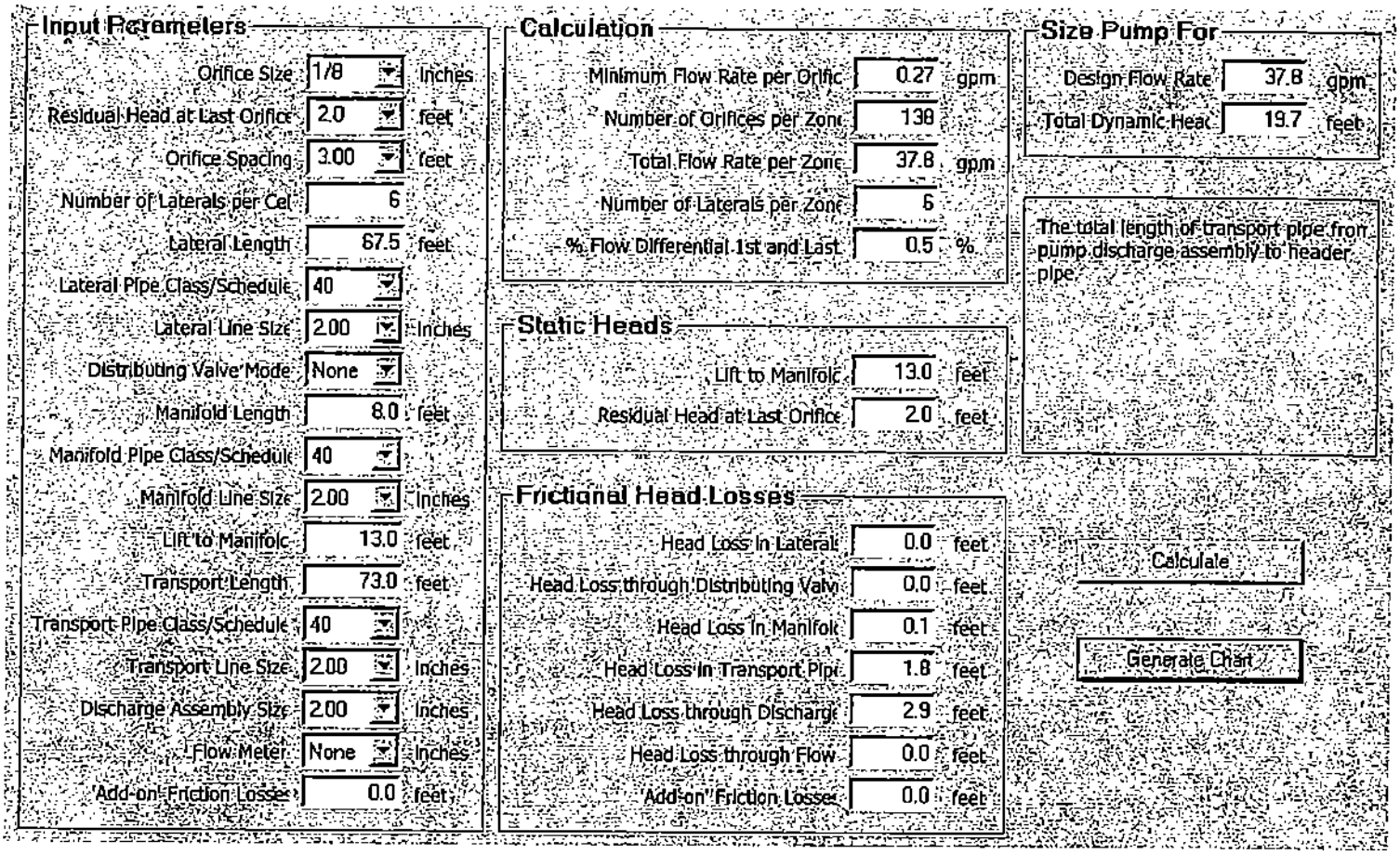
Alternate Site Buildings 5 & 6

B40	0-5	sandy loam	10YR 3/2	
	5-10	sandy loam	10YR 3/3	
	10-14	sandy loam	10YR 5/3	Mottled at 13"
	14-18	clay loam	10YR 5/3	
B41	0-4	silt loam	10YR 3/2	
	4-19	sandy silt loam	10YR 3/3	
	19-24	sandy loam	10YR 5/4	Mottled at 19"


ALTERNATE BORING LOCATIONS
Proposed Well
Proposed Well
Proposed Well
Edge of Wetland
WETLAND
Primary Drainfields
Alternate Drainfield Site
Proposed Woodchip Walking Path
Primary Drainfield
Primary Drainfield
NO. 17
Bituminous Surface Roadway
NORTH
0
100
200
SCALE IN FEET
OF THIS ELEVATION SYSTEM
ON AN ASSUMED DATUM

ALTERNATE BORING LOCATIONS




Input Parameters
Orifice Size 1/8 Inches
Residual Head at Last Orifice 2.0 feet
Orifice Spacing 3.00 feet
Number of Laterals per Cel 6
Lateral Length 67.5 feet
Lateral Pipe Class/Schedule 40
Lateral Line Size 2.00 Inches
Distributing Valve Mode None
Manifold Length 8.0 feet
Manifold Pipe Class/Schedule 40
Manifold Line Size 2.00 Inches
Lift to Manifold 13.0 feet
Transport Length 73.0 feet
Transport Pipe Class/Schedule 40
Transport Line Size 2.00 Inches
Discharge Assembly Size 2.00 Inches
Flow Meter None Inches
Add-on Friction Losses 0.0 feet
Calculation
Minimum Flow Rate per Orific 0.27 gpm
Number of Orifices per Zone 139
Total Flow Rate per Zone 37.8 gpm
Number of Laterals per Zone 6
% Flow Differential 1st and Last 0.5 %
Static Heads
Lift to Manifold 13.0 feet
Residual Head at Last Orifice 2.0 feet
Frictional Head Losses
Head Loss in Lateral 0.0 feet
Head Loss through Distributing Valv 0.0 feet
Head Loss in Manifold 0.1 feet
Head Loss in Transport Pipe 1.8 feet
Head Loss through Discharge 2.9 feet
Head Loss through Flow 0.0 feet
Add-on Friction Losses 0.0 feet
Size Pump For
Design Flow Rate 37.8 gpm
Total Dynamic Head 19.7 feet
The total length of transport pipe from pump discharge assembly to header pipe
Calculate
Generate Chart

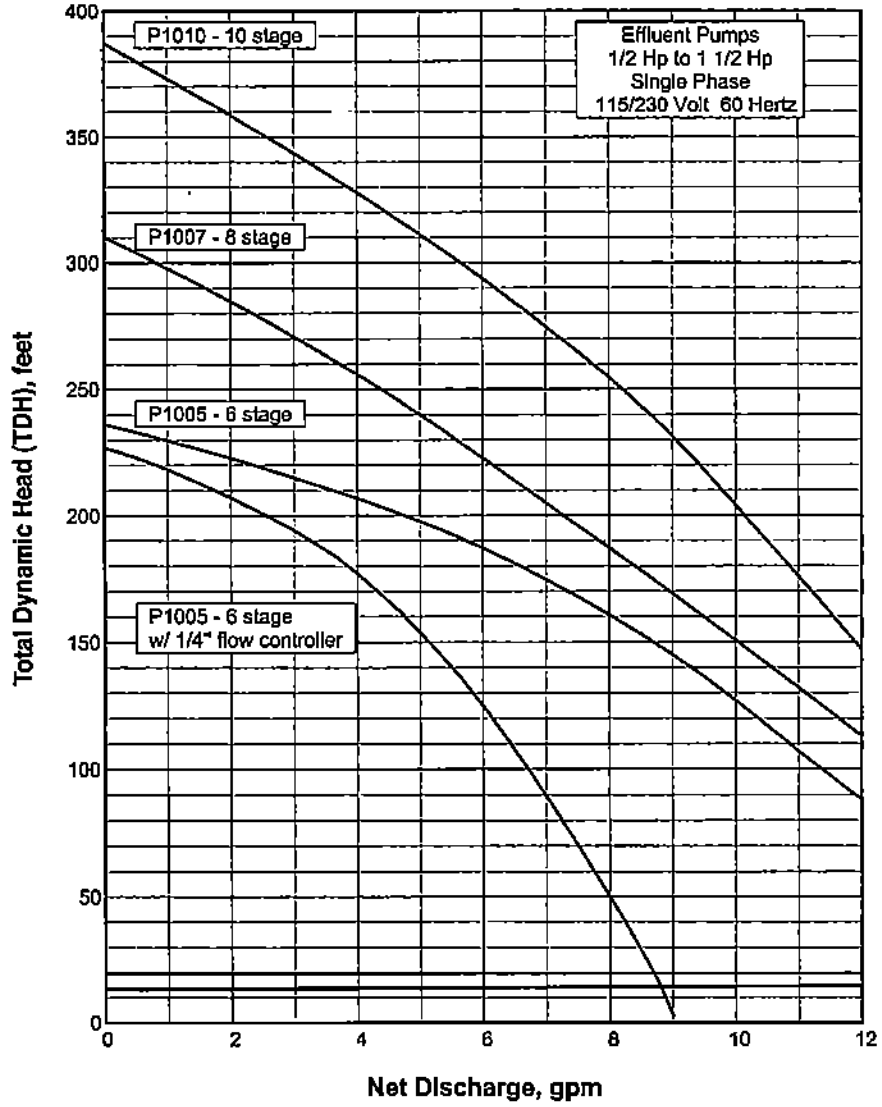
Pump Selection for a Pressurized System

Input Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	2.0	feet
Orifice Spacing	3.00	feet
Number of Laterals per Cell	6	
Lateral Length	67.5	feet
Lateral Line Size	2.00	inches
Lateral Pipe Class/Schedule	40	
Distributing Valve Model	None	
Manifold Length	8.0	feet
Manifold Line Size	2.00	inches
Manifold Pipe Class/Schedule	40	
Lift to Manifold	13.0	feet
Transport Length	73.0	feet
Transport Line Size	2.00	inches
Transport Pipe Class/Schedule	40	
Discharge Assembly Size	2.00	inches
Flow Meter	None	inches
'Add-on' Friction Losses	0.0	feet

Calculations

Minimum Flow Rate per Orifice	0.27	gpm
Number of Orifices per Zone	138	
Total Actual Flow Rate	37.8	gpm
Number of Lines per Zone	6	
Flow Differential 1st and Last Orifice	0.5	%
Lift to Manifold	13.0	feet
Residual Head at Last Orifice	2.0	feet
Head Loss in Laterals	0.0	feet
Head Loss Through Distributing Valve	0.0	feet
Head Loss in Manifold	0.1	feet
Head Loss in Transport Pipe	1.8	feet
Head Loss Through Discharge	2.9	feet
Head Loss Through Flow Meter	0.0	feet
'Add-on' Friction Losses	0.0	feet
Total Flow Rate	**37.8**	**gpm**
TDH	**19.7**	**feet**



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Input Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	2.0	feet
Orifice Spacing	3.00	feet
Number of Laterals per Cel	6	
Lateral Length	65.0	feet
Lateral Pipe Class/Schedule	40	
Lateral Line Size	2.00	Inches
Distributing Valve Mode	None	
Manifold Length	18.0	feet
Manifold Pipe Class/Schedule	40	
Manifold Line Size	2.00	Inches
Lift to Manifold	12.2	feet
Transport Length	122.0	feet
Transport Pipe Class/Schedule	40	
Transport Line Size	2.00	Inches
Discharge Assembly Size	2.00	Inches
Flow Meter	None	inches
Add-on Friction Losses	0.0	feet

Calculation

Minimum Flow Rate per Orific	0.27	gpm
Number of Orifices per Zone	132	
Total Flow Rate per Zone	36.2	gpm
Number of Laterals per Zone	6	
% Flow Differential 1st and Last	0.4	%

Static Heads

Lift to Manifold	12.2	feet
Residual Head at Last Orifice	2.0	feet

Frictional Head Losses

Head Loss In Lateral	0.0	feet
Head Loss through Distributing Valve	0.0	feet
Head Loss in Manifold	0.1	feet
Head Loss in Transport Pipe	2.7	feet
Head Loss through Discharge	2.6	feet
Head Loss through Flow	0.0	feet
Add-on Friction Losses	0.0	feet

Size Pump For

Design Flow Rate	36.2	gpm
Total Dynamic Head	19.6	feet

The total length of transport pipe from pump discharge assembly to header pipe.

Calculate

Generate Chart

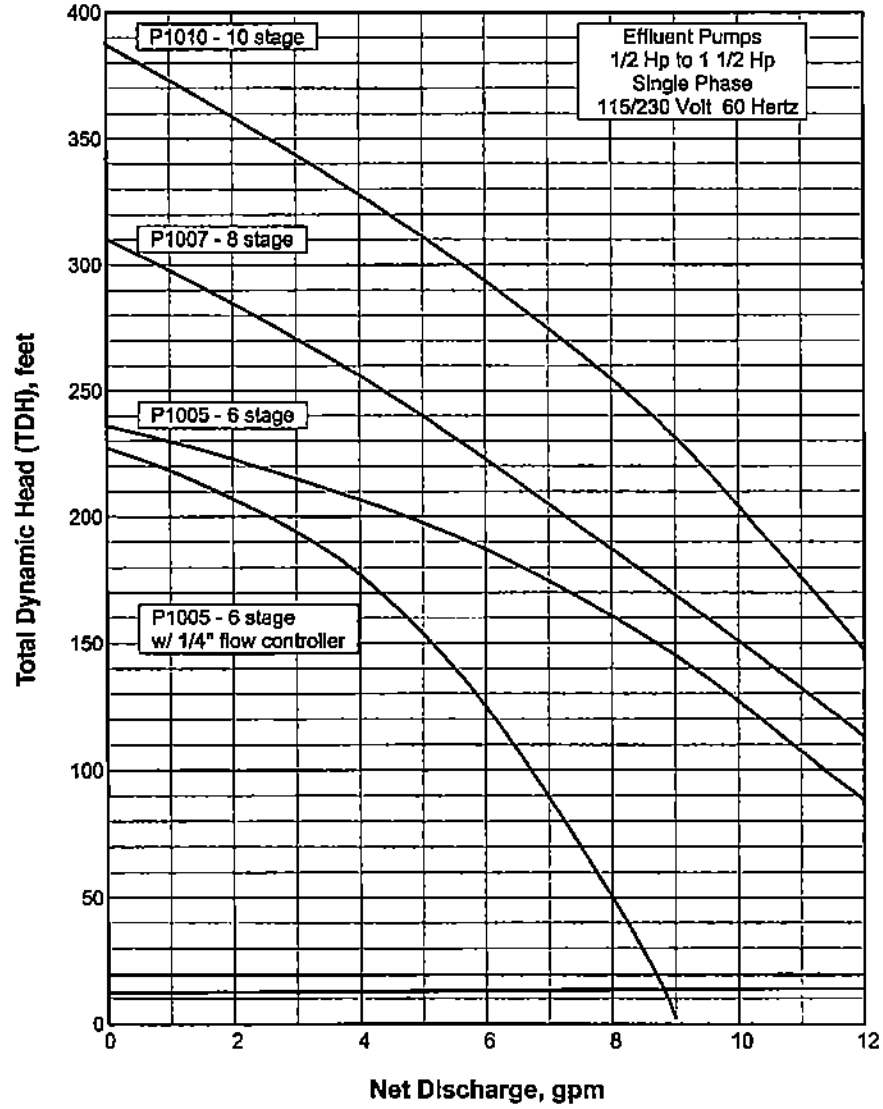
Pump Selection for a Pressurized System

Input Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	2.0	feet
Orifice Spacing	3.00	feet
Number of Laterals per Cell	6	
Lateral Length	65.0	feet
Lateral Line Size	2.00	Inches
Lateral Pipe Class/Schedule	40	
Distributing Valve Model	None	
Manifold Length	18.0	feet
Manifold Line Size	2.00	Inches
Manifold Pipe Class/Schedule	40	
Lift to Manifold	12.2	feet
Transport Length	122.0	feet
Transport Line Size	2.00	Inches
Transport Pipe Class/Schedule	40	
Discharge Assembly Size	2.00	Inches
Flow Meter	None	Inches
'Add-on' Friction Losses	0.0	feet

Calculations

Minimum Flow Rate per Orifice	0.27	gpm
Number of Orifices per Zone	132	
Total Actual Flow Rate	36.2	gpm
Number of Lines per Zone	6	
% Flow Differential 1st and Last Orifice	0.4	%
Lift to Manifold	12.2	feet
Residual Head at Last Orifice	2.0	feet
Head Loss in Laterals	0.0	feet
Head Loss Through Distributing Valve	0.0	feet
Head Loss in Manifold	0.1	feet
Head Loss in Transport Pipe	2.7	feet
Head Loss Through Discharge	2.6	feet
Head Loss Through Flow Meter	0.0	feet
'Add-on' Friction Losses	0.0	feet
Total Flow Rate	**36.2**	**gpm**
TDH	**19.6**	**feet**



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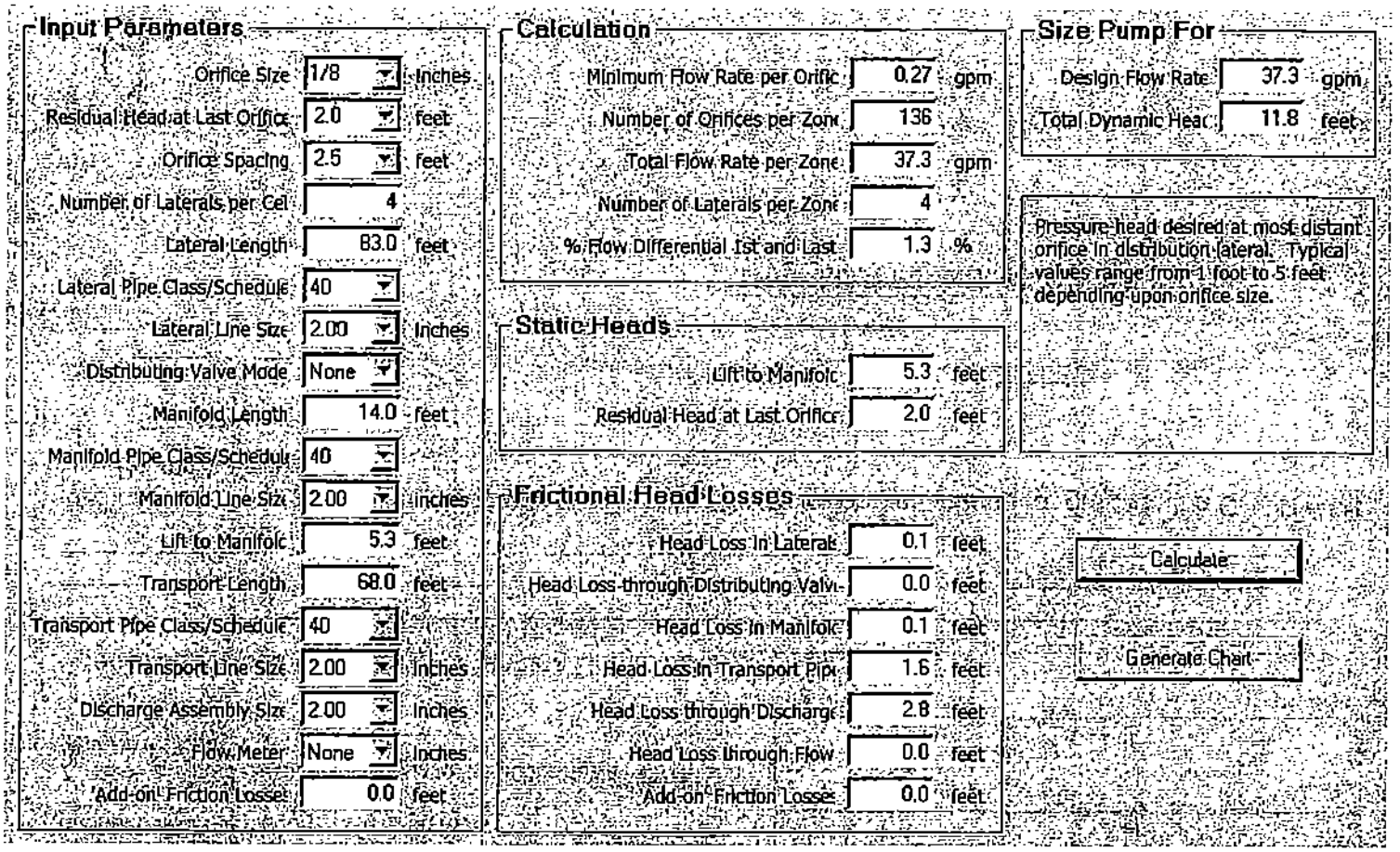

Input Parameters
Orifice Size 1/8 inches
Residual Head at Last Orifice 2.0 feet
Orifice Spacing 2.5 feet
Number of Laterals per Cel 4
Lateral Length 83.0 feet
Lateral Pipe Class/Schedule 40
Lateral Line Size 2.00 inches
Distributing Valve Mode None
Manifold Length 14.0 feet
Manifold Pipe Class/Schedul 40
Manifold Line Size 2.00 inches
Lift to Manifolc 5.3 feet
Transport Length 68.0 feet
Transport Pipe Class/Schedule 40
Transport Line Size 2.00 inches
Discharge Assembly Size 2.00 inches
Flow Meter None inches
Add-on Friction Losses 0.0 feet
Calculation
Minimum Flow Rate per Orific 0.27 gpm
Number of Orifices per Zon 136
Total Flow Rate per Zone 37.3 gpm
Number of Laterals per Zon 4
% Flow Differential 1st and Last 1.3 %
Static Heads
Lift to Manifolc 5.3 feet
Residual Head at Last Orifice 2.0 feet
Frictional Head Losses
Head Loss In Lateral 0.1 feet
Head Loss through Distributing Valv 0.0 feet
Head Loss In Manifolc 0.1 feet
Head Loss in Transport Pipe 1.6 feet
Head Loss through Discharge 2.8 feet
Head Loss through Flow 0.0 feet
Add-on Friction Losses 0.0 feet
Size Pump For
Design Flow Rate 37.3 gpm
Total Dynamic Heac 11.8 feet
Pressure head desired at most distant orifice in distribution lateral. Typical values range from 1 foot to 5 feet depending upon orifice size.
Calculate
Generate Chart

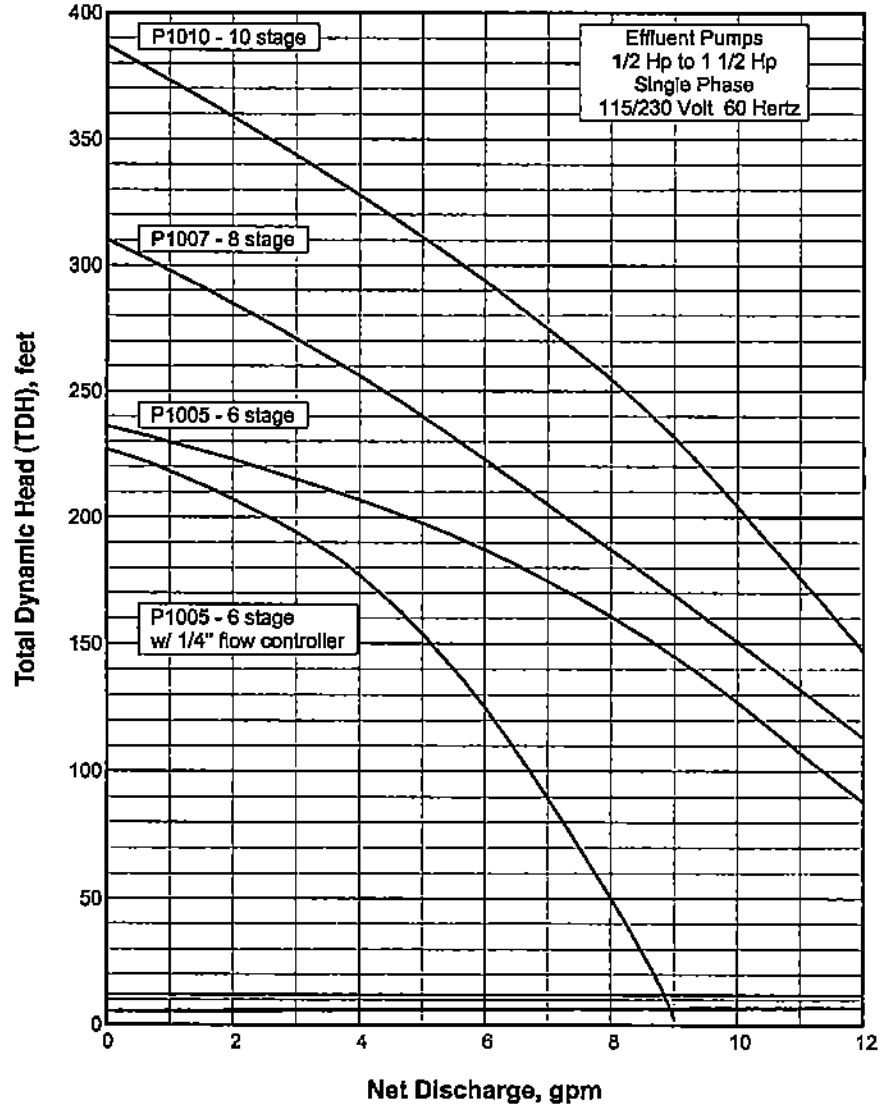
Pump Selection for a Pressurized System

Input Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	2.0	feet
Orifice Spacing	2.5	feet
Number of Laterals per Cell	4	
Lateral Length	83.0	feet
Lateral Line Size	2.00	Inches
Lateral Pipe Class/Schedule	40	
Distributing Valve Model	None	
Manifold Length	14.0	feet
Manifold Line Size	2.00	Inches
Manifold Pipe Class/Schedule	40	
Lift to Manifold	5.3	feet
Transport Length	68.0	feet
Transport Line Size	2.00	Inches
Transport Pipe Class/Schedule	40	
Discharge Assembly Size	2.00	Inches
Flow Meter	None	Inches
'Add-on' Friction Losses	0.0	feet

Calculations

Minimum Flow Rate per Orifice	0.27	gpm
Number of Orifices per Zone	136	
Total Actual Flow Rate	37.3	gpm
Number of Lines per Zone	4	
Flow Differential 1st and Last Orifice	1.3	%
Lift to Manifold	5.3	feet
Residual Head at Last Orifice	2.0	feet
Head Loss in Laterals	0.1	feet
Head Loss Through Distributing Valve	0.0	feet
Head Loss in Manifold	0.1	feet
Head Loss in Transport Pipe	1.6	feet
Head Loss Through Discharge	2.8	feet
Head Loss Through Flow Meter	0.0	feet
'Add-on' Friction Losses	0.0	feet
Total Flow Rate	**37.3**	**gpm**
TDH	**11.8**	**feet**



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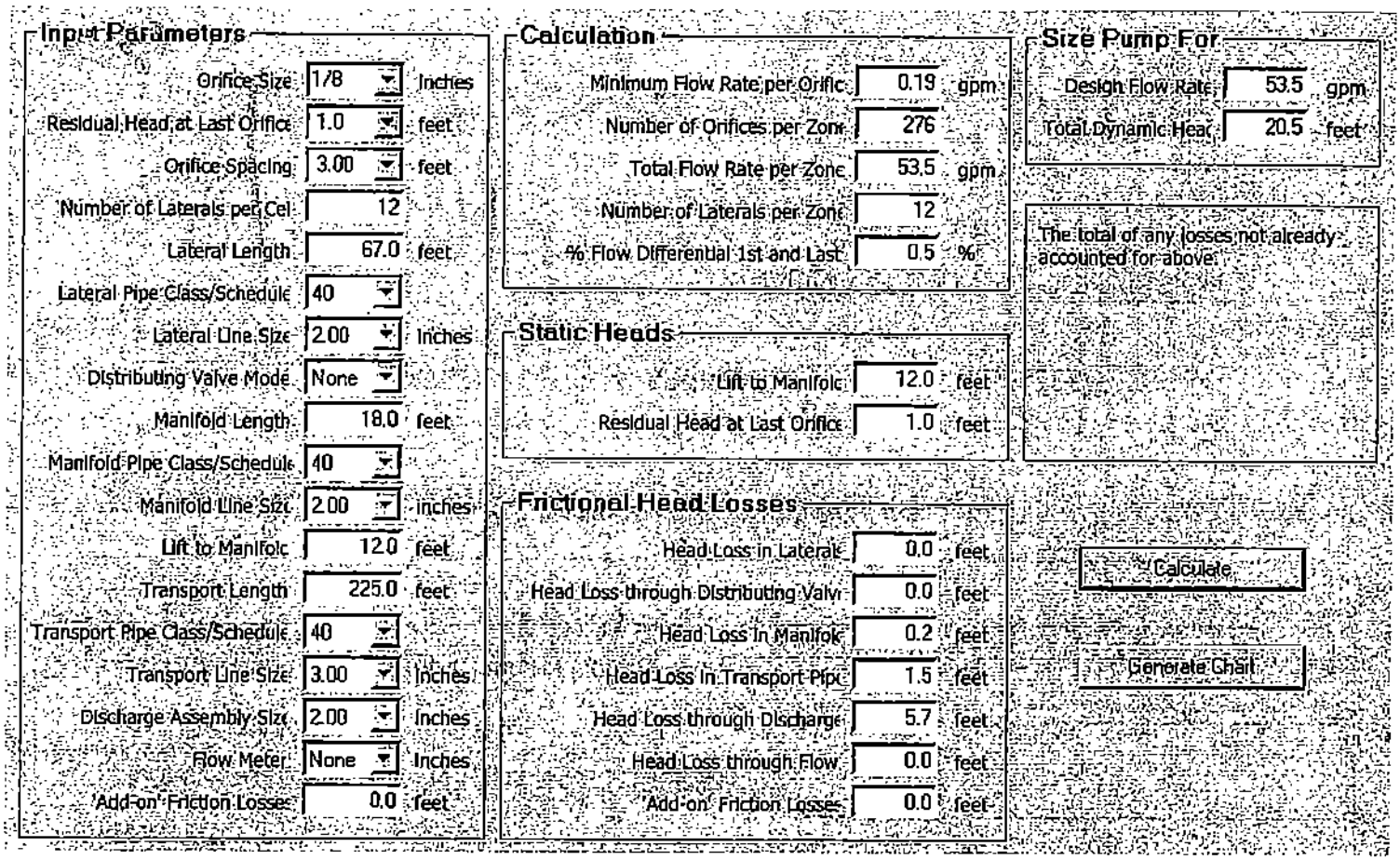

Input Parameters
Orifice Size 1/8 Inches
Residual Head at Last Orifice 1.0 feet
Orifice Spacing 3.00 feet
Number of Laterals per Cel 12
Lateral Length 67.0 feet
Lateral Pipe Class/Schedule 40
Lateral Line Size 2.00 Inches
Distributing Valve Mode None
Manifold Length 18.0 feet
Manifold Pipe Class/Schedule 40
Manifold Line Size 2.00 inches
Lift to Manifold 12.0 feet
Transport Length 225.0 feet
Transport Pipe Class/Schedule 40
Transport Line Size 3.00 Inches
Discharge Assembly Size 2.00 Inches
Flow Meter None Inches
Add-on Friction Losses 0.0 feet
Calculation
Minimum Flow Rate per Orific 0.19 gpm
Number of Orifices per Zone 276
Total Flow Rate per Zone 53.5 gpm
Number of Laterals per Zone 12
% Flow Differential 1st and Last 0.5 %
Static Heads
Lift to Manifold 12.0 feet
Residual Head at Last Orifice 1.0 feet
Frictional Head Losses
Head Loss in Laterals 0.0 feet
Head Loss through Distributing Valv 0.0 feet
Head Loss in Manifold 0.2 feet
Head Loss in Transport Pipe 1.5 feet
Head Loss through Discharge 5.7 feet
Head Loss through Flow 0.0 feet
Add-on Friction Losses 0.0 feet
Size Pump For
Design Flow Rate 53.5 gpm
Total Dynamic Head 20.5 feet
The total of any losses not already accounted for above.
Calculate
Generate Chart

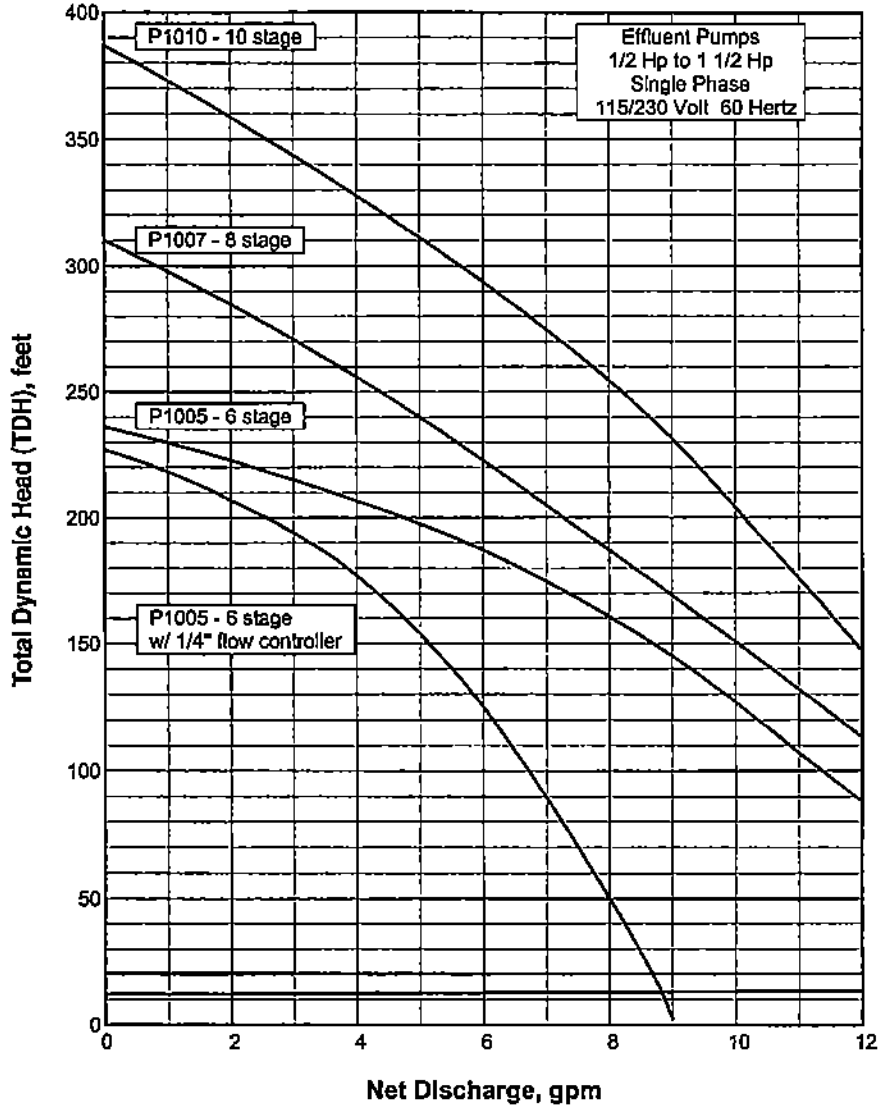
Pump Selection for a Pressurized System

Input Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	1.0	feet
Orifice Spacing	3.00	feet
Number of Laterals per Cell	12	
Lateral Length	67.0	feet
Lateral Line Size	2.00	Inches
Lateral Pipe Class/Schedule	40	
Distributing Valve Model	None	
Manifold Length	18.0	feet
Manifold Line Size	2.00	Inches
Manifold Pipe Class/Schedule	40	
Lift to Manifold	12.0	feet
Transport Length	225.0	feet
Transport Line Size	3.00	Inches
Transport Pipe Class/Schedule	40	
Discharge Assembly Size	2.00	Inches
Flow Meter	None	Inches
'Add-on' Friction Losses	0.0	feet

Calculations

Minimum Flow Rate per Orifice	0.19	gpm
Number of Orifices per Zone	276	
Total Actual Flow Rate	53.5	gpm
Number of Lines per Zone	12	
% Flow Differential 1st and Last Orifice	0.5	%
Lift to Manifold	12.0	feet
Residual Head at Last Orifice	1.0	feet
Head Loss in Laterals	0.0	feet
Head Loss Through Distributing Valve	0.0	feet
Head Loss in Manifold	0.2	feet
Head Loss in Transport Pipe	1.5	feet
Head Loss Through Discharge	5.7	feet
Head Loss Through Flow Meter	0.0	feet
'Add-on' Friction Losses	0.0	feet
Total Flow Rate	**53.5**	**gpm**
TDH	**20.5**	**feet**



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Input Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	2.0	feet
Orifice Spacing	3.00	feet
Number of Laterals per Cel	12	
Lateral Length	67.0	feet
Lateral Pipe Class/Schedule	40	
Lateral Line Size	2.00	Inches
Distributing Valve Mode	None	
Manifold Length	18.0	feet
Manifold Pipe Class/Schedul	40	
Manifold Line Size	2.00	Inches
Lift to Manifolc	12.0	feet
Transport Length	225.0	feet
Transport Pipe Class/Schedule	40	
Transport Line Size	3.00	Inches
Discharge Assembly Size	2.00	Inches
Flow Meter	None	Inches
'Add-on' Friction Losses	0.0	feet

Calculation

Minimum Flow Rate per Orific	0.27	gpm
Number of Orifices per Zone	276	
Total Flow Rate per Zone	75.6	gpm
Number of Laterals per Zone	12	
% Flow Differential 1st and Last	0.5	%

Static Heads

Lift to Manifolc	12.0	feet
Residual Head at Last Orifice	2.0	feet

Frictional Head Losses

Head Loss in Laterals	0.0	feet
Head Loss through Distributing Valv	0.0	feet
Head Loss in Manifolc	0.4	feet
Head Loss in Transport Pipe	2.8	feet
Head Loss through Discharge	11.4	feet
Head Loss through Flow	0.0	feet
'Add-on' Friction Losses	0.0	feet

Size Pump For

Design Flow Rate	75.6	gpm
Total Dynamic Heac	28.7	feet

Pressure head desired at most distant orifice in distribution lateral. Typical values range from 1 foot to 5 feet depending upon orifice size.

Calculate

Generate Chart

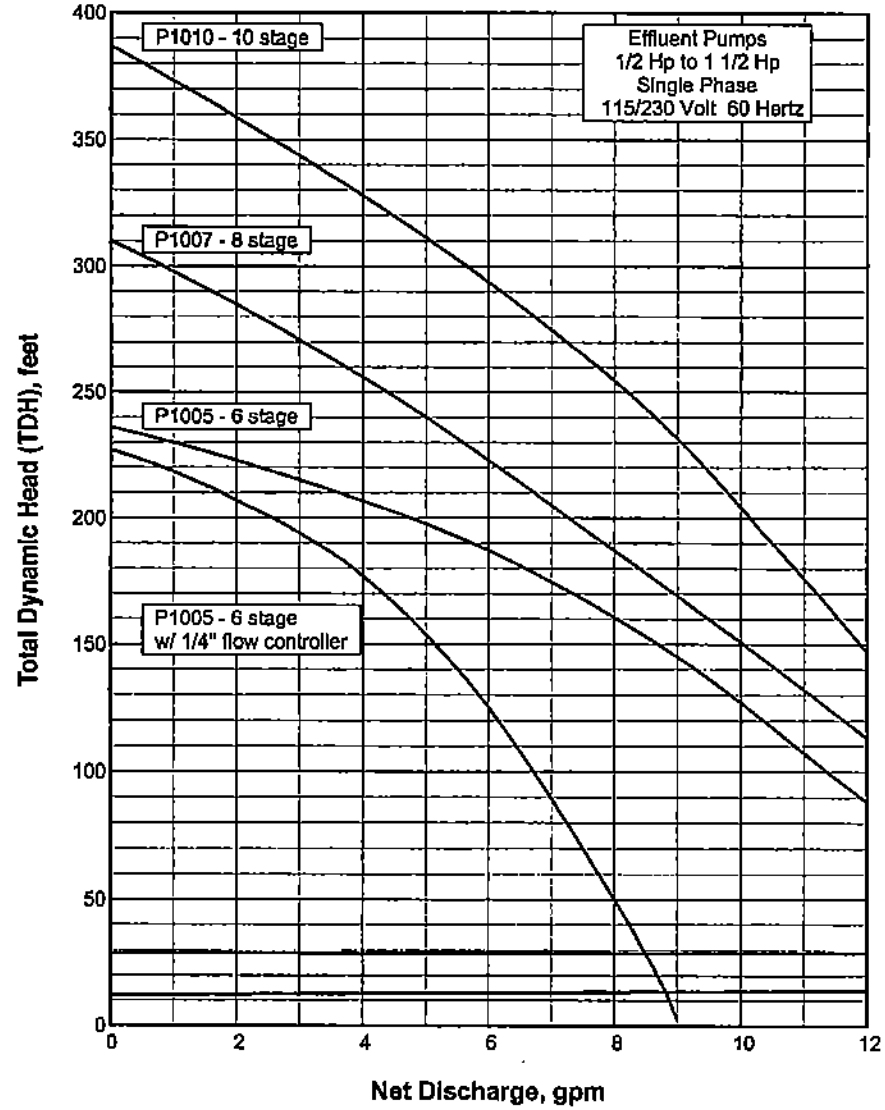
Pump Selection for a Pressurized System

Input Parameters

Orifice Size	1/8	Inches
Residual Head at Last Orifice	2.0	feet
Orifice Spacing	3.00	feet
Number of Laterals per Cell	12	
Lateral Length	67.0	feet
Lateral Line Size	2.00	Inches
Lateral Pipe Class/Schedule	40	
Distributing Valve Model	None	
Manifold Length	18.0	feet
Manifold Line Size	2.00	Inches
Manifold Pipe Class/Schedule	40	
Lift to Manifold	12.0	feet
Transport Length	225.0	feet
Transport Line Size	3.00	Inches
Transport Pipe Class/Schedule	40	
Discharge Assembly Size	2.00	Inches
Flow Meter	None	Inches
'Add-on' Friction Losses	0.0	feet

Calculations

Minimum Flow Rate per Orifice	0.27	gpm
Number of Orifices per Zone	276	
Total Actual Flow Rate	75.6	gpm
Number of Lines per Zone	12	
Flow Differential 1st and Last Orifice	0.5	%
Lift to Manifold	12.0	feet
Residual Head at Last Orifice	2.0	feet
Head Loss in Laterals	0.0	feet
Head Loss Through Distributing Valve	0.0	feet
Head Loss in Manifold	0.4	feet
Head Loss in Transport Pipe	2.8	feet
Head Loss Through Discharge	11.4	feet
Head Loss Through Flow Meter	0.0	feet
'Add-on' Friction Losses	0.0	feet
Total Flow Rate	**75.6**	**gpm**
TDH	**28.7**	**feet**



Orenco Systems®
Incorporated

814 AIRWAY AVENUE
SUTHERLIN, OREGON
97479-9012

TELEPHONE:
(541) 459-4449

FACSIMILE:
(541) 459-2884

MULTI•FLO

Simply the Best

Multi-Flo is a convenient alternative to the central sewage system or the septic tank and is ideal for the renovation of a failing on-site sewage system. And thanks to its durable, lightweight construction, Multi-Flo can be installed quickly and easily in any location, even those with limiting factors.

But most of all, Multi-Flo offers the highest quality of any wastewater treatment system in its class... it's simply the best.

Clean, Odorless Effluent

A unique feature of the Multi-Flo System is that the entire process takes place in a single tank. Multi-Flo has been Tested and Certified under ANSI/NSF Standard 40 as a Class I System — the Highest Rating. Because of the high degree of treatment, the Multi-Flo effluent is allowed by some states and local agencies for surface discharge as well as recycle and irrigation use.

Founded in 1970, Multi-Flo has set the standard in wastewater treatment. From the day of its inception, Multi-Flo was developed with the highest efficiency — consequently we have never had to change to meet standards required by NSF International (NSF). Initially tested by NSF in 1973, again in 1981, and most recently in 1991, we have always maintained those high standards to guarantee a Class I rating.

Multi-Flo has sold thousands of units across the country. This success is due not only to the outstanding product, but also to the people involved with Multi-Flo. We take pride in our product and stand behind it. Multi-Flo is a company built on reputation. We are committed to our product, our customers, and the environment.

Five Sizes:
500, 600, 750, 1000, and 1500 gallons per day.

Electrical Requirements:
120 volts/2.6 amps single phase 60 cycle

MULTI•FLO

Features and Benefits

No Odor

[illegible] septic tanks.

Quiet Operation

The specially designed totally submerged aerator is almost 100% noise-free. This eliminates the annoying noise created by top-mounted aerators and auxiliary compressors which must be located in or near the home.

Low Operating Cost

This newly redesigned aerator costs only a few cents a day to operate. This is less than the cost to operate most common household appliances.

No Owner Maintenance

Although periodic, routine maintenance is necessary to insure continuous, trouble-free operation, all service is provided by local factory-trained representatives. The Multi-Flo alarm system alerts the homeowner of any pending problem.

Low Installation Cost

The lightweight, single tank design allows for simple installation without the need for heavy, expensive equipment. The durable fiberglass tank can be transported in a pick-up truck.

Minimal Space Requirements

The Multi-Flo requires only a small space (approximately 6' in diameter) for installation. In addition, depending on local and state regulations, it may be permissible to reduce normal drainfield sizing requirements or to discharge the effluent (with disinfection) directly to an approved receiving stream. *CHECK WITH YOUR STATE, COUNTY, OR LOCAL REGULATORY OFFICIAL TO DETERMINE IF SUCH REDUCTIONS ARE PERMITTED.*

Easy Access for Service

The low-profile lid allows immediate accessibility to all of the Multi-Flo components. All necessary inspection and maintenance can be done quickly and easily without digging up the yard. Tamperproof fasteners prevent unauthorized entry into the unit.

Two (2) Year Warranty

[illegible]

Prevents Drainfield Failure

[illegible] the Multi-Flo [illegible] sewage [illegible] and failure of conventional systems.

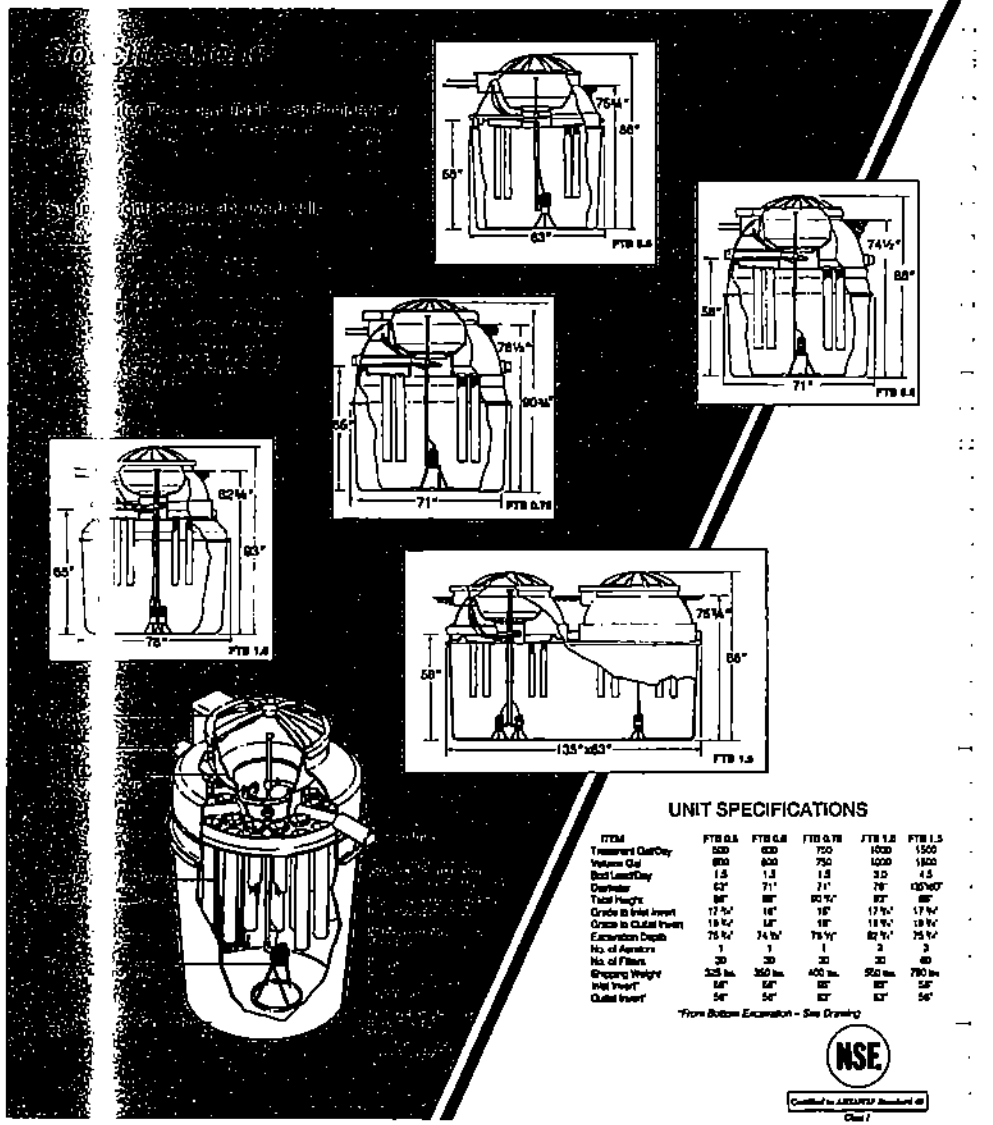
Several Plant Sizes Available

Multi-Flo provides five (5) individual treatment plant capacities: 500, 600, 750, 1000 and 1500 gallons per day (GPD). This allows for proper sizing of the plant based upon actual (or anticipated) sewage flows.

NSF Tested and Certified Class I System

Multi-Flo has achieved the highest performance rating from the NSF. Based upon their testing results, the Multi-Flo is one of the most efficient treatment plants in the market.

MULTI-FLO



UNIT SPECIFICATIONS

ITEM	FTB 0.5	FTB 0.8	FTB 0.75	FTB 1.0	FTB 1.5
Treatment Cap/Day	500	800	750	1000	1500
Volume Gal	650	800	750	1000	1500
Bod Load/Day	1.0	1.6	1.5	2.0	3.0
Diameter	63"	71"	71"	76"	135"x63"
Total Height	88"	88"	93 ½"	93"	88"
Grade to Inlet Invert	17 ½"	16"	16"	17 ½"	17 ½"
Grade to Outlet Invert	18 ½"	17"	16"	18 ½"	18 ½"
Excavation Depth	75 ½"	74 ½"	75 ½"	82 ½"	75 ½"
No. of Aerators	1	1	1	2	2
No. of Filters	20	20	20	20	40
Shipping Weight	325 lbs	350 lbs	400 lbs.	550 lbs	780 lbs
Inlet Invert*	58"	58"	55"	55"	58"
Outlet Invert	58"	58"	55"	53"	58"

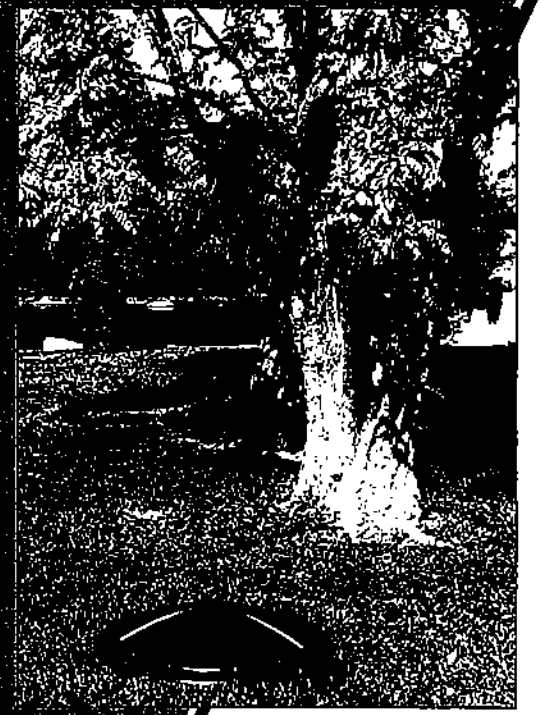
*From Bottom Excavation - See Drawing

NSF

Certified to ANSI/NSF Standard 40 Class I

MULTI-FLO 1501 Commerce Center Drive • Franklin, Ohio 45005 • 513/746-2727 • Fax513/746-1448

MULTI-FLO



Simply The Best

Rich Courtemanche stated units 21-24 could be shifted to make the 100-foot buffer between the property lines. He further stated there is a septic site in the northwest quarter. The septic site would have to be cleared of vegetation.

Dale Jesser asked if the Fire Department had been notified.

Rich Courtemanche stated yes, the Fire Department had been notified.

Mr. Gillem stated the Fire Chief's only concern was that the project has an access for the trucks. He further stated there is a pond on the property.

Dave Jesser stated the value of his property had not been discussed. He further stated once the project is completed no one would want to buy is property.

The chair asked the Board if they would like to discuss this issue. She further stated public testimony is closed.

Kathy Galliger stated the findings of fact would address Mr. Jesser's concerns.

The chair called for a motion.

Mike Murphy made a motion to approve with 6 conditions.

The chair called for the **FINDINGS OF FACT:**

1. ***The requested use will not be injurious to the use and enjoyment of the environment or of other property in the immediate vicinity, nor diminish substantially, nor impair property values within the surrounding neighborhood.***

Nancy Eddy	Kathy Galliger	Bill Renstrom	Mike Murphy
Yes, the density is less than what would be allowed. The project would be controlled.	Yes, based on the site visit and testimony provided. The covenants indicate the project would be single family owned dwellings.	Absent	Yes

2. ***The requested use will not increase local or state expenditures in relation to costs of servicing or maintaining neighboring properties.***

Nancy Eddy	Kathy Galliger	Bill Renstrom	Mike Murphy
Yes	Yes, based on testimony.	Absent	Yes

3. ***The location and character of the requested use are considered to be consistent with a desirable pattern of development for the locality in general.***

Nancy Eddy	Kathy Galliger	Bill Renstrom	Mike Murphy
Yes	Yes, based on testimony provided that the units would be single family owned.	Absent	Yes

4. ***The requested use conforms to the comprehensive land use for the County.***

Yes, requested use is allowed as a Conditional Use Permit.

5. ***Proper notice has been given to those people required under Minnesota Statutes, Chapter 394, of the propose requested use and of the hearing planned before the planning commission.***

Yes

6. ***That other applicable requirements of this ordinance, or other ordinances of the County have been met.***

Nancy Eddy	Kathy Galliger	Bill Renstrom	Mike Murphy
Yes	Yes	Absent	Yes

7. ***The requested use is not injurious to the public health, safety and general welfare.***

Nancy Eddy	Kathy Galliger	Bill Renstrom	Mike Murphy
Yes	Yes, based on testimony.	Absent	Yes

The chair called for a second. Kathy Galliger supported the motion
The chair called the question. Motion carried unanimously **3.0 to approve with 6 conditions.**

1. **Downward directed lighting required.**
2. **150 foot building setback from Tributary Stream maintained.**
3. **100-foot natural vegetated buffer to be managed to maintain vegetation to the North, West and East property lines, excluding the road.**
4. **Constructed as proposed.**
5. **An erosion control plan is established between the buildings and Otterbelly pond from the Soil and Water Conservation District.**

6. **Must adhere to all Local, State and Federal rules.**

Mr. Gillem signed the Notice of Decision.

The chair called for a motion to approve the March 18, 2002 minutes as submitted.

Nancy Eddy moved to approve the March 18, 2002 minutes. Mike Murphy seconded the motion. Kathy Galliger was absent the March 18, 2002 Planning Commission meeting. The chair called the question. Motion carried unanimously **2.0 to approve the March 18, 2002 minutes.**

Kathy Galliger moved to adjourn. Mike Murphy seconded the motion. The chair called the question. Motion carried unanimously **3.0 to adjourn.**

Meeting adjourned at 5:30 p.m.

Respectfully submitted,

Missy Kingsley

Missy Kingsley
Secretary/Clerk

Last Revision: April 30, 2002

Approved: May 20, 2002

AITKIN COUNTY
CERTIFICATE OF COMPLIANCE/NOTICE OF NONCOMPLIANCE

This certificate of compliance/notice of noncompliance has been issued this 23 day of September 2003 to certify compliance\noncompliance with Aitkin County's Individual Sewage Treatment System and Wastewater Ordinance No. 1. The premises covered by this certificate are legally described as: SE SW

Section 33 Township 47 Range 26 Lake Tributary

PERMIT NO. 30675 Owner Name _____

Address 37709 - Dove St., Aitkin, MN 56431

Installer Name ROM

Type of System Inspected "Other" performance based pressured w/aerobic tanks

The certificate of compliance/notice of noncompliance was based on, No 1 of the following:

1) Inspection of the installation or construction as in accordance with the above referenced permit and application design.

2) Review of as-built plans submitted in accordance with Subdivision 4.21 C. Of Aitkin County's Individual Sewage Treatment System and Wastewater Ordinance No. 1.

If the above permitted individual sewage treatment system is in noncompliance with Aitkin County's Individual Sewage Treatment System and Wastewater Ordinance No. 1, then the following shall serve as a Notice of Violation:

1) Statement of the findings of fact through inspections or investigations: _____

2) List of specific violations of Ordinance: _____

3) Requirements for correction or removal of violations: _____

4) Time schedule for compliance: _____

Failure to correct or remove the above violations will result in this matter being turned over to the Aitkin County Attorney's Office for further legal action which may result in revocation of licenses or registrations, fine's and/or imprisonment.

INSPECTOR SIGNATURE _____

c:\wp61\terry.dir\certform.doc

AITKIN COUNTY ENVIRONMENTAL SERVICES-PLANNING & ZONING

209 Second Street, NW
Aitkin, Minnesota 56431

PH: (218) 927-7342
FX: (218) 927-4372

November 10, 2003

RE: Septic System, permit #30675

LOWELL & KATHLEEN GILLEM
37704 DOVE ST
AITKIN MN 56431

To Whom It May Concern:

Our office inspected the installation of your septic system on August 21, 2003. During that inspection the following inconsistencies with your Operating Permit and State Septic Codes were observed:

1) A water meter needs to be installed and water usage recorded on a monthly basis

2) Septic system needs electrical hookup

Therefore, your septic system has not received a Certificate of Compliance. Our office has received no correspondence from your septic installer or you regarding the water meter installation.

The use of your septic system is conditional under a valid Operating Permit and the septic is not in compliance without the water meter. It is requested that you submit documentation of the water meter installation within 30 days of receipt of this letter. Without this documentation a Compliance Certificate can not be issued and your septic system will be deemed *not in compliance*. Please submit the requested documentation or contact our office at your earliest convenience. I appreciate your anticipated assistance in bringing your septic into compliance.

Sincerely,

Richard Courtemanche
Assistant Zoning Administrator
Aitkin County

INDIVIDUAL SEWAGE TREATMENT SYSTEM INSPECTION FORM
AITKIN COUNTY, MINNESOTA

Township Spencer Date of Inspection 9/23/03 Permit Number 30675

Owner Lowell Gillem Spencer Parcel Number 31-1-083600

Project Address S E 1/4 SW 1/4, Sec 33 Installer ROM

City Aitkin Zip Code 56431 New X Repair

Building 6 septic DIST. or DROP BOX & TYPE

SETBACKS:

Buildings to tank(s) 12

Buildings to drainfield > 100'

Well(s) 50' or 100'

Lake/Creek/Wetland None

SEPTIC TANKS:

Liquid capacity 1650

Manufacturer & type Bauerly Cement 1 chamber

Type of baffle Fiberglass

Inspection pipes 3 @ 4"

Manholes access 1 @ 26"

No. & height of risers 1 @ 37 2 @ 25 3 Liberty 1/3 HP

MOUNDS:

Percent slope 0

Upslope dike width —

Downslope dike width —

Sideslope dike width —

Drainfield rock below pipe 9"

Depth of sand below rock

Perforation size & spacing 1/8" @ 36"

Pipe size & spacing 2" @ 33",

Dimensions of rock bed 10 x 133'

Dimensions of sand base —

Final cover

TRENCHES, BEDS, OR GRAVELLESS LEACHFIELD:

Trench depth 9-10"

Trench length 133

Trench bottom width 10'

Trench bottom level yes

Trench spacing —

Drainfield rock below pipe 9"

Size of gravelless pipe —

Depth of backfill

Absorption area: square feet 1,333

lineal feet 133

PUMPS:

Tank capacity 1650

Tank manufacturer & type Bauerly

No. & height of risers 1 @ 26

Pump manufacturer & model# 2 @ Liberty 283

Horsepower & GPM 1/2 HP

Feet of head 14

Cycles per day 8

Gallons per cycle 65 gal

Size of discharge line 2"

Type of electrical hookup Outside Post (Rhombus)

Type & location of alarm in multiflow/elecconbox

Cycle counter (commercial) in Rhombus cont. (X) soil pit

DRAWING OF SYSTEM

Inspector's Comments System put in shallow, cover & insulate drainfield;

Corrective Action Required

Inspector's Signature

Installer's Signature

White-County Yellow-Applicant Pink-Installer

30675 31-1-083600

AITKIN COUNTY ENVIRONMENTAL SERVICES-PLANNING & ZONING

209 Second Street, NW
Aitkin, Minnesota 56431

PH: (218) 927-7342
FX: (218) 927-4372

June 2, 2005

RE: Renewed Operating Permit

To Whom It May Concern:

This letter is to inform you that your Operating Permit (No. 119) has been renewed until May 31, 2006. You should note that all renewal dates that were formerly on December 31 have been moved forward to allow your Operation and Maintenance provider suitable time to complete the monitoring report.

Please adhere to your monitoring and maintenance contract including monitoring your water use. Failure to do so would violate the agreement to operate your system and could void the operating permit. You should contact your Operation and Maintenance provider directly with questions that you may have during the year.

Thank you for your good stewardship and we hope that your system continues to operate well, protecting groundwater for you and the environment.

Sincerely,

Richard Courtemanche
Assistant Zoning Administrator
Aitkin County

Rct 6639

AITKIN COUNTY ENVIRONMENTAL SERVICES

OPERATING PERMIT FOR WASTEWATER TREATMENT AND DISPERSAL

OPERATING PERMIT #: 119

FEE: $50.00

PERMITTEE: Lowell & Kathleen Gillem

PHONE: (218) 927-4974

ADDRESS: 37704 Dove Street
Aitkin, MN 56431-

A-6639

ZONING PERMIT # 30675

31-1-083600
PARCEL #: ~~31-0-066201~~

LEGALDESCRIPTION: That Portion North of Co. Rd. 17 in SE 1/4 of SW 1/4, Sec 33 Twsp 47,

ISSUE DATE 1/ 1/05 **EXPIRATION DATE** 12/31/05

Aitkin County Environmental Services authorizes the Permittee to operate a wastewater treatment and dispersal system located on the above described property in accordance with the requirements of this permit.

This permit is effective on the issuance date identified above.

This permit and the authorization to treat and disperse from the above system shall expire on the above expiration date. The Permittee is not authorized to discharge after the date of expiration. The Permittee shall submit such information and forms as required by Aitkin County Environmental Services no later than thirty (30) days prior to the expiration date. When the required information is submitted and approved by Aitkin County Environmental Services, the permit may be renewed. This permit is not transferable from owner to owner.

I hereby certify with my signature as the permittee that I understand the provisions of this permit including the maintenance and monitoring requirements. I agree to indemnify and hold Aitkin County harmless from all loss, damages, costs and charges that may be incurred by use of this system and if I fail to comply with the provisions of this Operating Permit. If I sell this property during the life of the permit, I will inform the new owner(s) of the permit requirements and the need to renew the permit.

Lowell Gillem
Signature of Permittee

5/10/05
Date

Kathleen Gillem

Signature of Permitting Authority

5-09-05
Date

If You have any questions regarding this permit, including the specific permit requirements, permit reporting or permit compliance status, please contact Aitkin County Environmental Services at 218-927-7342.

A. DESCRIPTION OF WASTEWATER TREATMENT AND DISPERSAL SYSTEM

Planned Community Development will utilize Multi-Flo Aerobic treatment plants to pretreatwaste. Pressure beds will be used for disposal. Effluent will flow by gravity into trash traps (pretanks). From there it will be time dosed into the aerobic treatment plants, then gravity flow to pump tanks and be dosed to the fields. Sized for 48 bedrooms (4,800 gallons per day). Anticipated System life (25-40 years). Operational Cost = 450/mo. Monitoring and Servicing = First year - no charge, $150/yr for 750 gpd units, $300/yr for 1,500 gpd units {Total $900). Testing = $900 first year then $450/yr for 2 years.

B. PERFORMANCE STANDARD REQUIREMENTS:

During the period beginning on the effective date (issuance date) of this permit and lasting until this permits expiration date, the Permittee is authorized to discharge from the wastewater treatment unit to subsurface dispersal. No surface discharge is permitted. The following parameters must be monitored and the reuslts must be found within the compliance limits.

PARAMETER	COMPLIANCE LIMIT	SAMPLE LOCATION	SAMPLE FREQUENCY	SAMPLE TYPE	REPORTING FREQUENCY
BOD5	75 mg/l	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY
Fats, Oil and Greases	< 30 mg/l	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY
Fecal Coliform	<2,500 cfu/100 ml	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY
Flow	4,800 gpd	Water Meter	EVERY 6 MONTHS	Record on Log Sheet	ANNUALLY
TSS	22 mg/l	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY

C. MAINTENANCE REQUIREMENTS:

PARAMETER	LOCATION	FREQUENCY
Aerobic Tank Function	Aerobic Tank	ANNUAL
Flow	Water Meter	MONTHLY
Pumps, Floats & Alarms	Pump Chamber	ANNUAL
Solids Removal & Water Tightness	Septic tank(s)	ANNUAL
Vegetative Cover	Dispersal System	ANNUAL

D. MONITORING AND REPORTING REQUIREMENTS:

Monitoring results obtained during each calendar year shall be submitted no later than December 31st of that year to:

Aitkin County Environmental Services
209 2nd Street NW
Aitkin, MN 56431

The monitoring reports shall be signed by the Permittee. Copies are to be retained by the Permittee.

The Permittee shall notify Aitkin County Environmental Services within thirty (30) days when monitoring results do not meet the monitoring plan requirements of this permit.

Monitoring plans may be modified as necessary and reapproved by Aitkin County Environmental Services.

Sampling and laboratory testing procedures shall be performed in accordance with Standard Methods and the testing and shall be performed by a Minnesota Department of Health approved laboratory. All sampling and testing costs shall be the responibility of the Permittee.

Monitoring will be done by Eric Larson

E. MITIGATION PLAN:

If surfacing should occur: reduce water use, increase absorption and distribution area. Waste strength: if fecals exceed limit, add disinfection or increase separation. If BOD, TSS, or FOG exceed limit, reduce effluent strength. Reserve sites available for replacemnt systems.

F. SPECIAL REQUIREMENTS:

* A WATER METER MUST BE INSTALLED BEFORE COMPLIANCE CERTIFICATE CAN BE ISSUED **

Septic Check,™ Inc.
Septic System Management Services

12-18-04

Aitkin County Environmental Services
209 - 2nd Street NW
Aitkin, MN 56431

RE: Operating Permit for Parcel # 31-0-066201

Lowell & Kathleen Gillem
The Woods at Otterbelly
37704 Dove Street
Aitkin, MN 56431

Parameter	Compliance Limit	Actual
Fecal Coliform	<2500 CFU/100ml	No test in 2004 because system use began late fall.
Daily Flow	800 GPD	47 GPD (Sept - Dec 13)

Eric Larson
Lic 2624

Lowell Gillem

Septic Check, Inc.

AITKIN COUNTY
ENVIRONMENTAL SERVICES

209 SECOND STREET NW
AITKIN, MN 56431
218-927-7250

Wednesday, March 15, 2006

Lowell & Kathleen Gillem
37704 Dove Street
Aitkin, MN 56431-

Re: Operating Permit #: 119
Parcel Identification #: 31-1-083600

Dear Resident:

This letter is to remind you that the Operating Permit for the septic system on the above listed parcel of land will expire on May 31, 2006. The operating permit (OP) was issued as a MN Pollution Control Agency requirement to allow the installation of your septic system and must be renewed annually until the County and your Compliance Inspector agree that the system is being properly maintained and is operating appropriately. As a condition of the OP, your septic system must be monitored for the following performance standards:

PARAMETER	COMPLIANCE LIMIT	SAMPLE LOCATION	SAMPLE FREQUENCY	SAMPLE TYPE	REPORTING FREQUENCY
BOD5	75 MG/L	AEROBIC TANK EFFLUENT	EVERY 6 MONTHS	GRAB	ANNUALLY
FATS, OIL AND GREASES	< 30 MG/L	AEROBIC TANK EFFLUENT	EVERY 6 MONTHS	GRAB	ANNUALLY
FECAL COLIFORM	<2,500 CFU/100 ML	AEROBIC TANK EFFLUENT	EVERY 6 MONTHS	GRAB	ANNUALLY
FLOW	4,800 GPD	WATER METER	EVERY 6 MONTHS	RECORD ON LOG SHEET	ANNUALLY
TSS	22 MG/L	AEROBIC TANK EFFLUENT	EVERY 6 MONTHS	GRAB	ANNUALLY

In addition, the following maintenance practices must be performed:

PARAMETER	LOCATION	FREQUENCY
Aerobic Tank Function	Aerobic Tank	ANNUAL
Flow	Water Meter	MONTHLY
Pumps, Floats & Alarms	Pump Chamber	ANNUAL
Solids Removal & Water Tightness	Septic tank(s)	ANNUAL
Vegetative Cover	Dispersal System	ANNUAL

The performance and life expectancy of this septic system is dependent on regular monitoring and maintenance of all parts of the system. Your compliance with the operating permit will ensure continued high performance of the system. Failure to perform the monitoring and maintenance of this system could cause costly repairs or replacement and is a violation of the Aitkin County Individual Sewage Treatment System and Wastewater Ordinance.

A copy of this letter will be sent to Eric Larson

AITKIN COUNTY ENVIRONMENTAL SERVICES

OPERATING PERMIT FOR WASTEWATER TREATMENT AND DISPERSAL

OPERATING PERMIT #: 119 **FEE:** $50.00

PERMITTEE: Lowell & Kathleen Gillem **PHONE:** (218) 927-4974

ADDRESS: 37704 Dove Street
Aitkin, MN 56431-

ZONING PERMIT # 30675 **PARCEL #:** 31-1-083600

LEGALDESCRIPTION: That Portion North of Co. Rd. 17 in SE 1/4 of SW 1/4, Sec 33 Twsp 47,

ISSUE DATE 5/31/2006 **EXPIRATION DATE** 5/31/2007

Aitkin County Environmental Services authorizes the Permittee to operate a wastewater treatment and dispersal system located on the above described property in accordance with the requirements of this permit.

This permit is effective on the issuance date identified above.

This permit and the authorization to treat and disperse from the above system shall expire on the above expiration date. The Permittee is not authorized to discharge after the date of expiration. The Permittee shall submit such information and forms as required by Aitkin County Environmental Services no later than thirty (30) days prior to the expiration date. When the required information is submitted and approved by Aitkin County Environmental Services, the permit may be renewed. This permit is not transferable from owner to owner.

I hereby certify with my signature as the permittee that I understand the provisions of this permit including the maintenance and monitoring requirements. I agree to indemnify and hold Aitkin County harmless from all loss, damages, costs and charges that may be incurred by use of this system and if I fail to comply with the provisions of this Operating Permit. If I sell this property during the life of the permit, I will inform the new owner(s) of the permit requirements and the need to renew the permit.

Lowell Gillem 5/4/06

Signature of Permittee **Date**

Signature of Permitting Authority **Date**

If You have any questions regarding this permit, including the specific permit requirements, permit reporting or permit compliance status, please contact Aitkin County Environmental Services at 218-927-7342.

A. DESCRIPTION OF WASTEWATER TREATMENT AND DISPERSAL SYSTEM

Planned Community Development will utilize Multi-Flo Aerobic treatment plants to pretreatwaste. Pressure beds will be used for disposal. Effluent will flow by gravity into trash traps (pretanks). From there it will be time dosed into the aerobic treatment plants, then gravity flow to pump tanks and be dosed to the fields. Sized for 48 bedrooms (4,800 gallons per day). Anticipated System life (25-40 years). Operational Cost = 450/mo. Monitoring and Servicing = First year - no charge, $150/yr for 750 gpd units, $300/yr for 1,500 gpd units {Total $900). Testing = $900 first year then $450/yr for 2 years.

B. PERFORMANCE STANDARD REQUIREMENTS:

During the period beginning on the effective date (issuance date) of this permit and lasting until this permits expiration date, the Permittee is authorized to discharge from the wastewater treatment unit to subsurface dispersal. No surface discharge is permitted. The following parameters must be monitored and the reuslts must be found within the compliance limits.

PARAMETER	COMPLIANCE LIMIT	SAMPLE LOCATION	SAMPLE FREQUENCY	SAMPLE TYPE	REPORTING FREQUENC
BOD5	75 mg/l	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY
Fats, Oil and Greases	< 30 mg/l	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY
Fecal Coliform	<2,500 cfu/100 ml	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY
Flow	4,800 gpd	Water Meter	EVERY 6 MONTHS	Record on Log Sheet	ANNUALLY
TSS	22 mg/l	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY

C. MAINTENANCE REQUIREMENTS:

PARAMETER	LOCATION	FREQUENCY
Aerobic Tank Function	Aerobic Tank	ANNUAL
Flow	Water Meter	MONTHLY
Pumps, Floats & Alarms	Pump Chamber	ANNUAL
Solids Removal & Water Tightness	Septic tank(s)	ANNUAL
Vegetative Cover	Dispersal System	ANNUAL

D. MONITORING AND REPORTING REQUIREMENTS:

Monitoring results obtained during each calendar year shall be submitted no later than December 31st of that year to:

Aitkin County Environmental Services
209 2nd Street NW
Aitkin, MN 56431

The monitoring reports shall be signed by the Permittee. Copies are to be retained by the Permittee.

The Permittee shall notify Aitkin County Environmental Services within thirty (30) days when monitoring results do not meet the monitoring plan requirements of this permit.

Monitoring plans may be modified as necessary and reapproved by Aitkin County Environmental Services.

Sampling and laboratory testing procedures shall be performed in accordance with Standard Methods and the testing and shall be performed by a Minnesota Department of Health approved laboratory. All sampling and testing costs shall be the responibility of the Permittee.

Monitoring will be done by Eric Larson

E. MITIGATION PLAN:

If surfacing should occur: reduce water use, increase absorption and distribution area. Waste strength: if fecals exceed limit, add disinfection or increase separation. If BOD, TSS, or FOG exceed limit, reduce effluent strength. Reserve sites available for replacemnt systems.

F. SPECIAL REQUIREMENTS:

* A WATER METER MUST BE INSTALLED BEFORE COMPLIANCE CERTIFICATE CAN BE ISSUED **

4

3/1/2012

Septic Check, Inc.

6549 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
PARCEL (APN): 31-0-066201

Use: Residential, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: Multi-Flo Pretreatment & Pressur
Owner: Otterbelly South System

Fold Here

ONSITE SEWAGE SYSTEM INSPECTION REPORT

Inspected: 04/25/2011 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Fold Here

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify ommited inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

SERVICE INFORMATION

Company:	*Work Performed By:*	*Submitted 03/01/2012 by:*
Septic Check, Inc.	Jared Deboer	Greg Sokoloski

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments)	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	11	
Pumping recommended:	NO	
Aerobic Treatment Unit: ATU, Manufacturer= Consolidated Treatment Systems - Multi-Flow FTP-0.75 750 GPD Multi-Flo		
Manufacturer: Consolidated Treatment Systems Model: Multi-Flow FTP-0.75		
This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments)	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
ATU serviced per manufacturers requirements including cleaning of applicable filter(s):	YES	
Trash Compartment solids accumulation within operational limits per manufacturer (n/a = no trash compartment):	YES	
Aerobic Chamber solids accumulation within manufacturer operational limits (n/a = no aerobic chamber):	YES	
Clarifying Chamber solids accumulation within manufacturer operational limits (n/a = no clarifying chamber):	N/A	
Pumping recommended:	NO	
TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	
Pump: Effluent Pump Primary Pump		
This component was:	**Partially Inspected**	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	**Partially Inspected**	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	**Partially Inspected**	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	N/A	
Pump 1: off hours (override in parentheses - if present):	N/A	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	22695	
Pump 2: on minutes (override in parentheses - if present):	N/A	
Pump 2: off hours (override in parentheses - if present):	N/A	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	22690	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	**Partially Inspected**	
Lateral lines flushed:	NO	
Average squirt height (if performed) (Feet, if other specify):	N/A	
Ponding Present:	NO	

Septic Check, Inc.

6549 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
PARCEL (APN): 31-0-066201

Use: Residential, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: Multi-Flo Pretreatment & Pressur
Owner: Otterbelly South System

Fold Here

ONSITE SEWAGE SYSTEM INSPECTION REPORT

Inspected: 11/17/2011 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Fold Here

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify ommited inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

SERVICE INFORMATION

Company:	*Work Performed By:*	*Submitted 03/01/2012 by:*
Septic Check, Inc.	Greg Sokoloski	Greg Sokoloski

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments)	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	8	
Pumping recommended:	NO	
Aerobic Treatment Unit: ATU, Manufacturer= Consolidated Treatment Systems - Multi-Flow FTP-0.75 750 GPD Multi-Flo		
Manufacturer: Consolidated Treatment Systems Model: Multi-Flow FTP-0.75		
This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments)	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
ATU serviced per manufacturers requirements including cleaning of applicable filter(s):	YES	
Trash Compartment solids accumulation within operational limits per manufacturer (n/a = no trash compartment):	YES	
Aerobic Chamber solids accumulation within manufacturer operational limits (n/a = no aerobic chamber):	YES	
Clarifying Chamber solids accumulation within manufacturer operational limits (n/a = no clarifying chamber):	N/A	
Pumping recommended:	NO	
TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	6	
Pumping recommended:	YES	
Pump: Effluent Pump Primary Pump		
This component was:	**Partially Inspected**	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	**Partially Inspected**	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	**Partially Inspected**	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	N/A	
Pump 1: off hours (override in parentheses - if present):	N/A	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	21943	
Pump 2: on minutes (override in parentheses - if present):	N/A	
Pump 2: off hours (override in parentheses - if present):	N/A	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	21938	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	**Partially Inspected**	
Lateral lines flushed:	NO	
Average squirt height (if performed) (Feet, if other specify):	N/A	
Ponding Present:	NO	

8-15-14

Atkin Co. Envir. Services

RE: Atterbelly Townhomes
Zoning Permit 30675
Operating Permit 119

I called Septic Check today as they take care of our Systems. I was told all testing are done & have been reported They also said to send $100 Check and it is enclosed.

Alice Smith
Sec Tr.
Atterbelly Homeowner Assn

Septic Check
1-888-983-2447
Att: Eric Larson or Shelly

AUG 17 2011

AITKIN COUNTY ENVIRONMENTAL SERVICES

OPERATING PERMIT FOR WASTEWATER TREATMENT AND DISPERSAL

OPERATING PERMIT #: 119 **FEE:** 100

PERMITTEE: Woodlands National Bank Onamia **PHONE:** (218) 927-4974

ADDRESS: 424 Main Street, PO BOX
Onamia, MN 56359-

ZONING PERMIT # 30675 **PARCEL #:** 31-1-083600

ISSUE DATE: 6/30/2011 **RENEW DATE:** 5/31/2012

LEGALDESCRIPTION: That Portion North of Co. Rd. 17 in SE 1/4 of SW 1/4, Sec 33 Twsp 47,

Aitkin County Environmental Services authorizes the Permittee to operate a wastewater treatment and dispersal system located on the above described property in accordance with the requirements of this permit.

This permit is effective on the issuance date identified above.

This permit and the authorization to treat and disperse from the above system shall expire on the above expiration date. The Permittee is not authorized to discharge after the date of expiration. The Permittee shall submit such information and forms as required by Aitkin County Environmental Services no later than thirty (30) days prior to the expiration date. When the required information is submitted and approved by Aitkin County Environmental Services, the permit may be renewed. This permit is not transferable from owner to owner.

I hereby certify with my signature as the permittee that I understand the provisions of this permit including the maintenance and monitoring requirements. I agree to indemnify and hold Aitkin County harmless from all loss, damages, costs and charges that may be incurred by use of this system and if I fail to comply with the provisions of this Operating Permit. If I sell this property during the life of the permit, I will inform the new owner(s) of the permit requirements and the need to renew the permit.

Otterbelly Homeowners Assn
Dwight Smith Sec. Treas. 8-15-11

~~Signature of Permittee~~ Date

K. Kunz 8/23/11

Signature of Permitting Authority Date

If You have any questions regarding this permit, including the specific permit requirements, permit reporting or permit compliance status, please contact Aitkin County Environmental Services at 218-927-7342.

Ck# 1264 dated 8/15/11 Receipt 1697165 KK
(from: The Woods at Otterbelly Homeowner's Assoc.)

AITKIN COUNTY ENVIRONMENTAL SERVICES-PLANNING & ZONING

209 Second Street, NW
Aitkin, Minnesota 56431

PH: (218) 927-7342
FX: (218) 927-4372

August 23, 2011

RE: **Renewed Operating Permit #119**
Parcel 31-1-083600

Dear Woodlands National Bank:

This letter is to inform you Operating Permit (No. 119) has been renewed until May 31, 2012.

Please adhere to your monitoring and maintenance contract including monitoring your water use. Failure to do so would violate the agreement to operate your system and could void the operating permit. You should contact your Operation and Maintenance provider directly with questions that you may have during the year.

Thank you for your good stewardship and we hope that your system continues to operate well, protecting groundwater for you and the environment.

Sincerely,
Aitkin County Planning & Zoning

MAY 06 2013

AITKIN COUNTY ENVIRONMENTAL SERVICES
OPERATING PERMIT FOR WASTEWATER TREATMENT AND DISPERSAL RENEWAL

ISSUANCE DATE: 5 /31/2013
RENEWAL PERIOD: ANNUALLY

OPERATING PERMIT #: 119
ZONING PERMIT #: 30675
PARCEL #: 31-1-083601

PERMITTEE: ~~Chester & Dixie Smith~~ Otterbelly Homeowners Assn.

TELEPHONE:

MAILING ADDRESS:
37760 Dove St. #24
Aitkin, MN 56431-

PROPERTY ADDRESS:
33760 Dove St. Unit 24
Aitkin, MN 56431

LEGAL DESCRIPTION: That Portion North of Co. Rd. 17 in SE 1/4 of SW 1

Aitkin County Environmental Services authorizes the Permittee to operate a wastewater treatment and dispersal system located on the above described property in accordance with the requirements of this permit.

This permit is effective on the issuance date identified above.

This permit and the authorization to treat and disperse from the above system is valid through the renewal period identified above. The Permittee is not authorized to discharge after the renewal period. The Permittee shall submit such information and forms as required by Aitkin County Environmental Services no later than thirty (30) days prior to the expiration date. When the required information is submitted and approved by Aitkin County Environmental Services, the permit may be renewed. This permit is not transferable from owner to owner.

I hereby certify with my signature as the permittee that I understand the provisions of this permit including the maintenance and monitoring requirements. I agree to indemnify and hold Aitkin County harmless from all loss, damages, costs and charges that may be incurred by use of this system and if I fail to comply with the provisions of this Operating Permit. If I sell this property during the life of the permit, I will inform the new owner(s) of the permit requirements and the need to renew the permit.

Otterbelly Homeowners Assn
Signature of Permittee

Date 5-3-13

By Alice Smith, Sec. Treas.
Signature of Permitting Authority

Date 5-3-13

If you have any questions regarding this permit, including the specific permit requirements, permit reporting or permit compliance status, please contact Aitkin County Environmental Services at 218-927-7342.

Ck# 1335, Receipt 374745, 5/13/13 $100

31-1-083601
OP# 119
P# 30675

12/31/2012

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
PARCEL (APN): 31-0-066201

Use: Residential, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: Multi-Flo Pretreatment & Pressur

Owner: Otterbelly South System

Fold Here

ONSITE SEWAGE SYSTEM INSPECTION REPORT

Inspected: 10/30/2012 - Inspection Type: ROUTINE - Correction Status: Corrections in progress

Fold Here

COMMENTS & GENERAL INSPECTION NOTES

Deficiencies Were Noted: Corrections are in progress.

Replaced aerator alarm cap and aerator vent cap. Both were missing. New support legs will need to be installed on the aerator at the next service visit. The aerator alarm does not work and it is recommended that it be replaced.
Contact Dean at 320-630-3276 with any questions.

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify ommited inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

SERVICE INFORMATION

Company:	*Work Performed By:*	*Submitted 12/31/2012 by:*
Septic Check	Dean Nelson	Dean Nelson

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments)	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	SKIM	
Compartment 1 Sludge accumulation (Inches, if other specify):	12	
Pumping recommended:	NO	
Aerobic Treatment Unit: ATU, Manufacturer= Consolidated Treatment Systems - Multi-Flow FTP-0.75 750 GPD Multi-Flo		
Manufacturer: Consolidated Treatment Systems Model: Multi-Flow FTP-0.75		
This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments)	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	NO	In Progress
ATU serviced per manufacturers requirements including cleaning of applicable filter(s):	YES	
Trash Compartment solids accumulation within operational limits per manufacturer (n/a = no trash compartment):	YES	
Aerobic Chamber solids accumulation within manufacturer operational limits (n/a = no aerobic chamber):	YES	
Clarifying Chamber solids accumulation within manufacturer operational limits (n/a = no clarifying chamber):	YES	
Pumping recommended:	NO	
TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	1	
Pumping recommended:	NO	
Pump: Effluent Pump Primary Pump		
This component was:	**Partially Inspected**	
Controls functioning:	YES	
Tested gallons per minute flow:	NO	
Pump: Effluent Pump Effluent Pump		
This component was:	**Partially Inspected**	
Controls functioning:	YES	
Tested gallons per minute flow:	NO	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	**Partially Inspected**	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1 MIN	
Pump 1: off hours (override in parentheses - if present):	0.22 HRS	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	24612	
Pump 2: on minutes (override in parentheses - if present):	1 MIN	
Pump 2: off hours (override in parentheses - if present):	0.22 HRS	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	24608	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	**Partially Inspected**	
Lateral lines flushed:	NO	
Average squirt height (if performed) (Feet, if other specify):	N/A	
Ponding Present:	NO	

SAMPLING REPORT

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

10/30/2012sample entered by :Dean Nelson

Notes:

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	*Other*	800 GPD	256.5 gpd

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
PARCEL (APN): 31-0-066201

Use: Residential, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: Multi-Flo Pretreatment & Pressur

Owner: Otterbelly South System

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

Fold Here

Fold Here

ONSITE SEWAGE SYSTEM INSPECTION REPORT

Inspected: 06/05/2012 - Inspection Type: ROUTINE - Correction Status: No corrections needed

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify ommited inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces), cover; or settling problems observed:	NO

SERVICE INFORMATION

Company:	Work Performed By:	Submitted 06/22/2012 by:
Septic Check	Jared Deboer	Brian Koski

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	**Partially Inspected**	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments)	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	n/a	
Compartment 1 Sludge accumulation (Inches, if other specify):	n/a	
Pumping recommended:	NO	
Aerobic Treatment Unit: ATU, Manufacturer= Consolidated Treatment Systems - Multi-Flow FTP-0.75 750 GPD Multi-Flo		
Manufacturer: Consolidated Treatment Systems Model: Multi-Flow FTP-0.75		
This component was:	**Partially Inspected**	
Effluent level within operational limits (if NO explain in comments)	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
ATU serviced per manufacturers requirements including cleaning of applicable filter(s):	YES	
Trash Compartment solids accumulation within operational limits per manufacturer (n/a = no trash compartment):	YES	
Aerobic Chamber solids accumulation within manufacturer operational limits (n/a = no aerobic chamber):	YES	
Clarifying Chamber solids accumulation within manufacturer operational limits (n/a = no clarifying chamber):	YES	
Pumping recommended:	NO	
TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	**Partially Inspected**	
Compartment 1 Scum accumulation (Inches, if other specify):	n/a	
Compartment 1 Sludge accumulation (Inches, if other specify):	n/a	
Pumping recommended:	NO	
Pump: Effluent Pump Primary Pump		
This component was:	**Partially Inspected**	
Controls functioning:	YES	
Tested gallons per minute flow:	n/a	
Pump: Effluent Pump Effluent Pump		
This component was:	**Partially Inspected**	
Controls functioning:	YES	
Tested gallons per minute flow:	n/a	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	**Partially Inspected**	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	n/a	
Pump 1: off hours (override in parentheses - if present):	n/a	
Pump 1: gallons per dose (override in parentheses - if present):	n/a	
Pump 1: ETM hours (override in parentheses - if present):	n/a	
Pump 1: Cycle Count (override in parentheses - if present):	106	
Pump 2: on minutes (override in parentheses - if present):	n/a	
Pump 2: off hours (override in parentheses - if present):	n/a	
Pump 2: gallons per dose (override in parentheses - if present):	n/a	
Pump 2: Cycle Count (override in parentheses - if present):	113	
Pump 2: ETM hours (override in parentheses - if present):	n/a	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	**Partially Inspected**	
Lateral lines flushed:	NO	
Average squirt height (if performed) (Feet, if other specify):	n/a	
Ponding Present:	NO	

AITKIN COUNTY ENVIRONMENTAL SERVICES-PLANNING & ZONING
209 Second Street, NW Room# 100
Aitkin, Minnesota 56431
PH: (218) 927-734
FX: (218) 927-437

5/22/2013

Otterbelly Homeowner's Associati
37760 Dove St. #24
Aitkin, MN 56431-

Re: Operating Permit # 119
Zoning Permit # 30675
Parcel # 31-1-083601

Dear Permittee:

This letter is to inform you that your Operating Permit has been renewed until 5 /31/2014.

Please adhere to your monitoring and maintenance contract including monitoring your water use. Failure to do so would violate the agreement to operate your system and could void the operating permit. You should contact your Operation and Maintenance provider directly with questions that you may have during the year.

Thank you for your good stewardship and we hope that your system continues to operate well, protecting groundwater for you and the environment.

Sincerely,

Kristi K.

Aitkin County Planning & Zoning

AITKIN COUNTY ENVIRONMENTAL SERVICES

APR 28 2014

OPERATING PERMIT FOR WASTEWATER TREATMENT AND DISPERSAL

OPERATING PERMIT #: 119
ZONING PERMIT #: 30675
PARCEL #: 31-1-083601
PERMITTEE: Otterbelly Homeowner's Association

ORGINAL DATE ISSUED: 6 /30/2011
RENEWAL PERIOD:
RENEWAL EXPIRATION: 5 /31/2014

MAILING ADDRESS: 37760 Dove St. #24
Aitkin, MN 56431-

PROPERTY ADDRESS:
33760 Dove St. Unit 24
Aitkin, MN 56431

TELEPHONE:

LEGAL: That Portion North of Co. Rd. 17 in SE 1/4 of SW 1

FEE PAID: 100 **DATE PAID:** **RECEIPT:** **CK #:**

Aitkin County Environmental Services authorizes the Permittee to operate a wastewater treatment and dispersal system located on the above described property in accordance with the requirements of this permit.

This permit is effective on the issuance date identified above.

This permit and the authorization to treat and disperse from the above system shall expire on the above expiration date. The Permittee is not authorized to discharge after the date of expiration. The Permittee shall submit such information and forms as required by Aitkin County Environmental Services no later than thirty (30) days prior to the expiration date. When the required information is submitted and approved by Aitkin County Environmental Services, the permit may be renewed. This permit is not transferable from owner to owner.

I hereby certify with my signature as the permittee that I understand the provisions of this permit including the maintenance and monitoring requirements. I agree to indemnify and hold Aitkin County harmless from all loss, damages, costs and charges that may be incurred by use of this system and if I fail to comply with the provisions of this Operating Permit. If I sell this property during the life of the permit, I will inform the new owner(s) of the permit requirements and the need to renew the permit.

Otterbelly Homeowners Association
Dixie Smith - Sec. Tr.
Signature of Permittee

4-24-14
Date

K. Kunz
Signature of Permitting Authority

5-2-14
Date

If you have any questions regarding this permit, including the specific permit requirements, permit reporting or permit compliance status, please contact Aitkin County Environmental Services at 218-927-7342.

Septic System is taking care of all tests etc. Dixie

CK#1380/Receipt#199122
$100

- Permit ok to move to a 5 year.

A. DESCRIPTION OF WASTEWATER TREATMENT AND DISPERSAL SYSTEM

Planned Community Development will utilize Multi-Flo Aerobic treatment plants to pretreatwaste. Pressure beds will be used for disposal. Effluent will flow by gravity into trash traps (pretanks). From there it will be time dosed into the aerobic treatment plants, then gravity flow to pump tanks and be dosed to the fields. Sized for 48 bedrooms (4,800 gallons per day). Anticipated System life (25-40 years). Operational Cost = 450/mo. Monitoring and Servicing = First year - no charge, $150/yr for 750 gpd units, $300/yr for 1,500 gpd units {Total $900). Testing = $900 first year then $450/yr for 2 years.

B. PERFORMANCE STANDARD REQUIREMENTS:

During the period beginning on the effective date (issuance date) of this permit and lasting until this permit's expiration date, the Permittee is authorized to discharge from the wastewater treatment unit to subsurface dispersal. No surface discharge is permitted. The following parameters must be monitored and the results must be found within the compliance limits.

PARAMETER	COMPLIANCE LIMIT	SAMPLE LOCATION	SAMPLE FREQUENCY	SAMPLE TYPE	REPORTING FREQUENC
Flow	4,800 gpd	Water Meter	EVERY 6 MONTHS	Record on Log Sheet	ANNUALLY
TSS	22 mg/l	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY
Fecal Coliform	<2,500 cfu/100 ml	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY
Fats, Oil and Greases	< 30 mg/l	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY
BOD5	75 mg/l	Aerobic Tank Effluent	EVERY 6 MONTHS	Grab	ANNUALLY

C. MAINTENANCE REQUIREMENTS:

PARAMETER	LOCATION	FREQUENCY
Aerobic Tank Function	Aerobic Tank	ANNUAL
Flow	Water Meter	MONTHLY
Pumps, Floats & Alarms	Pump Chamber	ANNUAL
Solids Removal & Water Tightness	Septic tank(s)	ANNUAL
Vegetative Cover	Dispersal System	ANNUAL

D. MONITORING AND REPORTING REQUIREMENTS:

Monitoring results obtained during each calendar year shall be submitted no later than May 31st of that year to:

Aitkin County Environmental Services
209 2nd Street NW, Room 100
Aitkin, MN 56431

The monitoring reports shall be signed by the Permittee. Copies are to be retained by the Permittee.

The Permittee shall notify Aitkin County Environmental Services within thirty (30) days when monitoring results do not meet the monitoring plan requirements of this permit.

Monitoring plans may be modified as necessary and reapproved by Aitkin County Environmental Services.

Sampling and laboratory testing procedures shall be performed in accordance with Standard Methods and shall be performed by a Minnesota Department of Health approved laboratory. All sampling and testing costs shall be the responsibility of the Permittee.

Monitoring will be performed by: Eric Larson

E. MITIGATION PLAN:

If surfacing should occur: reduce water use, increase absorption and distribution area. Waste strength: if fecals exceed limit, add disinfection or increase separation. If BOD, TSS, or FOG exceed limit, reduce effluent strength. Reserve sites available for replacemnt systems.

Kristi Kunz OP# 119 / P# 30675 / 31-1-083601

Subject: FW: Aitkin County Operating Permit Renewals

From: Brian Koski [mailto:Brian@septiccheck.com]
Sent: Friday, April 18, 2014 5:31 PM
To: Kristi Kunz
Subject: RE: Aitkin County Operating Permit Renewals

Kristi,

I would recommend the following go to 5 year renewal: I can write letters for these if you would like.

- Otterbelly
- Robert Dotzler
- Gary Hill
- Ukuras
- Eastside marina
- Luke lucas

Let me know if you need anything else,

Thanks,

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION
Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201
Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w test 5 yr
Owner: Otterbelly South System

Fold Here

ONSITE SEWAGE SYSTEM INSPECTION REPORT

Inspected: 10/31/2013 - Inspection Type: ROUTINE - Correction Status: No corrections made

Company:	Work Performed By:	Submitted 11/19/2013 by:
Septic Check	Dean Nelson	Ann Flann

Fold Here

COMMENTS & GENERAL INSPECTION NOTES

Deficiencies Noted: deficiencies must be corrected to ensure proper longevity of the Onsite Sewage System.

System was pumped by Goble's Sewer Service today. Multi-flo primary sensor needs to be replaced; Dean has ordered the part and will replace it at the next service visit.

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments)	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	skim	
Compartment 1 Sludge accumulation (Inches, if other specify):	2"	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Multi-Flo

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments)	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
ATU serviced per manufacturers requirements including cleaning of applicable filter(s):	YES	
Trash Compartment solids accumulation within operational limits per manufacturer (n/a = no trash compartment):	N/A	
Aerobic Chamber solids accumulation within manufacturer operational limits (n/a = no aerobic chamber):	YES	
Clarifying Chamber solids accumulation within manufacturer operational limits (n/a = no clarifying chamber):	YES	
Pumping recommended:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0"	
Compartment 1 Sludge accumulation (Inches, if other specify):	0"	
Pumping recommended:	NO	
Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	NO	Deficient
Pump 1: on minutes (override in parentheses - if present):	N/A	
Pump 1: off hours (override in parentheses - if present):	N/A	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	27303	
Pump 2: on minutes (override in parentheses - if present):	N/A	
Pump 2: off hours (override in parentheses - if present):	N/A	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	27295	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (Feet, if other specify):	N/A	
Ponding Present? If YES explain in comments:	NO	

SAMPLING REPORT

1/17/2014

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Laboratory:A.W.Research Lab

10/31/2013sample entered by :Ann Flann

Notes:

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	*Other*	800 GPD	241
Pump Tank 1600 Gallon	Effluent	Fecal	<2500 cfu/100m	1,960

This report indicates certain characteristics of the sample taken at the time of visit. In no way is this report a guarantee of operation or future performance.

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm maint 2 w Test 5 yr
Owner: Otterbelly South System

Fold Here

ONSITE SEWAGE SYSTEM INSPECTION REPORT

Fold Here

Inspected: 05/31/2013 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 07/23/2013 by:
Septic Check	Jared Deboer	Ann Flann

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments)	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	N/A	
Compartment 1 Sludge accumulation (Inches, if other specify):	N/A	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Multi-Flo

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments)	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
ATU serviced per manufacturers requirements including cleaning of applicable filter(s):	YES	
Trash Compartment solids accumulation within operational limits per manufacturer (n/a = no trash compartment):	YES	
Aerobic Chamber solids accumulation within manufacturer operational limits (n/a = no aerobic chamber):	YES	
Clarifying Chamber solids accumulation within manufacturer operational limits (n/a = no clarifying chamber):	YES	
Pumping recommended:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	N/A	
Compartment 1 Sludge accumulation (Inches, if other specify):	N/A	
Pumping recommended:	NO	
Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	N/A	
Pump 1: off hours (override in parentheses - if present):	N/A	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	26149	
Pump 2: on minutes (override in parentheses - if present):	N/A	
Pump 2: off hours (override in parentheses - if present):	N/A	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	26144	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (Feet, if other specify):	N/A	
Ponding Present? If YES explain in comments:	NO	

SAMPLING REPORT

1/17/2014

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly North System
Use: Multi Family

Service Company:
Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Laboratory:A.W. Research Lab

10/31/2013sample entered by :Ann Flann

Notes: New cycle counter was installed at 10/31/13 service visit.

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	Flow	1200 GPD	no flow
Pump Tank 1600 Gallon Effluent	Effluent	Fecal	<1000 cfu/100m	<5

Kristi Kunz

From: Brian Koski [Brian@septiccheck.com]
Sent: Friday, May 02, 2014 2:48 PM
To: Kristi Kunz
Subject: RE: Otterbelly Homeowner's Association

Follow Up Flag: Follow up
Flag Status: Flagged

6-3-14 Spoke with Terry Neff - ok to move to 5yr. Change BOD, TSS, FOG's to 5yr check for visual/smell.

Kristi,

I have reviewed the Otterbelly operating permit. At this point it is my opinion that the sampling requirements for BOD, TSS, and FOG are not necessary. The performance of the system since the original installation has been under these limits regularly. I would however recommend to continue sampling flow and fecal coliform as part of the operating permit renewal.

Please contact me with any questions,

Brian Koski

A Division of WEX Companies, Inc.
www.SepticCheck.com
6074 Keystone Road Milaca, MN 56353
Phone: 320.983.2447 Cell: 218-428-0391
Fax: 320.983.2151 brian@septiccheck.com

From: Kristi Kunz [mailto:kristi.kunz@co.aitkin.mn.us]
Sent: Friday, May 02, 2014 2:23 PM
To: Brian Koski
Subject: Otterbelly Homeowner's Association

Attached is a scanned copy of the OP Contract we have. Let me know if you have any changes you would like made to the contract.

Thanks again!

Kristi K.
Aitkin County Planning & Zoning
218-927-7342

AITKIN COUNTY ENVIRONMENTAL SERVICES-PLANNING & ZONING
209 Second Street, NW Room# 100
Aitkin, Minnesota 56431
PH: (218) 927-7342
FX: (218) 927-4372

5/2/2014

Re: Operating Permit #119
Zoning Permit #30675
Parcel #31-1-083601

Otterbelly Homeowner's Associatio
37760 Dove St. #24
Aitkin, MN 56431-

Dear Permittee:

This letter is to inform you that your Operating Permit has been renewed until 5/31/2019 and the Operating Permit renewal period has been moved to a 5 YEAR based on the recommendation from your Operating and Maintenance provider.

Please adhere to your monitoring and maintenance contract including monitoring your water use. Failure to do so would violate the agreement to operate your system and could void the operating permit. You should contact your Operation and Maintenance provider directly with questions that you may have during the year.

Thank you for your good stewardship and we hope that your system continues to operate well, protecting groundwater for you and the environment.

Sincerely,
Kristi K.
Aitkin County Planning & Zoning

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w test

Owner: Otterbelly South System

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ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Fold Here

Inspected: 10/27/2014 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 11/07/2014 by:
Septic Check	Scott Shelito	Angie Stafford

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	11	
Pumping recommended:	YES	

Aerobic Treatment Unit: ATU, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Multi-Flo

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments):	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
ATU serviced per manufacturers requirements including cleaning of applicable filter(s):	YES	
Trash Compartment solids accumulation within operational limits per manufacturer (n/a = no trash compartment):	N/A	
Aerobic Chamber solids accumulation within manufacturer operational limits (n/a = no aerobic chamber):	YES	
Clarifying Chamber solids accumulation within manufacturer operational limits (n/a = no clarifying chamber):	YES	
Pumping recommended:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	
Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1 min	
Pump 1: off hours (override in parentheses - if present):	0.4 hrs	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	29969	
Pump 2: on minutes (override in parentheses - if present):	N/A	
Pump 2: off hours (override in parentheses - if present):	N/A	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	N/A	
Pump 2: ETM hours (override in parentheses - if present):	29957	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	N/A	
Ponding present? If YES explain in comments:	NO	

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w test

Owner: Otterbelly South System

Fold Here

ONSITE SEWAGE SYSTEM INSPECTION REPORT

Fold Here

Inspected: 05/21/2014 - Inspection Type: ROUTINE - Correction Status: Some Corrections Made

Company:	*Work Performed By:*	*Submitted 06/05/2014 by:*
Septic Check	Scott Shelito	Devon Schmitz

COMMENTS & GENERAL INSPECTION NOTES

Deficiencies Noted: deficiencies must be corrected to ensure proper longevity of the Onsite Sewage System.

The control switch was off which caused a high water level in the pump tank. To resolve this issue, a new aerator was installed. Date Code 12/13 Serial # 0024325

GENERAL SITE & SYSTEM CONDITIONS

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0.5"	
Compartment 1 Sludge accumulation (Inches, if other specify):	13"	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Multi-Flo

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments):	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	NO	See Comments
ATU serviced per manufacturers requirements including cleaning of applicable filter(s):	YES	
Trash Compartment solids accumulation within operational limits per manufacturer (n/a = no trash compartment):	N/A	
Aerobic Chamber solids accumulation within manufacturer operational limits (n/a = no aerobic chamber):	YES	
Clarifying Chamber solids accumulation within manufacturer operational limits (n/a = no clarifying chamber):	YES	
Pumping recommended:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0"	
Compartment 1 Sludge accumulation (Inches, if other specify):	1"	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	N/A	
Pump 1: off hours (override in parentheses - if present):	N/A	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	28631	
Pump 2: on minutes (override in parentheses - if present):	1 min	
Pump 2: off hours (override in parentheses - if present):	.42 hrs	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	28619	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	N/A	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

10/28/2014

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Laboratory:A.W. Research Laboratories

07/23/2014sample entered by :Angie Stafford

Notes: Septic Check will re-sample.

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT	
Pump Tank 1600 Gallon	Effluent	Fecal	?500 cfu/100r	4500	-Limit Exceeded

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION
Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test
Owner: Otterbelly South System

Fold Here

ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Inspected: 05/12/2016 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 05/18/2016 by:
Septic Check	Torrey Boser	Angie Stafford

Fold Here

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	YES	
Previous signs of foaming overflow noted on Weir Plate:	YES	
Filter Socks cleaned:	YES	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1 MIN	
Pump 1: off hours (override in parentheses - if present):	0.4 HRS	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	33452	
Pump 2: on minutes (override in parentheses - if present):	N/A	
Pump 2: off hours (override in parentheses - if present):	N/A	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	33444	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	N/A	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

5/18/2016

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:
Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Laboratory:A.W. Research Laboratories

05/12/2016sample entered by :Angie Stafford

Notes:

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Pump Tank 1600 Gallon	Effluent	Fecal	2500 cfu/100r	1,900

This report indicates certain characteristics of the sample taken at the time of visit. In no way is this report a guarantee of operation or future performance.

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Owner: Otterbelly South System

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

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ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Inspected: 11/10/2016 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 11/30/2016 by:
Septic Check	Brian Koski	Angie Stafford

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	5"	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	NO	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1 MIN	
Pump 1: off hours (override in parentheses - if present):	0.4 HRS	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	34719	
Pump 2: on minutes (override in parentheses - if present):	N/A	
Pump 2: off hours (override in parentheses - if present):	N/A	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	34711	
Drainfield: Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	N/A	
Ponding present? If YES explain in comments:	NO	

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Owner: Otterbelly South System

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ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Fold Here

Inspected: 05/04/2017 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 05/23/2017 by:
Septic Check	Blesener Dave	Angie Tvedt

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

During the site inspection I installed a new circuit board in the panel and now the panel is functioning properly.

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	1"	
Compartment 1 Sludge accumulation (Inches, if other specify):	4"	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	YES	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1 MIN	
Pump 1: off hours (override in parentheses - if present):	0.4 HRS	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	35852	
Pump 2: on minutes (override in parentheses - if present):	1 MIN	
Pump 2: off hours (override in parentheses - if present):	0.4 HRS	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	35843	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	N/A	
Ponding present? If YES explain in comments:	NO	

Sep. eck
6074 Keys Rd
Milaca, MN 56353
320-983-2447
Fax: 320-983-2151

PROPERTY INFORMATION
Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Mail To: Current Resident
37760 Dove Street #24
Aitkin, MN
56431

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ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Inspected: 11/16/2017 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	*Work Performed By:*	*Submitted 12/06/2017 by:*
Septic Check	Blesener Dave	Angie Tvedt

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COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	6"	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	NO	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1 MIN	
Pump 1: off hours (override in parentheses - if present):	0.4 HRS	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	37268	
Pump 2: on minutes (override in parentheses - if present):	1 MIN	
Pump 2: off hours (override in parentheses - if present):	0.4 HRS	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	37257	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	N/A	
Ponding present? If YES explain in comments:	NO	

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201 31-1-083601-604

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

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ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

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Inspected: 05/07/2019 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 05/30/2019 by:
Septic Check	Blesener Dave	Angie Tvedt

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments):	YES	
All required baffles in place (N/A = No baffles required):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	2"	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	NO	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	N/A	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1 MIN	
Pump 1: off hours (override in parentheses - if present):	0.4 HRS	
Pump 1: gallons per dose (override in parentheses - if present):	N/A	
Pump 1: ETM hours (override in parentheses - if present):	N/A	
Pump 1: Cycle Count (override in parentheses - if present):	40391	
Pump 2: on minutes (override in parentheses - if present):	N/A	
Pump 2: off hours (override in parentheses - if present):	N/A	
Pump 2: gallons per dose (override in parentheses - if present):	N/A	
Pump 2: ETM hours (override in parentheses - if present):	N/A	
Pump 2: Cycle Count (override in parentheses - if present):	40382	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	N/A	
Ponding present? If YES explain in comments:	NO	

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mall To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

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ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Inspected: 10/18/2019 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 11/18/2019 by:
Septic Check	Chris King	Heather Johnson

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COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments):	YES	
All required baffles in place (N/A = No baffles required):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	YES	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	0.4 MIN	
Pump 1: off hours (override in parentheses - if present):	1.0HRS	
Pump 1: gallons per dose (override in parentheses - if present):	NA	
Pump 1: ETM hours (override in parentheses - if present):	NA	
Pump 1: Cycle Count (override in parentheses - if present):	41033	
Pump 2: on minutes (override in parentheses - if present):	0.4MIN	
Pump 2: off hours (override in parentheses - if present):	NA	
Pump 2: gallons per dose (override in parentheses - if present):	NA	
Pump 2: ETM hours (override in parentheses - if present):	NA	
Pump 2: Cycle Count (override in parentheses - if present):	41024	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	YES	
Average squirt height (if performed) (feet, if other specify):	NA	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

12/31/2019

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Laboratory:A.W. Research Laboratories

Sample Date: 05/07/2019 **Sample entered by: Angie Tvedt** **Report submitted: 05/30/2019**

Notes:

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	*Other*	800 GPD	637.17
Pump Tank 1600 Gallon	Effluent	Fecal	2500 cfu/100	1460

This report indicates certain characteristics of the sample taken at the time of visit. In no way is this report a guarantee of operation or future performance.

SAMPLING REPORT

12/31/2019

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Laboratory:A.W. Research Laboratories

Sample Date: 10/21/2019 **Sample entered by: Heather Johnson** **Report submitted: 12/18/2019**

Notes:

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT	
Effluent Pump Effluent Pump	Effluent	*Other*	800 GPD	978	-Limit Exceeded
Pump Tank 1600 Gallon	Effluent	Fecal	2500 cfu/100	1100	

This report indicates certain characteristics of the sample taken at the time of visit. In no way is this report a guarantee of operation or future performance.

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Mail To: Otterbelly South System
37760 Dove Street #24
Aitkin, MN
56431

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ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Fold Here

Inspected: 06/29/2020 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 07/14/2020 by:
Septic Check	Blesener Dave	Heather Johnson

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	3	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	YES	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	1	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1	
Pump 1: off hours (override in parentheses - if present):	.4	
Pump 1: gallons per dose (override in parentheses - if present):	NA	
Pump 1: ETM hours (override in parentheses - if present):	NA	
Pump 1: Cycle Count (override in parentheses - if present):	42530	
Pump 2: on minutes (override in parentheses - if present):	NA	
Pump 2: off hours (override in parentheses - if present):	NA	
Pump 2: gallons per dose (override in parentheses - if present):	NA	
Pump 2: ETM hours (override in parentheses - if present):	NA	
Pump 2: Cycle Count (override in parentheses - if present):	42522	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	NA	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:
Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Laboratory:A.W. Research Laboratories

Sample Date: 06/29/2020 **Sample entered by: Heather Johnson** **Report submitted: 07/14/2020**

Notes:

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT	
Effluent Pump Effluent Pump	Effluent	Flow	800 GPD	1468	-Limit Exceeded
Pump Tank 1600 Gallon	Effluent	Fecal	2500 cfu/100	64900	

This report indicates certain characteristics of the sample taken at the time of visit. In no way is this report a guarantee of operation or future performance.

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Mail To: Otterbelly South System
37760 Dove Street #23
Aitkin, MN
56431

Fold Here

ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Fold Here

Inspected: 11/13/2020 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	*Work Performed By:*	*Submitted 11/18/2020 by:*
Septic Check	Michael Pederson	Heather Johnson

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	2	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	NO	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1	
Pump 1: off hours (override in parentheses - if present):	.40	
Pump 1: gallons per dose (override in parentheses - if present):	NA	
Pump 1: ETM hours (override in parentheses - if present):	NA	
Pump 1: Cycle Count (override in parentheses - if present):	43293	
Pump 2: on minutes (override in parentheses - if present):	NA	
Pump 2: off hours (override in parentheses - if present):	NA	
Pump 2: gallons per dose (override in parentheses - if present):	NA	
Pump 2: ETM hours (override in parentheses - if present):	NA	
Pump 2: Cycle Count (override in parentheses - if present):	43286	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	NA	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:
Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Sample Date: 11/13/2020 **Sample entered by: Heather Johnson** **Report submitted: 12/30/2020**

Notes:

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	Flow	800 GPD	245.2

OP 119

30675

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #23
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

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ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Fold Here

Inspected: 04/02/2021 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 04/06/2021 by:
Septic Check	Michael Pederson	Heather Johnson

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

*2.64 amps

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	YES	
Filter Socks cleaned:	YES	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1	
Pump 1: off hours (override in parentheses - if present):	.40	
Pump 1: gallons per dose (override in parentheses - if present):	NA	
Pump 1: ETM hours (override in parentheses - if present):	NA	
Pump 1: Cycle Count (override in parentheses - if present):	43747	
Pump 2: on minutes (override in parentheses - if present):	1	
Pump 2: off hours (override in parentheses - if present):	.40	
Pump 2: gallons per dose (override in parentheses - if present):	NA	
Pump 2: ETM hours (override in parentheses - if present):	NA	
Pump 2: Cycle Count (override in parentheses - if present):	43740	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	NA	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:
Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Laboratory:A W Labs

Sample Date: 04/02/2021 **Sample entered by: Heather Johnson** **Report submitted: 04/06/2021**

Notes: NA on sample until 2024

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	Flow	800 GPD	816.96
Pump Tank 1600 Gallon	Effluent	Fecal	2500 cfu/100	

OP 119
30675

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #23
Aitkin, MN
56431

PROPERTY INFORMATION
Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Fold Here

ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Inspected: 09/10/2021 - Inspection Type: ROUTINE - Correction Status: No corrections needed

Company:	Work Performed By:	Submitted 09/14/2021 by:
Septic Check	Michael Pederson	Heather Johnson

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COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

The aerator was replaced at this visit.

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
All required baffles in place (N/A = No baffles required):	YES	
Effluent level within operational limits (if NO explain in comments):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	2	
Pumping recommended:	NO	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul

Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75

This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	YES	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	

TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	

Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1	
Pump 1: off hours (override in parentheses - if present):	.40	
Pump 1: gallons per dose (override in parentheses - if present):	NA	
Pump 1: ETM hours (override in parentheses - if present):	NA	
Pump 1: Cycle Count (override in parentheses - if present):	44241	
Pump 2: on minutes (override in parentheses - if present):	NA	
Pump 2: off hours (override in parentheses - if present):	NA	
Pump 2: gallons per dose (override in parentheses - if present):	NA	
Pump 2: ETM hours (override in parentheses - if present):	NA	
Pump 2: Cycle Count (override in parentheses - if present):	44234	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	NA	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Sample Date: 09/10/2021 **Sample entered by: Heather Johnson** **Report submitted: 09/14/2021**

Notes: Aerator was replaced at this visit

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	Flow	800 GPD	248.81

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #23
Aitkin, MN
56431

PROPERTY INFORMATION

Otterbelly South System
Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Fold Here

ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Fold Here

Inspected: 04/25/2022 - Inspection Type: ROUTINE - Correction Status: Corrections in progress

Company:	Work Performed By:	Submitted 04/27/2022 by:
Septic Check	Michael Pederson	Heather Johnson

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

South system: there is a little bit of water leaking into the first riser but can be patched up at the next visit when it's dry . The mound should be cleaned up a bit, there are trees almost growing on top of the mound and a lot on the sides which can cause big issues eventually. Everything else looks good and is working properly.

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments):	YES	
All required baffles in place (N/A = No baffles required):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	3	
Pumping recommended:	NO	

Pump: Effluent Pump, Manufacturer= Goulds Pumps - PE Series Trash tank pump

Manufacturer: Goulds Pumps Model: PE Series

This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	

Pump: Effluent Pump, Manufacturer= Goulds Pumps - PE Series Trash tank pump

Manufacturer: Goulds Pumps Model: PE Series

This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul		
Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75		
This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	YES	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	
TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	
Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	NA	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1	
Pump 1: off hours (override in parentheses - if present):	.4	
Pump 1: gallons per dose (override in parentheses - if present):	NA	
Pump 1: ETM hours (override in parentheses - if present):	NA	
Pump 1: Cycle Count (override in parentheses - if present):	44715	
Pump 2: on minutes (override in parentheses - if present):	1	
Pump 2: off hours (override in parentheses - if present):	.4	
Pump 2: gallons per dose (override in parentheses - if present):	NA	
Pump 2: ETM hours (override in parentheses - if present):	NA	
Pump 2: Cycle Count (override in parentheses - if present):	44710	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	NA	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Sample Date: 04/25/2022 **Sample entered by: Heather Johnson** **Report submitted: 04/27/2022**

Notes: Next sample 2024
amps-3.17

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	Flow	800 GPD	523.12

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

PROPERTY INFORMATION

Otterbelly South System

Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Mail To: Otterbelly South System
37760 Dove Street #23
Aitkin, MN
56431

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Fold Here

ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Inspected: 11/02/2022 - Inspection Type: ROUTINE - Correction Status: Corrections in progress

Company:	*Work Performed By:*	*Submitted 11/04/2022 by:*
Septic Check	Michael Pederson	Heather Johnson

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

South system: the last tank should be pumped it has 6in of sludge at the bottom. Everything else looks good and is working properly.

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments):	YES	
All required baffles in place (N/A = No baffles required):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	1	
Pumping recommended:	NO	

Pump: Effluent Pump, Manufacturer= Goulds Pumps - PE Series Trash tank pump

Manufacturer: Goulds Pumps Model: PE Series

This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	

Pump: Effluent Pump, Manufacturer= Goulds Pumps - PE Series Trash tank pump

Manufacturer: Goulds Pumps Model: PE Series

This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul		
Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75		
This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	YES	
Filter Socks cleaned:	YES	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	
TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	6	
Pumping recommended:	YES	
Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1	
Pump 1: off hours (override in parentheses - if present):	.4	
Pump 1: gallons per dose (override in parentheses - if present):	-	
Pump 1: ETM hours (override in parentheses - if present):	-	
Pump 1: Cycle Count (override in parentheses - if present):	45412	
Pump 2: on minutes (override in parentheses - if present):	1	
Pump 2: off hours (override in parentheses - if present):	.4	
Pump 2: gallons per dose (override in parentheses - if present):	-	
Pump 2: ETM hours (override in parentheses - if present):	-	
Pump 2: Cycle Count (override in parentheses - if present):	45407	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	-	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly North System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Sample Date: 11/02/2022 **Sample entered by: Heather Johnson** **Report submitted: 11/04/2022**

Notes:

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	Flow	1200 GPD	33

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

PROPERTY INFORMATION

Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Mail To: Otterbelly South System
37760 Dove Street #23
Aitkin, MN
56431

Fold Here

Fold Here

ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Inspected: 06/01/2023 - Inspection Type: ROUTINE - Correction Status: Corrections in progress

Company:	*Work Performed By:*	*Submitted 06/06/2023 by:*
Septic Check	Kyle Wade	Heather Johnson

COMMENTS & GENERAL INSPECTION NOTES

No Deficiencies Noted

SOUTH:
I would recommend clearing the trees and brush from the mound on the south system as the roots could cause failure.
I would also recommend raising the junction boxes to a minimum of 12" to keep them out of the snow.

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	YES
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments):	YES	
All required baffles in place (N/A = No baffles required):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	1	
Compartment 1 Sludge accumulation (Inches, if other specify):	5	
Pumping recommended:	NO	

Pump: Effluent Pump, Manufacturer= Goulds Pumps - PE Series Trash tank pump

Manufacturer: Goulds Pumps Model: PE Series

This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	

Pump: Effluent Pump, Manufacturer= Goulds Pumps - PE Series Trash tank pump

Manufacturer: Goulds Pumps Model: PE Series

This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul		
Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75		
This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	YES	
Filter Socks cleaned:	YES	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	NO	
TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	
Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1 min	
Pump 1: off hours (override in parentheses - if present):	.4 hrs	
Pump 1: gallons per dose (override in parentheses - if present):	-	
Pump 1: ETM hours (override in parentheses - if present):	-	
Pump 1: Cycle Count (override in parentheses - if present):	46583	
Pump 2: on minutes (override in parentheses - if present):	1	
Pump 2: off hours (override in parentheses - if present):	.4 hrs	
Pump 2: gallons per dose (override in parentheses - if present):	-	
Pump 2: ETM hours (override in parentheses - if present):	-	
Pump 2: Cycle Count (override in parentheses - if present):	46679	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	-	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Sample Date: 06/01/2023 **Sample entered by: Heather Johnson** **Report submitted: 06/06/2023**

Notes: Next sample 2024

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	Flow	800 GPD	1447 -Limit Exceeded

Septic Check

6074 Keystone Rd
Milaca, MN 56353

320-983-2447
Fax: 320-983-2151

Mail To: Otterbelly South System
37760 Dove Street #23
Aitkin, MN
56431

PROPERTY INFORMATION

Location: 37760 Dove St #24
Aitkin
Tax ID: 31-0-066201

Use: Commercial, Multi Family
System Design Flow: 750
GENERAL SYSTEM TYPE: MF Comm 2 w 5 yr test

Fold Here

Fold Here

ON-SITE WASTEWATER TREATMENT SYSTEM INSPECTION REPORT

Inspected: 10/10/2023 - Inspection Type: ROUTINE - Correction Status: Corrections in progress

Company:	*Work Performed By:*	*Submitted 10/18/2023 by:*
Septic Check	Kyle Wade	Heather Johnson

COMMENTS & GENERAL INSPECTION NOTES

Deficiencies Were Noted: Corrections are in progress.

South system.
First tank is at 60% solids, we recommend pumping at 30%.
The multiflo doesn't have much for solids, however the socks are plugged, restricting flow. I was unable to do a full service on this unit.
Everything else looks fine.

GENERAL SITE & SYSTEM CONDITIONS

The General Site and System Conditions were:	Fully Inspected
Components accessible for service:	YES
All required service performed (if no - specify omitted inspection items in notes):	NO - *In Progress*
Surfacing effluent from any component (including mound seepage):	NO
Components appear to be watertight - no visual leaks:	YES
Improper encroachment (structures/impervious surfaces); cover; or settling problems observed:	NO

ONSITE SEWAGE SYSTEM INSPECTION DETAIL

TANK: Trash Tank, Manufacturer= Local Manufacturer - Concrete 2000 Gallon

Manufacturer: Local Manufacturer Model: Concrete

This component was:	Fully Inspected	
Effluent level within operational limits (if NO explain in comments):	YES	
All required baffles in place (N/A = No baffles required):	YES	
Compartment 1 Scum accumulation (Inches, if other specify):	1	
Compartment 1 Sludge accumulation (Inches, if other specify):	13	
Pumping recommended:	YES	

Pump: Effluent Pump, Manufacturer= Goulds Pumps - PE Series Trash tank pump

Manufacturer: Goulds Pumps Model: PE Series

This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	

Pump: Effluent Pump, Manufacturer= Goulds Pumps - PE Series Trash tank pump

Manufacturer: Goulds Pumps Model: PE Series

This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	

Aerobic Treatment Unit: ATU - Consolidated Treatment Systems - Multiflo, Manufacturer= Consolidated Treatment Systems - Multi-Flo FTP-0.75 750 GPD Mul		
Manufacturer: Consolidated Treatment Systems Model: Multi-Flo FTP-0.75		
This component was:	Fully Inspected	
Unit alarms functioning:	YES	
Aerobic Mechanism appears to be functioning per manufacturers specifications:	YES	
Impeller assembly removed and cleaned:	NO	
Previous signs of foaming overflow noted on Weir Plate:	NO	
Filter Socks cleaned:	NO	
Filter Socks were partially changed out:	NO	
Filter Socks were completely changed out:	NO	
Gaskets on Surge Bowl need replacing:	NO	
Digester settleable solids test resulted in greater than 40% settleable solids: (If Yes, pumping needed)	NO	
Pumping needed:	YES	In Progress
TANK: Pump Tank, Manufacturer= Local Manufacturer - Concrete 1600 Gallon		
Manufacturer: Local Manufacturer Model: Concrete		
This component was:	Fully Inspected	
Compartment 1 Scum accumulation (Inches, if other specify):	0	
Compartment 1 Sludge accumulation (Inches, if other specify):	0	
Pumping recommended:	NO	
Pump: Effluent Pump Primary Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	
Pump: Effluent Pump Effluent Pump		
This component was:	Fully Inspected	
Controls functioning:	YES	
Tested gallons per minute flow:	-	
Panel: Control - 2 Pumps Multi-Flo Panel		
This component was:	Fully Inspected	
Panel functioning (including alarm):	YES	
Pump 1: on minutes (override in parentheses - if present):	1 min	
Pump 1: off hours (override in parentheses - if present):	.4 hrs	
Pump 1: gallons per dose (override in parentheses - if present):	-	
Pump 1: ETM hours (override in parentheses - if present):	-	
Pump 1: Cycle Count (override in parentheses - if present):	47549	
Pump 2: on minutes (override in parentheses - if present):	1 min	
Pump 2: off hours (override in parentheses - if present):	.4 hrs	
Pump 2: gallons per dose (override in parentheses - if present):	-	
Pump 2: ETM hours (override in parentheses - if present):	-	
Pump 2: Cycle Count (override in parentheses - if present):	47546	
Drainfield (disposal): Pressure Bed Rockbed 10' X 135' w/3 laterals		
This component was:	Fully Inspected	
Lateral lines flushed:	NO	
Average squirt height (if performed) (feet, if other specify):	-	
Ponding present? If YES explain in comments:	NO	

SAMPLING REPORT

Location: 37760 Dove St #24
Aitkin
31-0-066201

Owner: Otterbelly South System
Use: Multi Family

Service Company:

Septic Check
6074 Keystone Rd
Milaca, MN 56353
320-983-2447

Sample Date: 10/10/2023 **Sample entered by: Heather Johnson** **Report submitted: 10/18/2023**

Notes:

ONSITE SEWAGE SYSTEM SAMPLING DETAIL

COMPONENT	TYPE	SAMPLE	LIMIT	RESULT
Effluent Pump Effluent Pump	Effluent	Flow	800 GPD	1749 -Limit Exceeded