ROLLANS *SOIL & ENVIRONMENTAL SERVICES*

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Attached is a proposed design for a PPBPS Septic System with low pressure distribution for a 4 bedroom single family residence on Lot #3 in Knox Haven Subdivision, Iredell County, North Carolina.

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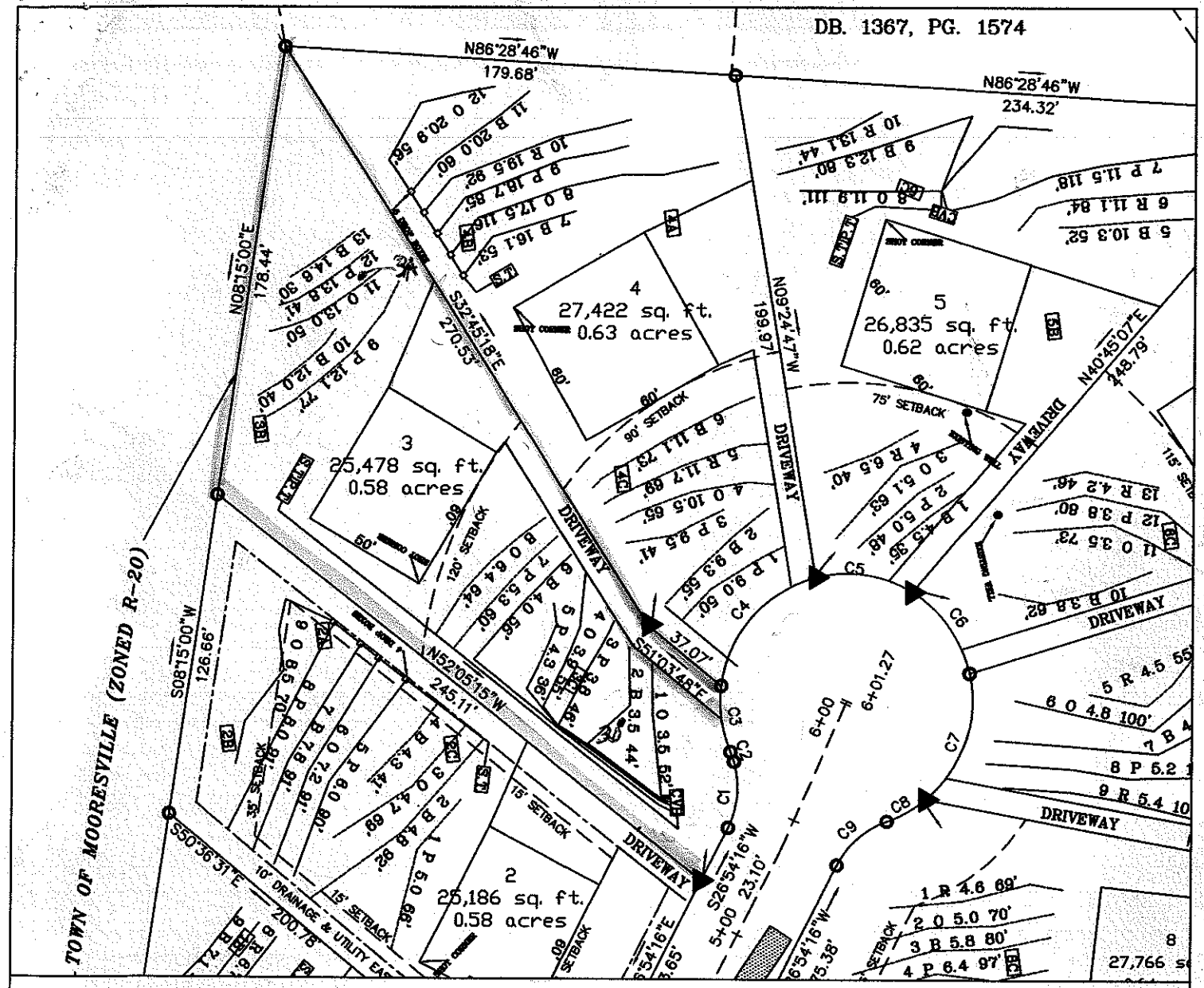
Design Information
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January 3, 2005
Project No. 01-1167
Design By: Rollans Soil & Environmental Services



LEGEND

- Areas contain soils with 24 inches or more of useable material and have potential for conventional, modified conventional and low-pressure pipe (lpp) septic systems.
- Unsuitable areas.
- System lines.
- Repair lines.
- Temporary Bench Mark (TBM)
- Well Location.

GRAPHIC SCALE
1" = 60'

60 0 60 120

FOR PRELIMINARY PLANNING PURPOSES ONLY. ALL LOTS WILL REQUIRE FINAL APPROVAL BY THE COUNTY HEALTH DEPARTMENT ON A LOT BY LOT BASIS. THIS MAP SHOULD BY USED AS A GENERAL GUIDE, SOME ADJUSTMENTS WILL BE NECESSARY IN THE FIELD DUE TO SOIL VARIABILITY AND COMPLEX TOPOGRAPHIC FEATURES. THIS MAP ONLY REFLECTS EXISTING SOIL SUITABILITY FOR ON-SITE SEPTIC TANK SYSTEMS.

PLEASE REFER TO ATTACHED SOIL REPORT FOR ADDITIONAL SITE SPECIFIC INFORMATION

ROLLANS SOIL & ENVIRONMENTAL SERVICES
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MAP TITLE: SITE PLAN & DRAINFIELD AREAS

PROJECT NAME: MIKE RYON/ KNOWHAWK

LOCATION/DATE: KNOX HAWK LANE IREDELL COUNTY, NORTH CAROLINA DECEMBER 2005

JOB #.: 01-1167
FILE: C:\JOBS\01-1167
PROJECT MGR.: C.B.F.
FIELD WORK: S.A.R., C.B.F. AND A.L.P.
DRAWN BY: C.B.F.

LP PPBPS SYSTEM
FOR WASTEWATER TREATMENT

Owner/Applicant: Mike Ryon

Address: 127B Promenade Dr.
Mooresville, NC 28117

Phone: 704 361 1084

County: Iredell

Location: Knox Haven Subdivision Lot #3

Source of Wastewater Flow: 4 Bedroom Single Family Residence > 267 Ft PPBPS

Estimated Daily Wastewater Production: 480 gpd

System Flow: 27.34384615

Design Specifications

Drainfield Size: 289

Loading Rate: 0.3 gal/ft2

Depth of Gravel in Trench: NA (PPBPS)

Gravel Size: NA (PPBPS)

Trench Depth: 36 in.

Trench Width: 36 in.

Septic Tank Size: 1000

Pump Tank Size: 1000

Estimated Supply Line Length: 210

Supply Line Diameter: 2 in. SCH 40 PVC

Supply Line Volume: 36.54

Dosing Volume: 164.02

Supply Manifold: N/A

Supply Manifold Length: N/A

Supply Manifold Volume: N/A

Recommended Float Controls: SJE Sensor Float Control Switches as Required for Control Panel or County Approved Equivalents

Recommended Control Panel: SJE-Rhombus Model 112 (NEMA 4x) Control Panel or County Approved Control Panel.

Pressure Head: 2 ft.

Friction Head: 3.74

Elevation Head: 15.30

Total Dynamic Head: 24.19

Threaded Union: In Tank

Gate Valves: 1 in Tank
1 per lateral (4)

Check Valves: In Tank

Anti-Siphon Hole: NA

Additional Comments: Soil suitability was performed by Rollans Soil & Environmental Services

Knox Haven Lot 3
LP PPBPS

DESIGN FLOW:	480
SOIL APPLICATION RATE:	0.3
TOTAL AREA TRENCH BOTTOM:	867
TOTAL LATERAL LENGTH:	289 (267)
NUMBER OF FIELDS:	1
LATERAL LENGTH REQUIRED PER FIELD:	270
SUPPLY LINE LENGTH:	210
TOTAL DYNAMIC HEAD:	24.19
MANIFOLD SIZE:	N/A
DOSING VOLUME:	164.02 (127.4 = 75%)
PUMP TANK DRAW DOWN*:	7.8
SEPTIC TANK SIZE:	1000
PUMP TANK SIZE:	1000

**Pump tank draw down based on a volume basis of 21 gallons per inch. Draw down may vary among pump tank manufacturers.*

KNOXVIEW Lot 3

Project #: 01-1167

LAYOUT FOR 4 BEDROOM HOME — January 3, 2006

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		6.0			100.00		
INSTR. 1			106.00				
HOUSE CNR				7.00	99.00		
P. TANK				11.80	94.20		
1	*ORANGE*			*3.50*	*102.50*	*52*	*52*
2	*BLUE*			*3.50*	*102.50*	*44*	*44*
3	*PINK*			*3.80*	*102.20*	*46*	*46*
4	*ORANGE*			*3.90*	*102.10*	*55*	*55*
5	*PINK*			*4.30*	*101.70*	*36*	*36*
6	*BLUE*			*4.00*	*102.00*	*56*	*56*
7	PINK			5.30	100.70	60	60
8	ORANGE			6.40	99.60	64	64
9	PINK			12.10	93.90	77	77
10	BLUE			12.00	94.00	40	40
11	ORANGE			13.00	93.00	50	50
12	PINK			13.80	92.20	41	41
13	BLUE			14.60	91.40	30	30
					Total	651	651

	LINE LENGTH	LTAR GPD/FT2	SYSTEM TYPE	SOIL LTAR GPD/FT2	TRENCH SYSTEM	DISTRIBUTION
** System*	*289*	*0.3*	*MOD.*	*0.30*	*PPBPS*	*LOW PRESSURE*
Repair	362	0.3	MOD.	0.30	PPBPS	LOW PRESSURE

Notes:
** TBM located top of ground at corner of property (see site plan)
**TBM is assumed to be 100'
**All measures in feet
**Nitrification lines are demonstrated on contour via colored pin flags
**BS, HI, and FS indicate rod readings

LP PPBPS TAPSHEET -Knox Haven Lot 3

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/hole	Trench Area	Number of Panels
1	*ORANGE*	102.5	*52*	0.156	**0.41**	156	12
2	*BLUE*	102.5	*44*	0.156	**0.41**	132	10.15384615
3	*PINK*	102.2	*46*	0.156	**0.41**	138	10.61538462
4	*ORANGE*	102.1	*55*	0.156	**0.41**	165	12.69230769
5	*PINK*	101.7	*36*	0.156	**0.41**	108	8.307692308
6	*BLUE*	102	*56*	0.156	**0.41**	168	12.92307692

total	**feet =**	**289**	**gal/min =**	**27.343846**
		Des. Flow	**480**	
		Pump Run=	**5.88**	
		soil LTAR	**0.3**	
		LTAR +5%	**0.315**	
		LTAR with mod.	**0.27**	
		LTAR with mod. +5%	**0.2835**	

.156 equals 5/32 inch hole

CALCULATIONS

Location Knox Haven

Project Number 01-1167

Lot No: Lot 3

No. of Bedrooms	4	
Design Flow	480	$^{gal}/_{day}$
LTAR	0.3	gal/ft2
PPBPS? (YES OR NO)	YES	
Supply Line Length	210	ft.
Supply Line Volume	36.54	gal.
Required Feet of Line	270	ft.
Amount of Line from Layout	289	ft.
Gallons per Minute	27.91154	$^{gal}/_{min}$

Note: Flow/hole (.41gpm) x # of panels (68)

Required Septic Tank Capacity	1000	gal.
Minimum Standard Tank Size	1000	
Panel Volume	3.6	gal.
# of Panels	68	
Dosing Volume	164.02	gal.

Note: Dosing Volume based on ~~99%~~ 67 of # of panels times 3.6 gal/panel

Tank Draw Down	7.8	*Generic Draw Down of 21 gal.per in.*
Pump Run Time	5.88	minutes
Elevation Head	15.3	ft.
Pressure Head	2	ft.
Friction Factor	1.78	ft./100 ft. *(From the interpolater.)*
Friction Head	3.74	ft.
Total Dynamic Head (+15%)	24.19	ft.

FRICTION FACTOR INTERPOLATER
2" SCH 40 PVC

GPM	*f*
20	0.84
	-0.88
25	1.27
	-1.28
30	1.78
	-1.76
35	2.37
	-2.25
40	3.03
43.07	3.48
45	3.77
48.14	4.28
50	4.58
57.11	5.89
60	6.42

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

Sheet 1 *of* ____
PROPERTY ID #: _____
COUNTY: IREDELL

SOIL/SITE EVALUATION
for ON-SITE WASTEWATER SYSTEM

OWNER: MIKE RYON APPLICATION DATE 1/06
ADDRESS: 127B Promenade Dr. Mooresville, NC 28117 DATE EVALUATED: 12/05
PROPOSED FACILITY: RES PROPOSED DESIGN FLOW (.1949): 480 PROPERTY SIZE: _____
LOCATION OF SITE: KNOX HAVEN LOT 3 PROPERTY RECORDED: N
WATER SUPPLY: ☐ Private X Public ☐ Well ☐ Spring ☐ Other _____
EVALUATION METHOD: X Auger Boring X Pit ☐ Cut TYPE OF WASTEWATER: X Sewage ☐ Industrial Process ☐ Mixed

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941) .1941 STRUCTURE/ TEXTURE	.1941 CONSISTENCE/ MINERALOGY	OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	PROFILE CLASS & LTAR
3B	LINEAR 5-10%	0-27	RC SBK/ABK	FRI SSSP SEXP	N/A	48"	N/A	N/A	PS .3GPD/FT2
		27-48	RCL MFSBK	FRI SSSP SEXP					
3C	LINEAR 5-10%	0-4	BSCL WSBK	FRI SSSP SEXP	N/A	49"	N/A	N/A	PS .3GPD/FT2
		4-24	RC SBK/ABK	FRI SSSP SEXP					
		24-48	RCL MFSBK	FRI SSSP SEXP					
3A	L/S-10	0-24	Rc msbk	Fr SSSP SEXP	-C sap	46	-	—	PS 0.3
		24-46	Rcl wsbk	Fr SSSP SEXP					
3D	L/S-10	0-36	Rc msbk	Fr SSSP SEXP	-f. sap	48	-	—	PS 0.3
		36-48	Rcl msbk	Fr SSSP SEXP					

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	867 sqft	1086 sqft
System Type(s)	PPBPS	PPBPS
Site LTAR	.3GPD/FT2	.3GPD/FT2

OTHER FACTORS (.1946): _____
SITE CLASSIFICATION (.1948): PS
EVALUATED BY: **Rollans Soil & Environmental Services**
OTHER(S) PRESENT: _____

COMMENTS: _____