ROLLANS *SOIL & ENVIRONMENTAL SERVICES*

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Attached is a proposed design for an Innovative (25% reduction) Septic System with Pressure Manifold distribution for a 4 bedroom single family residence on Lot #31A Anniston Subdivision, Iredell County, North Carolina.

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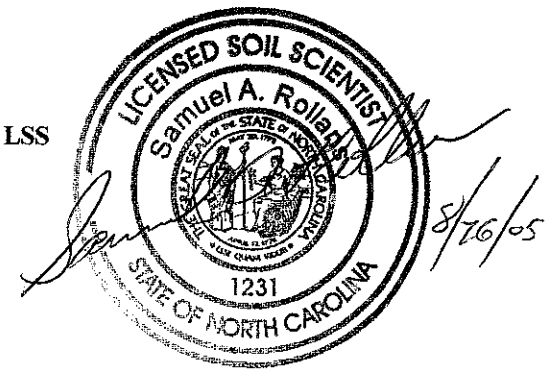
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July 29, 2005
Project No. 01-1005
Design By: Samuel A. Rollans, LSS



INFORMATION FOR THE INSTALLER:

- The permit should be read very carefully prior to bidding. The following are details that must be considered along with all other considerations.
- Tanks shall be approved by DEHNR, and certification supplied by the manufacturer.
- Tanks shall be water tested prior to installation.
- The installer shall be responsible to the owner for placement of the tanks and to insure that final grades are returned to the original natural grade, with exception of added structural features.
- The supply trench shall be compacted to eliminate cavities left during initial fill placement.
- Installation of the system shall be during dry conditions in order to protect the soil structure.
- All fittings shall be pressure rated fittings.
- All joints shall be cleaned with PVC pipe cleaner and a heavy bodied glue applied to weld all joints.
- Where required by the county health department, post installation inspections by the designer must be scheduled 5 week days in advance.
- Trenches shall be carefully excavated so the bottom is within 2" from the highest to . the lowest points of elevation within the trench. If the bottom elevation needs adjusting after it has been trenched, it will be done by removing high points rather than filling low points. It is extremely important to insure that trenches are not over excavated during initial trenching. All fine grading within the trench will be hand done with a shovel. No loose material will be left in the trench
- All pipe openings in the tanks shall be properly grouted. This also applies to the joints around the riser.
- All tanks shall be properly back filled and compacted to prevent slump at a later date.
- Earth dams, constructed of relatively impervious material, shall be installed at the beginning and end of each lateral.
- No heavy equipment shall be used on the field during or after installation. The use of a small loader (i.e. Bobcat) or a trencher (i.e. Ditch Witch 2300/2310) may be used for installation.
- Elevations at pinflag locations should be checked by the installer prior to beginning trenches.
- Pumptank riser should be 6" above grade, control panel should be 12" above grade.
- Septic tank riser shall be a minimum of 6" above finished grade.
- Design precludes use of foundation drains on the residence.
- System is specified as an innovative 25% reduction installation.
- Repair is specified as a PPBPS with low pressure distribution installation.
- rake trench walls, lime side-walls, install trenches 36" wide and have no more than 1/4" fall in 10 feet.
- See force main design for pump supply line material specification, elevations and locations (provided by Piedmont Design Associate, PA)

ANNISTON LOT 31A
PRESSURE MANIFOLD DESIGN

DESIGN FLOW:	480	
SOIL APPLICATION RATE:	0.25 gpd/ft.^{2}	
TOTAL AREA TRENCH BOTTOM:	1620	
TOTAL LATERAL LENGTH:	540	
NUMBER OF FIELDS:	1	
LATERAL LENGTH REQUIRED PER FIELD:	480	
SUPPLY LINE LENGTH:	1149	
TOTAL DYNAMIC HEAD:	107.99	
MANIFOLD SIZE:	4 in.SCH 80 PVC	
DOSING VOLUME:	246.83	
PUMP TANK DRAW DOWN*:	11.8	
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.*

ANNISTON LOT #31A

Project #: 01-1005

LAYOUT FOR 4 BEDROOM HOME

JULY 29 2005

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		4.1			100.00		
INSTR. 1			104.10				
1	***BLUE-RED***			***4.90***	***99.20***	***90***	***90***
2	***ORANGE-WHITE***			***5.70***	***98.40***	***90***	***90***
3	***BLUE-RED***			***6.00***	***98.10***	***90***	***90***
4	***ORANGE-WHITE***			***6.70***	***97.40***	***90***	***90***
5	***BLUE-RED***			***7.40***	***96.70***	***95***	***90***
6	***ORANGE-WHITE***			***8.30***	***95.80***	***95***	***90***
7	BLUE-RED			8.90	95.20	95	95
8	ORANGE-WHITE			9.30	94.80	85	85
9	BLUE-RED			10.20	93.90	70	70
10	ORANGE			10.70	93.40	55	55
11	BLUE			11.70	92.40	35	35
					Total	**890**	**880**

	LINE LENGTH	LTAR GPD/FT^2	SYSTEM TYPE	SOIL LTAR GPD/FT^2	TRENCH SYSTEM	DISTRIBUTION
** System*	***540***	***0.25***	***INNOV.***	***0.25***	***25% RED.***	**PRESSURE MANIFOLD**
Repair	***340***	0.25	*MOD.*	0.25	PPBPS	LOW PRESSURE

Notes:

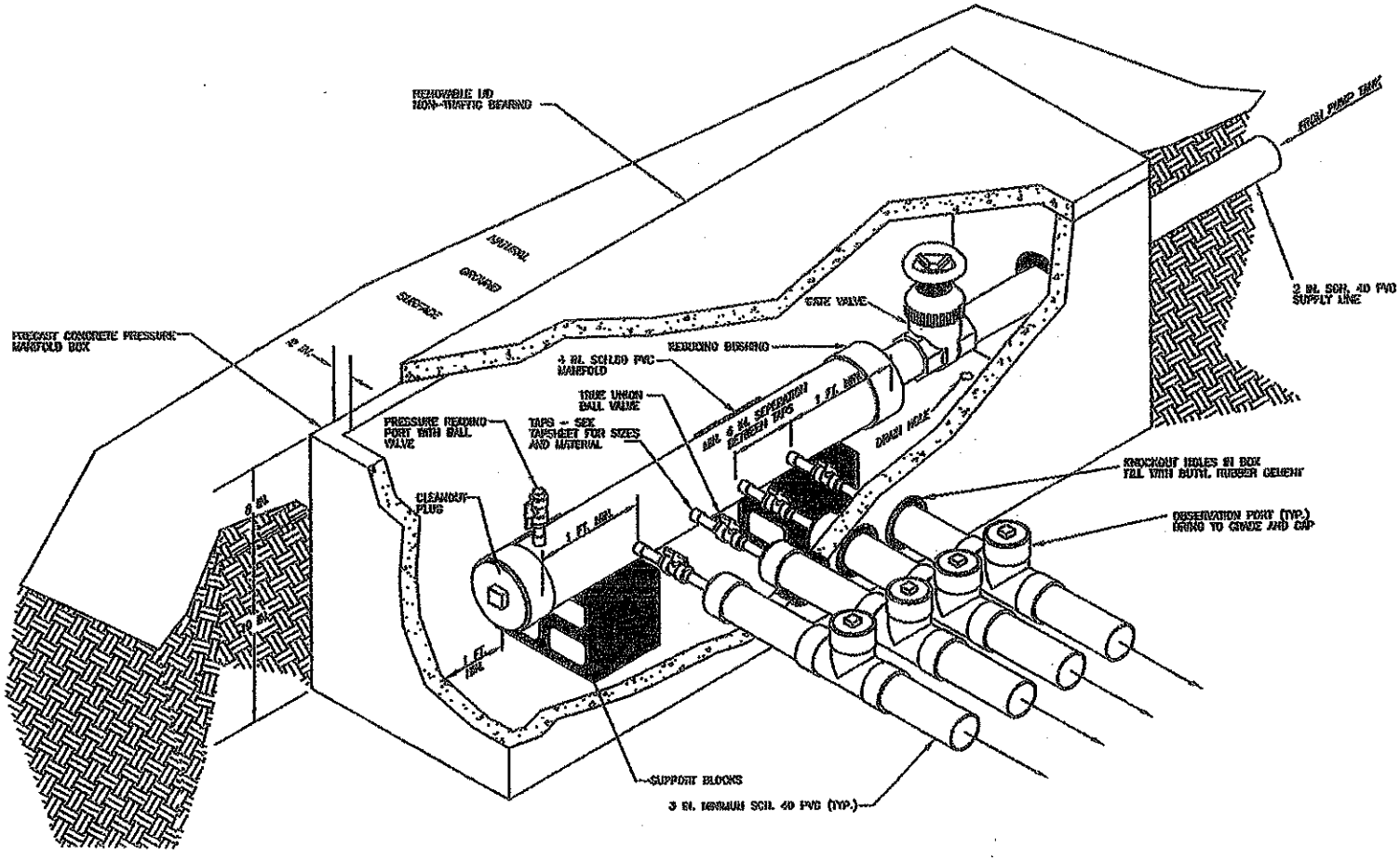
** TBM located on top of ground @eip Lots 31A/39A (see site plan)
**TBM is assumed to be 100'
**All measures in feet
**Nitrification lines are demonstrated on contour via colored pin flags
**BS, HI, and FS indicate rod readings

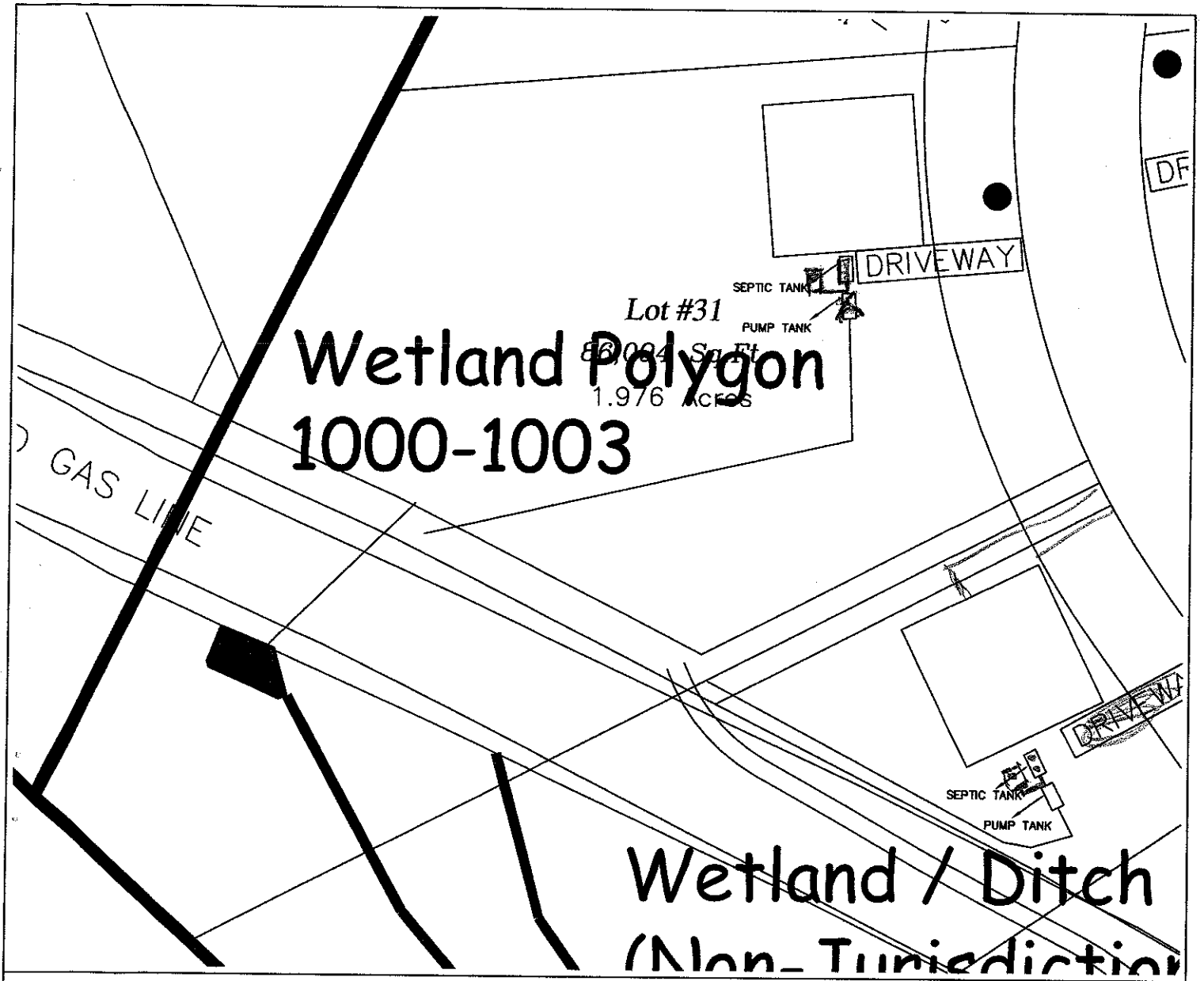
PRESSURE MANIFOLD TAPSHEET - ANNISTON LOT 31A

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/Tap	gpd	Trench Area	Line LTAR
1	BLUE-RED	99.2	**90**	SCH 40 1/2	**7.11**	80.00	270	0.30
2	ORANGE-WHITE	98.4	**90**	SCH 40 1/2	**7.11**	80.00	270	0.30
3	BLUE-RED	98.1	**90**	SCH 40 1/2	**7.11**	80.00	270	0.30
4	ORANGE-WHITE	97.4	**90**	SCH 40 1/2	**7.11**	80.00	270	0.30
5	BLUE-RED	96.7	**90**	SCH 40 1/2	**7.11**	80.00	270	0.30
6	ORANGE-WHITE	95.8	**90**	SCH 40 1/2	**7.11**	80.00	270	0.30
	total	**feet =**	**540**	**gal/min =**	**42.66**			
			Des. Flow	**480**				
			Pump Run=	**11.25**				
			soil LTAR	**0.25**				
			LTAR +5%	**0.2625**				
			LTAR with INNOV.	**0.333333333**				
			LTAR with INNOV. + 5%	**0.35**				

TYPICAL SCHEMATIC FOR PRESSURE MANIFOLD





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.
- Building Envelope (60' x 60')
- 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

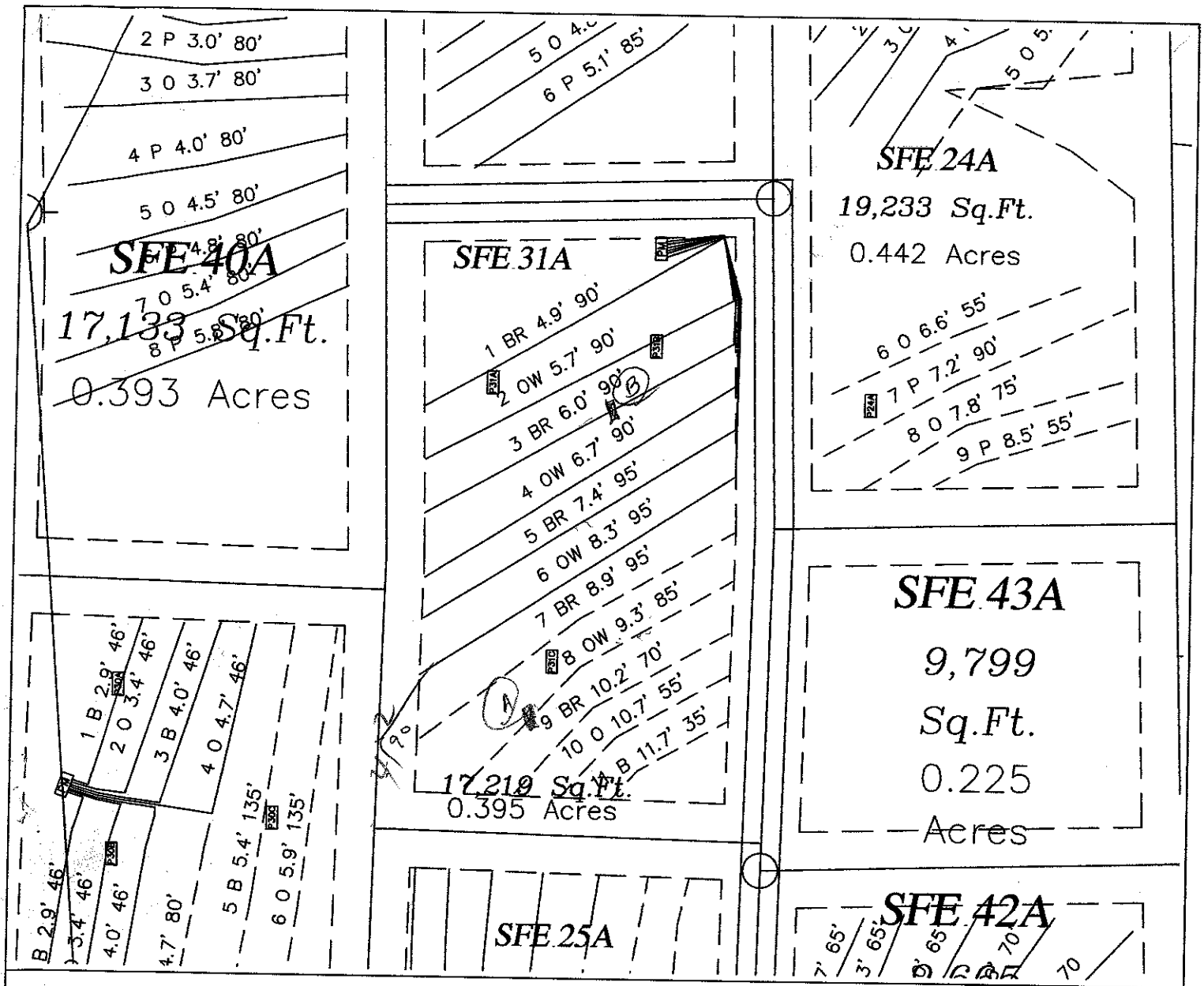
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MAP TITLE: SITE PLAN & DRAINFIELD AREAS

PROJECT NAME: RIDGELINE DEVELOPMENT CORP. / ANNISTON PHASE II

LOCATION/DATE: SHEARER CHAPEL ROAD, IREDELL COUNTY, NORTH CAROLINA, AUGUST 2005

JOB # : 01-1005
FILE: C:\JOBS\01-1005
PROJECT MGR.: S.A.R.
FIELD WORK: S.A.R.
DRAWN BY: S.A.R.



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- Building Envelope (60' x 60')
- System lines.
- Repair lines.
- Temporary Bench Mark (TBM)
- Well Location.

GRAPHIC SCALE
1" = 40'

40 0 40 80

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22
4 | 90
9
16

CALCULATIONS

Location ANNISTON SUBDIVISION

Project Number 01-1005

Lot No: LOT 31A

No. of Bedrooms 4

Design Flow 480 $^{gal}/_{day}$

LTAR 0.25 $^{gal}/_{ft^2\ day}$

25% RED.? (YES OR NO) YES

Supply Line Length	1149	ft.
Supply Line Volume	199.926	gal.
Required Feet of Line	480	ft.
Amount of Line from Layout	540	ft.
Gallons per Minute	42.66 $^{gal}/_{min}$	
Required Septic Tank Capacity	1000	gal.
Minimum Standard Tank Size	1000	
Lateral Line Volume	352.62	gal.
Dosing Volume	246.83	gal.

Note: Dosing Volume based on70% of lateral line volume

Tank Draw Down	11.8	*Generic Draw Down of 21 gal.per in.*
Pump Run Time	5.79	minutes
Elevation Head	52	ft.
Pressure Head	2	ft.
Friction Factor	1	ft./100 ft. *(From the interpolater.)*
Friction Head	39.90	ft.
Total Dynamic Head (+15%)	107.99	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