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 THE ORCHARDS Subdivision, Iredell County, North Carolina.

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August 7, 2006
Project #: 01-1195
Design By: Rollans Soil & Environmental Services

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.
- System is specified as a PPBPS installation.
- Repair is specified as a PPBPS installation.
- Backfill 4 - 6" of material (County Approved) over panels, rake trench walls, lime side-walls, install trenches 36" wide and have no more than 1/4" fall in 10 feet.

LP PPBPS SYSTEM
FOR WASTEWATER TREATMENT

Owner/Applicant: THE ORCHARDS LLC

Address: 227 Hideaway Lane
Mooresville, NC 28117
Phone: 704-201-6465
County: Iredell
Location: THE ORCHARDS Subdivision Lot #3

Source of Wastewater Flow: 4 Bedroom Single Family Residence
Estimated Daily Wastewater Production: 480 gpd
System Flow: 25.54615385

Design Specifications

Drainfield Size: 270
Loading Rate: 0.3 gpd/ft.^{2}
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: 90
Supply Line Diameter: 2 in. SCH 40 PVC
Supply Line Volume: 15.66
Dosing Volume: 150.29
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: 1.60
Elevation Head: 11.90
Total Dynamic Head: 17.83

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

THE ORCHARDS Subdivision Lot #3
LP PPBPS

DESIGN FLOW:	480
SOIL APPLICATION RATE:	0.3 gpd/ft.2
TOTAL AREA TRENCH BOTTOM:	810
TOTAL LATERAL LENGTH:	270
NUMBER OF FIELDS:	1
LATERAL LENGTH REQUIRED PER FIELD:	266.6666667
SUPPLY LINE LENGTH:	90
TOTAL DYNAMIC HEAD:	17.83
MANIFOLD SIZE:	N/A
DOSING VOLUME:	150.29
PUMP TANK DRAW DOWN*:	7.2
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.*

THE ORCHARDS LOT 3

Project #: 01-1195

LAYOUT FOR 4 BEDROOM HOME

August 7, 2006

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		9.0			100.00		
INSTR. 1			109.00				
HOUSE CNR				11.10	97.90		
P. TANK				11.50	97.50		
1	ORANGE			3.40	105.60	40	40
2	***BLUE***			***4.60***	***104.40***	***95***	***90***
3	***RED***			***5.70***	***103.30***	***97***	***90***
4	***PINK***			***6.20***	***102.80***	***100***	***90***
5	ORANGE			7.70	101.30	104	104
6	BLUE			9.20	99.80	106	106
7	RED			10.00	99.00	55	55
					Total	597	575

	LINE LENGTH	LTAR GPD/FT2	SYSTEM TYPE	SOIL LTAR GPD/FT2	TRENCH SYSTEM	DISTRIBUTION
** System*	*270*	*0.3*	*MOD.*	*0.30*	*PPBPS*	*LOW PRESSURE*
Repair	305	0.3	MOD.	0.30	PPBPS	LOW PRESSURE

Notes:

** TBM located top of ground at EIP at corner of lot (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

THE ORCHARDS LOT 3

Project #: 01-1195

LAYOUT FOR 4 BEDROOM HOME

August 7, 2006

LINE #	FLAG COLOR	BS	HI	FS	ELEVATION	FLAGGED LINE LENGTH	DESIGN LINE LENGTH
TBM		9.0			100.00		
INSTR. 1			109.00				
HOUSE CNR				11.10	97.90		
P. TANK				11.50	97.50		
1	ORANGE			3.40	105.60	38	38
2	***BLUE***			***4.60***	***104.40***	***95***	***90***
3	***RED***			***5.70***	***103.30***	***92***	***90***
4	***PINK***			***6.20***	***102.80***	***96***	***90***
5	ORANGE			7.70	101.30	100	100
6	BLUE			9.20	99.80	100	100
7	RED			10.00	99.00	50	50
					Total	571	558

	LINE LENGTH	LTAR GPD/FT2	SYSTEM TYPE	SOIL LTAR GPD/FT2	TRENCH SYSTEM	DISTRIBUTION
****System***	***270***	***0.3***	***MOD.***	***0.30***	***PPBPS***	***LOW PRESSURE***
Repair	288	0.3	MOD.	0.30	PPBPS	LOW PRESSURE

Notes:

** TBM located top of ground at EIP at corner of lot (see site plan)

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**All measures in feet

**Nitrification lines are demonstrated on contour via colored pin flags

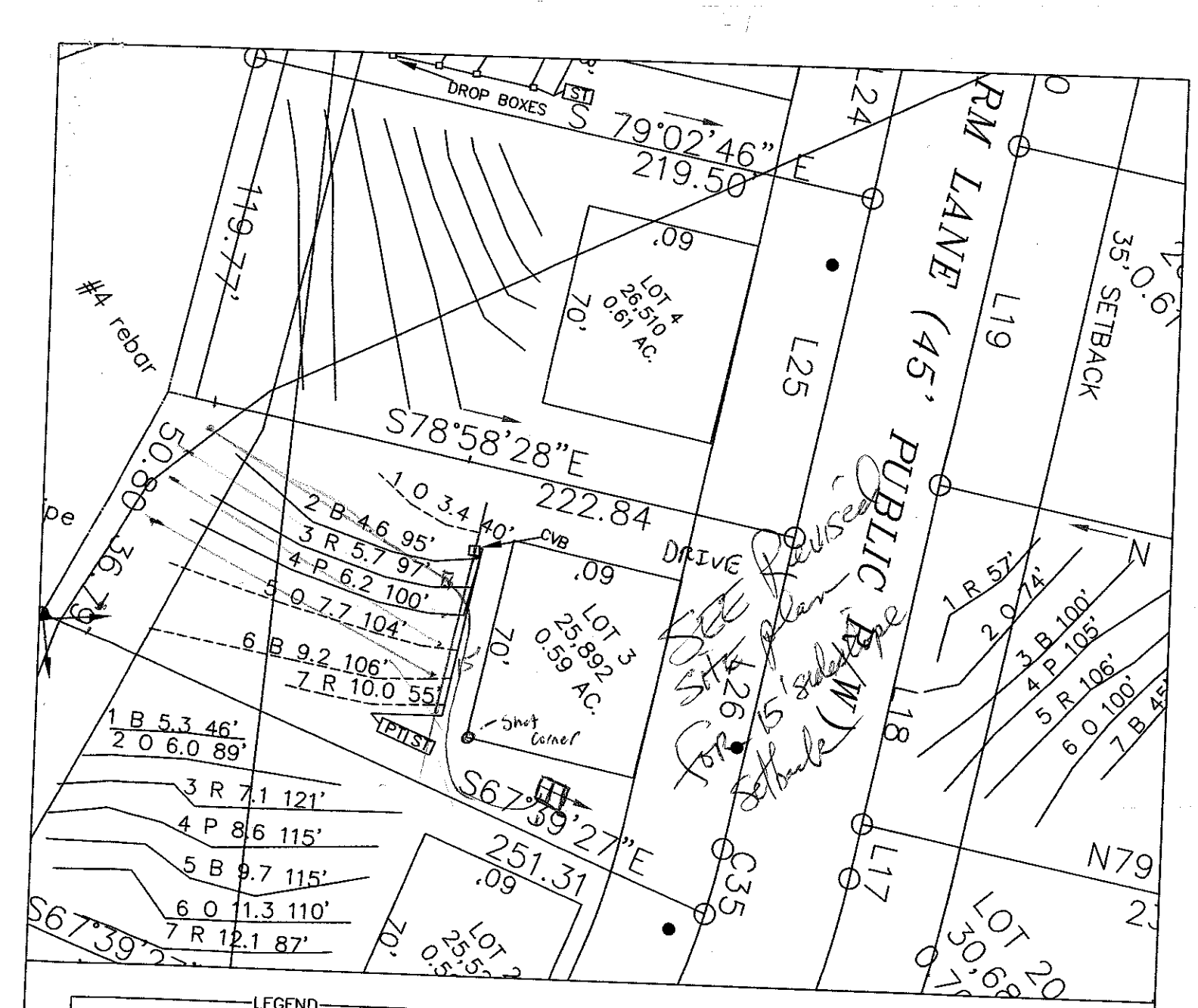
**BS, HI, and FS indicate rod readings

LP PPBPS TAPSHEET -THE ORCHARDS LOT 3

SYSTEM

Line #	Color	Elevation	Length	Hole Size	Flow/hole	Trench Area	Number of Panels
2	***BLUE***	104.4	***90***	0.156	**0.41**	270	21
3	***RED***	103.3	***90***	0.156	**0.41**	270	21
4	***PINK***	102.8	***90***	0.156	**0.41**	270	21
	total	**feet =**	**270**	**gal/min =**	**25.546154**		
			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



LEGEND

- House Box
- System lines.
- Repair lines.
- Temporary Bench Mark (TBM)
- Well Location.

GRAPHIC SCALE
1" = 50'

50 0 50 100

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

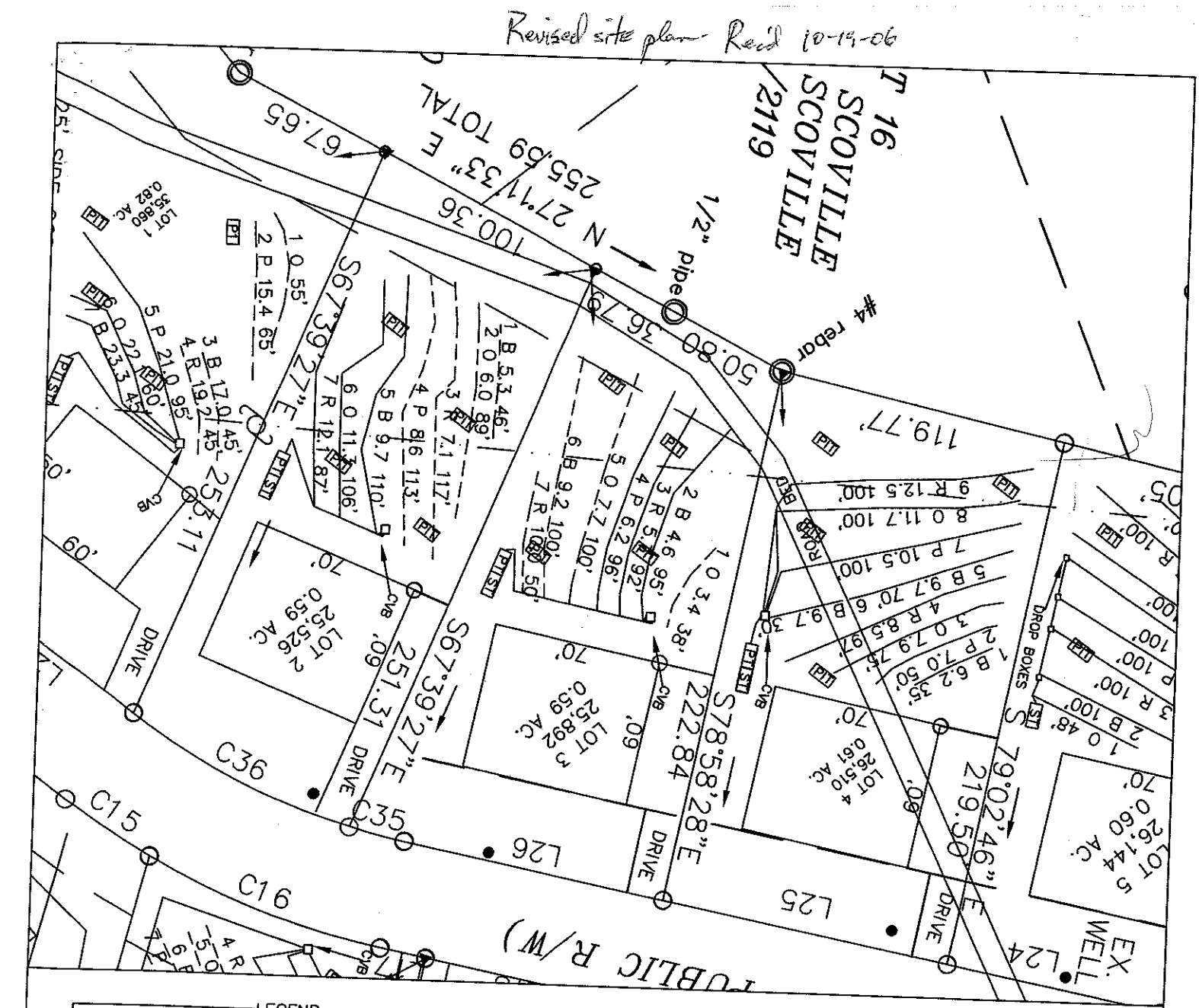
ROLLANS SOIL & ENVIRONMENTAL SERVICES
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MAP TITLE: SITE PLAN & DRAINFIELD AREAS			JOB #: 01-1195
PROJECT NAME: THE ORCHARDS LLC./THE ORCHARDS SUBDIVISION	LOCATION/DATE: PERTH ROAD IREDELL COUNTY, NORTH CAROLINA AUGUST 2008		FILE: C:\JOBS\01-1195
			PROJECT MGR.: C.B.F.
			FIELD WORK: C.B.F.
			DRAWN BY: C.B.F.

200 ft
100

Revised site plan - Rec'd 10-19-06



LEGEND

- House Box.
- System lines.
- Repair lines.
- Temporary Bench Mark (TBM)
- Well Location.

GRAPHIC SCALE
1" = 60'

60 0 60 120

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MAP TITLE: SITE PLAN & DRAINFIELD AREAS

PROJECT NAME: THE ORCHARDS LLC / THE ORCHARDS

LOCATION/DATE: PERTH ROAD, IREDELL COUNTY, NORTH CAROLINA, AUGUST 2006

JOB # : 01-1195
FILE: C:\JOBS\01-1195
PROJECT MGR.: CBF
FIELD WORK: CBF
DRAWN BY: CBF

CALCULATIONS

Location THE ORCHARDS

Project Number 01-1195

Lot No: Lot 3

No. of Bedrooms	4	
Design Flow	480	$^{gal}/_{day}$
LTAR	0.3	gpd/ft2
PPBPS? (YES OR NO)	YES	
Supply Line Length	90	ft.
Supply Line Volume	15.66	gal.
Required Feet of Line	266.6667	ft.
Amount of Line from Layout	270	ft.
Gallons per Minute	25.54615	$^{gal}/_{min}$
Required Septic Tank Capacity	1000	gal.
Minimum Standard Tank Size	1000	
Panel Volume	3.6	gal.
# of Panels	62	
Dosing Volume	150.29	gal.

Note: Dosing Volume based on 33% of # of panels times 3.6 gal/panel

Tank Draw Down	7.2	*Generic Draw Down of 21 gal.per in.*
Pump Run Time	5.88	minutes
Elevation Head	11.9	ft.
Pressure Head	2	ft.
Friction Factor	1.78	ft./100 ft. *(From the interpolater.)*
Friction Head	1.60	ft.
Total Dynamic Head (+15%)	17.83	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