# ROLLANS *Soil & Environmental Services, Inc.*

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**Attached is a proposed design for an Accepted (25% reduction) Septic System with Pressure Manifold distribution for a 3 bedroom single family residence on Lot #29 in Shepherds Bluff Subdivision, Iredell County, North Carolina.**

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**May 24, 2007**
**Project #: 01-1064**
**Design By: Rollans Soil and Environmental Services**

# PRESSURE MANIFOLD SYSTEM
# FOR WASTEWATER TREATMENT

| | |
|---|---|
| **Owner:** | Shepherds Bluff, LLC |
| **Address:** | 111-B Raceway Dr<br>Mooresville, NC 28117 |
| **Phone:** | 704-664-7029 |
| **County:** | Iredell |
| **Location:** | Shepherds Bluff Lot 29 |
| **Source of Wastewater Flow:** | 3 Bedroom Single Family Residence |
| **Estimated Gallons Per Day Flow:** | 360 |
| **System Flow:** | 21.92 |

## Design Specifications

| | |
|---|---|
| **Drainfield Size:** | 300 |
| **Loading Rate (gpd/ft.$^2$):** | 0.3 |
| **Depth of Gravel in Trench:** | NA (25% reduction ) |
| **Gravel Size:** | NA (25% reduction ) |
| **Trench Depth:** | 36 in. |
| **Trench Width:** | 36 in. |
| **Septic Tank Size:** | 1000 |
| **Pump Tank Size:** | 1000 |
| **Estimated Supply Line Length:** | 76 |
| **Supply Line Diameter:** | 2 in. SCH 40 PVC |
| **Supply Line Volume:** | 13.22 |
| **Dosing Volume:** | 137.13 |
| **Supply Manifold:** | 4 in. SCH 80 PVC |
| **Supply Manifold Length:** | 4 ft. (minimum) |
| **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:** | 0.97 |
| **Elevation Head:** | 10.80 |
| **Total Dynamic Head:** | 15.83 |
| **Threaded Union:** | In Tank |
| **Gate Valves:** | 1 in Tank<br>1 at Pressure Manifold |
| **Check Valves:** | In Tank |
| **Anti-Siphon Hole:** | NA |
| **Additional Comments:** | Soil suitability was performed by Rollans Soil & Environmental Services. |

# Shepherds Bluff Lot 29
## PRESSURE MANIFOLD DESIGN

| | |
|---|---|
| **DESIGN FLOW (gpd):** | 360 |
| **SOIL APPLICATION RATE (gpd/ft.$^2$):** | 0.3 |
| **TOTAL AREA TRENCH BOTTOM:** | 900 |
| **TOTAL LATERAL LENGTH:** | 300 |
| **NUMBER OF FIELDS:** | 1 |
| **LATERAL LENGTH REQUIRED PER FIELD:** | 300 |
| **SUPPLY LINE LENGTH:** | 76 |
| **TOTAL DYNAMIC HEAD:** | 15.83 |
| **MANIFOLD SIZE:** | 4 in.SCH 80 PVC |
| **DOSING VOLUME:** | 137.13 |
| **PUMP TANK DRAW DOWN*:** | 6.5 |
| **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.*

# Shepherds Bluff Lot 29

Project #: 01-1064

LAYOUT FOR 3 BEDROOM HOME

June 6, 2007

| LINE # | FLAG COLOR | BS | HI | FS | ELEVATION | FLAGGED LINE LENGTH | DESIGN LINE LENGTH |
|---|---|---|---|---|---|---|---|
| TBM | | | | | 200.00 | | |
| INSTR. 1 | | | | | 200.00 | | |
| HOUSE CNR | | | | | 204.60 | | |
| P. TANK | | | | | 202.00 | | |
| 1 | PINK | | | | 209.90 | 42 | 42 |
| 2 | WHITE | | | | 208.90 | 27 | 27 |
| 3 | ORANGE | | | | 208.60 | 49 | 49 |
| 4 | PINK | | | | 208.20 | 70 | 70 |
| ***5*** | ***WHITE*** | | | | ***207.80*** | ***84*** | ***75*** |
| ***6*** | ***ORANGE*** | | | | ***208.60*** | ***81*** | ***75*** |
| ***7*** | ***PINK*** | | | | ***206.90*** | ***80*** | ***75*** |
| ***8*** | ***WHITE*** | | | | ***206.40*** | ***79*** | ***75*** |
| 9 | ORANGE | | | | 205.70 | 48 | 48 |
| | | | | | **Total** | **560** | **536** |

| | LINE LENGTH | LTAR GPD/FT$^2$ | SYSTEM TYPE | SOIL LTAR GPD/FT$^2$ | TRENCH SYSTEM | DISTRIBUTION |
|---|---|---|---|---|---|---|
| ****System*** | ***300*** | ***0.30*** | ***ACCEPT.*** | ***0.30*** | ***25% RED.*** | **PRESSURE MANIFOLD** |
| Repair | 236 | 0.30 | *MOD.* | 0.30 | PPBPS | LOW PRESSURE |

**Notes:**

**Elevations Obtained by Don Allen & Associates Surveying

**All measures in feet

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

**BS, HI, and FS indicate rod readings

# PRESSURE MANIFOLD TAPSHEET - Shepherds Bluff Lot 29

## SYSTEM

| Line # | Color | Elevation | Length | Hole Size | Flow/Tap | Trench Area |
|---|---|---|---|---|---|---|
| *5* | *WHITE* | *207.80* | *75* | SCH 80 1/2 | 5.48 | 225 |
| *6* | *ORANGE* | *208.60* | *75* | SCH 80 1/2 | 5.48 | 225 |
| *7* | *PINK* | *206.90* | *75* | SCH 80 1/2 | 5.48 | 225 |
| *8* | *WHITE* | *206.40* | *75* | SCH 80 1/2 | 5.48 | 225 |
| | total | feet = | 300 | gal/min = | 21.92 | |
| | | | Des. Flow | 360 | | |
| | | | Pump Run= | 6.26 | | |
| | | | soil LTAR | 0.3 | | |
| | | | LTAR +5% | 0.315 | | |
| | | | LTAR with ACCEPTED | 0.4 | | |
| | | | LTAR with ACCEPTED + 5% | 0.42 | | |

## CALCULATIONS

Location Shepherds Bluff

Project Number 01-1064

Lot No: Lot 29

| | | |
|---|---|---|
| No. of Bedrooms | 3 | |
| Design Flow | 360 | $^{gal}/_{day}$ |
| LTAR | 0.3 | $^{gpd/ft^2}$ |
| 25% RED.? (YES OR NO) | YES | |
| Supply Line Length | 76 | ft. |
| Supply Line Volume | 13.224 | gal. |
| Required Feet of Line | 300 | ft. |
| Amount of Line from Layout | 300 | ft. |
| Gallons per Minute | 21.92 | $^{gal}/_{min}$ |
| Required Septic Tank Capacity | 1000 | gal. |
| Minimum Standard Tank Size | 1000 | |
| Lateral Line Volume | 195.9 | gal. |
| Dosing Volume | 137.13 | gal. |

*Note: Dosing Volume based on70% of lateral line volume*

| | | |
|---|---|---|
| Tank Draw Down | 6.5 | *Generic Draw Down of 21 gal.per in.* |
| Pump Run Time | 6.26 | minutes |
| Elevation Head | 10.8 | ft. |
| Pressure Head | 2 | ft. |
| Friction Factor | 1.27 | ft./100 ft. *(From the interpolater.)* |
| Friction Head | 0.97 | ft. |
| Total Dynamic Head (+15%) | 15.83 | 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 |