

1/8/2008

duponbj

Groundwater and Wastewater Services File Imaging Project

May 2007

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CERTIFICATE OF COMPLETION/OPERATION PERMIT

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
700 NORTH TRYON ST., SUITE 211
CHARLOTTE, NC 28202
PHONE (704) 336-5103

FILE: 55588 DATE: 12/2/05

TC: 199-601-01 ☑ L ☐ CRT

SERIAL Nº 20068

Name of Owner THE SANCTUARY @ LAKE WYLIE Juris.: _____

Address of Property WILDLIFE RD.

Inspection Data:

Tank Material PCC

Total Length of Drainfield 1501

Number of Lines 11@125' 2@63' @ _____

Cover Depth 12"

Water Supply Source ~~750 @~~ COMMUNITY

Distance to Water Source 750'

Excavation Inspected 12/2/05

Tank(s) Inspected 12/2/05

Wash Line Inspected N/A

High Water Alarm Inspected 12/2/05

SYSTEM INSTALLED ACCORDING TO PLANS ON FILE SUBMITTED BY LAND DESIGN 6/05.

PLOT

Design 2005, INV, E-Z Flow, 3500PT, 3000ST, 4503SF, T CTR# STANLEY

The undersigned has inspected the Septic Tank System described above, and certifies it has been

☐ installed or constructed ☐ altered or repaired

☐ in accordance with the permit issued ☐ as detailed in the plot above

and meets the provisions of 15A NCAC 18A. 1900, "Laws And Rules For Sewage Treatment and Disposal Systems" in effect on the date of issuance of the permit. This issuance of this

☐ Certificate of Completion ☐ Operation Permit

does not in any way guarantee that the system will operate properly or relieve any person now or hereafter owning, controlling, or using such system from any liability resulting from the failure of the system to operate properly. This document is issued subject to those restrictions and conditions shown on the permit(s) and the provisions of 15A NCAC 18A. 1900 in addition to those listed below under "COMMENTS." This document shall be null and void if any information contained in the application is untrue or if any additions are made to the property which would increase the requirements for said system.

Notice: Disturbance of the designated repair area may result in the suspension/revocation of this permit.

COMMENTS: SYSTEM INSTALLED ACCORDING TO PLANS ON FILE SUBMITTED BY LAND DESIGN 6/05

_____, RS
Environmental Health Specialist

Mecklenburg County services are available without regard to ethnic origin, sex, or disability.

INSTALLATION, CONSTRUCTION, ALTERATION, AND/OR REPAIR APPROVAL

HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
700 NORTH TRYON ST., SUITE 211
CHARLOTTE, NC 28202
PHONE (704) 336-5103

FILE: 55588 DATE: 12/2/05

TC: 199-601-01 ☑ L

SERIAL Nº 20298

Permission is hereby given to _____ (Install or) Construct, _____ Alter or Repair the individual septic tank wastewater treatment system with subsurface, soil absorption, effluent discharge as specified herein at the described location. *This permit is granted* based upon the information supplied in the *application dated* 7/8/04. All work shall be completed on or before 12/29/05, after which date this permit shall be null and void. The system shall meet all of the construction requirements of 15A NCAC 18A. 1900 which are in effect on the date of the granting of this permit. A *Certificate* of Completion or an Operation Permit must be obtained from the Mecklenburg County Health Department before any system can be covered up or placed into service. The issuance of this permit does not in any way guarantee that the system anticipated to be constructed will operate properly, or relieve any person now or hereafter owning, controlling or using such system from any liability resulting from the failure of the system to operate properly.

INSTALL ACCORDING TO PLANS ON FILE SUBMITTED BY TONEY JACOBS & LAND DESIGN 6/05.

PLOT OF SYSTEM

Liquid Capacity of Septic Tank 3000 gallons

Liquid Capacity of Dosing Tank 3000 gallons

Tank Construction PCC

Trench Depth 24"

Absorption and/or Nitrification Lines:

Trench Width 3 feet

Trench Walls Scored and Porous YES

Total Line Length 1501 feet

Number of Lines 11@125' & 2@63'

Depth of Stone N/A inches

Distance from House 75 feet

Distance from Property Line 710 feet

Distance from Well 750 feet

NOTICE: This system shall not be installed while soils are in a wet condition.

NAME OF OWNER THE SANCTUARY @ LAKE WYLIE

LOCATION OF PROPERTY WILDLIFE RD. - JJ AUDUBON LODGE & CAMP

Comments: INSTALL ACCORDING TO PLANS ON FILE SUBMITTED BY LANDDESIGN, INC.

Environmental Health Specialist

PRESSURE MANIFOLD, 25% REDUCTION - INFILTRATOR CHAMBER SEPTIC SYSTEM FOR SUBSURFACE WASTEWATER DISPOSAL AT THE SANCTUARY AMENITY SITE MECKLENBURG COUNTY, NORTH CAROLINA

Prepared for:
Crescent Resources Inc.
400 S. Tyron Street
Charlotte, NC 28201

COPY

Call Jack Whytsell before Final Inspection by Pressure Manifold

Prepared by:
Toney C. Jacobs & Associates, Inc.
168 Broadbill Drive
Mooresville, North Carolina 28117
office (704) 663-6905
fax (704) 662-9845
e-mail jacobs@i-america.net

August 12, 2004

LICENSED SOIL SCIENTIST
PAUL G. PENNINGER
1065
STATE OF NORTH CAROLINA

Copy: Mr. David Cornelius, R.S.
Mecklenburg County Health Dept.

Mr. James Martin
Crescent Resources, Inc.

Paul G. Penninger, LSS
Toney C. Jacobs, LSS

The Sanctuary Amenity Site Septic System Design

The proposed septic system will serve the amenity complex for The Sanctuary subdivision. This is a Crescent Resources, Inc. residential subdivision off Wildlife and Island Point Roads in Mecklenburg County. There will be approximately 350 five-bedroom homes in this subdivision. In February 2004, we discussed the primary features of the amenity site with David Cornelius and Mr. Kelly Randall of the Mecklenburg County Health Department and reviewed the water use records from The Harbour subdivision in an effort to determine a reasonable design flow for The Sanctuary amenity site. These were the same water records used to permit The Farms amenity site in Iredell County, which is currently being constructed.

We discussed that trying to tie the design flow to a per lot basis made the most sense. Over the period we monitored the Harbour, the average water use at the amenity site per lot was 0.5 gpd/lot with a range of .03 to 2.99 gpd/lot. In our February meeting we discussed using a 3 gpd/lot for the design of The Sanctuary amenity site. This number was approved by Mr. Cornelius and Mr. Randall. This reflects a 1050 gpd design flow for The Sanctuary amenity site. If flows are similar to The Harbour, the system will be over designed, but this number is probably reasonable given there are more proposed amenities at The Sanctuary vs. The Harbour. The extras are basically more tennis courts, an outdoor amphitheater, and a hot tub (spa). It is our understanding that the Amenity site is being constructed for the use of the residents of The Sanctuary subdivision and their guests only. According to the attached site plan, wastewater going to the septic system will only be generated at the lodge. This wastewater should only come from the sinks, toilets, and showers.

The soils at the proposed septic areas for the amenity site were evaluated by Mr. Bill Marlin of the Mecklenburg County Health Department on July 15, 2004. The soils were approved at a 0.3 gpd/ft^2 LTAR. Toney C. Jacobs and Associates, Inc. flagged the primary and repair systems in the field, and the proposed lines have been located by the surveyor. Attached is the site plan showing the system layout. Also attached are the details and specifications necessary to install the proposed system. Tri-County Wastewater (TCWW) will be the certified operator for the proposed system. Any requirements of TCWW that are greater than those in this plan or required by the county should be discussed with Mr. Tim Bannister of TCWW. <u>All system components and installation procedures should meet or exceed state and county regulations. If there are any questions please call Toney Jacobs, the Mecklenburg County Health Department or Mr. Tim Bannister of TCWW.</u>

A condition of the Authorization to Construct should be an onsite meeting with the installer, TCWW, Toney C. Jacobs and Associates and the County Environmental Health Department Staff prior to installation to review the system location and components.

The Sanctuary Amenity Site Septic System Specifications and Design

Design Flow:
3 gpd/lot

3 gpd * approx. 350 lots = 1050 gpd design flow

LTAR:
0.3 gpd/ft^2

Type and length of trenches:
Proposing 25% reduction, Infiltrator chambers or other approved 25% reduction system for primary and repair system

1050 gpd / (0.3 gpd/ft^2 * 3 ft) = 1167 ft of conv. trench required

1167 * 0.75 = 875 ft of 25% reduction, Infiltrator chambers

-install trenches 24-36 in. deep, level from end to end

-install observation port in each trench, down 2/3 length of trench

Septic Tank Size
Volume Required = 1.17Q + 500

Volume Required = 1.17*1050 + 500 = 1729 gal for minimum septic tank size—use 2000 gal septic tank

Pump Tank Size
minimum of 2000 gal

Pressure Manifold Design
-system will use 10 trenches ~~108~~ ft. long.

-pressure manifold will use one 1/2 inch SCH 80 PVC tap per trench for a total of 10 taps

-at 2 ft of head pressure, the flow per tap will be 5.5 gpm

-total flow required for the pressure manifold = 10 taps * 5.5 gpm/tap = 55 gpm

-use 4 in. SCH 80 barrel on pressure manifold (see diagram)

(An alternative design would use 5 taps off the manifold and use 5 flow dividers to split the flow to the 10 trenches. This alternative can be discussed prior to installation if there is a need to reduce gpm flow through system and reduce the pump size.)

Repair Area

- use 875 ft. of 25% reduction system for proposed repair
- approx. 1225+ ft. of repair has been shown on site plan

SUMMARY OF SYSTEM SPECIFICATIONS AND PUMP REQUIREMENTS FOR THE SANCTUARY AMENITY SYSTEM

(*pump requirement calculations based on contours of attached site plan for the amenity site and should be field verified prior to installation of tanks and drainfield by septic installer, after final grades are established)

Daily design flow:	1050 gpd.
Septic tank size:	2000 gal. (2 compartments)
Pumping tank size:	2000 gal.
Effluent loading rate:	0.3 gpd/ft^2
Total length and diameter of supply pipe:	approx. 850 ft. 3" SCH 40 PVC)
Number and length of laterals:	10@ ~~108~~ 98 ft. dosed by a pressure manifold (use 25% reduction trench - Infiltrator chambers)
Pressure Manifold:	use 10 taps at 1/2 in. SCH 80 PVC (flow is 5.5 gpm/tap at 2 ft. head pressure)
Flow rate through the system:	55 gpm
Elevation head:	*approx. 61'
Pressure head:	2.0'
Friction head:	approx. 8.6'
20% contingency	13.3'
Total head:	84.9'
Pump requirements:	55 gpm at 85' of head; use Goulds WE 20H pump or equivalent with compatible electrical
Dosing volume:	500 gal. – 2.1 doses/day at design flow
Depth of water pumped per dose:	calculated to specific tank by measure or dealer engineering specifications (1 cubic ft. of water equals 7.48 gal.)
Pump run per dose:	approx. 9 min
Check valve:	Yes
Siphon break hole:	No

LIST OF ATTACHMENTS

1. SITE PLAN
2. PUMP CURVE
3. MANIFOLD DETAIL
4. TRENCH DETAIL
5. MECKLENBURG COUNTY SOIL EVALUATION SHEETS
6. TCWW SYSTEM INSTALLATON MANUAL* (will forward when received fromTCWW)

GOULDS PUMPS

Submersible Effluent Pump

MODEL 3885

WE Series

PROSURANCE AVAILABLE FOR RESIDENTIAL APPLICATIONS.



APPLICATIONS

Specifically designed for the following uses:

- Homes
- Farms
- Trailer courts
- Motels
- Schools
- Hospitals
- Industry
- Effluent systems

SPECIFICATIONS

Pump

- Solids handling capabilities: ¼" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature: 104°F (40°C) continuous 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

FEATURES

■ **Impeller:** Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

■ **Casing:** Cast iron volute type for maximum efficiency. 2" NPT discharge.

■ **Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE** sealing faces. Stainless steel metal parts, BUNA-N elastomers.

■ **Shaft:** Corrosion-resistant, stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.

■ **Fasteners:** 300 series stainless steel.

■ Capable of running dry without damage to components.

■ Designed for continuous operation when fully submerged.

MOTORS

■ Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.

■ Class B insulation on ⅓-1½ HP models.

■ Class F insulation on 2 HP models.

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.
- ⅓ and ½ HP models have NEMA three prong grounding plugs.
- ¾ HP and larger units have bare lead cord ends.

Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.

■ **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.

■ **Bearings:** Upper and lower heavy duty ball bearing construction.

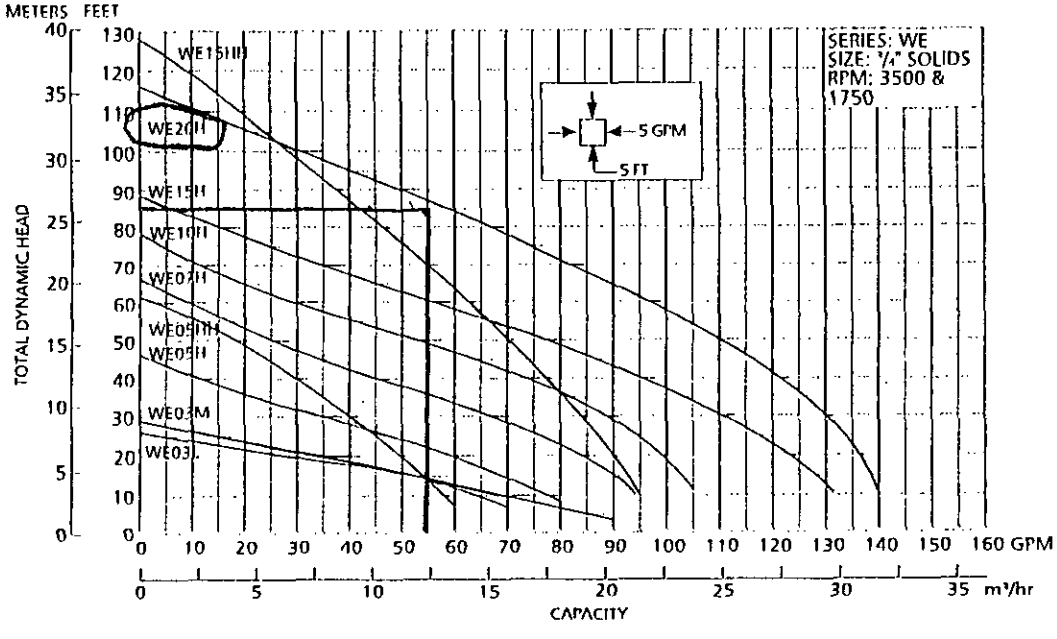
■ **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.

■ **O-ring:** Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS

C SA US — Tested to UL 778 and CSA 22.2 108 Standards By Canadian Standards Association File #LR38549

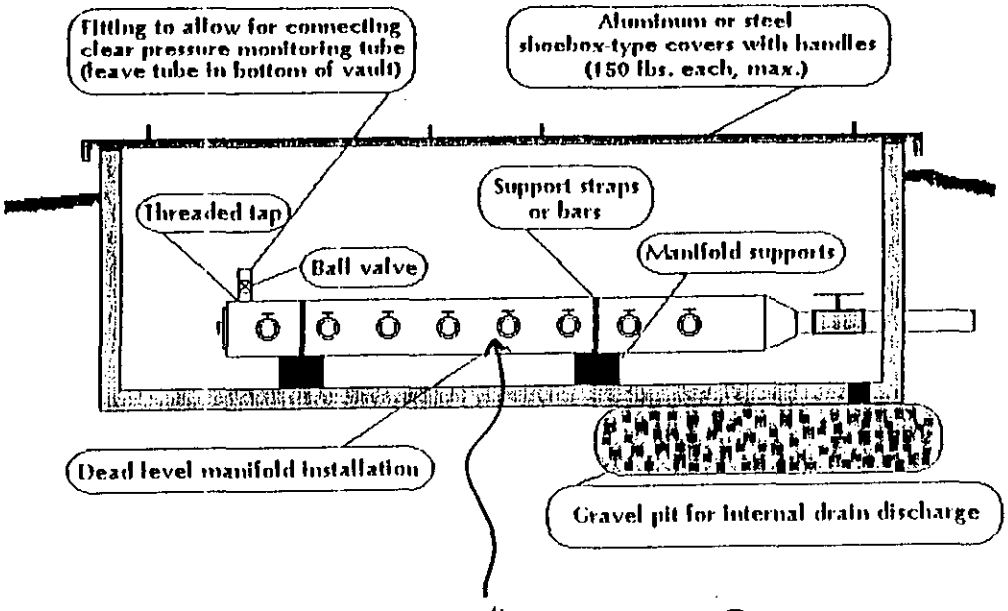
Goulds Pumps is ISO 9001 Registered.



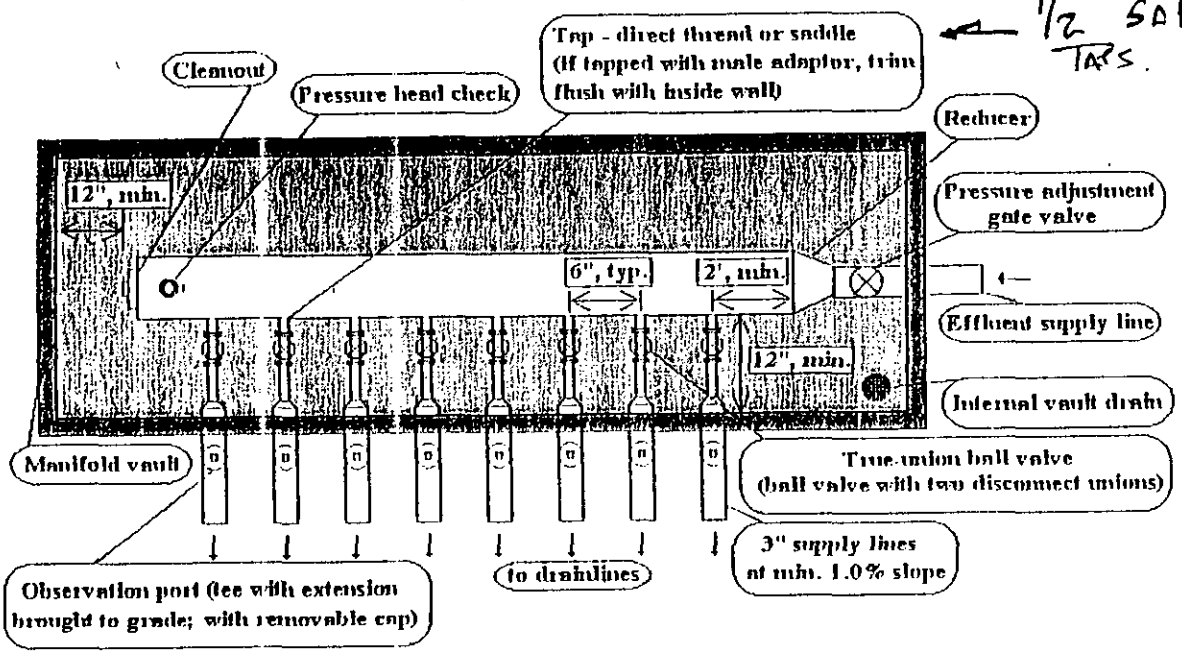
Goulds Pumps

ITT Industries

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Effective July, 2003
B3885

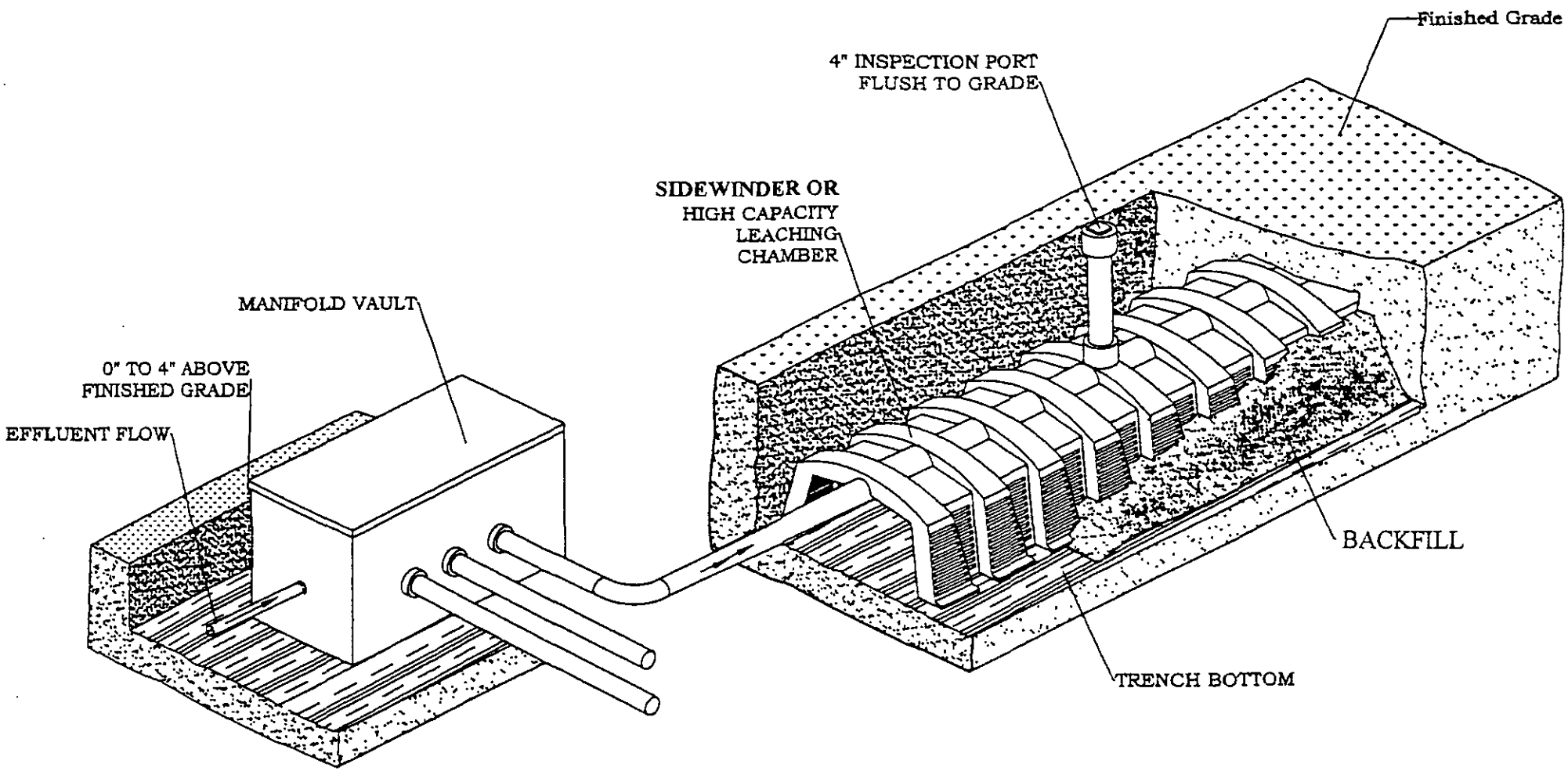


Profile View of Pressure Manifold for Sloping Site Installation (not to scale)



*Proposed system uses 10 taps

GRAVITY FED LEACHING CHAMBER
FED BY PRESSURE MANIFOLD



from TCWW Northview

Department of Environment, Health, and Natural Resources
Division of Environmental Health
On-Site Wastewater Section

Sheet: 1 of 2
Property ID: PO 199-371-03
Lot #: Amenity area
File #: 5558B
Code: 1

SOIL/SITE EVALUATION for ON-SITE WASTEWATER SYSTEM

Applicant: Toney Jacobs
Owner: The Sanctuary at Lake Wylie
Date Evaluated: 7/15/2004
Address: 10933 Ballantyne Crossing Ave., Charlotte, N. C. 28227
Property Size: Approx. 1.0 acres inv.
Proposed Facility: Amenity area Design Flow (.1949): 1050gpd
Property Recorded:
Location of Site:
Water Supply: [x] Public [ ] Individual [ ] Well [ ] Spring [ ] Other
Evaluation Method: [x] Auger Boring [ ] 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 (IN.)	.1956 Sapro Class	.1944 Restr Horiz	Profile Class & LTAR
1	LS, 6	0-3	GR/CL	FR/SEXP/SS/SP	>50" TO SOIL WETNESS	50	N/A	NONE	PS, IV .3GPD/FT²
		3-50	SBK/C	FI/SEXP/S/P					
2	"	0-2	GR/CL	FR/SEXP/SS/SP	>48" TO SOIL WETNESS	48	"	"	"
		2-48	SBK/C	FI/SEXP/S/P					
3	LS, 10	0-3	GR/SCL	FR/SEXP/SS/SP	"	"	"	"	"
		3-48	SBK/C	FI/SEXP/S/P					
4	"	0-4	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		4-48	SBK/C	FI/SEXP/S/P					
5	"	0-8	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		8-48	SBK/C	FI/SEXP/S/P					
6	"	0-5	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		5-48	SBK/C	FI/SEXP/S/P					

Description	Initial System	Repair System
Available Space (.1945)	PS	PS
System Type(s)		
Site LTAR	.3GPD/FT²	.3GPD/FT²

Other Factors (.1946):
Site Classification (.1948): PROVISIONALLY SUITABLE
Evaluated By: W. R. Marlin, LSS, 7/15/2004,
Others Present:

* COMMENTS:
100% repair

Landscape Position	Group	Texture	.1955 LTAR
R-Ridge	I	S-Sand	1.2 - 0.8
SS-Shoulder Slope		LS-Loamy Sand	
LS-Linear Slope			
FS-Food Slope	II	SL-Sandy Loam	0.8 - 0.6
NS-Nose Slope		L-Loam	
HS-Head Slope			
CC-Concave Slope	III	SI-Silt	0.6 - 0.3
CV-Convex Slope		SICL-Silty Clay Loam	
T-Terrace		CL-Clay Loam	
FP-Flood Plain		SCL-Sandy Clay Loam	
	IV	SC-Sandy Clay	0.4 - 0.1
		SIC-Silty Clay	
		C-Clay	

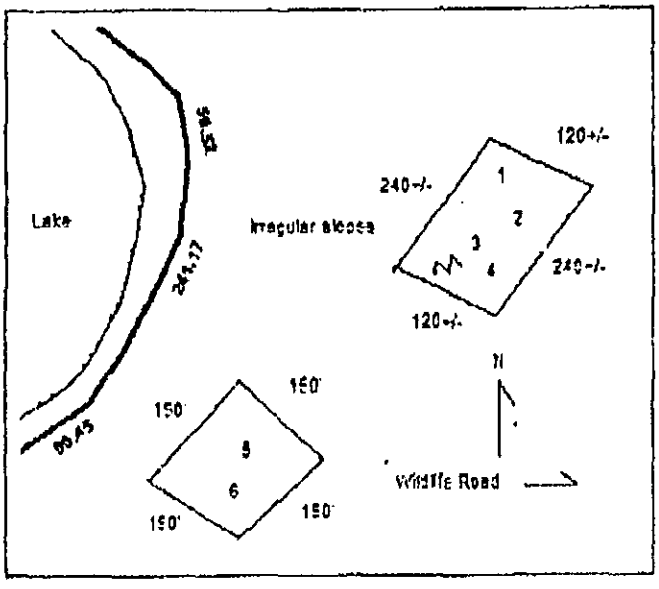
Structure
SG-Single Grain
M-Massive
CR-Crumb
GR-Granular
SBK-Subangular Blocky
ABK-Angular Blocky
PL-Platy
PR-Prismatic

Consistence Moist
VFR-Very Friable
FR-Friable
FI-Firm
VFI-Very Firm
EFI-Extremely Firm

Consistence Wet
NS-Non-Sticky
SS-Slightly Sticky
S-Sticky
VS-Very Sticky
NP-Non-Plastic
SP-Slightly Plastic
P-Plastic
VP-Very Plastic

Mineralogy
SEXP-Slightly Expansive
EXP-Expansive

Sketch of Soil Evaluation Locations



CONDITIONS OF IMPROVEMENT PERMIT

Permit Number: **5558B**

Tax Number: **199-371-03**

- The IMPROVEMNET PERMIT is subject to revocation if site plans or the intended use change. There is to be **NO** grading, filling, or disturbance of the soil in the area of the septic tank system or repair area.
- CONSTRUCTION AUTHORIZATION must be obtained prior to receiving a Building Permit. The Construction Authorization is **NOT** transferable. Do not clear, grade, fill or disturb soil prior to obtaining a Construction Authorization.
- Domestic-type wastewater only. No industrial process wastewater may be discharged into the system.

Basement: ☐ Yes ☒ No ☐ Partial Basement

Primary Wastewater System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☐ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental:

0.3 Long-term acceptance rate (GPD/ft^2)	1050 Max gallons/day wastewater flow	4500 Absorption Area (ft^2)	9 Trench spacing (min. on centers) (ft)
Serviced by private well: ☐ Yes ☒ No	3000 Gallon septic tank	1500 Total trench length (ft)	24 Maximum trench depth (in) (At least 12" of provisionally suitable soil must remain between trench bottom and unsuitable soil conditions.)
na Bedrooms in residence	3000 Gallon pump tank	na Depth of stone (in)	

Any surface water present: **Yes** Type: **Lake** Minimum separation distance (ft): **100**

Additional conditions: **Install according to plans on file submitted by Landscape Design. Amenity Site**

Repair Area System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☐ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental:

4500 Absorption Area (ft^2) 1500 Total trench length (ft)	na Depth of stone (in)	9 Trench spacing (min. on centers) (ft)	24 Maximum trench depth (in)

The undersigned, an authorized agent of the MECKLENBURG COUNTY HELTH DEPARTMENT, certifies that the Department has approved the Request for the Job Location contained in this document. The approval is granted in accordance with the provisions of Laws and Rules For Sewage, Treatment and Disposal in effect at the time of issuance of the permit and is subject to the following provisions:

*** No work shall be conducted on the septic tank system until an Installation, Construction, Alteration and/or Repair Approval is granted by this Department.

*** This Improvement permit is transferable.

DENR Authorized Agent — Date: 9/27/05

Owner/Agent Signature — Date: 9-27-05

MECKLENBURG COUNTY
HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR.
SUITE 211
700 N. TRYON ST.
CHARLOTTE, NC 28202
(704) 336-5103

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL, HEALTH, AND
NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

SEPTIC SYSTEM CALCULATIONS

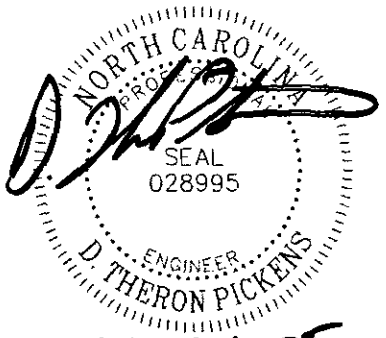
FOR

SANCTUARY SITE – JJ AUDUBON LODGE & CAMP PHASE II

REVISION TO THE PERMIT ISSUED 08-26-2004
MCHD FILE #5558B

June 2005
LandDesign PN: 1005136





06-24-05

LandDesign.

TABLE OF CONTENTS

INTRODUCTION

SEPTIC SYSTEM CALCULATIONS

SUMMARY OF SYSTEM SPECIFICATIONS & PUMP REQUIREMENTS

PUMP CURVE

SEPTIC TANK DETAIL

PUMP TANK DETAIL

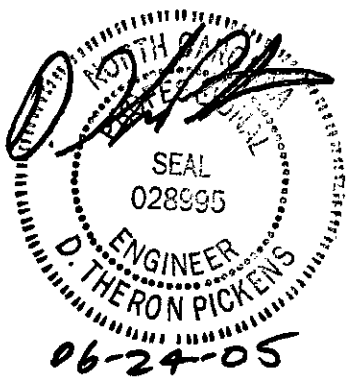
PRIMARY DRAIN FIELD SOIL EVALUATION

REPAIR FIELD SOIL EVALUATION

CONDITIONS OF EXISTING PERMIT

DRAWINGS (ATTACHED)

1. SEPTIC SYSTEM OVERALL PLAN (C7.9 TJ)
2. REPAIR DRAIN FIELD (C7.9 TJa)
3. PRIMARY DRAIN FIELD (C7.9 TJb)
4. SEPTIC LINE PROFILE (C7.9 TJc)
5. MANIFOLD AND TRENCH DETAILS (C7.9 TJd)



EXTRACT FROM REPORT BY TONEY JACOBS & ASSOCIATES

Explanation of revision to Permit 5558B (Sanctuary Amenity Site – JJ Audubon Lodge and Camp)

The Sanctuary Amenity site was originally permitted in August 24, 2004 assuming approximately 350 homes from the Sanctuary phases 1-4 would use the facilities. Based on water records from other similar facilities, the design flow was based on 3 gpd/home for a maximum design flow of 1050 gpd. A 25% reduction system and repair were permitted.

After this permit was issued, Crescent decided that it would like to allow approximately 250 additional homes from a proposed sewered community to use the Amenity site. The additional homes would be from a Crescent community. This would bring the total number of homes using the facility to 600, with a design flow of 1800 gpd.

The additional land for the revised system has been identified and has been evaluated by Mr. Bill Marlin of the Mecklenburg County Health Department. Toney C. Jacobs and Associates, Inc. flagged the new primary system and LandDesign has engineered the design. The proposed system will use dual pumps and pump to two subfields. The system and repair area of the August 24, 2004 permit will now be the repair area for the revised system.

EXTRACT FROM REPORT SUBMITTED BY TONEY JACOBS & ASSOCIATES ON AUG. 12, 2004 TO GET PERMIT

The Sanctuary Amenity Site Septic System Design

The proposed septic system will serve the amenity complex for The Sanctuary subdivision. This is a Crescent Resources, Inc. residential subdivision off Wildlife and Island Point Roads in Mecklenburg County. There will be approximately 350 five-bedroom homes in this subdivision. In February 2004, we discussed the primary features of the amenity site with David Cornelius and Mr. Kelly Randall of the Mecklenburg County Health Department and reviewed the water use records from The Harbour subdivision in an effort to determine a reasonable design flow for The Sanctuary amenity site. These were the same water records used to permit The Farms amenity site in Iredell County, which is currently being constructed.

We discussed that trying to tie the design flow to a per lot basis made the most sense. Over the period we monitored the Harbour, the average water use at the amenity site per lot was 0.5 gpd/lot with a range of .03 to 2.99 gpd/lot. In our February meeting we discussed using a 3 gpd/lot for the design of The Sanctuary amenity site. This number was approved by Mr. Cornelius and Mr. Randall. This reflects a 1050 gpd design flow for The Sanctuary amenity site. If flows are similar to The Harbour, the system will be over designed, but this number is probably reasonable given there are more proposed amenities at The Sanctuary vs. The Harbour. The extras are basically more tennis courts, an outdoor amphitheater, and a hot tub (spa). It is our understanding that the Amenity site is being constructed for the use of the residents of The Sanctuary subdivision and their guests only. According to the attached site plan, wastewater going to the septic system will only be generated at the lodge. This wastewater should only come from the sinks, toilets, and showers.

The soils at the proposed septic areas for the amenity site were evaluated by Mr. Bill Marlin of the Mecklenburg County Health Department on July 15, 2004. The soils were approved at a 0.3 gpd/ft^2 LTAR. Toney C. Jacobs and Associates, Inc. flagged the primary and repair systems in the field, and the proposed lines have been located by the surveyor. Attached is the site plan showing the system layout. Also attached are the details and specifications necessary to install the proposed system. Tri-County Wastewater (TCWW) will be the certified operator for the proposed system. Any requirements of TCWW that are greater than those in this plan or required by the county should be discussed with Mr. Tim Bannister of TCWW. All system components and installation procedures should meet or exceed state and county regulations. If there are any questions please call Toney Jacobs, the Mecklenburg County Health Department or Mr. Tim Bannister of TCWW.

A condition of the Authorization to Construct should be an onsite meeting with the installer, TCWW, Toney C. Jacobs and Associates and the County Environmental Health Department Staff prior to installation to review the system location and components.

SEPTIC SYSTEM CALCULATIONS

Septic System Specification and Design
SANCTUAURY AMENITY SITE - JJ AUDUBON LODGE & CAMP

SEPTIC SYSTEM SHOULD BE INSTALLED AND TESTED TO MEET LAWS AND RULES OUTLINED IN NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES SEWAGE TREATMENT AND DISPOSAL SYSTEMS 15A NCAC 18A .1900.

Design Flow (Q)

Design Flow = no. of lots **x** flow rate

Approx. no. of lots using facility= 350 (initial estimate) + 250 (inclusive of all parcels)

= 600 lots

Flow rate = 3gpd/lot;

Design Flow = 600 lots 3gpd/lot

= ***1800gpd***

LTAR

Long Term Acceptance Rate based on Soil/ Site Evaluation Report (see attached report by W.R. Marlin, Meck. County Health Dept)

=$0.3gpd/ft^2$

Septic Tank Sizing (for sewage flow between 1,500 and 4,500 gallons)

Per 15A NCAC 18A .1952 (b)(2)(C) of NCDEHNR Sewage Treatment and Disposal Systems

Volume req. = 0.75Q + 1,125

= (0.75 * 1800) + 1,125 = 2475gal for minimum septic tank size. Use ***3000gal*** Septic Tank capacity

Pump Tank Sizing

Per 15A NCAC 18A .1952 (C)(1)(B) of NCDEHNR Sewage Treatment and Disposal Systems

Equal to septic tank size

3000gal Pump Tank capacity

Type and Length of Trenches

Per 15A NCAC 18A .1955 (c) of NCDEHNR Sewage Treatment and Disposal Systems

Proposing 25% reduction, Infiltrator chambers or other approved 25% reduction system for primary and repair system.

Assume 3ft wide trenches.

Total length of trench required = Design Flow (Q) / (LTAR * Trench Width)

1800gpd / (0.3gpd/ft^2 * 3ft) = 2000ft (conventional trench before 25% trench reduction)

2000ft * 0.75 = 1500 ft required for drain field trenches after 25% trench reduction. Please refer to 15A NCAC 18A.1969 (9) & (10) for information regarding reductions in total nitrification trench length.

"When the design daily flow from a single system exceeds 3,000 gallons per day or when the total length of nitrification lines exceeds 2,000 linear feet in a single system, alternating siphons or pumps shall be used which shall discharge to separate nitrification fields" per 15A NCAC 18A.1952 (a).

Design daily flow from the system = 1800 gpm (below 3000 gpm). Total length of the nitrification lines = 1500' (below 2000'). Even though the length of nitrification line is under 2000', a dual pump system was requested. The Septic System has been designed for an alternating pump with a dual field layout. There is 750' of total trench length per field.

1. Design for pressure manifold distribution system. Use two separate nitrification fields with 750 linear feet of nitrification lines each.

2. Install trenches 24 – 36 in deep, level from end to end

3. Install observation port in each trench, down 2/3 of the trench

Pressure Manifold Design

Per "Pressure Manifold Design for Ground Absorption Sewage Systems", S.J. Berkowitz, Feb. 1986

Dual Manifold System Design
Use two sub-fields with 750ft 25% reduction trench each.
The Primary System will use:

i) Sub-field with 6 trenches each 125 ft long
ii) Sub-field with 5 trenches each 125 ft long & 2 trenches each 63 ft long

One pressure manifold will use ½ inch SCH 80 PVC tap per trench for a total of 6 taps

h = 2 ft of head pressure (assumed per p.3 of "Pressure Manifold Design for Ground Absorption Sewage Systems")
d = diameter of orifice, inches

Flow per tap $Q_t = 13(d^2)(h)^{½} = 13(0.546^2)(2)^{½}$
$= 5.5$gpm

Total flow required for the pressure manifold
= 6taps * 5.5gpm /tap = 33gpm

Use 3 inch SCH 80 barrel on pressure manifold (see diagram)

The other pressure manifold will use ½ inch SCH 80 PVC tap per trench for a total of 6 taps with divider on 6th tap to split flow equally between 63ft long trenches.

Head Loss Due to Friction using
Use Williams Hazens Equation of Head Loss

h_f= Head Loss (ft)
L = Length of Pipe (ft) => 2600 per field
C = Design Coefficient Based on Type of Pipe => C =150 for SDR 13.5
Q = Flow Rate (gal/min) => 33 gpm
D = Diameter of orifice => 2.982 in per Ewing spec sheet

$h_f = [0.002083L(100/C)^{1.85}Q^{1.85}]/ D^{4.8655}$
$h_f = [0.002083(2600)(100/150)^{1.85}33^{1.85}]/ 2.982^{4.8655}$
h_f=8.1 ft

Repair Area
Required 1500 ft of 25% reduction system for proposed repair
Provided approx, 2293+ ft of repair has been shown on the site plan.

SUMMARY OF SYSTEM SPECIFICATIONS & PUMP REQUIREMENTS

Summary of System Specifications & Pump Requirements
SANCTUAURY AMENITY SITE - JJ AUDUBON LODGE & CAMP
(*pump requirement calculations based on engineers final grades of the amenity site and should be verified prior to installation by septic installer)

Daily Design Flow:	1800gpd
Septic Tank Size:	3000gal (2 compartments)
Pumping Tank Size:	3000gal
Effluent Loading Rate:	0.3gpd/ft^2 per Soil/Site Evaluation
Total Length and Diameter of Supply Pipe:	Approx. 2600 ft for each 3" SDR 13.5 PVC supply line (2668.11' and 2669.55') as specified by NCDOT
Number and Length of Laterals:	11 @ 125' and 2@ 63 dosed by a dual system manifold Use 25% reduction trench - infiltrator chambers
Pressure Manifold:	i) 6 taps at ½ inch SCH 80 PVC ii) 6 taps at ½ inch SCH 80 PVC w/1 divider
Flow Rate through the system:	i) 33gpm per drain field ii) 33gpm per drain field **Total = 66gpm*** *alternating pump system
Elevation Head:	657' – 589' = 68'
Pressure Head:	2ft (assumed)
Friction Head:	8.1'
20% contingency:	.20(8.1 + 2 + 68) = 15.62'
Total Head:	15.62' + 8.1 + 2 + 68 = 93.72'
Pump requirements	33 gpm at 95 ft of head: Use 2 Goulds WE20H pumps or equivalent w/ compatible electrical
Dosing Volume:	450gal – 4 doses /day at design flow
Depth of water pumped per dose:	Calculated to specific tank by measure or dealer engineering specification (1cubic ft. of water = 7.48 gal).
Pump run per dose	Approx. 14 min. (450 gal/ 33 gpm = 13.64 min.)
Check Valve	Yes
Siphon Break hole:	Yes

PUMP CURVE

GOULDS PUMPS



Submersible Effluent Pump

MODEL 3885

WE Series

PROSURANCE AVAILABLE FOR RESIDENTIAL APPLICATIONS.

APPLICATIONS

Specifically designed for the following uses:

- Homes
- Farms
- Trailer courts
- Motels
- Schools
- Hospitals
- Industry
- Effluent systems

SPECIFICATIONS

Pump

- Solids handling capabilities: ¾" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature: 104°F (40°C) continuous 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

FEATURES

■ **Impeller:** Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

■ **Casing:** Cast iron volute type for maximum efficiency. 2" NPT discharge.

■ **Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE** sealing faces. Stainless steel metal parts, BUNA-N elastomers.

■ **Shaft:** Corrosion-resistant, stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.

■ **Fasteners:** 300 series stainless steel.

■ Capable of running dry without damage to components.

■ Designed for continuous operation when fully submerged.

MOTORS

■ Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.

■ Class B insulation on ⅓-1½ HP models.

■ Class F insulation on 2 HP models.

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.
- ⅓ – 1 HP models have NEMA three prong grounding plugs.
- 1½ HP and larger units have bare lead cord ends.

Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.

■ **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.

■ **Bearings:** Upper and lower heavy duty ball bearing construction.

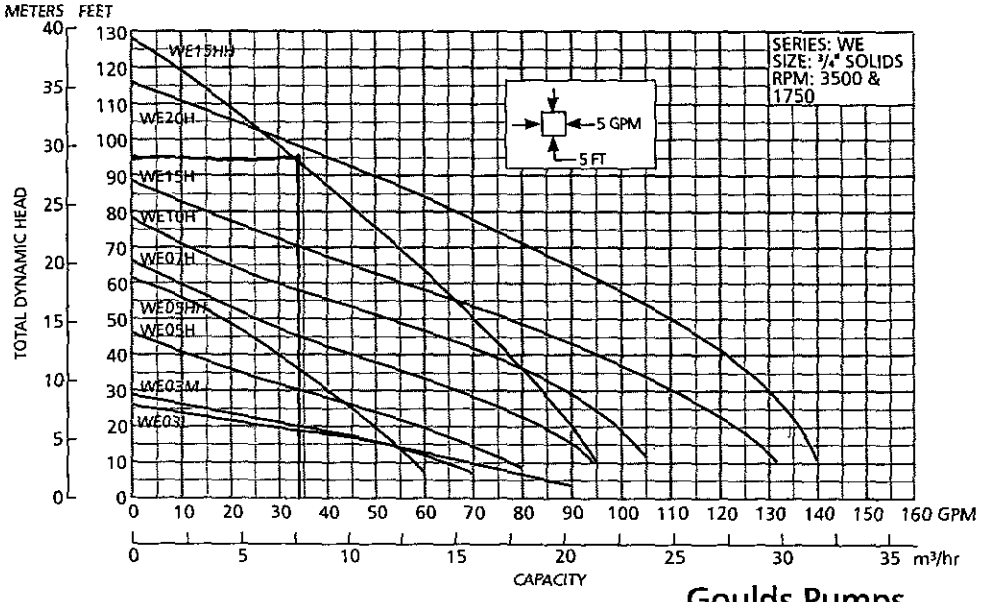
■ **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.

■ **O-ring:** Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS

Tested to UL 778 and CSA 22.2 108 Standards By Canadian Standards Association File #LR38549

Goulds Pumps is ISO 9001 Registered.



Goulds Pumps

ITT Industries

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B3885

GOULDS PUMPS

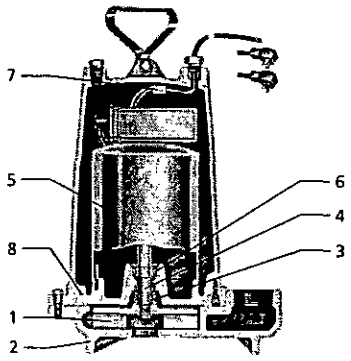
Submersible Effluent Pump

MODEL 3885

WE Series

COMPONENTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O-Ring



MODELS

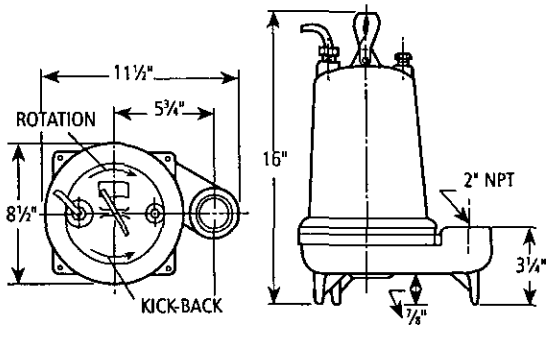
Order No.	HP	Volts	Phase	Max. Amp.	RPM	Solids	Wt. (lbs.)
WE0311L	⅓	115	1	10.7	1750	¾"	56
WE0318L		208		6.8			
WE0312L		230		4.9			
WE0311M		115		10.7			
WE0318M		208		6.8			
WE0312M		230		4.9			
WE0511H	½	115	1	14.5	3500		60
WE0518H		208		8.1			
WE0512H		230		7.3			
WE0538H		200	3	4.9			
WE0532H		230		3.3			
WE0534H		460		1.7			
WE0537H		575		1.4			
WE0511HH		115	1	14.5			
WE0518HH		208		8.1			
WE0512HH		230		7.3			
WE0538HH		200	3	4.9			
WE0532HH		230		3.6			
WE0534HH		460		1.8			
WE0537HH		575		1.5			
WE0718H	¾	208	1	11.0			70
WE0712H		230		10.0			
WE0738H		200	3	6.2			
WE0732H		230		5.4			
WE0734H		460		2.7			
WE0737H		575		2.2			
WE1018H	1	208	1	14.0			
WE1012H		230		12.5			
WE1038H		200	3	8.1			
WE1032H		230		7.0			
WE1034H		460		3.5			
WE1037H		575		2.8			
WE1518H	1½	208	1	17.5			80
WE1512H		230		15.7			
WE1538H		200	3	10.6			
WE1532H		230		9.2			
WE1534H		460		4.6			
WE1537H		575		3.7			
WE1518HH		208	1	17.5			
WE1512HH		230		15.7			
WE1538HH		200	3	10.6			
WE1532HH		230		9.2			
WE1534HH		460		4.6			
WE1537HH		575		3.7			
WE2012H	2	230	1	18.0			83
WE2038H		200	3	12.0			
WE2032H		230		11.6			
WE2034H		460		5.8			
WE2037H		575		4.7			

PERFORMANCE RATINGS (gallons per minute)

Order No.		WE03L	WE03M	WE05H	WE07H	WE10H	WE15H	WE05HH	WE15HH	WE20H
	HP	⅓	⅓	½	¾	1	1½	½	1½	2
	RPM	1750	1750	3500	3500	3500	3500	3500	3500	3500
Total Head Feet of Water	5	86	–	–	–	–	–	–	–	–
	10	70	63	78	94	–	–	58	95	–
	15	52	52	70	90	103	128	53	93	138
	20	27	35	60	83	98	123	49	90	136
	25	–	–	48	76	94	117	45	87	133
	30	–	–	35	67	88	110	40	83	130
	35	–	–	22	57	82	103	35	80	126
	40	–	–	–	45	74	95	30	77	121
	45	–	–	–	35	64	86	25	74	116
	50	–	–	–	25	53	77	–	70	110
	55	–	–	–	–	40	67	–	66	103
	60	–	–	–	–	30	56	–	63	96
	65	–	–	–	–	20	45	–	58	89
	70	–	–	–	–	–	35	–	55	81
	75	–	–	–	–	–	25	–	51	74
	80	–	–	–	–	–	–	–	47	66
	90	–	–	–	–	–	–	–	37	49
	100	–	–	–	–	–	–	–	28	30

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



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Goulds Pumps

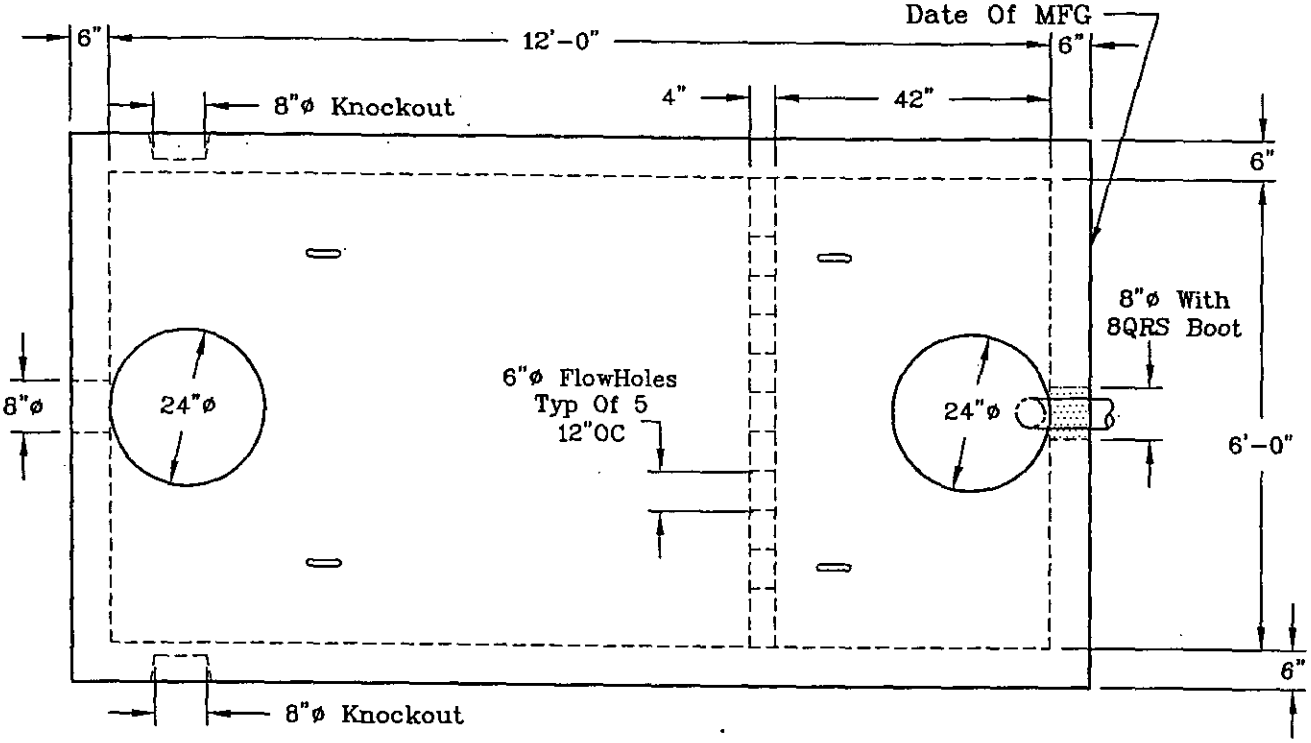
ITT Industries

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

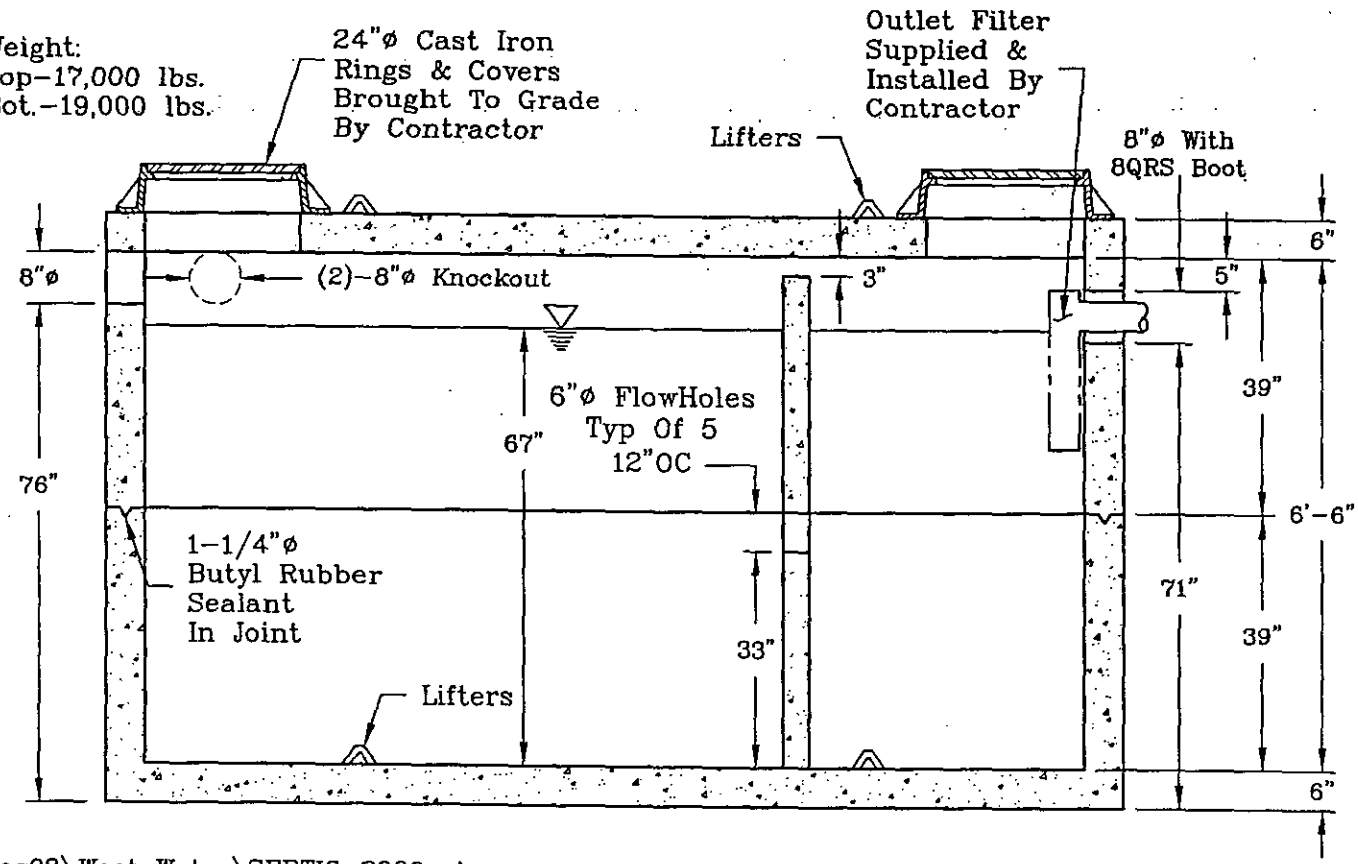
SEPTIC TANK DETAIL

NOTES:
1. REINFORCEMENT: H-20 BRIDGE LOADING
2. CONCRETE: 4000 PSI @28 DAYS

Imprinted On Tank:
SRPC
STB-920
3000 Gal
Date Of MFG



Weight:
Top-17,000 lbs.
Bot.-19,000 lbs.



Catalog03\WasteWater\SEPTIC_3000gst

Stay-Right Precast, Inc.
www.stayright.com

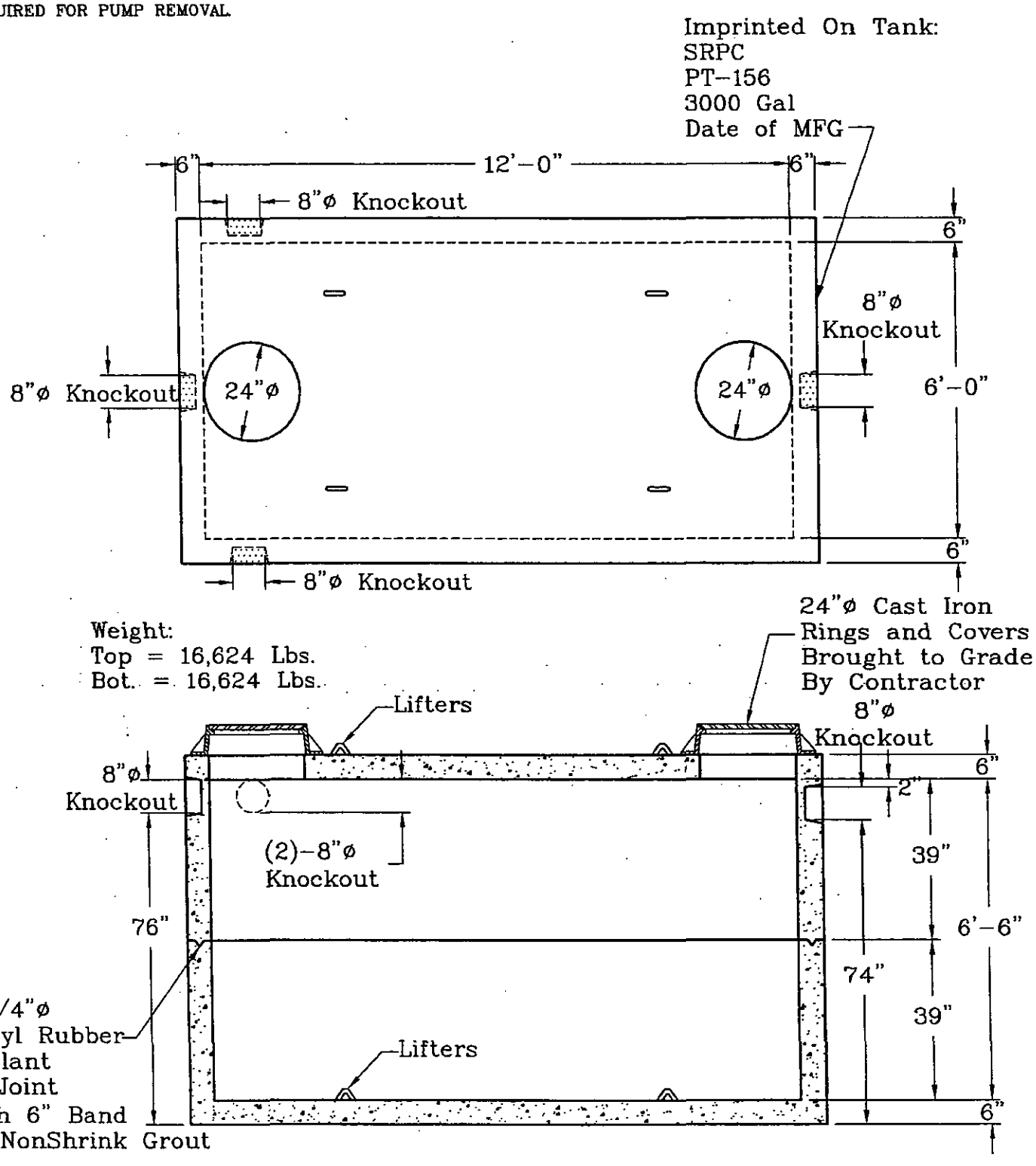
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P.O. Box 58659
Raleigh, NC 27658
Phone (919) 876-8600

3000 Gallon Septic Tank Traffic Rated

PUMP TANK DETAIL

NOTES:
1. REINFORCEMENT: H-20 BRIDGE LOADING
2. CONCRETE: 4000 PSI @28 DAYS
3. OUTLET ACCESS OPENING MAY VARY AS REQUIRED FOR PUMP REMOVAL.



Catalog03\WasteWater\PUMP_3000gpt

Stay-Right Precast, Inc.
www.stayright.com

Proprietary Note
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Raleigh, NC 27658
Phone (919) 876-8600

3000 Gallon Pump Tank Traffic Rated

PRIMARY DRAIN FIELD SOIL EVALUATION

Department of Environment, Health, and Natural Resources
Division of Environmental Health
On-site Wastewater Section

Sheet: 1 of 2
Property ID: PO 199-371-03
Lot #: Amenity area
File #: 5558B
Code: 1

SOIL/SITE EVALUATION for ON-SITE WASTEWATER SYSTEM

Owner: The Sanctuary at Lake Wylie
Applicant: Toney Jacobs
Address: 10933 Ballantyne Crossing Ave., Charlotte, n. C. 28227
Date Evaluated: 10/26/2004
Proposed Facility: Amenity area
Design Flow (.1949): 1050gpd
Property Size: 1.0a. Inv.
Location of Site: Off Old Camp Trail
Property Recorded:
Water Supply: [x] Public [ ] Individual [ ] Well [ ] Spring [ ] Other
Evaluation Method: [x] Auger Boring [ ] Pit [ ] Cut
Type of Wastewater: [x] Sewage [ ] Industrial Process [ ] Mixed

Pit/Profile No.	.10 Landscape Position/ Slope%	Horizon Depth (IN)	SOIL MORPHOLOGY .1941 .04 Structure/ Texture	.04 Consistence/ Mineralogy	OTHER PROFILE FACTORS .02 Soil Wetness/ Redox Color	.03 Soil Depth (IN)	.56 Saprolite Class	.04 Restrictive Horiz.	Profile Class & Suitability
1	LS, 8	0-3	GR/CL	FR/SEXP/SS/SP	>48" TO SOIL WETNESS	48+	N/A	NONE	PS, IV
		3-48	SBK/C	FI/SEXP/S/P					.3GPD/FT^2
2	"	0-6	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		6-48	SBK/C	FI/SEXP/S/P					
3	"	0-5	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		5-48	SBK/C	FI/SEXP/S/P					
4	LS, 5	0-2	GR/CL	FR/SEXP/SS/SP	>49" TO SOIL WETNESS	49+	"	"	"
		2-49	SBK/C	FI/SEXP/S/P					
5	"	0-4	GR/CL	FR/SEXP/SS/SP	>48" TO SOIL WETNESS	48+	"	"	"
		4-48	SBK/C	FI/SEXP/S/P					
6	"	0-3	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		3-48	SBK/C	FI/SEXP/S/P					

Description	Initial System	Repair System
Available Space (.1945)	PS	PS
System Type(s)		
Site LTAR	.3GPD/FT^2	.3GPD/FT^2

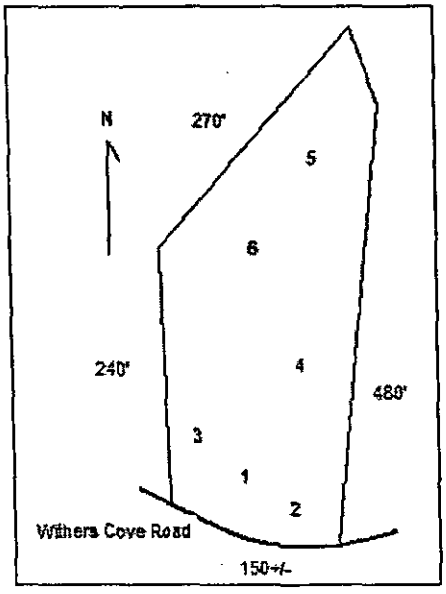
Other Factors (.1946):
Site Classification (.1948): PROVISIONALLY SUITABLE
Evaluated By: W. R. Marlin, LSS, 10/26/2004
Others Present:

COMMENTS:
100% repair required

Landscape Position	Group	Texture	.1955 LTAR	Structure
R-Ridge	I	S-Sand	1.2 - 0.8	SG-Single Grain
SS-Shoulder Slope		LS-Loamy Sand		M-Massive
LS-Linear Slope				CR-Crumb
FS-Food Slope	II	SL-Sandy Loam	0.8 - 0.6	GR-Granular
NS-Nose Slope		L-Loam		SBK-Subangular Blocky
HS-Head Slope				ABK-Angular Blocky
CC-Concave Slope	III	SI-Silt	0.6 - 0.3	PL-Platy
CV-Convex Slope		SICL-Silty Clay Loam		PR-Prismatic
T-Terrace		CL-Clay Loam		
FP-Flood Plain		SCL-Sandy Clay Loam		
	IV	SC-Sandy Clay	0.4 - 0.1	
		SIC-Silty Clay		
		C-Clay		

Consistence Moist	Consistence Wet	Mineralogy
VFR-Very Friable	NS-Non-Sticky	SEXP-Slightly Expansive
FR-Friable	SS-Slightly Sticky	EXP-Expansive
FI-Firm	S-Sticky	
VFI-Very Firm	VS-Very Sticky	
EFI-Extremely Firm	NP-Non-Plastic	
	SP-Slightly Plastic	
	P-Plastic	
	VP-Very Plastic	

Sketch of Soil Evaluation Locations



REPAIR FIELD SOIL EVALUATION

...nment, Health, and Natural Resources
...ntal Health
...ection

Sheet: 1 of 2
Property ID: PO 199-371-03
Lot #: Amenity area
File #: 5558B
Code: 1

SOIL/SITE EVALUATION
for ON-SITE WASTEWATER SYSTEM

(NEW REPAIR AREA)

Owner: The Sanctuary at Lake Wylie
Applicant: Toney Jacobs
Address: 10933 Ballantyne Crossing Ave., Charlotte, N. C. 28227
Date Evaluated: 7/15/2004
Proposed Facility: Amenity area
Design Flow (.1949): 1050gpd
Property Size: Approx. 1.0 acres inv.
Location of Site:
Property Recorded:
Water Supply: [x] Public [ ] Individual [ ] Well [ ] Spring [ ] Other
Evaluation Method: [x] Auger Boring [ ] Pit [ ] Cut
Type of Wastewater: [x] Sewage [ ] Industrial Process [ ] Mixed

PROFILE #	1940 Landscape Position/ Slope%	Horizon Depth (IN.)	SOIL MORPHOLOGY 1941 Structure/ Texture	SOIL MORPHOLOGY 1941 Consistence Mineralogy	OTHER PROFILE FACTORS .1942 Soil Wetness/ Color	.1943 Soil Depth (IN.)	1956 Sapro Class	.1944 Restr Horiz	Profile Class & LTAR
1	LS, 6	0-3	GR/CL	FR/SEXP/SS/SP	>50" TO SOIL WETNESS	50	N/A	NONE	PS, IV
		3-50	SBK/C	FI/SEXP/S/P					.3GPD/FT²
2	"	0-2	GR/CL	FR/SEXP/SS/SP	>48" TO SOIL WETNESS	48	"	"	"
		2-48	SBK/C	FI/SEXP/S/P					
3	LS, 10	0-3	GR/SCL	FR/SEXP/SS/SP	"	"	"	"	"
		3-48	SBK/C	FI/SEXP/S/P					
4	"	0-4	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		4-48	SBK/C	FI/SEXP/S/P					
5	"	0-8	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		8-48	SBK/C	FI/SEXP/S/P					
6	"	0-5	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		5-48	SBK/C	FI/SEXP/S/P					

Description	Initial System	Repair System
Available Space (.1945)	PS	PS
System Type(s)		
Site LTAR	.3GPD/FT²	.3GPD/FT²

Other Factors (.1946):
Site Classification (.1948): PROVISIONALLY SUITABLE
Evaluated By: W. R. Marlin, LSS, 7/15/2004, W. R. Marlin
Others Present:

COMMENTS:
100% repair

Landscape Position	Group	Texture	1955 LTAR
R-Ridge	I	S-Sand	1.2 - 0.8
SS-Shoulder Slope		LS-Loamy Sand	
LS-Linear Slope			
FS-Food Slope	II	SL-Sandy Loam	0.8 - 0.6
NS-Nose Slope		L-Loam	
HS-Head Slope			
CC-Concave Slope	III	SI-Silt	0.6 - 0.3
CV-Convex Slope		SICL-Silty Clay Loam	
T-Terrace		CL-Clay Loam	
FP-Flood Plain		SCL-Sandy Clay Loam	
	IV	SC-Sandy Clay	0.4 - 0.1
		SIC-Silty Clay	
		C-Clay	

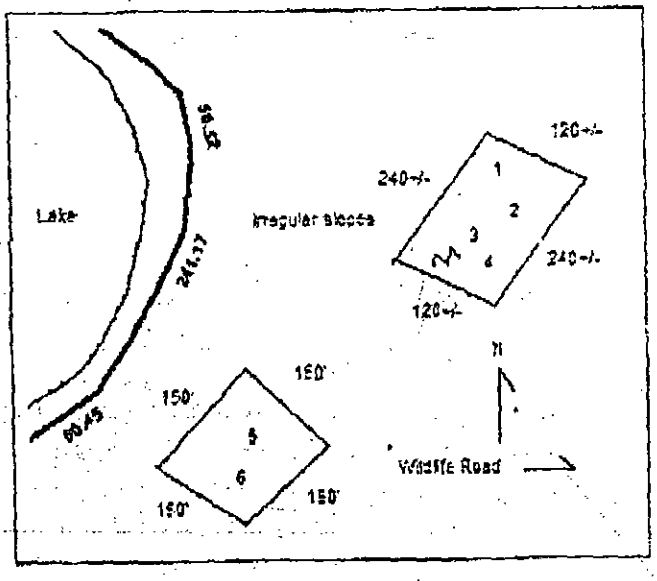
Structure
SG-Single Grain
M-Massive
CR-Crumb
GR-Granular
SBK-Subangular Blocky
ABK-Angular Blocky
PL-Platy
PR-Prismatic

Consistence Moist
VFR-Very Friable
FR-Friable
FI-Firm
VFI-Very Firm
EFI-Extremely Firm

Consistence Wet
NS-Non-Sticky
SS-Slightly Sticky
S-Sticky
VS-Very Sticky
NP-Non-Plastic
SP-Slightly Plastic
P-Plastic
VP-Very Plastic

Mineralogy
SEXP-Slightly Expansive
EXP-Expansive

Sketch of Soil Evaluation Locations



CONDITIONS OF EXISTING PERMIT

Permit Number: 5558B Amenity Site

CONDITIONS OF IMPROVEMENT PERMIT → Existing Permit

Tax Number: 199-371-0

- The IMPROVEMNET PERMIT is subject to *revocation if site plans or the intended use change.* There is to be NO grading, filling, or disturbance the soil in the area of the septic tank system or repair area.
- CONSTRUCTION AUTHORIZATION must be obtained prior to receiving a Building Permit. The Construction Authorization is NOT transferable. Do not clear, grade, fill or disturb soil prior to obtaining a Construction Authorization.
- Domestic-type wastewater only. No industrial process wastewater may be discharged into the system.

Basement: ☐ Yes ☒ No ☐ Partial Basement

Primary Wastewater System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☐ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental

0.3 Long-term acceptance rate (GPD/ft^2)	1050 Max gallons/day wastewater flow	3500 Absorption Area (ft^2)	9 Trench spacing (min. on centers) (ft)
Serviced by private well: ☐ Yes ☒ No	2000 Gallon septic tank	880 Total trench length (ft)	24 Maximum trench depth (in) (At least 12" of provisionally suitable soil must remain between trench bottom and unsuitable soil conditions.)
na Bedrooms in residence	2000 Gallon pump tank	na Depth of stone (in)	

Any surface water present: Yes Type: Lake Minimum separation distance (ft): 100

Additional conditions: **Install according to plans on file submitted by Toney Jacobs and associates.**

Repair Area System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☐ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental

3500 Absorption Area (ft^2) 880 Total trench length (ft)	na Depth of stone (in)	9 Trench spacing (min. on centers) (ft)	24 Maximum trench depth (in

The undersigned, an authorized agent of the MECKLENBURG COUNTY HELTH DEPARTMENT, certifies that the Department has approved the Request for the Job Location contained in this document. The approval is granted in accordance with the provisions of Laws and Rules For Sewage, Treatment and Disposal in effect at the time of issuance of the permit and is subject to the following provisions:

*** No work shall be conducted on the septic tank system until an Installation, Construction, Alteration and/or Repair Approval is granted by this Department.

*** This Improvement permit is transferable.

RS 8/26/04

DENR Authorized Agent Date

MECKLENBURG COUNTY
HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR.
SUITE 211
700 N. TRYON ST.
CHARLOTTE, NC 28202
(704) 336-5103

9-7-04

Owner/Agent Signature Date

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL, HEALTH, AND
NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

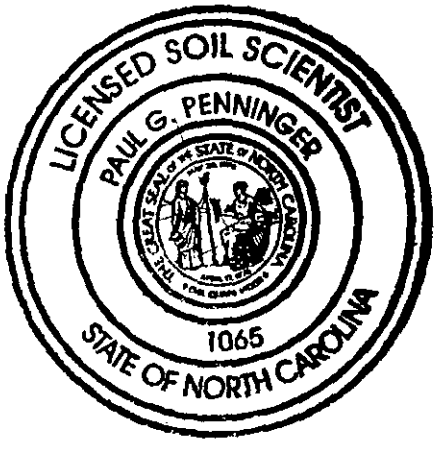
PO Box 36959 Charlotte, NC 28236-6959 223 North Graham Street Charlotte, NC 28202 V: 704.333.0325 F: 704.376.8235

PRESSURE MANIFOLD, 25% REDUCTION - INFILTRATOR CHAMBER SEPTIC SYSTEM FOR SUBSURFACE WASTEWATER DISPOSAL AT THE SANCTUARY AMENITY SITE MECKLENBURG COUNTY, NORTH CAROLINA

Prepared for:
Crescent Resources Inc.
400 S. Tyron Street
Charlotte, NC 28201

Prepared by:
Toney C. Jacobs & Associates, Inc.
168 Broadbill Drive
Mooresville, North Carolina 28117
office (704) 663-6905
fax (704) 662-9845
e-mail jacobs@i-america.net

August 12, 2004



Copy: Mr. David Cornelius, R.S.
Mecklenburg County Health Dept.

Mr. James Martin
Crescent Resources, Inc.

Paul G. Penninger, LSS
Toney C. Jacobs, LSS

The Sanctuary Amenity Site Septic System Design

The proposed septic system will serve the amenity complex for The Sanctuary subdivision. This is a Crescent Resources, Inc. residential subdivision off Wildlife and Island Point Roads in Mecklenburg County. There will be approximately 350 five-bedroom homes in this subdivision. In February 2004, we discussed the primary features of the amenity site with David Cornelius and Mr. Kelly Randall of the Mecklenburg County Health Department and reviewed the water use records from The Harbour subdivision in an effort to determine a reasonable design flow for The Sanctuary amenity site. These were the same water records used to permit The Farms amenity site in Iredell County, which is currently being constructed.

We discussed that trying to tie the design flow to a per lot basis made the most sense. Over the period we monitored the Harbour, the average water use at the amenity site per lot was 0.5 gpd/lot with a range of .03 to 2.99 gpd/lot. In our February meeting we discussed using a 3 gpd/lot for the design of The Sanctuary amenity site. This number was approved by Mr. Cornelius and Mr. Randall. This reflects a 1050 gpd design flow for The Sanctuary amenity site. If flows are similar to The Harbour, the system will be over designed, but this number is probably reasonable given there are more proposed amenities at The Sanctuary vs. The Harbour. The extras are basically more tennis courts, an outdoor amphitheater, and a hot tub (spa). It is our understanding that the Amenity site is being constructed for the use of the residents of The Sanctuary subdivision and their guests only. According to the attached site plan, wastewater going to the septic system will only be generated at the lodge. This wastewater should only come from the sinks, toilets, and showers.

The soils at the proposed septic areas for the amenity site were evaluated by Mr. Bill Marlin of the Mecklenburg County Health Department on July 15, 2004. The soils were approved at a 0.3 gpd/ft^2 LTAR. Toney C. Jacobs and Associates, Inc. flagged the primary and repair systems in the field, and the proposed lines have been located by the surveyor. Attached is the site plan showing the system layout. Also attached are the details and specifications necessary to install the proposed system. Tri-County Wastewater (TCWW) will be the certified operator for the proposed system. Any requirements of TCWW that are greater than those in this plan or required by the county should be discussed with Mr. Tim Bannister of TCWW. <u>All system components and installation procedures should meet or exceed state and county regulations. If there are any questions please call Toney Jacobs, the Mecklenburg County Health Department or Mr. Tim Bannister of TCWW.</u>

A condition of the Authorization to Construct should be an onsite meeting with the installer, TCWW, Toney C. Jacobs and Associates and the County Environmental Health Department Staff prior to installation to review the system location and components.

The Sanctuary Amenity Site Septic System Specifications and Design

Design Flow:
3 gpd/lot

3 gpd * approx. 350 lots = 1050 gpd design flow

LTAR:
0.3 gpd/ft^2

Type and length of trenches:
Proposing 25% reduction, Infiltrator chambers or other approved 25% reduction system for primary and repair system

1050 gpd / (0.3 gpd/ft^2 * 3 ft) = 1167 ft of conv. trench required

1167 * 0.75 = 875 ft of 25% reduction, Infiltrator chambers

-install trenches 24-36 in. deep, level from end to end

-install observation port in each trench, down 2/3 length of trench

Septic Tank Size
Volume Required = 1.17Q + 500

Volume Required = 1.17*1050 + 500 = 1729 gal for minimum septic tank size—use 2000 gal septic tank

Pump Tank Size
minimum of 2000 gal

Pressure Manifold Design
-system will use 10 trenches ~~100~~ 88 ft. long.

-pressure manifold will use one 1/2 inch SCH 80 PVC tap per trench for a total of 10 taps

-at 2 ft of head pressure, the flow per tap will be 5.5 gpm

-total flow required for the pressure manifold = 10 taps * 5.5 gpm/tap = 55 gpm

-use 4 in. SCH 80 barrel on pressure manifold (see diagram)

(An alternative design would use 5 taps off the manifold and use 5 flow dividers to split the flow to the 10 trenches. This alternative can be discussed prior to installation if there is a need to reduce gpm flow through system and reduce the pump size.)

Repair Area

- use 875 ft. of 25% reduction system for proposed repair
- approx. 1225+ ft. of repair has been shown on site plan

SUMMARY OF SYSTEM SPECIFICATIONS AND PUMP REQUIREMENTS FOR THE SANCTUARY AMENITY SYSTEM

(*pump requirement calculations based on contours of attached site plan for the amenity site and should be field verified prior to installation of tanks and drainfield by septic installer, after final grades are established)

Daily design flow:	1050 gpd.
Septic tank size:	2000 gal. (2 compartments)
Pumping tank size:	2000 gal.
Effluent loading rate:	0.3 gpd/ft^2
Total length and diameter of supply pipe:	approx. 850 ft. 3" SCH 40 PVC)
Number and length of laterals:	10@ ~~108~~ 98 ft. dosed by a pressure manifold (use 25% reduction trench - Infiltrator chambers)
Pressure Manifold:	use 10 taps at 1/2 in. SCH 80 PVC (flow is 5.5 gpm/tap at 2 ft. head pressure)
Flow rate through the system:	55 gpm
Elevation head:	*approx. 61'
Pressure head:	2.0'
Friction head:	approx. 8.6'
20% contingency	13.3'
Total head:	84.9'
Pump requirements:	55 gpm at 85' of head; use Goulds WE 20H pump or equivalent with compatible electrical
Dosing volume:	500 gal. – 2.1 doses/day at design flow
Depth of water pumped per dose:	calculated to specific tank by measure or dealer engineering specifications (1 cubic ft. of water equals 7.48 gal.)
Pump run per dose:	approx. 9 min
Check valve:	Yes
Siphon break hole:	No

LIST OF ATTACHMENTS

1. SITE PLAN
2. PUMP CURVE
3. MANIFOLD DETAIL
4. TRENCH DETAIL
5. MECKLENBURG COUNTY SOIL EVALUATION SHEETS
6. TCWW SYSTEM INSTALLATON MANUAL* (will forward when received fromTCWW)

GOULDS PUMPS



Submersible Effluent Pump

MODEL 3885

WE Series

PROSURANCE AVAILABLE FOR RESIDENTIAL APPLICATIONS.

APPLICATIONS

Specifically designed for the following uses:

- Homes
- Farms
- Trailer courts
- Motels
- Schools
- Hospitals
- Industry
- Effluent systems

SPECIFICATIONS

Pump

- Solids handling capabilities: ¾" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature: 104°F (40°C) continuous 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

FEATURES

■ **Impeller:** Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

■ **Casing:** Cast iron volute type for maximum efficiency. 2" NPT discharge.

■ **Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE** sealing faces. *Stainless steel metal parts,* BUNA-N elastomers.

■ **Shaft:** Corrosion-resistant, stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.

■ **Fasteners:** 300 series stainless steel.

■ Capable of running dry without damage to components.

■ Designed for continuous operation when fully submerged.

MOTORS

■ Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.

■ Class B insulation on ⅓-1½ HP models.

■ Class F insulation on 2 HP models.

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.
- ⅓ and ½ HP models have NEMA three prong grounding plugs.
- ¾ HP and larger units have bare lead cord ends.

Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.

■ **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.

■ **Bearings:** Upper and lower heavy duty ball bearing construction.

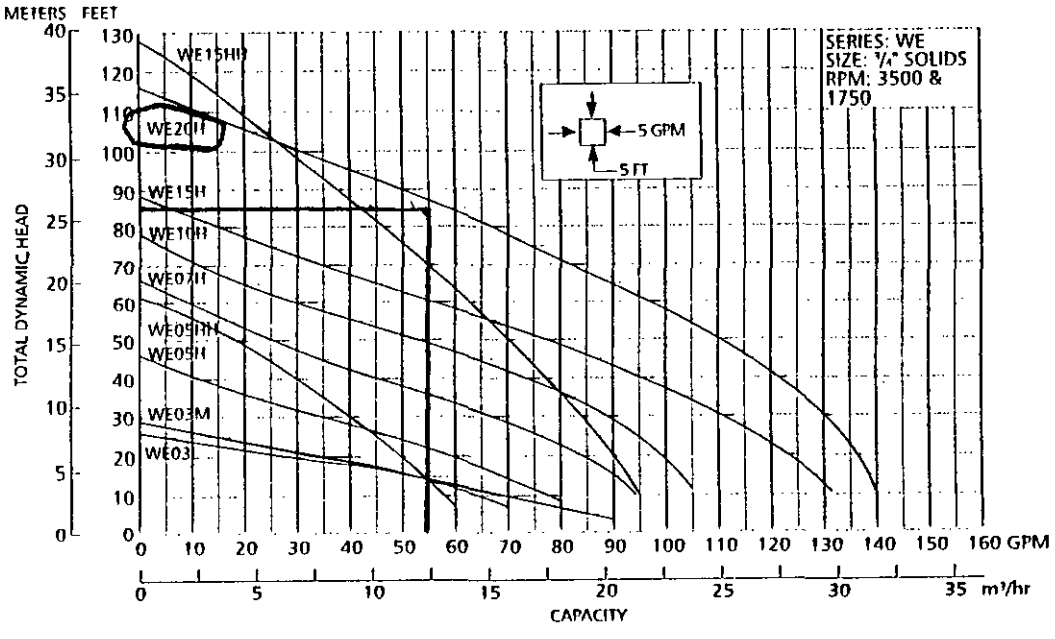
■ **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.

■ **O-ring:** Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS

C SA US — Tested to UL 778 and CSA 22.2 108 Standards By Canadian Standards Association File #LR38549

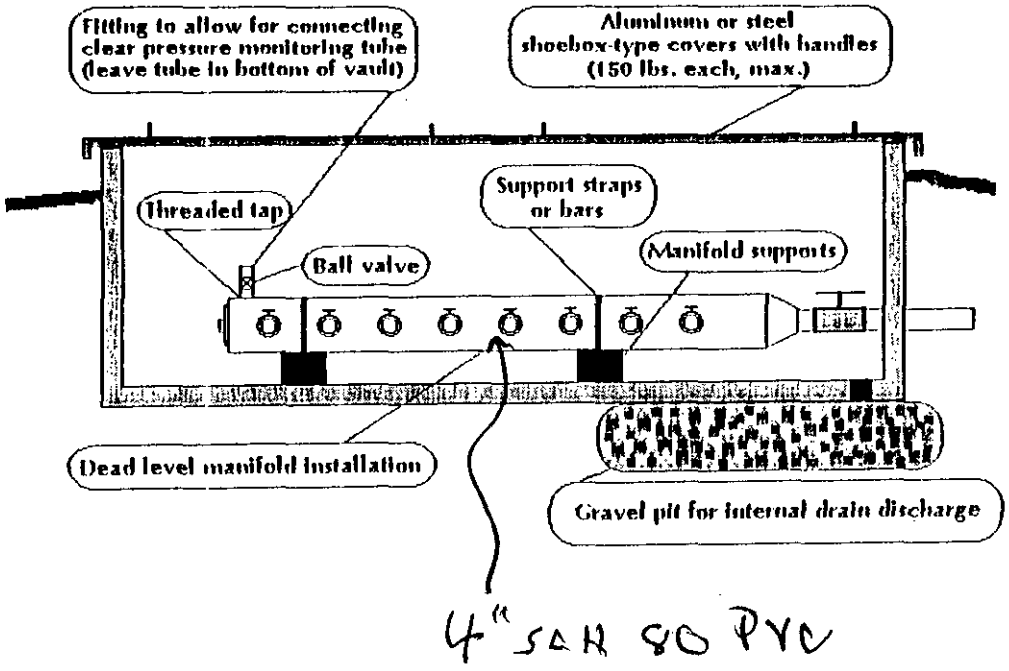
Goulds Pumps is ISO 9001 Registered.



Goulds Pumps

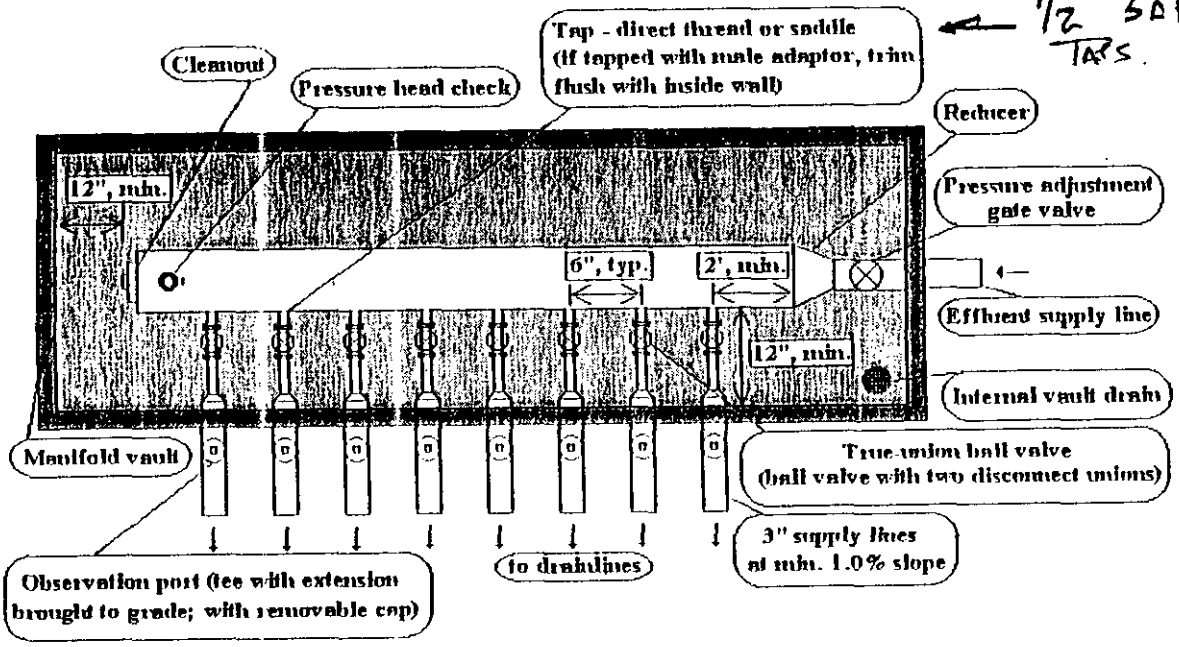
ITT Industries

© 2003 Goulds Pumps
Effective July, 2003
B3885



4" SCH 80 PVC

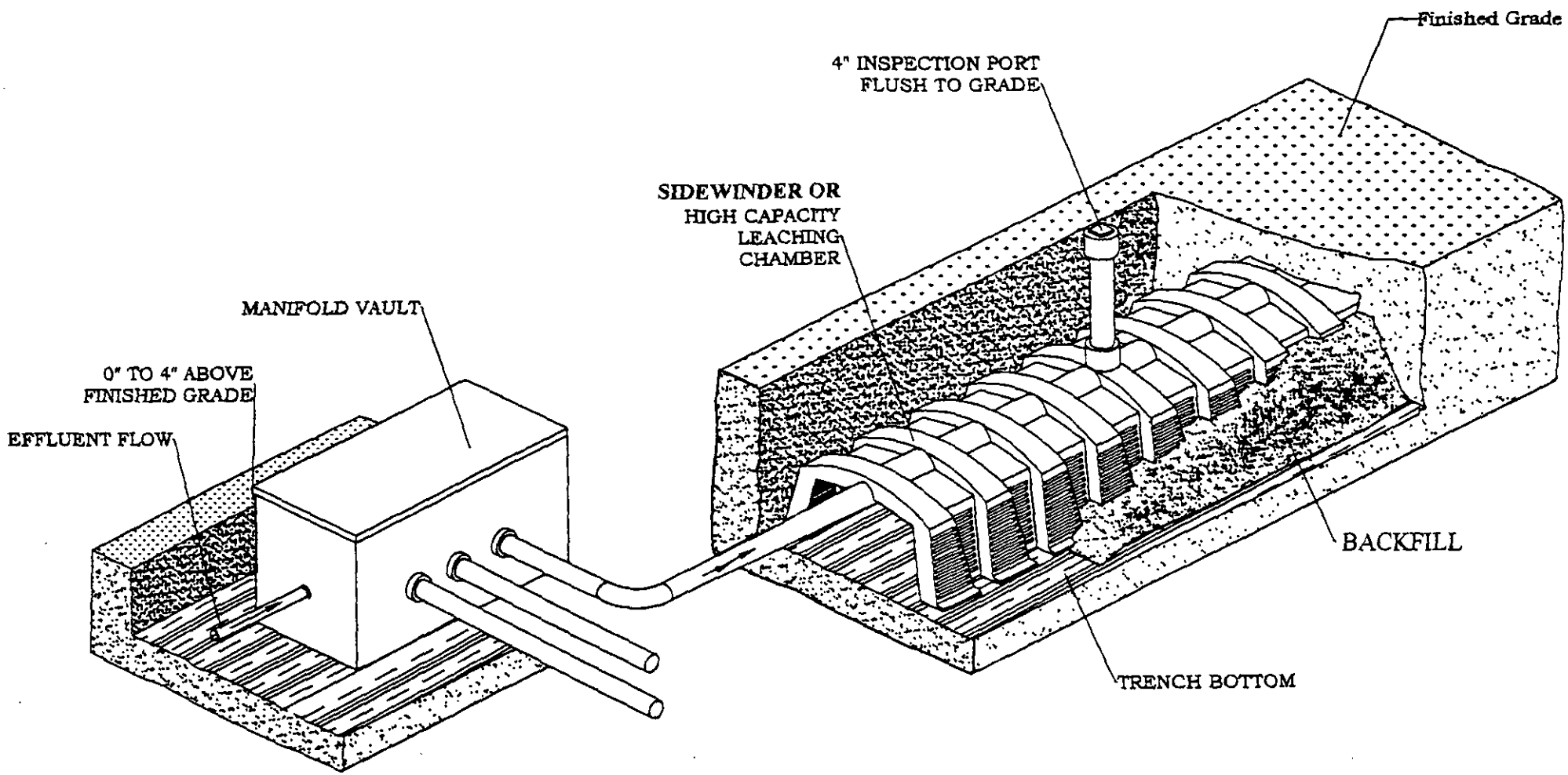
Profile View of Pressure Manifold for Sloping Site Installation (not to scale)



1/2" SCH 80 TARS

*Proposed system uses 10 taps

GRAVITY FED LEACHING CHAMBER
FED BY PRESSURE MANIFOLD



from TRWW Northview Manor

Department of Environment, Health, and Natural Resources
Division of Environmental Health
On-Site Wastewater Section

Sheet: 1 of 2
Property ID: PO 199-371-03
Lot #: Amenity area
File #: 5558B
Code: 1

SOIL/SITE EVALUATION for ON-SITE WASTEWATER SYSTEM

Applicant: Toney Jacobs
Owner: The Sanctuary at Lake Wylie
Address: 10933 Ballantyne Crossing Ave., Charlotte, N. C. 28227
Date Evaluated: 7/15/2004
Property Size: Approx. 1.0 acres inv.
Proposed Facility: Amenity area
Design Flow (.1949): 1050gpd
Property Recorded:
Location of Site:
Water Supply: [x] Public [ ] Individual [ ] Well [ ] Spring [ ] Other
Evaluation Method: [x] Auger Boring [ ] 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 (IN.)	1956 Sapro Class	1944 Restr Horiz	Profile Class & LTAR
1	LS, 6	0-3	GR/CL	FR/SEXP/SS/SP	>50" TO SOIL WETNESS	50	N/A	NONE	PS, IV .3GPD/FT^2
		3-50	SBK/C	FI/SEXP/S/P					
2	"	0-2	GR/CL	FR/SEXP/SS/SP	>48" TO SOIL WETNESS	48	"	"	"
		2-48	SBK/C	FI/SEXP/S/P					
3	LS, 10	0-3	GR/SCL	FR/SEXP/SS/SP	"	"	"	"	"
		3-48	SBK/C	FI/SEXP/S/P					
4	"	0-4	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		4-48	SBK/C	FI/SEXP/S/P					
5	"	0-8	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		8-48	SBK/C	FI/SEXP/S/P					
6	"	0-5	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		5-48	SBK/C	FI/SEXP/S/P					

Description	Initial System	Repair System
Available Space (.1945)	PS	PS
System Type(s)		
Site LTAR	.3GPD/FT^2	.3GPD/FT^2

Other Factors (.1946):
Site Classification (.1948): PROVISIONALLY SUITABLE
Evaluated By: W. R. Marlin, LSS, 7/15/2004, W. R. Marlin
Others Present:

COMMENTS:
100% repair

Landscape Position	Group	Texture	1955 LTAR
R-Ridge	I	S-Sand	1.2 - 0.8
SS-Shoulder Slope		LS-Loamy Sand	
LS-Linear Slope			
FS-Food Slope	II	SL-Sandy Loam	0.8 - 0.6
NS-Nose Slope		L-Loam	
HS-Head Slope			
CC-Concave Slope	III	SI-Silt	0.6 - 0.3
CV-Convex Slope		SICL-Silty Clay Loam	
T-Terrace		CL-Clay Loam	
FP-Flood Plain		SCL-Sandy Clay Loam	
	IV	SC-Sandy Clay	0.4 - 0.1
		SIC-Silty Clay	
		C-Clay	

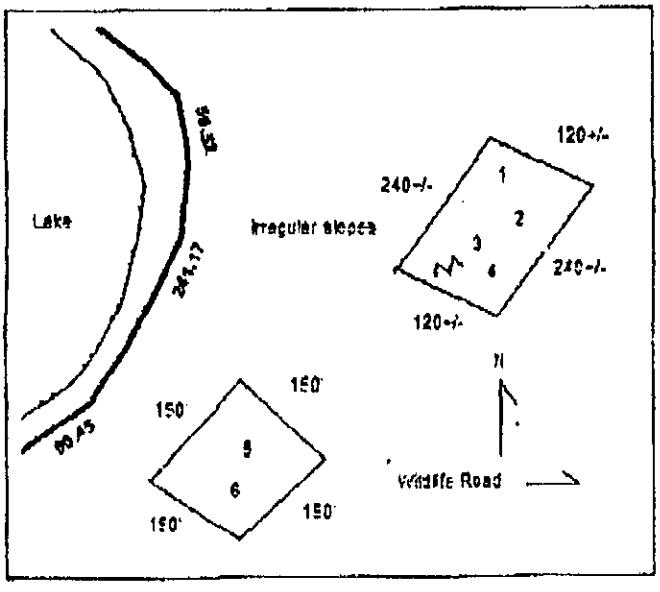
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SG-Single Grain
M-Massive
CR-Crumb
GR-Granular
SBK-Subangular Blocky
ABK-Angular Blocky
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PR-Prismatic

Consistence Moist
VFR-Very Friable
FR-Friable
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EFI-Extremely Firm

Consistence Wet
NS-Non-Sticky
SS-Slightly Sticky
S-Sticky
VS-Very Sticky
NP-Non-Plastic
SP-Slightly Plastic
P-Plastic
VP-Very Plastic

Mineralogy
SEXP-Slightly Expansive
EXP-Expansive

Sketch of Soil Evaluation Locations



CONDITIONS OF IMPROVEMENT PERMIT

Permit Number: **5558B**

Tax Number: **199-371-03**

- The IMPROVEMNET PERMIT is subject to revocation if site plans or the intended use change. There is to be **NO** grading, filling, or disturbance of the soil in the area of the septic tank system or repair area.
- CONSTRUCTION AUTHORIZATION must be obtained prior to receiving a Building Permit. The Construction Authorization is **NOT** transferable. Do not clear, grade, fill or disturb soil prior to obtaining a Construction Authorization.
- Domestic-type wastewater only. No industrial process wastewater may be discharged into the system.

Basement: ☐ Yes ☒ No ☐ Partial Basement

Primary Wastewater System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☐ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental:

0.3 Long-term acceptance rate (GPD/ft^2)	1050 Max gallons/day wastewater flow	4500 Absorption Area (ft^2)	9 Trench spacing (min. on centers) (ft)
Serviced by private well: ☐ Yes ☒ No	3000 Gallon septic tank	1500 Total trench length (ft)	24 Maximum trench depth (in) (At least 12" of provisionally suitable soil must remain between trench bottom and unsuitable soil conditions.)
na Bedrooms in residence	3000 Gallon pump tank	na Depth of stone (in)	

Any surface water present: **Yes** Type: **Lake** Minimum separation distance (ft): **100**

Additional conditions: **Install according to plans on file submitted by Landscape Design. Amenity Site**

Repair Area System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☐ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental:

4500 Absorption Area (ft^2) 1500 Total trench length (ft)	na Depth of stone (in)	9 Trench spacing (min. on centers) (ft)	24 Maximum trench depth (in)

The undersigned, an authorized agent of the MECKLENBURG COUNTY HELTH DEPARTMENT, certifies that the Department has approved the Request for the Job Location contained in this document. The approval is granted in accordance with the provisions of Laws and Rules For Sewage, Treatment and Disposal in effect at the time of issuance of the permit and is subject to the following provisions:

*** No work shall be conducted on the septic tank system until an Installation, Construction, Alteration and/or Repair Approval is granted by this Department.

*** This Improvement permit is transferable.

DENR Authorized Agent — Date: 9/27/05

Owner/Agent Signature — Date: 9-27-05

MECKLENBURG COUNTY
HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR.
SUITE 211
700 N. TRYON ST.
CHARLOTTE, NC 28202
(704) 336-5103

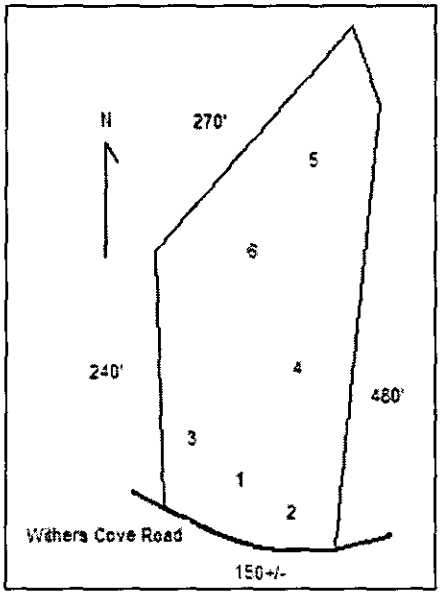
NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL, HEALTH, AND
NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

COMMENTS:
100% repair required

Landscape Position	Group	Texture	.1955 LTAR	Structure
R-Ridge	I	S-Sand	1.2 - 0.8	SG-Single Grain
SS-Shoulder Slope		LS-Loamy Sand		M-Massive
LS-Linear Slope				CR-Crumb
FS-Food Slope	II	SL-Sandy Loam	0.8 - 0.6	GR-Granular
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HS-Head Slope				ABK-Angular Blocky
CC-Concave Slope	III	SI-Silt	0.6 - 0.3	PL-Platy
CV-Convex Slope		SICL-Silty Clay Loam		PR-Prismatic
T-Terrace		CL-Clay Loam		
FP-Flood Plain		SCL-Sandy Clay Loam		
	IV	SC-Sandy Clay	0.4 - 0.1	
		SIC-Silty Clay		
		C-Clay		

Consistence Moist	Consistence Wet	Mineralogy
VFR-Very Friable	NS-Non-Sticky	SEXP-Slightly Expansive
FR-Friable	SS-Slightly Sticky	EXP-Expansive
FI-Firm	S-Sticky	
VFI-Very Firm	VS-Very Sticky	
EFI-Extremely Firm	NP-Non-Plastic	
	SP-Slightly Plastic	
	P-Plastic	
	VP-Very Plastic	

Sketch of Soil Evaluation Locations



Department of Environment, Health, and Natural Resources
Division of Environmental Health
On-site Wastewater Section

2nd site Evaluation 11/19/04 100.00 Check 1796

Sheet: 1 of 2
Property ID: PO 199-371-03 199,601-01
Lot #: Amenity area
File #: 5558B
Code: 1

ACS

SOIL/SITE EVALUATION for ON-SITE WASTEWATER SYSTEM

Owner: The Sanctuary at Lake Wylie
Applicant: Toney Jacobs
Address: 10933 Ballantyne Crossing Ave., Charlotte, n. C. 28227
Date Evaluated: 10/26/2004
Proposed Facility: Amenity area
Design Flow (.1949): 1050gpd
Property Size: 1.0a. Inv.
Location of Site: Off Old Camp Trail
Property Recorded:
Water Supply: [x] Public [ ] Individual [ ] Well [ ] Spring [ ] Other
Evaluation Method: [x] Auger Boring [ ] 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 (IN.)	.1956 Sapro Class	.1944 Restr Horiz	Profile Class & LTAR
1	LS, 8	0-3	GR/CL	FR/SEXP/SS/SP	>48" TO SOIL WETNESS	48+	N/A	NONE	PS, IV
		3-48	SBK/C	FI/SEXP/S/P					.3GPD/FT^2
2	"	0-6	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		6-48	SBK/C	FI/SEXP/S/P					
3	"	0-5	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		5-48	SBK/C	FI/SEXP/S/P					
4	LS, 5	0-2	GR/CL	FR/SEXP/SS/SP	>49" TO SOIL WETNESS	49+	"	"	"
		2-49	SBK/C	FI/SEXP/S/P					
5	"	0-4	GR/CL	FR/SEXP/SS/SP	>48" TO SOIL WETNESS	48+	"	"	"
		4-48	SBK/C	FI/SEXP/S/P					
6	"	0-3	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		3-48	SBK/C	FI/SEXP/S/P					

Description	Initial System	Repair System
Available Space (.1945)	PS	PS
System Type(s)		
Site LTAR	.3GPD/FT^2	.3GPD/FT^2

Other Factors (.1946):
Site Classification (.1948): PROVISIONALLY SUITABLE
Evaluated By: W. R. Marlin, LSS, 10/26/2004, W.R. Marlin
Others Present:

Applied Credit towards 2nd Site Evaluation
Over Payment of 200.00 on 11/3/04

CONDITIONS OF IMPROVEMENT PERMIT

Permit Number: **5558B**

Tax Number: **199-371-03**

- The IMPROVEMNET PERMIT is subject to revocation if site plans or the intended use change. There is to be **NO** grading, filling, or disturbance of the soil in the area of the septic tank system or repair area.
- CONSTRUCTION AUTHORIZATION must be obtained prior to receiving a Building Permit. The Construction Authorization is **NOT** transferable. Do not clear, grade, fill or disturb soil prior to obtaining a Construction Authorization.
- Domestic-type wastewater only. No industrial process wastewater may be discharged into the system.

Basement: ☐ Yes ☒ No ☐ Partial Basement

Primary Wastewater System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☒ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental:

0.3 Long-term acceptance rate (GPD/ft^2)	1050 Max gallons/day wastewater flow	3500 Absorption Area (ft^2)	9 Trench spacing (min. on centers) (ft)
Serviced by private well: ☐ Yes ☒ No	2000 Gallon septic tank	880 Total trench length (ft)	24 Maximum trench depth (in) (At least 12" of provisionally suitable soil must remain between trench bottom and unsuitable soil conditions.)
na Bedrooms in residence	2000 Gallon pump tank	na Depth of stone (in)	

Any surface water present: **Yes** Type: **Lake** Minimum separation distance (ft): **100**

Additional conditions: **Install according to plans on file submitted by Toney Jacobs and associates.**

Repair Area System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☐ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental:

3500 Absorption Area (ft^2) 880 Total trench length (ft)	na Depth of stone (in)	9 Trench spacing (min. on centers) (ft)	24 Maximum trench depth (in)

The undersigned, an authorized agent of the MECKLENBURG COUNTY HELTH DEPARTMENT, certifies that the Department has approved the Request for the Job Location contained in this document. The approval is granted in accordance with the provisions of Laws and Rules For Sewage, Treatment and Disposal in effect at the time of issuance of the permit and is subject to the following provisions:

*** No work shall be conducted on the septic tank system until an Installation, Construction, Alteration and/or Repair Approval is granted by this Department.

*** This Improvement permit is transferable.

RS 8/26/04

DENR Authorized Agent Date

MECKLENBURG COUNTY
HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR.
SUITE 211
700 N. TRYON ST.
CHARLOTTE, NC 28202
(704) 336-5103

9-7-04

Owner/Agent Signature Date

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL, HEALTH, AND
NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

Department of Environment, Health, and Natural Resources
Division of Environmental Health
On-site Wastewater Section

Sheet: 1 of 2
Property ID: PO 199-371-03 , 199 Lot 01
Lot #: Amenity area
File #: 5558B
Code: 1

ACS

SOIL/SITE EVALUATION
for ON-SITE WASTEWATER SYSTEM

Owner: The Sanctuary at Lake Wylie
Applicant: Toney Jacobs
Address: 10933 Ballantyne Crossing Ave., Charlotte, N. C. 28227
Date Evaluated: 7/15/2004
Proposed Facility: Amenity area
Design Flow (.1949): 1050gpd
Property Size: Approx. 1.0 acres inv.
Location of Site:
Property Recorded:
Water Supply: [x] Public [ ] Individual [ ] Well [ ] Spring [ ] Other
Evaluation Method: [x] Auger Boring [ ] 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 (IN.)	.1956 Sapro Class	.1944 Restr Horiz	Profile Class & LTAR
1	LS, 6	0-3	GR/CL	FR/SEXP/SS/SP	>50" TO SOIL WETNESS	50	N/A	NONE	PS, IV
		3-50	SBK/C	FI/SEXP/S/P					.3GPD/FT^2
2	"	0-2	GR/CL	FR/SEXP/SS/SP	>48" TO SOIL WETNESS	48	"	"	"
		2-48	SBK/C	FI/SEXP/S/P					
3	LS, 10	0-3	GR/SCL	FR/SEXP/SS/SP	"	"	"	"	"
		3-48	SBK/C	FI/SEXP/S/P					
4	"	0-4	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		4-48	SBK/C	FI/SEXP/S/P					
5	"	0-8	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		8-48	SBK/C	FI/SEXP/S/P					
6	"	0-5	GR/CL	FR/SEXP/SS/SP	"	"	"	"	"
		5-48	SBK/C	FI/SEXP/S/P					

Description	Initial System	Repair System
Available Space (.1945)	PS	PS
System Type(s)		
Site LTAR	.3GPD/FT^2	.3GPD/FT^2

Other Factors (.1946):
Site Classification (.1948): PROVISIONALLY SUITABLE
Evaluated By: W. R. Marlin, LSS, 7/15/2004, W. R. Marlin
Others Present:

COMMENTS:
100% repair

Landscape Position	Group	Texture	.1955 LTAR
R-Ridge	I	S-Sand	1.2 - 0.8
SS-Shoulder Slope		LS-Loamy Sand	
LS-Linear Slope			
FS-Food Slope	II	SL-Sandy Loam	0.8 - 0.6
NS-Nose Slope		L-Loam	
HS-Head Slope			
CC-Concave Slope	III	SI-Silt	0.6 - 0.3
CV-Convex Slope		SICL-Silty Clay Loam	
T-Terrace		CL-Clay Loam	
FP-Flood Plain		SCL-Sandy Clay Loam	
	IV	SC-Sandy Clay	0.4 - 0.1
		SIC-Silty Clay	
		C-Clay	

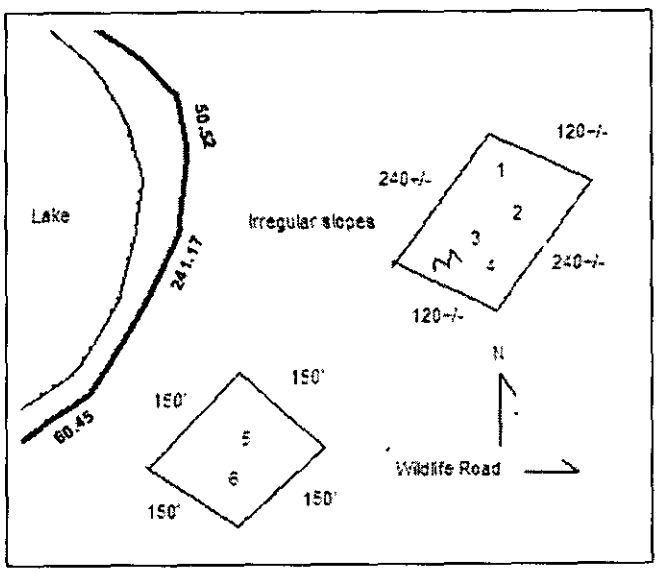
Structure
SG-Single Grain
M-Massive
CR-Crumb
GR-Granular
SBK-Subangular Blocky
ABK-Angular Blocky
PL-Platy
PR-Prismatic

Consistence
Moist
VFR-Very Friable
FR-Friable
FI-Firm
VFI-Very Firm
EFI-Extremely Firm

Consistence
Wet
NS-Non-Sticky
SS-Slightly Sticky
S-Sticky
VS-Very Sticky
NP-Non-Plastic
SP-Slightly Plastic
P-Plastic
VP-Very Plastic

Mineralogy
SEXP-Slightly Expansive
EXP-Expansive

Sketch of Soil Evaluation Locations



FEE: 200 ck credit from Bad 3/24/04 pmt forfeited

DATE: 7/8/04 pmt

APPLICATION FOR IMPROVEMENT PERMIT FOR RESIDENTIAL SITE INDIVIDUAL WATER AND WASTEWATER SYSTEMS PROGRAM

1 1 CRT

TYPE APPLICATION: ✓ NEW SYSTEM ___ EXPANSION/ ALTERATION OF EXISTING SYSTEM ___ REPAIR OF EXISTING SYSTEM

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

FILE #: 55588

PROPERTY INFORMATION (FROM ENGINEERING FORM) FOR JOB LOCATION:

TAX/PARCEL NUMBER: 199 601 01 80

STREET ADDRESS: off Wildlife Rd off Campfire Trail

SUBDIVISION OR MOBILE HOME PARK NAME: The Sanctuary at Lake Wylie, LLC

LOT NUMBER: Amenity Area

TYPE OF BUILDING (CHECK ONE):

___ SINGLE MOBILE HOME(S)
___ DOUBLE WIDE (D)
___ HOUSE (H)
___ MODULAR HOME (M)
___ MULTIPLE FAMILY (U)
✓ OTHER (O) Club Area

TOWNSHIP (CHECK ONE):

✓ 0 MECKLENBURG
___ 1 CHARLOTTE
___ 2 DAVIDSON
___ 3 CORNELIUS
___ 4 PINEVILLE
___ 5 MATTHEWS
___ 6 HUNTERSVILLE
___ 7 MINT HILL

HEATED SQUARE FOOTAGE: design flow 100

NUMBER OF BEDROOMS: NA

NUMBER OF OCCUPANTS: NA

CLOSING DATE _____

FOUNDATION FOR RESIDENCE:

___ WITHOUT BASEMENT
___ ON SLAB
___ CRAWL SPACE
___ WITH BASEMENT /PLUMBING
___ WITH BASEMENT /NO PLUMBING

IF EXPANSION/ALTERATION OF EXISTING SYSTEM, DESCRIBE THE PROPOSED BUILDING ADDITION:

WILL THERE BE A HOME BUSINESS IN THE RESIDENCE: ___ YES ✓ NO TYPE: _____

WATER SUPPLY (CHECK ONE):

___ COMMUNITY (C)
___ SHARED WELL (S)
✓ MUNICIPAL (M)
___ OTHER 'SPRINGS' (O)
___ PRIVATE WELL (P)

IF ANY OF THE FOLLOWING ARE LOCATED ON THE PROPERTY, PLEASE SHOW LOCATION ON PLAT:

BURIED CABLES, LANDFILLS, STUMPHOLES ___ YES ✓ NO
EXISTING WASTEWATER SYSTEMS ___ YES ✓ NO
EASTMENTS OR RIGHT-OF-WAYS ✓ YES ___ NO
WELL, SPRINGS OR WATERLINES ___ YES ✓ NO
DESIGNATED WETLANDS ___ YES ✓ NO

PROPERTY OWNER:

NAME: (LAST) The Sanctuary at Lake Wylie, LLC (FIRST) (MI)

ADDRESS: 10933 Ballantyne Crossing Ave

CITY: Charlotte STATE: NC ZIP: 28277

DAYTIME PHONE: 704 544-0201 ext 226

LEGAL AGENT FOR PROPERTY OWNER, IF APPLICABLE:

NAME: (LAST) Jacobs (FIRST) Tony (MI) C

DAYTIME PHONE: 704 663-6905

m 704 582 9219

WHAT DATE WAS THE PROPERTY ORIGINALLY DEEDED AND RECORDED? 2004

An Improvement Permit is subject to suspension or revocation if site plans or the intended use change or if information submitted in this application is falsified or changed. The undersigned, owner, or legal agent for the owner, of the property described above as the "Job Location" has read the foregoing application, acknowledges that the contents of same are true, and authorizes agents of the Mecklenburg County Health Department to enter onto the property for the purpose of processing this request.

SIGNED: Tony C Jacobs, CPSS (Agent) DATE: 7/8/04

MECKLENBURG COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR., SUITE 211, 700 N. TRYON ST., CHARLOTTE, N.C. 28202., (704) 336-5102

555SB
199-601-01PQ
Amenity Area

ROAD MAP on back

5' SOFT SURFACE TRAIL

SITE

PSDE

OLD CAMP TRAIL

29
2.28 ac.
99,123 sq.ft.

30
2.17 ac.
94,489 sq.ft.

31
4.34 ac.
189,268 sq.ft.

32
2.96 ac.
129,047 sq.ft.

33
3.88 ac.
169,187 sq.ft.

35

20' FRONT SETBACK TYP.

N00°54'22"E
122.75'

N37°18'04"E
485.56'

N75°05'21"E
478.52'

N62°18'09"E

N52°04'43"E
256.34'

EXISTING TREELINE

PROTECTED CORRIDOR
200' MAX.

RESTRICTED ZONE

WETLANDS

50' LOWER LA
OVERLAY DIST

50' ADD
SHOREL

LandDesign.

urban design planning civil engineering landscape architecture

August 04, 2005

Mr. Troy Purvis,
Pool Plan Review-Commercial
Mecklenburg County Health Department
700 N. Tryon Street, Suite 208
Charlotte, NC 28202

RE: The Sanctuary – JJ Audubon Lodge, 10450 Wildlife Road
Pool Permit No.131149
LDI Project No. 1005136

Dear Mr. Purvis:

As requested by your office, LandDesign, Inc. on behalf of Crescent Resources is providing the following notes in response to comments received from your office in reference to the swimming pool backwash system for the JJ Audubon Lodge. The lodge will serve as the amenity site for the Sanctuary at Lake Wylie subdivision project. In addition, special provisions have been included on plans to ensure that no public nuisance, environmental health hazard or mosquito harborage will result from the pools backwash.

COMMENTS:

1) The backwash must be moved further away from the septic area repair. The location of the must be approved by Kelly Randall (704 336 5575).

LDI Response:

The swimming pool backwash line and the dry riverbed have been relocated to ensure a twenty-five foot (25') minimum separation with the septic repair drain field at any point as advised by Kelly Randall of the Mecklenburg County Health Department and Paul Penninger (Project Soil Scientist). Plans will be submitted to Kelly Randall for review.

2) Provide a letter that no public nuisance, environmental health hazard or mosquito harborage will result from the pools backwash.

LDI Response:

In addition to this letter, the following special provisions have been included in sheet C7.9 and are specific to the pool back wash system.

1. ***The dry riverbed is not designed to be the primary means of swimming pool backwash treatment. Backwash effluent must be pre-treated to meet water quality requirements before it is discharged into the dry riverbed.***
2. ***To meet water quality requirements and safeguard aquatic life the following steps are recommended by the EPA and will be implemented by Crescent Resources through the Home.Owners Association.***

http://www.epa.nsw.gov.au/stormwater/whatdo/local+councils/pools.htm

- ***Avoid draining a pool unless necessary***

223 North Graham Street
Charlotte, NC 28202

V: 704.333.0325
F: 704.332.3246

www.LandDesign.com

Washington DC
Charlotte NC
Pinehurst NC
Asheville NC
Tampa FL
Nashville TN
Beijing PRC

- *Consider using maintenance products that can be applied to water in the pool*
- *If discharging to the environment, allow water to stay in the pool for a time so that chlorine can dissipate (add sodium thiosulphate if necessary) and for ph to adjust to that of receiving waters (chemically modify if necessary).*
- *Monitor chlorine levels and ph before discharging the water*
- *If discharging to storm water, discharge the water at a slow rate to avoid erosion*

3. *The dry riverbed will be graded uniformly as shown on plan to ensure positive flow such that effluent is not subject to forming any stagnant pools along its flow path.*
4. *Level spreader shall be installed as shown on plan and detailed on sheet C7.13 to facilitate sheet flow prior to entering the 100' Lake Wylie Buffer where further natural infiltration and treatment will occur before entering the lake.*
5. *The level spreader and dry riverbed will be maintained by the Home Owners Association.*
6. *The natural topography is such that the dry riverbed will primarily convey the backwash with little additional storm water runoff from the area.*

Thank you for your help with this project. Please feel free to call me directly should you have any questions or comments or need any additional information.

Respectfully submitted,

Theron Pickens, P.E.
LANDDESIGN, INC. | Charlotte
704.376.7777

cc: Kelly Randall - Mecklenburg County Health Department
Bill Davenport - Southern Pools
James F. Martin – Crescent Resources
Art Oldham – OPDA
John Murphy – Choate Construction
Paul Penninger – SNME Inc.
File

Washington DC
Charlotte NC
Pinehurst NC
Asheville NC
Tampa FL
Nashville TN
Beijing PRC

CONDITIONS OF IMPROVEMENT PERMIT

Permit Number: **5558B**

Tax Number: **199-371-03**

- The IMPROVEMNET PERMIT is subject to revocation if site plans or the intended use change. There is to be **NO** grading, filling, or disturbance of the soil in the area of the septic tank system or repair area.
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- Domestic-type wastewater only. No industrial process wastewater may be discharged into the system.

Basement: ☐ Yes ☒ No ☐ Partial Basement

Primary Wastewater System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☐ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental:

0.3 Long-term acceptance rate (GPD/ft^2)	1950 Max gallons/day wastewater flow	3500 Absorption Area (ft^2)	9 Trench spacing (min. on centers) (ft)
Serviced by private well: ☐ Yes ☒ No	2000 Gallon septic tank	880 Total trench length (ft)	24 Maximum trench depth (in) (At least 12" of provisionally suitable soil must remain between trench bottom and unsuitable soil conditions.)
na Bedrooms in residence	2000 Gallon pump tank	na Depth of stone (in)	

Any surface water present: **Yes** Type: **Lake** Minimum separation distance (ft): **100**

Additional conditions: **Install according to plans on file submitted by Toney Jacobs and Associates. Amenity Site**

Repair Area System

Type: ☐ I ☐ II ☒ III ☐ IV ☐ V ☐ VI

☐ Conventional
☐ Prefabricated, permeable block panel system
☐ Shallow Placed Conventional
☐ Low Pressure Pipe
☐ Large Diameter Pipe
☐ Fill
☐ Other
☒ Innovative or Experimental:

3500 Absorption Area (ft^2) 880 Total trench length (ft)	na Depth of stone (in)	9 Trench spacing (min. on centers) (ft)	24 Maximum trench depth (in)

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*** This Improvement permit is transferable.

DENR Authorized Agent — Date: R.S. 3/15/05

Owner/Agent Signature — Date: 3/15/05

MECKLENBURG COUNTY
HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
c/o HAL MARSHALL CTR.
SUITE 211
700 N. TRYON ST.
CHARLOTTE, NC 28202
(704) 336-5103

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENTAL, HEALTH, AND
NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL HEALTH
ON-SITE WASTEWATER SECTION

IWWS-100195