HAL OWEN & ASSOCIATES, INC.

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5 July 2022

Juan Ramirez
51 MMB Lane
Lillington, NC 27546

Reference: Soil Investigation and Septic System Design
727 Mt Olive Church Road; PIN 0518-95-4622.000

Dear Mr. Ramirez,

A site investigation was conducted on 25 May 2022 for the above referenced property, which is located at 727 Mt Olive Church Road in Harnett County, North Carolina. The purpose of the investigation was to determine the ability of this lot to support a subsurface sewage waste disposal system for a typical three-bedroom home. Public water supplies will be utilized. At the time of the investigation, the site had been cleared, the water meter installed, lot corners marked, and the house built. It is our understanding that the area originally permitted for the initial septic system was damaged and the system needs to be redesigned. It is further our understanding that the Harnett County Health Department has the information necessary to identify the repair area and therefore this report addresses only the initial system.

All ratings and determinations were made in accordance with "Laws and Rules for Sewage Treatment and Disposal Systems, 15A NCAC 18A .1900". This report represents my professional opinion but does not guarantee or represent permit approval for any lot by the Local Health Department. The permit you receive from the Local Health Department may contain some modifications or amendments to our submitted design. Please carefully review your permit and adhere to all prescribed requirements.

SOIL INVESTIGATION

The soils were evaluated under moist soil conditions through the advancing of auger borings. Soils at the site were observed to be sandy loams and loams underlain by firm clay subsoils. The soils indicated as provisionally suitable for subsurface sewage waste disposal systems are so rated due to clayey textured subsoil layers (Figure 1). These soils appear adequate to support long-term acceptance rates of 0.3 gal/day/sqft for conventional or accepted status drainlines.

SEPTIC SYSTEM DESIGN

Adequate amounts of usable soils were observed on the front of this lot to support an initial septic system. The initial septic system has been designed for the proposed single-family residence containing three bedrooms and having a design daily flow of 360 gallons. The home does not have a basement. A 1000-gallon septic tank and an approved septic effluent filter is required. A 1000-gallon pump tank will be required to pump the effluent to the drainfield.

The initial septic system is proposed as a pump to six drainlines in serial distribution totaling 300 linear feet of accepted status drainlines utilizing a 25% reduction (Figure 2). The six drainline segments will be connected using step-downs or drop boxes. The long-term acceptance rate is 0.3 gal/day/sqft. The drainlines should be installed on contour with maximum trench bottom depths at 21 inches below surface.

Conformance to all regulatory setbacks shall be maintained. The minimum horizontal setback from a septic system to a property line is 10 feet, to a building foundation is 5 feet, to a well is 50 feet, and to a water line is 10 feet. All drainlines shall be installed on nine-foot centers or greater, as flagged at the site.

Potential septic system drainlines have been demonstrated with various colored pin flags that are located on the lot. **It is important that you do not disturb the septic system area**. It is recommended that a staked line or protective fence be placed around the system prior to construction to eliminate any potential damage to the soil or the layout of the system.

SYSTEM MAINTENANCE

It is recommended that care be taken to preserve the life of the septic system. The septic tank, pump tank, and distribution boxes should be kept accessible for pumping and adjustment. Your septic system should be inspected periodically and the septic tank pumped out every 3 to 5 years by a professional contractor. Practicing water conservation in the home, such as promptly repairing leaky fixtures and running washing machines and dishwashers only when full, will help to avoid hydraulically overloading the septic system. Also, disposal of oils, fats, and grease into the septic system should be avoided because they could clog drainlines and conveyance pipes. A list of other useful suggestions can be found at https://content.ces.ncsu.edu/septic-system-owners-guide

CONCLUSION

This report and the attached septic system design information will need to be submitted to the Local Health Department for review and the permitting process. I appreciate the opportunity to provide this service and hope to be allowed to assist you again in the future. If you have any questions or need additional information, please contact me at your convenience.

Sincerely,

Hal Owen
Licensed Soil Scientist

WASTEWATER TREATEMENT SYSTEM PLANS

for Mt Olive Church Road

PROJECT INFORMATION

Facility Type	Residential	(3 bedrooms)
Wastewater Type	Domestic	
Water Supply	Public Water	
Design Wastewater Flow	360	gpd
Soil LTAR	0.3	gpd/ft^2

PROPERTY INFORMATION

Site Address	727 Mt Olive Church Road
S/D Name and Lot#	
PIN	0518-95-4622.000
Size (Acre)	1.5
County	Harnett

APPLICANT INFORMATION

Name	Juan Ramirez
Mailing Address	51 MMB Lane, Lillington, NC 27546
Telephone Number	910-986-5712
E-mail Address	juanramirezsan

CONSULTANT INFORMATION

Company Name	Hal Owen & Associates, Inc.
Mailing Address	PO Box 400, Lillington, NC 27546
Telephone Number	910-893-8743 Fax: 910-893-3594
E-mail Address	hal@halowensoil.com
Licensed Soil Scientist	Hal Owen, License #1102
System Designer	Krissina Newcomb

SOIL/SITE EVALUATION
FOR ON-SITE WASTEWATER SYSTEM

APPLICANT: Juan Ramirez OWNER: ☒ AGENT: ☐ PHONE: 910-986-5712
ADDRESS: 51 MMB Lane, Lillington, NC 27546
PROPOSED FACILITY: Single-Family Residence PROPOSED DAILY FLOW (.1941): 360 gpd
LOCATION OF SITE: 727 Mt Olive Church Road PROPERTY SIZE: 1.5 acres
COUNTY: Harnett PROPERTY ID #: 0518-95-4622.000
WATER SUPPLY: On-Site Well ☐, Community. Well ☐, Public ☒, Other
EVALUATION METHOD: Auger Boring ☒ Pit ☐
EVALUATED BY: Hal Owen, LSS 1102 DATE EVALUATED: 25 May 2022

PROFILE 1

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	MOTTLES ABUNDANCE/ SIZE/CONTRAST	.1941 (a)(1) TEXTURE	.1941 (a)(2) STRUCTURE	.1941 (a)(3) MINEROLOGY	CONSIS-TENCE MOIST
A	0-4	10YR 4/6			L	GR		FR
Bt1	4-10	7.5YR 6/6	5YR 5/8	c 2	C	2 m SBK		FI
			10R 3/6	f 1				
			10YR 7/6	f 1				
Bt2	10-24	10YR 6/6	10YR 5/8	m 1	C	2 m SBK		FI
			10R 3/6	f 1				
			5YR 6/6	f 1				
			2.5Y 6/8	c 1				
Bt3	24-33	5YR 5/8	7.5YR 6/8	c 1	L	2 m SBK		FR
			2.5YR 5/8	c 1				
Bt4	33-41	10YR 5/8	7.5YR 6/8	c 3	L	1 m SBK		FR
			2.5Y 6/8	c 3				
			5YR 6/8	c 3				
			2.5YR 5/8	c 3				
BC	44-48+	10YR 6/8	2.5YR 5/8	f 3	SL	1 m SBK		FR
			7.5YR 6/8	c 3				

.1940 LANDSCAPE POS./ SLOPE%	FS / < 5%	.1956 SAPROLITE CLASS	NA
.1942 SOIL WETNESS CONDITION		.1944 RESTRICTIVE HORIZON	NA
.1943 SOIL DEPTH	48"	PROFILE CLASSIFICATION & LTAR	PS 0.3 gpd/sf
COMMENTS			

PROFILE 2

HORIZON	DEPTH (IN)	MATRIX	MOTTLES	MOTTLES ABUNDANCE/ SIZE/CONTRAST	.1941 (a)(1) TEXTURE	.1941 (a)(2) STRUCTURE	.1941 (a)(3) MINEROLOGY	CONSIS-TENCE MOIST
A1	0-2	10YR 4/3			L	1 m SBK		FR
Bt	2-11	10YR 5/8	2.5Y 6/8	f 1	SCL	1 m SBK		FR
A2	11-17	10YR 5/4			SL	1 m SBK		FR
E	17-20	2.5Y 6/6			SL	2 m SBK		FR
Bt1	20-35	10YR 5/8			C	2 m SBK		FI
Bt2	35-48+	10YR 7/8	5YR 5/8	c 1	C	2 m SBK		FI
			2.5YR 4/8	c 1				
			10YR 7/4	c 1				

.1940 LANDSCAPE POS./ SLOPE%	FS / < 5%	.1956 SAPROLITE CLASS	NA
.1942 SOIL WETNESS CONDITION		.1944 RESTRICTIVE HORIZON	NA
.1943 SOIL DEPTH	48"	PROFILE CLASSIFICATION & LTAR	PS 0.3 gpd/sf
COMMENTS			

DESCRIPTION	INITIAL SYSTEM
.1945 AVAILABLE SPACE	1200 sf trench bottom (conventional) 900 sf trench bottom (25% reduction)
SYSTEM TYPE	Accepted status (25% reduction)
SITE LTAR (gpd/ft^2)	0.3

.1946 OTHER FACTORS:_____

.1948 SITE CLASSIFICATION: Provisionally Suitable

COMMENTS:_____

LEGEND OF ABBREVIATIONS FOR SITE EVALUATION FORM

LANDSCAPE POSITION	TEXTURE GROUP	TEXTURE CLASS	.1955 LTAR (gal/day/sqft)
CC - Concave Slope	I	S - Sand	1.2-0.8
CV - Convex Slope		LS - Loamy Sand	
DS - Debris Slump			
D - Depression	II	SL - Sandy Loam	0.8 – 0.6
DW - Drainage Way		L - Loam	
FP - Flood Plain			
FS - Foot Slope	III	SCL - Sandy Clay Loam	0.6 – 0.3
H - Head Slope		CL - Clay Loam	
L - Linear Slope		SiL - Silt Loam	
N - Nose Slope		Si - Silt	
R - Ridge		SiCL- Silt Clay Loam	
S - Shoulder Slope			
T - Terrace	IV	SC - Sandy Clay	0.4 – 0.1
		C - Clay	
MINEROLOGY		SiC - Silty Clay	
SEXP - Slightly Expansive			
EXP - Expansive		O - Organic	none

STRUCTURE	MOIST CONSISTENCE	WET CONSISTENCE
G - Single Grain	VFR - Very Friable	NS - Non Stick
M - Massive	FR - Friable	SS - Slightly Sticky
CR - Crumb	FI - Firm	MS - Moderately Stick
GR - Granular	VFI - Very Firm	VS - Very Sticky
SBK - Subangular Blocky	EFI - Extremely Firm	
ABK - Angular Blocky		NP - Non Plastic
PL - Platy	**MINERALOGY**	SP - Slightly Plastic
PR - Prismatic	NEXP - Non Expansive	MP - Moderately Plastic
	SEXP - Slightly Expansive	VP - Very Plastic
	EXP - Expansive	

MOTTLES

f – few	1 - fine	F - Faint
c – common	2 - medium	D - Distinct
m – many	3 - coarse	P - Prominent

Give Horizon Depth in inches below natural soil surface and Fill Depth in inches above land surface.
Depth to Soil Wetness: inches below land surface to free water or to soil colors with chroma 2 or less.
Classification S – Suitable PS – Provisionally Suitable U – Unsuitable

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Figure 1. Soil Map showing Septic Suitability

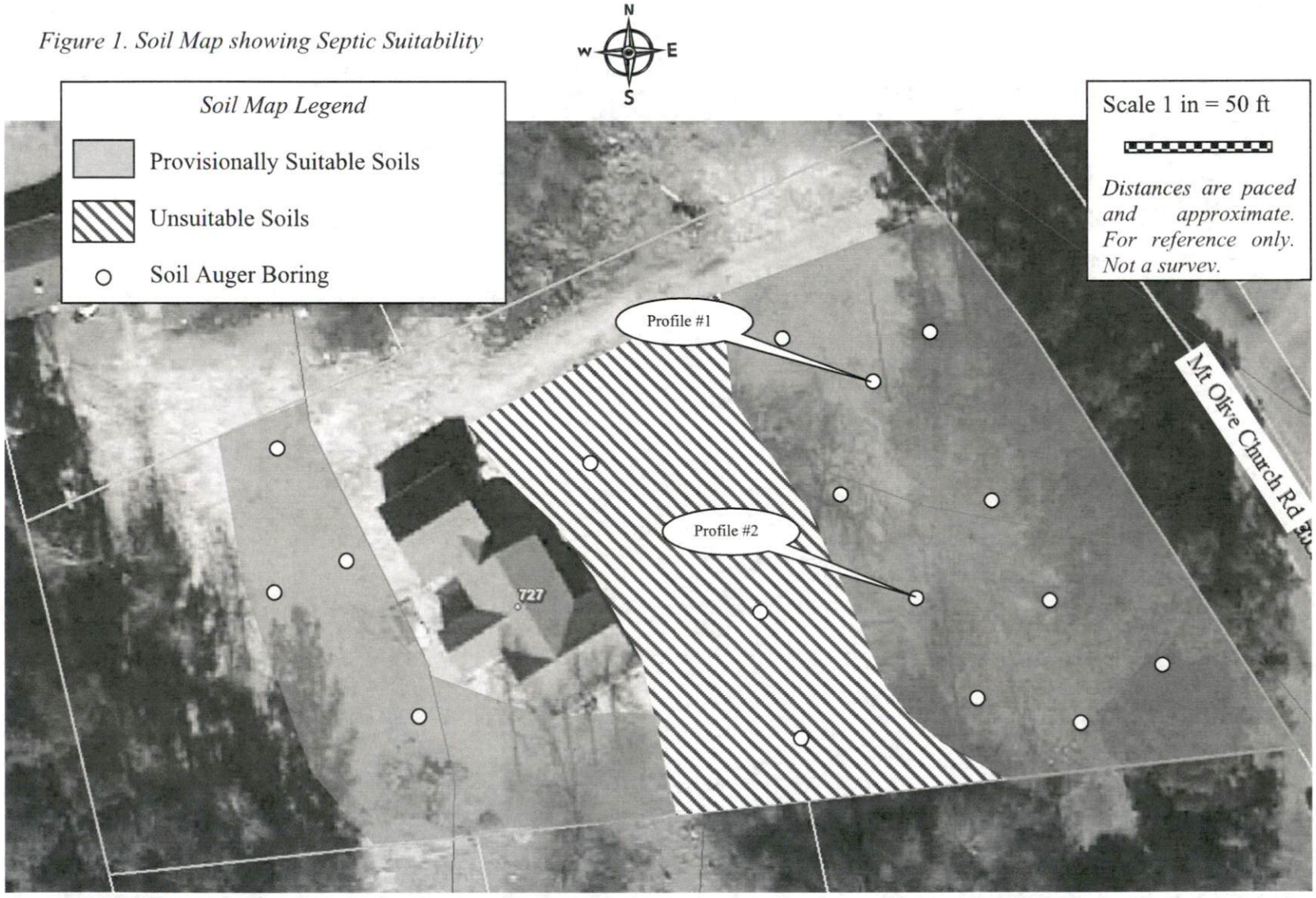

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Figure 2. Septic system design and layout

Scale 1 in = 50 ft

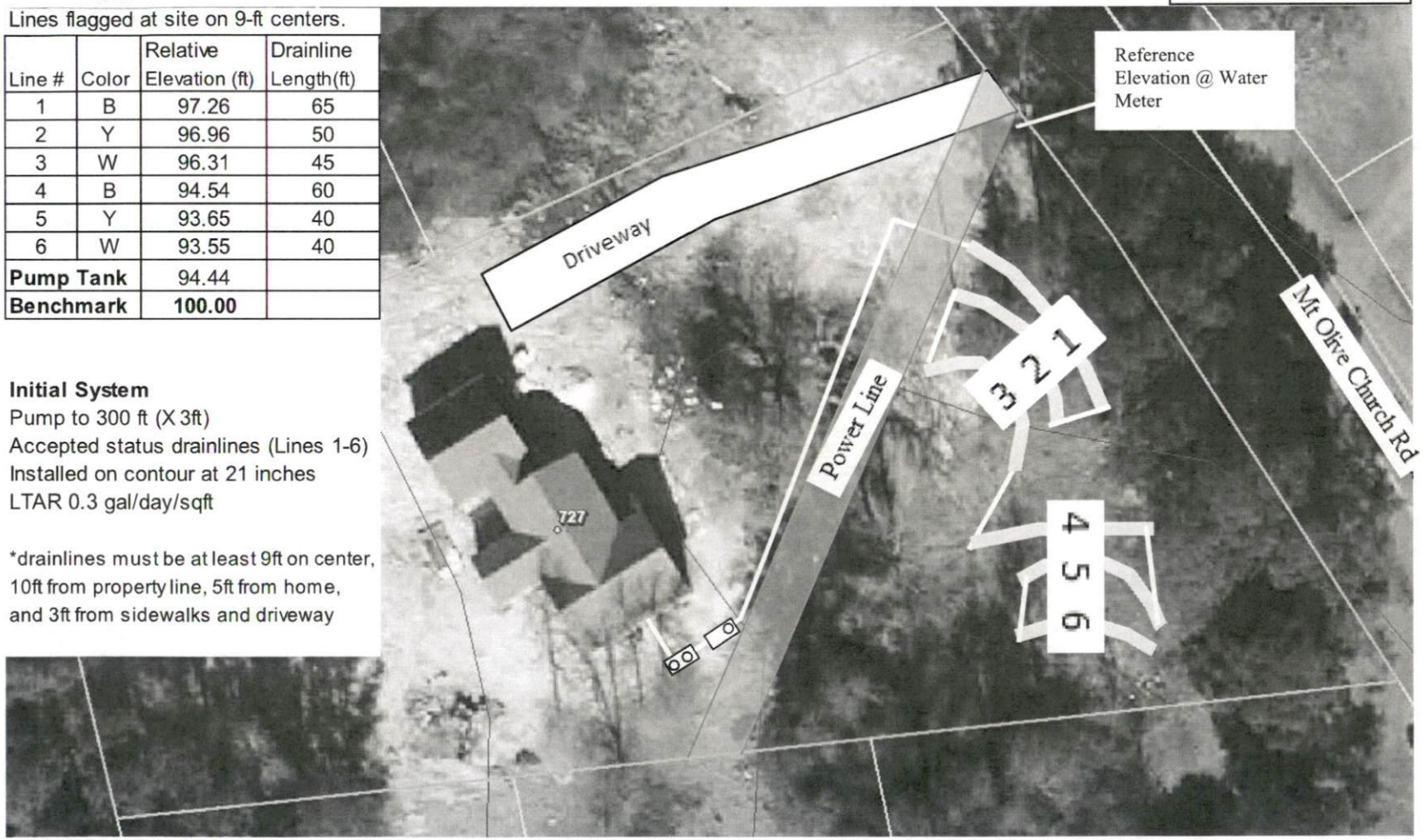
Distances are paced and approximate. For reference only. Not a survey.

Lines flagged at site on 9-ft centers.

Line #	Color	Relative Elevation (ft)	Drainline Length(ft)
1	B	97.26	65
2	Y	96.96	50
3	W	96.31	45
4	B	94.54	60
5	Y	93.65	40
6	W	93.55	40
Pump Tank		94.44	
Benchmark		**100.00**	

Initial System
Pump to 300 ft (X 3ft)
Accepted status drainlines (Lines 1-6)
Installed on contour at 21 inches
LTAR 0.3 gal/day/sqft

*drainlines must be at least 9ft on center, 10ft from property line, 5ft from home, and 3ft from sidewalks and driveway



Mt Olive Church Road

Pump System Design Criteria

DESIGN DAILY FLOW 360 gallons **SOIL LTAR:** 0.3 gpd/ft^2

TANKS (min) Septic Tank: 1000 gallons Pump Tank: 1000 gallons

SUPPLY LINE Length (ft): 165 Diameter: 2 " sch 40 pvc

Min total flow (gpm) to maintain 2fps scour velocity = 20.9 gpm

TRENCHES Drainline Type: Accepted (25% reduction) System Elevation 97.98 feet

Max trench depth: 21 inches

Trench width: 3 feet Trench Length Factor: 75 %

Absorption Area: 900 sqft Min Linear Length: 300 feet

Actual Trench Length: 1 X 300 feet = **300 feet**

PUMP CALCULATIONS:

Total Flow: 23 gpm

Dose Volume (gal): 147 gallons, with Pipe Volume at 75 % *65.3gal/100ft pipe

Dose Pump Run Time (min): 6.39 Daily Pump Run Time (min): 15.65

Drawdown (in.): 147 gallons ÷ 20 gal/ inch = 7.35 inches

Pump Tank Elevation (ft): 94.44 Pump Elevation (ft): 89.44

Friction Head: 2.56 *Hazen Williams Formula (use supply line length+70' for fittings in pump tank)

Elevation Head: 9.5 Design Head: 2.0 Total Head: 14.10 feet

Pump to Deliver: **23.00** gpm @ **14.10** ft head

NEMA 4X Simplex Control Panel with elapsed time meter, cycle counter, audible and visible alarm, hand-off-automatic (HOA) switch, and pump on separate circuits is required. A septic tank filter is required. Floats to be determined by type of pump tank used.

Prepared By: Hal Owen and Associates, Inc.
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7/5/2022