

# HAL OWEN & ASSOCIATES, INC.

SOIL & ENVIRONMENTAL SCIENTISTS

P.O. Box 400, Lillington, NC 27546-0400

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www.halowensoil.com

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13 March 2018

Mr. Paul Faircloth  
PJ's Truck Bodies & Equipment Co.  
PO Box 1207  
Dunn, NC 28335

Reference: Report Addendum to Comprehensive Soil Investigation and Septic System Design  
JPF Properties LLC Property; PIN 1537-17-7973

Dear Mr. Faircloth,

This addendum is for the report issued 27 December 2017 for the property located at 1560 George Perry Lee Road in Dunn, Harnett County, North Carolina. In that report, a detailed septic system design was provided for the proposed initial system and repair area for the business. Since that report was issued, it has come to our attention that there is a 30ft road easement straddling the western property line beside the proposed septic fields (see attached map).

Due to the presence of the road easement, the available space for the septic drainfield is reduced slightly. The setback for septic drainlines from a property line is typically ten feet. However, the presence of the road easement effectively increases the setback along this property line to 15 feet because drainlines may not be installed in the easement.

An easy solution would be to reduce the length of each line of the system by five feet. The initial drainfield was designed as six conventional drainlines each 141 feet long. Reducing each line by five feet would result in six conventional drainlines each 136 feet. In this scenario, the long term application rate would back calculate to 0.42 gal/day/sqft. Soil observations made at the site support this loading rate.

Another solution would be to convert the system from conventional gravel drainlines to accepted status drainlines, such as EZflow. Use of accepted status drainlines in place of conventional lines allows the required amount of linear drainline to be reduced by up to 25%. Given a daily design flow of the facility of 1016 gallons and a loading rate of 0.4 gal/day/sqft, the minimum amount of accepted status drainline is calculated as 635 feet. This could be evenly distributed into six lines with each drainline 106 feet.

Another option would be to add an additional drainline to each system. Additional usable soil area is available above the proposed repair area which is not currently utilized in the design. Each system (initial and repair) is currently designed with six lines, but could be redesigned with seven conventional drainlines each 121 feet long.

This report represents my professional opinion as a Licensed Soil Scientist but does not guarantee or represent permit approval by the local Health Department.

This report will need to be submitted to the Harnett County 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,

A handwritten signature in cursive script that reads "Hal Owen".

Hal Owen  
Licensed Soil Scientist



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27 December 2017

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PO Box 1207  
Dunn, NC 28335

Reference: Comprehensive Soil Investigation and Septic System Design  
JPF Properties LLC Property; PIN 1537-17-7973

Dear Mr. Faircloth,

A site investigation has been conducted for the above referenced property, located at 1560 George Perry Lee Road in Dunn, Harnett County, North Carolina. The purpose of the investigation was to determine the ability of this property and the existing septic system to support the current septic needs of the existing business. The Harnett County Health Department has expressed concerns about the business' current number of employees and your desire to add buildings that could cause an increase in the number of people that you employ and the effluent flow into the septic system. All sewage disposal 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 as a Licensed Soil Scientist but does not guarantee or represent permit approval by the local Health Department.

## EXISTING SYSTEM

It is my understanding that the northwestern corner of the subject property is being utilized for the subsurface sewage waste disposal system for your business. The area was reviewed and the existing system appeared to be functioning properly on the day of the investigation.

The existing septic system is designed for a flow of only about 400 gallons per day, or the equivalency of 16 employees (25 gpd/employee). It is our understanding that you currently have about 67 employees, which by regulation equates to a design flow of 1675 gallons of effluent per day. This scenario will likely lead to hydraulic overload of the system. It is also my understanding that the septic area has been largely consumed by your existing drainfield and only a small area is available to repair the system if it should fail.

## SOIL INVESTIGATION

A soil investigation was conducted and an additional portion of this property was observed to be underlain by provisionally suitable soils for subsurface sewage waste disposal (see Figure 1). These provisionally suitable soils were observed to be firm and friable sandy clay loams to greater than 30 inches and will support long term acceptance rates of 0.4 gal/day/sqft. This area contains greater than an acre of usable soil and appears adequate to support the initial septic system and repair area for at least 70 employees.

## DESIGN FLOW

The existing septic system was designed to handle a design daily flow of approximately 400 gallons (16 employees X 25 gallons/employee). It is our understanding that the business now has 67 full time employees. The design daily flow based on 67 employees is 1675 gallons per day. The existing septic system and repair area are inadequately sized to serve this number of employees.

As an alternative to using the published sewage flow rates in the cited septic regulations, a facility may use existing water usage data to justify a flow rate reduction. This method requires water consumption readings to be taken for at least 12 consecutive months. In addition, 30 consecutive daily water consumption readings should be taken in the month of normal or above normal consumption. This data is then used to calculate an adjusted daily design flow.

Using water usage data for this business, the adjusted daily design flow was calculated as 1,016 gallons per day. Monthly water usage data was taken from water department bills issued from September 2016 to September 2017. These records indicated September 2017 had the highest water usage for that annual period. Daily water meter readings were collected for this business between September 19 and October 18, 2017. Detailed information about water usage and the adjusted daily design flow calculations can be found at Table 1.

## SEPTIC SYSTEM DESIGN

An initial septic system and repair area have been designed for a design flow of 1,016 gallons per day (Figure 2) utilizing a long term application rate of 0.4 gal/day/ft<sup>2</sup>. A new septic tank with a minimum tank capacity of 1689 gallons will be required. This may be accomplished by adding an additional 1000 gallon septic tank or possibly by modifying the existing pump tank to meet this requirement. A new pump tank with a minimum tank capacity of 1126 gallons will also be necessary to pump effluent to the proposed drainfield. An engineer, in conjunction with the Harnett County Health Department staff, will likely be required to design the supply line from the pump tank to the drainfield due to the distance. In addition, an engineer may be required to locate the new tank(s) and evaluate the need for anti-flotation measures for the pump tank. Utilization of a traffic rated pump tank will likely avoid the need for additional anti-flotation measures.

Through traffic areas the septic supply line pipe will need to be installed under at least 30 inches of compacted cover, or ductile iron pipe (or equivalent) shall be used. The septic supply line will need to be installed through a jurisdictional wetland, and a permit authorizing wetland impacts shall be obtained prior to conducting land disturbing activities in the wetland.

The initial septic system and repair system are each proposed as a pressure-manifold to six 141-ft long conventional drainlines. The installer may choose to install accepted status drainlines (EZflow or chambers) which will allow for the installation of 25% less drainline. This is a recommendable format only if you can ensure that the drainfield area will be kept free of vehicular traffic. The drainlines should be installed on contour with trench bottom depths at 18 inches below surface. 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.

This report and the attached septic system design information will need to be submitted to the Harnett County 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,

A handwritten signature in black ink that reads "Krissina B. Newcomb".

Krissina B. Newcomb  
Project Environmental Scientist

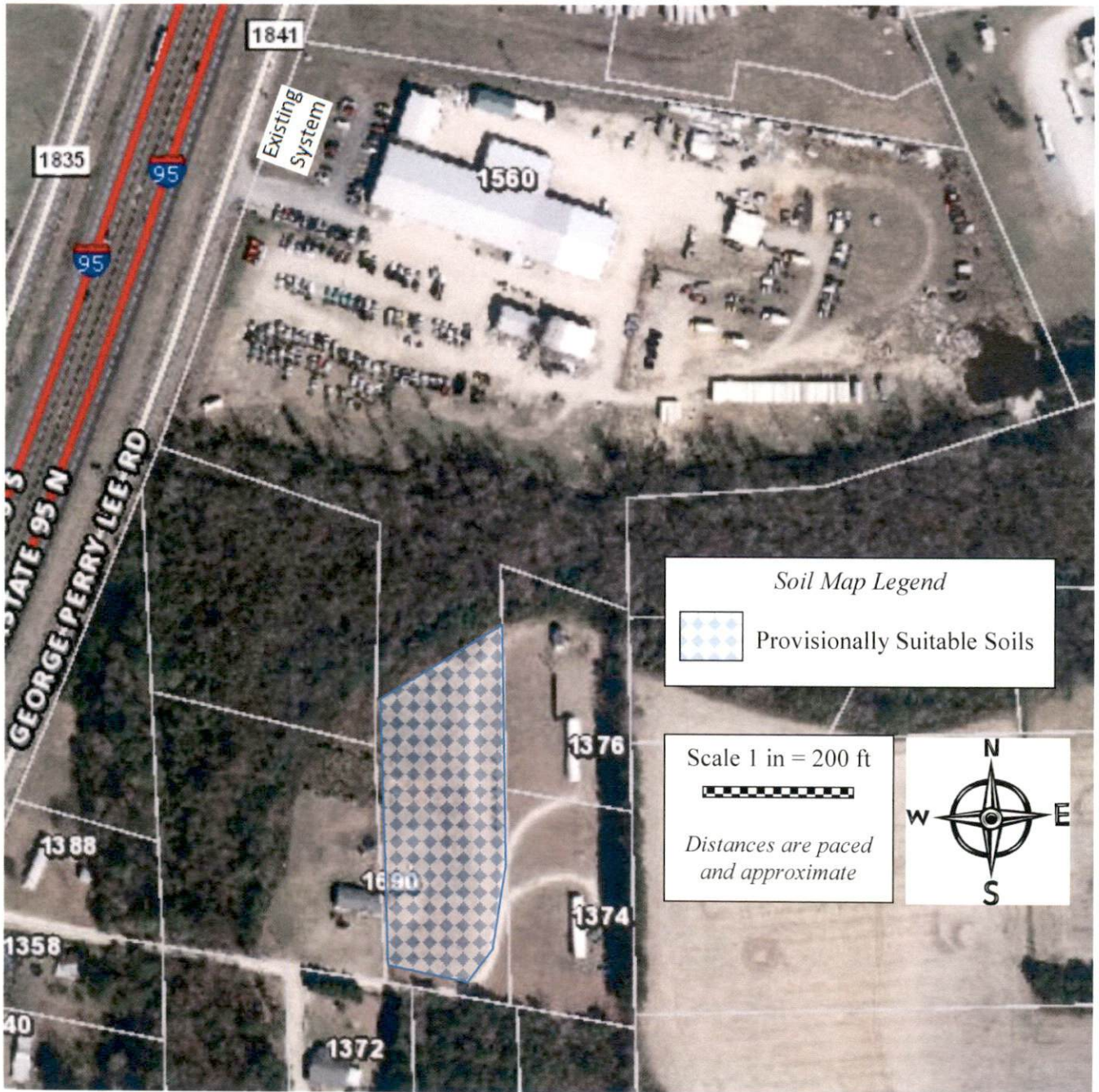
A handwritten signature in black ink that reads "Hal Owen".

Hal Owen  
Licensed Soil Scientist



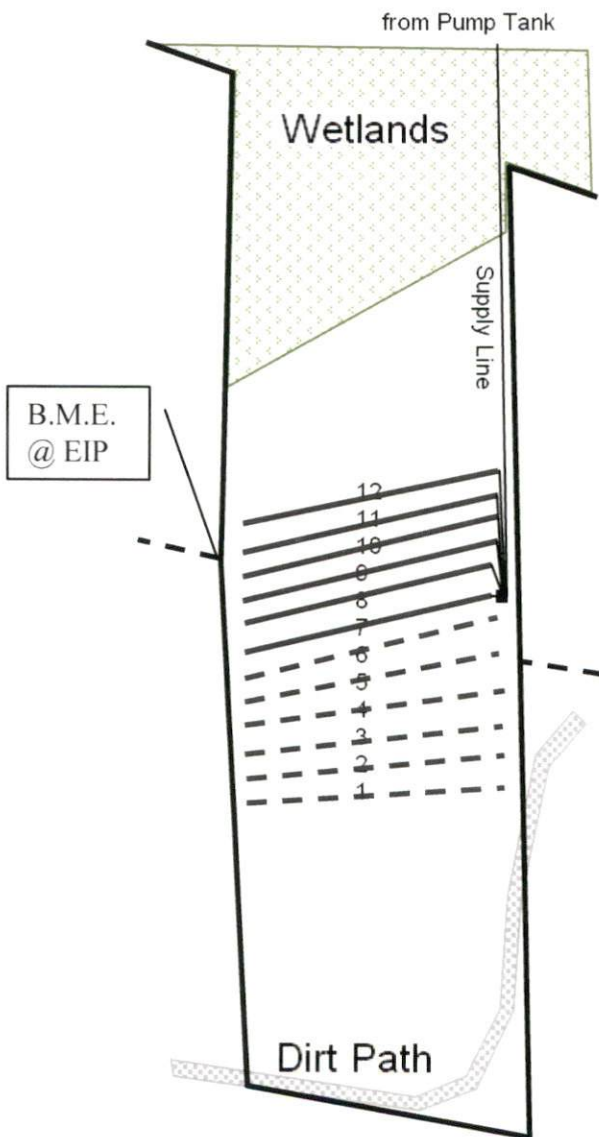
Comprehensive Soil Investigation and Septic System Design  
JPF Properties LLC Property; PIN 1537-17-7973  
27 December 2017

Figure 1. Soil Map showing Septic Suitability



Comprehensive Soil Investigation and Septic System Design  
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Figure 2. Septic System Layout



Design Flow = 1016 gallons per day

Lines flagged at site on 9-ft centers.

Line #	Color	Relative Elevation (ft)	Drainline Length(ft)
1	R	102.05	141
2	Y	101.91	141
3	W	101.74	141
4	R	101.58	141
5	Y	101.48	141
6	B	101.28	141
7	W	100.98	141
8	R	100.80	141
9	Y	100.57	141
10	B	100.50	141
11	W	100.29	141
12	R	100.09	141
<b>Pump Tank:</b>			
<b>Benchmark</b>		<b>100.00</b>	

**Initial System**

Pressure Manifold to 6 X 141-ft (X 3-ft)  
 Conventional drainlines (Lines 7-12)  
 Installed on contour at 18 inches  
 LTAR 0.4 gal/day/sqft

**Repair System**

Pressure Manifold to 6 X 141-ft (X 3-ft)  
 Conventional drainlines (Lines 1-6)  
 Installed on contour at 18 inches  
 LTAR 0.4 gal/day/sqft

\*drainlines must be at least 9ft on center and 10ft from property lines.

Scale 1 in = 100 ft  
  
 Distances are paced and approximate





Comprehensive Soil Investigation and Septic System Design  
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**PRESSURE MANIFOLD DESIGN CRITERIA**

Line Number	Line Color	Elevation	Drainline Length(ft)	Tap Size/Schedule	Flow/tap (gpm)	gpd/ft	LTAR (gpd/sqft)
7	W	100.98	141	3/4"sch 40	12.50	1,201	0.400
8	R	100.80	141	3/4"sch 40	12.50	1,201	0.400
9	Y	100.57	141	3/4"sch 40	12.50	1,201	0.400
10	B	100.50	141	3/4"sch 40	12.50	1,201	0.400
11	W	100.29	141	3/4"sch 40	12.50	1,201	0.400
12	R	100.09	141	3/4"sch 40	12.50	1,201	0.400

Total Drainline= 846 Total Flow= 75.00

Pressure Head (ft)= 2 Target LTAR\* (gpd/sf)= 0.40 LTAR + 5% 0.42  
 Daily Flow= 1016 Total Flow (gpm)= 75.00 Daily PRT(min)= 13.55  
 Dose Vol= 414.33 gallons w/ Pipe Vol @% 75 Dose PRT (min)= 5.52

**MANIFOLD DIAGRAM:**

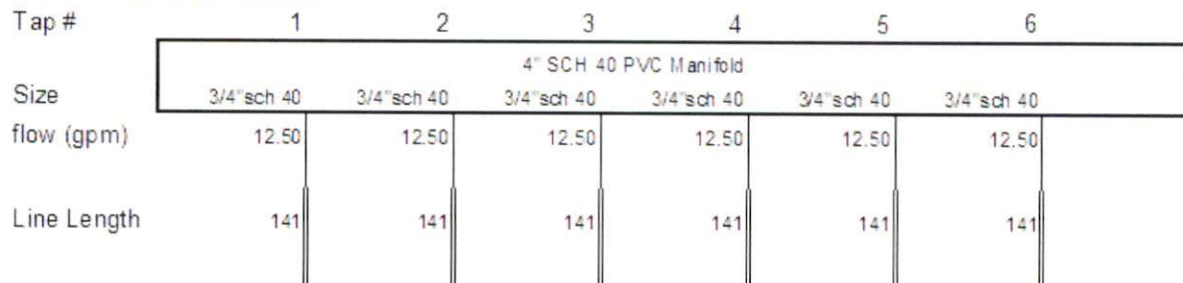


Table 1. Water Usage for PJ's Truck Bodies and adjusted daily flow calculations.

Daily Water Usage (meter reading)

DAY	DATE	TIME	Meter Reading	Daily Usage Vol (gal)
1	9/19/2017	4:05	624500	
2	9/20/2017	4:03	625700	1200
3	9/21/2017	4:07	626100	400
4	9/22/2017	4:01	626200	100
5	9/23/2017	3:55	626200	0
6	9/24/2017	4:00	626700	500
7	9/25/2017	4:01	626800	100
8	9/26/2017	4:09	627500	700
9	9/27/2017	4:05	628100	600
10	9/28/2017	4:00	628600	500
11	9/29/2017	3:48	628700	100
12	9/30/2017	3:50	629200	500
13	10/1/2017	4:02	629700	500
14	10/2/2017	4:10	630300	600
15	10/3/2017	4:05	630700	400
16	10/4/2017	4:00	631600	900
17	10/5/2017	4:05	631900	300
18	10/6/2017	4:00	632000	100
19	10/7/2017	4:00	632100	100
20	10/8/2017	4:00	632100	0
21	10/9/2017	4:10	632400	300
22	10/10/2017	3:55	633100	700
23	10/11/2017	3:50	633700	600
24	10/12/2017	4:00	634300	600
25	10/13/2017	4:00	634800	500
26	10/14/2017	4:00	635100	300
27	10/15/2017	4:00	635100	0
28	10/16/2017	3:58	635400	300
29	10/17/2017	4:10	635900	500
30	10/18/2017	3:55	636400	500

Monthly Water Usage (from water bill)

Month	# days in period	Total Usage (gal)	Avg. Daily Usage (gal)
Sep-16	30	10,400	347
Oct-16	31	7800	252
Nov-16	32	9900	309
Dec-16	34	10700	315
Jan-17	29	11200	386
Feb-17	26	10200	392
Mar-17	28	10200	364
Apr-17	31	11300	365
May-17	27	9800	363
Jun-17	30	11800	393
Jul-17	32	10900	341
Aug-17	28	12300	439
Sep-17	31	13400	432

Average Monthly Usage (12 mo): 10,762  
 Avg. Daily Usage from Water Bill: 361

Avg. Daily Usage from Meter Reading: 410

Total Monthly Flow: 11900 (total /29 days X 30 days=12,310)

- A) Peak Monthly Flow (Sep 2017): 13,400
- B) 30-day total (Sep to Oct 2017): 12,310 (adjusted)
- C) Peaking Factor (A/B): 1.09
- D) Highest 10% of Daily Readings: 1,200 700 900
- E) Average of D: 933
- F) Multiply by Peaking Factor (E\*C): 1,016

**Adjusted Daily Flow: 1,016 gal**

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26 June 2017

Mr. Paul Faircloth  
PJ's Truck Bodies & Equipment Co.  
PO Box 1207  
Dunn, NC 28335

Reference: Preliminary Soil Investigation  
JPF Properties LLC Property; PIN 1537-17-7973

Dear Mr. Faircloth,

A site investigation has been conducted for the above referenced property, located at 1560 George Perry Lee Road in Dunn, Harnett County, North Carolina. The purpose of this investigation was to determine the site's ability to support subsurface sewage waste disposal systems. All sewage disposal 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 as a Licensed Soil Scientist but does not guarantee or represent permit approval by the local Health Department.

It is my understanding that the northwestern corner of the subject property is being utilized for the subsurface sewage waste disposal system for your business. The area was reviewed and the existing system appeared to be functioning properly on the day of the investigation. I have been informed by the Harnett County Health Department that they have concerns about your current number of employees and your desire to add buildings that could cause an increase in the number of people that you employ or flow into the septic system. The health department has allowed you to proceed utilizing actual water usage data rather than the flow designated by the regulations. So although you have about 67 employees (which by regulation generates a design flow of 1675 gallons of effluent per day), your existing septic system is designed for a flow of only about 400 gallons per day. This scenario will likely lead to hydraulic overload of the system. We all wish to avoid a system wide failure with effluent coming to the ground surface. It is also my understanding that the septic area has been largely consumed by your existing drainfield and only a small area is available to repair the system if it should fail.

A soil investigation was conducted and an additional portion of this property was observed to be underlain by provisionally suitable soils for subsurface sewage waste disposal (see attached map). These provisionally suitable soils were observed to be firm sandy clay loams to greater than 30 inches and will support long term acceptance rates of 0.4 gal/day/sqft. This area contains greater than an acre of usable soil and appears adequate to support the initial septic system and repair area for at least 70 employees. The health department is encouraged to utilize any available space in the area in the northwestern corner to modify the existing system to provide for your current desire to add a building. When the area to the south becomes needed, you will be required to install a pump type system, but you can expect to be allowed to use conventional type drainlines. The pump and distance to the drainfield will have significant expense. Due to the distance you will be required to pump, an engineer will likely be required to design the supply line from the septic tank and pump tank to the drainfield. In addition, you will be required to obtain a permit to temporarily impact any wetlands that exist in the drainageway between the buildings and the drainfield. This assumes that you do not need to build a road across the drainageway. A permit for a permanent impact will be required if you build a road. More information about wetlands permitting can be provided at your request.

I appreciate the opportunity to provide this service and trust that you will feel free to call on me again in the future. If you have any questions or need additional information, please contact me at your convenience.



Sincerely,

A handwritten signature in black ink that reads "Hal Owen". The signature is written in a cursive, flowing style.

Hal Owen  
Licensed Soil Scientist



Preliminary Soil Investigation  
JPF Properties LLC Property; PIN 1537-17-7973  
26 June 2017

Soil Map

