August 21, 2013

WSP
128 Talbert Road
Suite A
Mooresville, North Carolina 28117

Attention: Mr. Jonathan Carter, P.E.

Reference: **Technical Assistance with Septic Permitting**
South Iredell Volunteer Fire Department (SIVFD)
Brumley Road and Linwood Road - Approximate 4.39 acre parcel
Iredell County, North Carolina
S&ME Project No. 1584-13-086

Dear Mr. Carter:

S&ME, Inc. (S&ME) has provided technical assistance in regard to obtaining a septic Construction Authorization Permit for the above referenced property in Iredell County, North Carolina. The evaluation was performed in general accordance with S&ME Proposal No. 1584-13-P206 (Revision 1) dated August 9, 2013.

BACKGROUND

The referenced property is located at the southeast corner of the intersection of Brumley Road and Linwood Road in Iredell County, North Carolina. The purpose of the technical assistance was to assist with obtaining a septic Construction Authorization for a proposed new Volunteer Fire Station. S&ME performed a preliminary soil evaluation on the site for WSP SELLS in 2010. WSP is providing the site plan and the engineer design for the Fast Track septic submittal to the Iredell County Health Department (ICHD). S&ME described six backhoe pits and flagged the proposed septic drainfield for the Fast Track submittal. Based on our latest phone conversation with you and the ICHD, we understand the design flow for the proposed SIVFD will be 550 gallons per day (gpd). The proposed septic area is in fescue grass and there is an existing gravel drive, steel building, and well on the site, as shown on the attached site plan.

SUMMARY OF THE SOIL EVALUATION AND PROPOSED SEPTIC SYSTEM LAYOUT

On August 20, 2013, Mr. Paul Penninger, S&ME Soil Scientist, visited the site and described six backhoe pits that were dug by a backhoe and operator supplied by the SIVFD to approximately 60 inches below the ground surface (bgs). The backhoe pits were located by WSP and are shown on the attached site plan. The soil profiles observed at the six pits generally had a clayey Bt horizon over a clay loam BC or transition horizon. Saprolite was observed in five of the six pits at depths ranging from 23 to 58 inches bgs (see attached soil profile descripitons). The pits were described as provisionally suitable with a proposed Long Term Acceptance Rate (LTAR) of 0.3 gallons per day per square foot (gpd/ft^2) if a 36 inch trench bottom is utilized. The LTAR range for a Group IV clay soil is 0.1 to 0.4 gpd/ft^2 and the LTAR range for a loam saprolite is 0.2 to 0.4 gpd/ft^2. At 36 inches bgs, the system trench bottom will generally be in a clay loam soil or a loam saprolite.

Approximately 1,500 feet of possible septic trench were flagged with a laser level and colored pin flags on August 20, 2013. Your surveyor located the flagged septic lines and the lines you are proposing for the system and repair areas are shown on the attached site plan. Your surveyor also staked the proposed building and septic tank locations on the site. You are proposing a gravity conventional system. The ICHD and contractor should verify prior to system installation that gravity flow can be utilized for the proposed system. If gravity flow cannot be achieved, a pump and pump tank will be required to dose the effluent to the drainfield.

There are two mounds of soil at the proposed septic area, as indicated on the site plan. This material is topsoil that was stockpiled from the construction of the existing gravel drive. Where this soil material is mounded on the proposed system area it should be removed from the site. This should be done under dry soil conditions to avoid compacting the soil at the system area. Stormwater should be diverted from the proposed system area.

This report is not an Improvement Permit or Construction Authorization and is intended only to summarize our activities that assisted you and the ICHD in permitting the referenced property. The ICHD should verify all soils and system specifications, and required setbacks before permitting and/or septic system installation. Soil evaluations and system layouts are done based on interpretations of the rules governing wastewater treatment and disposal systems and are not guarantees for site approval or future septic system performance.

CLOSURE

Thanks for the opportunity to provide technical assistance associated with septic permitting for the SIVFD site. Please call if you have any questions concerning this report.

Sincerely,

S&ME, Inc.

Paul G. Penninger, LSS
Licensed Soil Scientist

Rob Willcox, LSS
Natural Resources Services Leader

Attachments: Application Information Submitted to the ICHD

S:\1584\PROJECTS MASTER\Projects 2013\1584-13-086 WSP-South Iredell Vol. Fire Dept\WSP - SIVFD Septic Soil Evaluation Summary Report.doc

FAST TRACK

IREDELL COUNTY HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
Application for IMPROVEMENT PERMIT , AUTHORIZATION TO CONSTRUCT, or EXISTING SYSTEM INSPECTION

(THE ABOVE PERMIT DOCUMENTS WILL BECOME INVALID IF INFORMATION PROVIDED ON THIS APPLICATION IS FALSIFIED OR CHANGED, OR IF THE SITE IS ALTERED. THE IMPROVEMENT PERMIT IS VALID FOR EITHER 60 MONTHS OR WITHOUT EXPIRATION DEPENDING UPON DOCUMENTATION SUBMITTED - APPLICATION WITH SITE PLAN 60 MONTHS, APPLICATION WITH COMPLETE, SCALED PLAT WITHOUT EXPIRATION. SEE 15A NCAC 18A .1937(f) FOR DETAILS)

1. APPLICATION FOR: ___ Improvement Permit ✓ Authorization To Construct ___ BOTH ___ Existing System Inspection

2. Page 2: *Site Plan Worksheet* Form MUST Accompany This Application
   The following optional attachments may also be submitted: ___ Survey Plat, Scaled no more than 1 Inch = 60 Feet
   Place check ( ) beside whichever is submitted if applicable ✓ Custom Site Plan, Scaled no more than 1 Inch = 60 Feet

3. Applicant Information: P.O. Box 1751 Mooresville, NC 28115

Applicant Name	Mailing Address	Home Phone #	Alternate Phone #
Brian Weatherman	716 Linwood Road, Mooresville, NC 28115	980-721-5565	

Owner Name	Mailing Address	Home Phone #	Alternate Phone #
South Iredell VFD	P.O. Box 1751 Mooresville, NC 28115 716 Linwood Road, Mooresville, NC 28115	704 664 3043	

4. Property Information:

Street Address	Subdivision Name	Section/Phase and Lot Number
561 Linwood Road		

Driving Directions: From Mooresville, South on NC 3, LEFT on Williford Rd, LEFT on Linwood Rd, Right on Brumley, 1st Drive on Right

5. RESIDENTIAL Site Development Information: *(Check or Complete ALL that apply)*

( ) New, Single Family Residence
( ) New, Multi-Family Residence
( ) Expansion of Existing Septic System
( ) Repair To Failing Septic System
( ) Other ___

Maximum Number of Bedrooms ___
Maximum Number of Occupants ___
If Expansion, Current Number of Bedrooms ___

( ) Crawl Space Foundation?
(✓) Concrete Slab Foundation?
( ) Basement w/Plumbing?
( ) Basement w/out Plumbing?

IF Non-Residential Site Development:

Type of Business	Fire Department
Square Footage of Building	16,100 SF
Maximum Number of Employees	5
Maximum Number of Seats	50

6. Proposed Water Supply:

( ) New Well (✓) Existing Well ( ) Community Well ( ) City Water ( ) Other Public Water

7. Desired Septic System Type: *(You may rank in order of preference, if any)*

( ) Alternative (✓) Conventional ( ) Innovative ( ) Modified Conventional ( ) Other___ ( ) No Preference

8. Please Answer The Following To The Best of Your Ability:

( ) Yes (✓) No Does the site contain any jurisdictional wetlands?
( ) Yes (✓) No Is any non-domestic sewage (i.e. industry) to be generated?
(✓) Yes ( ) No Is the site subject to approval by any other public agency?

I have read this application and certify that the information provided herein is true, complete, and correct. Authorized county and state officials are granted right of entry to conduct necessary inspections to determine compliance with applicable laws and rules. I understand that I am solely responsible for the proper identification and labeling of all property lines and corners and making the site accessible so that a complete site evaluation can be performed.

9. Signature: Brian Weatherman
Property owner or owner's legal representative signature (SIGNATURE REQUIRED)

8/8/2013
DATE

IREDELL COUNTY HEATLH DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
PAGE 2: *SITE PLAN WORKSHEET*

SEE THE "SAMPLE SITE PLAN" BELOW. ***INCOMPLETE SITE PLANS WILL BE RETURNED TO YOU FOR COMPLETION AND MAY RESULT IN A DELAY IN THE ISSUANCE OF YOUR SEPTIC SYSTEM PERMIT!!!***

Place an (X) beside each item as you complete the site plan:

- ✓ Property Line measurements are clearly identified...
- ✓ All proposed structures are indicated...
  SHOW: proposed house or business footprint, wells, water lines, patios, pools and decks, and any other item that will occupy space on the site
- ✓ Front and side setbacks from property line...
- ✓ Preferred driveway location and configuration, preferred well location...
- ✓ Area you prefer your septic system to be placed...
- ✓ North arrow, or other sufficient indicator of direction...

Circle N/A on the following if appropriate:

- ✓ Location of septic systems and wells within 100' of your property... N/A
- ✓ Location of easements and rights of ways on your property... N/A
- ___ Location of any designated wetlands on the property... (N/A)

Signature: Brian Hoatlen
REQUIRED property owner or owner's legal representative signature.

8/8/2013
DATE

USE THIS SPACE TO DRAW YOUR SITE PLAN

ENVIRONMENTAL HEALTH REQUIREMENTS

The following numbered items MUST BE COMPLETED PRIOR TO THE SUBMITTAL of the Improvement Permit (IP) / Authorization to Construct (AC) / Existing System application packet. **Questions? Call Iredell County Environmental Health between 8:00-9:00a.m., Monday-Friday to speak with a Registered Sanitarian.**

Statesville Office (704)878-5305 Mooresville Office (704)664-5281

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1. **Complete all Environmental Health forms**: septic system application, site plan, new well water application (if applicable), and sign this green sheet **after** you completed all items. **Include in submittal a copy of the Zoning Permit.** A Zoning Permit is not required for septic system repairs or expansion where no addition is being made to an existing structure.

2. Clearly **mark all property corners**. Flag side lines every twenty-five feet if rear corners are not visible when standing on front corners.

3. **Stake or flag the footprint of the building structure**.

4. Where an **Authorization to Construct (AC) is desired**, submit a recorded copy of the **plat for the subdivision lot** (if not already on file at Environmental Health) and **include two(2) legible copies of the basic floor plan** not larger than 11" x 17" for each floor in the structure.

5. **Any site not having adequate visibility**(50' in any direction) **must be cleared of "undergrowth"** to allow access and provide good visibility.

6. All completed paperwork must be submitted to the Environmental Health Division of the Iredell County Health Department for review before any name will be placed on the service request (appointment) list. **Only properly completed applications will be placed on the service request list on a first come, first serve basis. Incomplete applications will be returned to the applicant.**

Completed permits must be picked up promptly. If it becomes necessary to send a certified letter (return receipt), postage will be charged and **any permit not picked up by the deadline in the letter will be voided. All monies paid to that point are non-refundable.**

Any site not ready when staff arrive for the evaluation will result in the applicant being charged a site revisit fee and the request being returned to the bottom of the service request list.

By signing below I am acknowledging the above specifications have been met and the site is ready to be evaluated.

Signature _____ **Date** 8/8/2013

Brady 704-402-4441

Iredell County
Planning & Enforcement
349 N. Center St. PO Box 788
Statesville, NC 28687
704-878-3113

Zoning Permit

Permit Number: 180530ZO

Printed: 8/15/2013

Master #: 180530

Associated Permits:

180530ZO	Zoning
180530GR	Grading

Applicant

Name: WSP USA Corp
Address: 128 Talbert Rd Ste A
Mooresville, NC 28117

Phone: 704-662-0100

Parcel

Parcel Number: 4676264308.000
Address: 651 Brumley Rd.
Mooresville, NC 28115
Subdivision:

Zoning: RA
Township: 0300
Area: 4.338
Lot(s):

Directions to Parcel: At the corner of Linwood Road and Brumely Road

Owners

Name: SOUTH IREDELL VOL FIRE DEPT
Address: P O BOX 1751
MOORESVILLE, NC 281151751

Phone: 704-664-3043

Contractors

Fees and Receipts:

Number	Description	Amount
FEE-293969-07	Zoning - Permit Application	$75.00
FEE-293970-07	Technology Fee - Planning	$2.25
FEE-293971-07	Site Plan Inspection	$100.00
FEE-293976-07	Environmental Health - Gravity - Fast Track	$350.00
	Total Fees:	**$527.25**
REC-149632-07		$527.25

Total Receipts:	**$527.25**

Conditions

Date: **Status:** **Code:**

Condition Description:

Condition Comments:

Permit Information:

Max Built Upon Area:	
Watershed:	WSII-BOW
Flood Zone:	No
Set Backs:	F35 R35 LS15 RS15
Minimum Lot Size:	
Minimum Lot Width:	
Min # Parking Spaces:	
Land Use Permitted:	Yes
Community Sewer:	No
Site Plan Reviewed:	Yes
Staff:	Rebecca Harper
Zoning Permit:	Yes
Septic Typet:	New System
Proposed Use:	Fire Department
Property Recorded:	Yes
Community Water:	No
Provider:	
Provider:	
Date:	8/15/2013
# of Stories:	0
# of Bedrooms:	0
# of Units in Building	0

Site Plan Conditions:
Zoning Permit Comments: South Iredell Fire Department

No Building permit shall be issued for a residential dwelling or a nonresidential principal structure until a grading permit has been issued. No land shall be graded for the purpose of construction of a residential dwelling or a nonresidential principal structure, until a grading permit has been issued by the County. The County shall collect such fees for the issuance of grading permits as are authorized by the fee schedule adopted by the Board of Commissioners.

In addition to obtaining the permit; the owner, building contractor, or other responsible party shall:

A. Control run-off as to not damage or adversely impact adjoining properties or natural watercourses by providing sufficient erosion control measures, such as silt fence, drainage ditches, swales, etc
B. Refrain from altering the general direction of natural drainage direction and avoid concentrated flows when possible.
C. If land clearing is needed for septic tank testing, then erosion control measures may be needed. Contact Erosion Control Department for further assistance.
D. Call in an inspection when measures are in place prior to any building footing/foundation inspection.

The applicant certifies that there are no deed restrictions, contractual agreements or governmental regulations of any kind that interfere with or prohibit the use of the property or the use for which this permit is requested. Applicant further acknowledges that enforcement of deed restrictions, plat conditions and other contractual agreements will not be undertaken by Iredell County and is the sole responsibilty of the affected parties.

Applicant: _____ Date _____

A non-refundable fee of $75.00 is charged on all permit applications

Permit Number: 180530ZO

S&ME, INC.
SITE/SOIL EVALUATION

CVL CRF 8/30/13

Project No. 1584-13-094 **Phone No.** _____ **Date:** 8-28-13

Location Bradley Acres **Pin** _____ **County:** Beaufort **Property Size** ~4.39 Ac

Proposed Facility: VFD **Water Supply:** On-Site Well ☒ Community ☐ Public ☐ **Evaluation:** Auger Boring ☐ Pit ☒ Cut ☐

Described By: PGD

Weather: Hot, Humid **Antecedent Moisture** Moist **Surface Water:** —

FACTORS	PROFILE 1	PROFILE 2	PROFILE 3	PROFILE 4
Landscape Position %	Between Bm	L c FS	L c FS	L c FS
Horizon Depth I	0-10	0-8	0-6	0-4
Color Munsell	red	red 2.5YR	5YR	
Texture	Clay	CL	CL	Clay
Structure		W SBK	M SBK	
Consistence	fr SS/SP	fr SS/SP	fr SS/SP	
	Fill Brow			
Boundary				
Horizon Depth II	10-19	8-30	6-29	4-24
Color – Munsell	red 2.5YR	2.5YR	2.5YR	2.5YR
Texture	CL	C	C	C
Mottles			2.5YR 6/4 (10%) f faint	f faint
Structure	W SBK	f f SBK	f f SBK	f f SBK
Consistence	fr SS/SP	fr SS/SP	fr SS/SP	fr SS/SP
Boundary				
Horizon Depth III	19-33	30-55	29-41	24-31
Color – Munsell	red 2.5YR	4/11 2.5YR	4/11 2.5YR	4/11 2.5YR
Texture	C	CL	CL	CL
Mottles	f faint/dist 6/4	c dist/f faint 6/4	c dist/f faint	c dist
Structure	m FARK	W SBK	W SBK	W SBK
Consistence	fr SS/P	fr SS/SP	fr SS/SP	fr SS/SP
Boundary				
Horizon Depth IV	33-58	more	41-58	31-60+
Color – Munsell	4/12 2.5YR	same as	4/11 2.5YR	4/11 2.5YR
Texture	C	N with	CAP	LOAM
Mottles	c dist/f faint 6/4	pith	f dist 6/4	f dist 6/4
Structure	W SBK		massive	massive
Consistence	fr SS/SP		fr SS/SP	fr SS/SP
Boundary	58-75			
~~Soil Wetness~~	4/11 2.5YR	—	—	—
Restrictive Horizon	LOAM SAP	—	—	—
~~Saprolite~~	f ind 6/4	INCL	41	31
~~LTAR~~	massive	.3	.3	.3
Classification	fr SS/SP	PS	PS	PS
	PS .3			

SAP @ 58'

LEGEND

LANDSCAPE POSITION

R	Ridge Interfluve
S	Shoulder
L	Linear Slope
FS	Foot Slope
N	Nose Slope
H	Head Slope
Cc	Concave Slope
Cv	Convex Slope
T	Terrace
P	Flood Plain

TEXTURE

s	sand
ls	loamy sand
sl	sandy loam
l	loam
si	silt
sil	silt loam
sicl	silty clay loam
cl	clay loam
scl	sandy clay loam
sc	sandy clay
sic	silty clay
c	clay

CONSISTENCE WET

Ns	non-sticky
Ss	slightly sticky
S	sticky
Vs	very sticky
Np	non-plastic
Sp	slightly plastic
P	plastic
Vp	very plastic

MOIST

vfr	Very friable
fr	friable
fi	firm
vfi	Very firm

STRUCTURE

sg	single grain
m	massive
cr	crumb
gr	granular
sbk	subangular blocky
abk	angular blocky
pl	platy
pr	prismatic

S&ME, INC.
SITE/SOIL EVALUATION

Project No. 1594-13-284 **Phone No.** _____ **Date:** 8-20-13
Location Bowsley Crossing **Pin** _____ **County:** Iredell **Property Size** _____

Proposed Facility: VED **Water Supply:** On-Site Well ☒ **Evaluation:** Auger Boring ☐
Community ☐ Pit ☒
Described By: FBP Public ☐ Cut ☐
Weather: Hot, Humid **Antecedent Moisture** Wet **Surface Water:** —

FACTORS	PROFILE 5	PROFILE 6	PROFILE	PROFILE
Landscape Position %	L 6/10%	L 6/10%		
Horizon Depth I	0-8	0-7		
Color Munsell	7.5YR 5/8	7.5YR 5/8		
Texture	cl	cl		
Structure	WSBK	WSBK		
Consistence	Fr SS/SP	Fr SS/SP		
Boundary				
Horizon Depth II	8-31	7-23	TH/BR	
Color – Munsell	7.5YR 5/8	7.5YR 5/8		
Texture	cl	cl		
Mottles	C 5YR 6/8	C 5YR 6/8		
Structure	MSBK / ABK	MSBK / ABK		
Consistence	Fr SS/SP	Fr SS/SP		
Boundary				
Horizon Depth III	31-45	23-60		
Color – Munsell	10YR 7/1	10YR 8/1		
Texture	cl	SCL / cl	SC	
Mottles	C 5YR 6/8	C 5YR 6/8		
Structure	WSBK	MSBK		
Consistence	Fr SS/SP	Fr SS/SP		
Boundary		Sc / Sap	Sap	
Horizon Depth IV	45-60			
Color – Munsell	10YR 7/1	In Depth		
Texture	SCL			
Mottles	C 5YR 6/8			
Structure	WSBK / Massive			
Consistence	Fr SS/SP			
Boundary				
Soil Wetness	—	—		
Restrictive Horizon	—	—		
Saprolite	45	23		
LTAR	7.5	8.0		
Classification	Fine	Fine		

LEGEND

LANDSCAPE POSITION

R	Ridge Interfluve
S	Shoulder
L	Linear Slope
S	Foot Slope
N	Nose Slope
H	Head Slope
Cc	Concave Slope
Cv	Convex Slope
T	Terrace
P	Flood Plain

TEXTURE

s	sand
ls	loamy sand
sl	sandy loam
l	loam
si	silt
sil	silt loam
sicl	silty clay loam
cl	clay loam
scl	sandy clay loam
sc	sandy clay
sic	silty clay
c	clay

CONSISTENCE WET

Ns	non-sticky
Ss	slightly sticky
S	sticky
Vs	very sticky
Np	non-plastic
Sp	slightly plastic
P	plastic
Vp	very plastic

MOIST

vfr	Very friable
fr	friable
fi	firm
vfi	Very firm

STRUCTURE

sg	single grain
m	massive
cr	crumb
gr	granular
sab	subangular blocky
ab	angular blocky
pl	platy
pr	prismatic

SEPTIC SYSTEM CALCULATIONS

FOR

SOUTH IREDELL VOLUNTEER FIRE DEPARTMENT

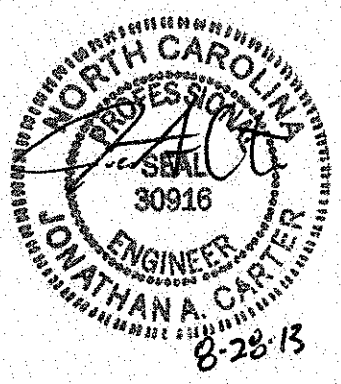
IREDELL COUNTY, NORTH CAROLINA

Revised August 28, 2013

PREPARED BY:

WSP

License No. F-0891
128 Overhill Drive, Suite 105
Mooresville, NC 28117
Phone: (704) 662-0100
Fax: (704) 662-0101



WSP

Project # I 10.6018.000
Project

Computed By JAC Date 8/28/13
Checked By Date

Sheet No. 1 of
Subject SEPTIC SYSTEM

DESIGN DAILY FLOW

50 PERSON CAPACITY MEETING ROOM
USE 5 GAL/DAY PER PERSON (FROM KEVIN NEAL - REGIONAL SOIL SPECIALIST)

50 PERSONS X 5 GAL/DAY = 250 GAL

5 BEDROOMS
USE 60 GAL/DAY (FROM KEVIN NEAL - REGIONAL SOIL SPECIALIST)

5 BEDROOMS X 60 GAL/DAY = 300 GAL

250 GAL + 300 GAL = 550 GAL

USE ~~750~~ GAL (MINIMUM REQUIRED)

VOLUME

$V = 1.17\,Q + 500$
$V = 1.17\,(750\ \text{GAL}) + 500$
$V = 1,248.8\ \text{GAL}$

USE 1,250 GAL TANK

MINIMUM AREA FOR NITRIFICATION TRENCH BOTTOM

TRENCH WIDTH = 36 IN

LONG TERM ACCEPTANCE RATE = 0.3 gpd/ft²
550 GAL/DAY ÷ 0.3 gpd/ft² = 1,833 ft²
TOTAL LENGTH = 1,833 ft² ÷ 3FT = 612 ft

USE 5 LINES @ 123FT