AMERICAN
TECHNICAL
SERVICES, INC.

8105 Black Hawk Rd • PO Box 558 • Black Hawk, SD 57718-0558 • Phone (605) 787-9303 • FAX (605) 787-9515
140 Pine Needle Drive • Spearfish, SD 57783 • Phone (605) 642-2742 • Mobile 390-3768

BRITTON ENGINEERING & LAND SURVEYING
8035 Black Hawk Road, Suite 5
Black Hawk, South Dakota 57718

November 1, 2007

Attn: Steve Thingelstad, LS/PE

Re: Report of Percolation Test Results & Analysis
Lot B of Lot 4R of High Sheridan Ranch Subdivision
Sand Lane off Sheridan Lake Road
Southwest of Rapid City, South Dakota

ATS. No. 07-7334

Following are the percolation test results for Lot B of Lot 4R of the High Sheridan Ranch Subdivision located on Sand Lane off Sheridan Lake Road southwest of Rapid City, South Dakota. The percolation test was requested on the lot for subdividing purposes. The percolation test was conducted near the center of the proposed 3.27 acre lot.

We performed the percolation tests in accordance with SDCL Chapter 74:03:01 "Individual and Small On-site Wastewater Systems". The results of the percolation test results are as follows:

Drain Field Site:

Boring 1:	26.5 min./inch
Boring 2:	30.0 min./inch
Boring 3:	33.0 min./inch

Average Percolation Rate = 29.8 min./inch

Depth to Bedrock: In excess of 8 feet.

Soil Type: Approximately 5 feet of brown silty clay with gravel (CL) overlying silty clay/clayey silt (CL-ML). Classified as alluvium.

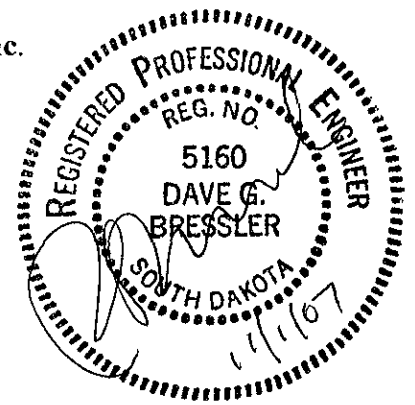
Depth to Groundwater: In excess of 8 feet.

Depth to Seasonal High Groundwater: In excess of 8 feet.

CLOSURE

If there are questions regarding the test results, or you desire additional consultation, feel free to call us at 787-9303.

Sincerely,
American Technical Services, Inc.



Dave G. Bressler, P.E.
Director of Engineering

Attachments - Site Sketch with Approximate Perc Test Locations
- Pennington County Drain Field Permit

cc: File

PENNINGTON COUNTY PLANNING DEPARMENT

MINIMUM DESIGN REQUIREMENTS FOR HOME WASTE DISPOSAL SYSTEMS

1. **DESIGN**: In accordance with Administrative Rules of South Dakota, Article 74:03, Individual and small on-site wastewater systems.

   Three (3) percolation tests must be done on all lots.

   A soil profile hole to a depth of 4 feet beneath the bottom of the proposed system will be done to determine the presence of groundwater or bedrock.

2. **LOCATION**: DRAINFIELD must be installed so as to meet the following general guidelines: (This is not a complete list.)

   Stay 10 feet inside property lines.

   Stay 20 feet from buildings.

   Stay 100 feet from surface water (high water line).

   Stay 150 feet from a well with the top of the aquifer less than 100 feet deep.

   Stay 100 feet from a well with the top of the aquifer more than 100 feet deep.

   Keep at least 4 feet of soil separation between bottom of system and groundwater, including seasonal highs.

   Keep at least 4 feet of soil separation between system and rock formations.

   Stay out of areas subject to flooding.

3. **INSTALLATION**: To be done under the supervision of a certified installer.

DO NOT BACKFILL UNTIL INSPECTED BY THE PENNINGTON COUNTY FIELD INSPECTOR

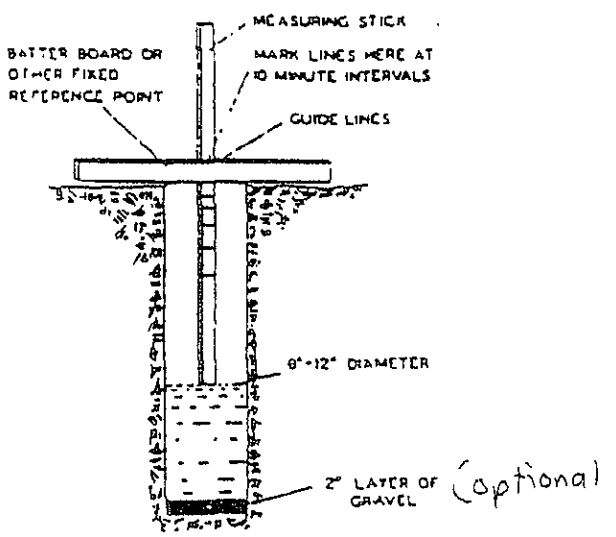
CONTACT
PENNINGTON COUNTY PLANNING DEPARTMENT
315 ST. JOSEPH STREET, RAPID CITY, SD 57701
(605) 394-2186
24 HOURS NOTICE IS REQUIRED FOR INSPECTION

Manner For Conducting Percolation Tests

A soil percolation test shall be made in at least 3 test holes within 5 feet of where the proposed absorption system or shallow wastewater system is to be located. The holes shall be randomly located in soil representative of and similar in character to the rest of the area where the system will be placed. An additional test hole shall be made to a depth of 4 feet beneath the bottom of the proposed absorption system, unless groundwater or bedrock is encountered first, to determine the type and depth of absorption system.

The horizontal diameter of the percolation hole shall be from 6 to 12 inches and the vertical sides shall extend to the maximum depth of the proposed absorption system or to a depth of at least 30 inches, whichever is greater.

Test holes shall be located in unfrozen soil and shall be filled at least 50 percent full with water for at least 8 hours but not more than 16 hours before making the soil percolation test. Immediately before making the test, each hole shall be refilled with water to at least 50 percent of its volume. When the water reaches the lower 25 percent of the test hole, the test shall begin. The percolation rate of a test hole shall be expressed in the number of minutes it takes the water level to drop 1 inch. The percolation rate for the area where the subsurface infiltration system is desired is the average percolation rate of all the test holes. The percolation tests shall be conducted for 2 hours unless the percolation rate is slower than 45 minutes per inch, in which case the percolation tests shall be run for at least 4 hours.



Soil percolation test.

Inspection of an On-Site Wastewater System

- The installer must set-up an inspection time with the Environmental Planner during the normal duty day at least 24 hours prior to the inspection.

- The installer shall provide an as-built diagram at the time of inspection with the following information:

Requirements for As-Built Drawings

The As-Built Drawing will be a layout drawing of the property showing all property lines, structures, and the septic system. The As-Built Drawing shall also include all the following:

- ☐ Measured distances pertaining to all required setbacks (i.e. all wells within 150 feet, property lines, structures, etc)
- ☐ North arrow
- ☐ All streams, creeks, bodies of water and drainage on the property and their distances to the septic tank and drainfield
- ☐ Depth of drainfield
- ☐ The drainfield reserve area
- ☐ Signature of the installer, certifying that the on-site wastewater disposal system was installed in accordance with all current regulations and guidelines.

- The as-built diagram may be a copy of the original site plan showing any changes made during the construction phase.

- In addition, a finder wire, composed of Number 14, solid strand insulated copper wire, shall be installed for all new and upgraded wastewater disposal system installations. The finder wire shall be access at the clean out and run to and around the septic tank access hole and through the trenches or around the bed.

PENNINGTON COUNTY
ON-SITE WASTEWATER SYSTEM CONSTRUCTION PERMIT APPLICATION

Pennington County Planning Department (605) 394-2186 **www.co.pennington.sd.us**

All portions on both sides of this form must be completed. A site plan must be submitted with this application that must reflect the location and design of the On-site Wastewater Treatment System. The site plan must also show the location of property lines, structures, percolation holes, and the profile hole. **No portion of the system may be buried until it has been inspected.**

☐ Form has been completely filled out on both sides ☐ Site plan shows all necessary items described above.

Owner/General Contractor _____ Daytime Phone ( )_____

complete address _____

Certified Installer _____ Daytime Phone ( )_____

complete address _____

Legal Description _____ Section_____ Twn_____ Range_____

Parcel size_____acres Water Source ☐ Well ☐ Public/community ☐ Cistern Well depth(if applicable)_____ft

System Information

☐ Trench System
☐ Bed System
☐ Mound System
☐ Other_____

☐ 4" Perforated Pipe
☐ Infiltrator System (20% reduct.)
☐ 10" Gravel-less pipe
☐ Other_____

Depth of clean rock under perforated pipe
☐ 6" or more but less than 12"
☐ 12" or more but less than 18" (20% reduction)
☐ 18" or more but less than 24" (34% reduction)
☐ 24" or more (40% percent reduction)

# Bedrooms	_____	
Garbage Disposal	_____	(yes/no)
Tank Size	_____	gallons
Percolation Rate	29.8	min/inch
Depth to bedrock	>8'	ft.

Required drainfield size _____ sq.ft.
Required drainfield size with reduction _____ sq.ft.

Setbacks

	Septic Tank	Absorption Area
Wells, cisterns, reservoirs	_____	_____
Lakes, streams, wetlands	_____	_____
Pressurized water lines	_____	_____
Dwelling, occupied bldg.	_____	_____
Property lines	_____	_____

Owner/General Contractor _____ (Print name) _____ (Signature) _____ (Date)

Certified Installer _____ (Print name) _____ (Signature) _____ (Date)

As a condition of receiving the permit(s), I hereby agree to perform all required work within the allowed time frame and in accordance with the applicable codes and ordinances in Pennington County and the State of South Dakota. I further acknowledge and authorize the Pennington County Planning Department staff and designees to enter onto and inspect the property described above, for the purpose of confirming compliance with the conditions of any and all permit(s) issued. This authorization shall remain in effect and continue throughout the time frame allowed to complete the work including any granted extensions, and shall apply to the subject property regardless of ownership during said time frame.

The proposed site plan and sewage disposal specifications have been reviewed for the proposed system.
The system _____ Does _____ Does Not meet with the approval of the Planning Department.

_____ **Issue Date** _____ **Expiration Date**

_____ **Environmental Planner** _____ **Expiration of Extension**

Attach to Bldg Permit # _____ **Septic Permit #** _____

SPECIFICATIONS VERIFIED THROUGH FIELD INSPECTION OF INSTALLED SYSTEM

DATE OF INSPECTION _____

Number of Finished Bedrooms: _____

Septic Tank Liquid Capacity: _____

Distance from Building to Septic Tank: _____

Square Feet Drainfield: _____

System Description: _____

_____

_____

DISTANCE FROM:

Property Lines: _____ Surface Water: _____

Ground Water: _____ Bedrock: _____

Well: _____ Dwelling: _____

Cistern: _____ Other: _____

INSTALLED ON-SITE SEWAGE DISPOSAL SYSTEM HAS BEEN REVIEWED ON THIS _____ DAY OF _____, 20_____. THE SYSTEM _____ DOES _____ DOES NOT MEET WITH THE APPROVAL OF THE PLANNING DEPARTMENT.

_____
Environmental Planner

Date: _____; RT/OT Hours _____

Date: _____; RT/OT Hours _____

Date: _____; RT/OT Hours _____

Totals RT X $100.00 = _____

OT X $250.00 = _____

Total Billing: $_____

Percolation Test Information

	Test Hole #1		Test Hole #2		Test Hole #3	
Inch 1	15	Minutes	15	Minutes	15	Minutes
Inch 2	15	Minutes	20	Minutes	15	Minutes
Inch 3	15	Minutes	20	Minutes	15	Minutes
Inch 4	20	Minutes	20	Minutes	30	Minutes
Inch 5	20	Minutes	30	Minutes	30	Minutes
Inch 6	30	Minutes	30	Minutes	30	Minutes
Inch 7	30	Minutes	30	Minutes	45	Minutes
Inch 8	30	Minutes	45	Minutes	45	Minutes
Inch 9	45	Minutes	45	Minutes	45	Minutes
Inch 10	45	Minutes	45	Minutes	60	Minutes
Inch 11		Minutes		Minutes		Minutes
Inch 12		Minutes		Minutes		Minutes
Averages	26.5	Minutes/inch	30.0	Minutes/inch	33.0	Minutes/inch

Average of all three holes 29.8 Minutes/inch (Transfer this number to the front of this form)

Person completing percolation testing DAVE G. BRESSLER, P.E.
Print Name

Signature

8-foot Soil Profile Information

Soil Type

1 foot — TOPSOIL
2 foot — SILTY CLAY W/SAND & GRAVEL (CL)
3 foot
4 foot
5 foot
6 foot — CLAYEY SILT/SILTY CLAY: (CL-ML)
7 foot
8 foot

Remarks: LOT B OF LOT 4R OF HIGH SHERIDAN RANCH SUBDIVISION PENNINGTON CO; SD

Person completing soil profile information DAVE G. BRESSLER, P.E.
Print Name

Signature

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5160
DAVE G. BRESSLER
SOUTH DAKOTA
11/1/07