SMALL REMARK FONT STANDARD 750-09.4-HANCOCK ER BRF 0174(16).GPJ GEODESIGN STANDARD .GDT 12/2/13

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# BORING LOG

**Project Name:** Hancock ER BRF 0174(16), Route 125, Hancock, Vermont

Boring No.: B-2A/B | Page No.: 1 of 3 | File No.: 750-09.4 | Checked By: DTH

| | | | Casing: | Sampler: |
|---|---|---|---|---|
| Boring Company: | Trans Tech Drilling Services | Type: | Flush | SS |
| Foreman: | John Leonhardt | I.D.: | 4.0 in. | 1.38 in. |
| GeoDesign Rep.: | Dan Howe/Jacob Wimett | Hammer Wt.: | N/A | 140 lbs |
| Date Started: | February 14, 2012 | Date Finished: February 16, 2012 | Hammer Fall: N/A | 30 in. |
| N. Coordinate: | | E. Coordinate: | Rig Type: | CME 75 Track Rig |
| Ground Surface Elevation (feet): | 1046.5 | | Hammer Type: | Automatic (C-E=1.43) |
| Station: 267+21 | Offset: 5 ft Left | | | |

**Groundwater Observations**

| Date | Depth (ft) | Elev. (ft) | Notes |
|---|---|---|---|
| 2/15/12, 11:00 | 17.0 | 1029.5 | wet sample. See Remarks. |
| 2/16/12, 9:40 | 13.5 | 1033.0 | removal of 3" Casing |
| 2/16/12, 10:00 | 13.5 | 1033.0 | In Casing |

**Sample Information**

| Depth (ft) | Casing Blows/ft | Number | Type | Penetration (inches) | Recovery (inches) | Depth (ft) | Blows 0 - 6 | 6 - 12 | 12 - 18 | 18 - 24 | Coring Time (min/ft) | Moisture Content (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S1 | SS | 7 | 5 | 0.5 | 60 | 50/1" | | | | |
| | | S2 | SS | 6 | 6 | 2 | 81 | 20/0" | | | | |
| 5 | | | | | | | | | | | | |
| | | S3 | SS | 24 | 17 | 5 | 11 | 17 | 18 | 14 | | |
| | | S4 | SS | 24 | 15 | 7 | 7 | 6 | 6 | 4 | | |
| 10 | | | | | | | | | | | | |
| | | S5 | SS | 24 | 11 | 10 | 7 | 4 | 2 | 3 | | |
| | | S6 | SS | 18 | 18 | 12 | 2 | 8 | 75/6" | | | |
| 15 | | | | | | | | | | | | |
| | | S7 | SS | 24 | 17 | 15 | 77 | 28 | 36 | 15 | | |
| | | S8 | SS | 24 | 5 | 17 | 20 | 15 | 6 | 4 | | |
| 20 | | | | | | | | | | | | |
| | | S9 | SS | 24 | 12 | 20 | 1 | 3 | 3 | 4 | | |
| 25 | | | | | | | | | | | | |
| | | S10 | SS | 24 | 18 | 25 | 4 | 2 | 2 | 3 | | |
| 30 | | | | | | | | | | | | |
| | | S11 | SS | 24 | 19 | 30 | 1 | 3 | 4 | 7 | | |
| 35 | | | | | | | | | | | | |

**Strata Description** (Depth & Elevation (feet))

- Asphalt — 1046.2
- Recent Temporary Bridge Fill with Possible Cobbles & Boulders
- 6 — Fill 1040.5
- 8.5 — 1038.0 — Silty Sand (with organic odor and wood) (Possible Fill)
- 16 — 1030.5 — Silty, Sandy Gravel
- 20 — 1026.5 — Silt / Silty Fine Sand

**Sample Description** (Classification System: Burmister)

S1) Refusal, gray fine to coarse SAND, little fine Gravel, some Silt, damp.

S2) Refusal, brown fine to coarse SAND and fine GRAVEL, little Silt, moist.

S3) Dense, brown fine to coarse SAND, little fine to coarse Gravel, little Silt, moist. Possible 1" thick asphalt layer at mid-sample.

S4) Medium dense;
S4A (Top 9"): brown fine to coarse SAND, little Silt, trace fine Gravel, moist.
S4B (Bottom 6"): brown fine to medium SAND, little Silt, trace fine to coarse Gravel, moist (with faint oxidized layers).

S5) Loose, brown fine to medium SAND and SILT, moist (with decomposed wood pieces and organic odor).

S6) Refusal;
S6A (Top 9"): Similar to S5.
S6B (Bottom 9"): Wood.

S7) Very dense;
S7A (Top 7"): partially decomposed wood pieces.
S7B (Bottom 10"): tan, fine to coarse GRAVEL, some fine to coarse Sand, trace Silt, dry.

S8) Medium dense, brown fine to coarse GRAVEL, some fine to coarse Sand, little Silt, wet.

S9) Loose, gray SILT, some fine Sand, wet.

S10) Similar to S9.

S11) Loose, olive, layered SILT to Clayey SILT, wet (with 1" SILT, little fine Sand layer approx. 2 inches from top of sample).

**Remarks**

1) Exploration location was estimated in the field by GeoDesign by taping to existing features. Ground surface elevation is approximate and is based on an email from VTrans dated 2/28/12. Stream bed was approximately 16' below temporary bridge surface.
2) Hollow stem auger advance was slow and grinding observed 0' to 5' deep.
3) Driller switched to 4" flush joint casing and wash rotary methods after sampling S7. Broke casing threads upon advancing casing to 10' deep. Retrieved all casing. Offset 4 feet west to B-2B and advanced using 4" flush joint casing and wash rotary methods.
4) Starting with sample S-8, relative moisture observations are likely to be affected by drill method.
5) Advanced open hole beyond 25' deep.

**Notes:**
1) Stratification Lines Represent Approximate Boundary Between Material Types, Transitions May Be Gradual.
2) Water Level Readings Have Been Made At Times And Under Conditions Stated. Fluctuations Of Groundwater May Occur Due To Other Factors Than Those Present At The Time Measurements Were Made.
A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A=Auger; C=Core; D=Driven; G=Grab; [illegible]; SS=Split Barrel (Split Spoon); ST=Shelby Tube; [illegible];
WOR/H=Weight of Rod/Hammer
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
6) Stratification lines represent approximate boundary between material types, transitions may be gradual.

Boring No.: B-2A/B

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# BORING LOG

**Project Name:** Hancock ER BRF 0174(16), Route 125, Hancock, Vermont

Boring No.: B-2A/B | Page No.: 2 of 3 | File No.: 750-09.4 | Checked By: DTH

Boring Company: Trans Tech Drilling Services; Foreman: John Leonhardt; GeoDesign Rep.: Dan Howe/Jacob Wimett; Date Started: February 14, 2012; Date Finished: February 16, 2012; N. Coordinate: ; E. Coordinate: ; Ground Surface Elevation (feet): 1046.5; Station: 267+21; Offset: 5 ft Left
Casing: Type Flush, I.D. 4.0 in.; Sampler: Type SS, I.D. 1.38 in.; Hammer Wt.: N/A, 140 lbs; Hammer Fall: N/A, 30 in.; Rig Type: CME 75 Track Rig; Hammer Type: Automatic (C-E=1.43)
Groundwater Observations: 2/15/12, 11:00 | 17.0 | 1029.5 | wet sample. See Remarks.; 2/16/12, 9:40 | 13.5 | 1033.0 | removal of 3" Casing; 2/16/12, 10:00 | 13.5 | 1033.0 | In Casing

**Sample Information**

| Depth (ft) | Casing Blows/ft | Number | Type | Penetration (inches) | Recovery (inches) | Depth (ft) | Blows 0 - 6 | 6 - 12 | 12 - 18 | 18 - 24 | Coring Time (min/ft) | Moisture Content (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S12 | SS | 24 | 13 | 35 | 4 | 3 | 3 | 4 | | |
| 40 | | | | | | | | | | | | |
| | | S13 | SS | 24 | 12 | 40 | 3 | 4 | 5 | 6 | | |
| 45 | | | | | | | | | | | | |
| | | S14 | SS | 24 | 13 | 45 | 1 | 2 | 2 | 1 | | |
| 50 | | | | | | | | | | | | |
| | | S15 | SS | 24 | 16 | 50 | 1 | 3 | 10 | 12 | | |
| | | C1 | C | 60 | 60 | 53.5 | | [REC= 100%; RQD= 93%] | | | 7 | |
| 55 | | | | | | | | | | | 7 | |
| | | | | | | | | | | | 7 | |
| | | | | | | | | | | | 8 | |
| | | | | | | | | | | | 8 | |
| | | C2 | C | 48 | 48 | 58.5 | | [REC= 100%; RQD= 81%] | | | 6 | |
| 60 | | | | | | | | | | | 7 | |
| | | | | | | | | | | | 7 | |
| | | | | | | | | | | | 8 | |
| | | C3 | C | 12 | 3 | 62.5 | | [REC= 35%; RQD= 0%] | | | 5 | |
| 65 | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |

**Strata Description** (Depth & Elevation (feet))

- Silt / Silty Fine Sand (Continued)
- 51.5 — 995.0 — Silty, Sandy Gravel (possible weathered rock)
- 53.5 — 993.0 — Schist / Phyllite
- 63.5 — Bottom 983.0 of Exploration at 63.5 ft

**Sample Description** (Classification System: Burmister)

S12) Loose;
S12A (Top 6"): brown fine to medium SAND, trace Silt, wet.
S12B (Bottom 7"): olive, layered SILT to Clayey SILT, trace fine Sand, wet.

S13) Loose, brown fine SAND, little Silt, wet.

S14) Medium, light gray, layered SILT & CLAY, 1" thick SILT layer a mid-sample.

S15) Stiff / medium dense;
S15A (Top 12"): light gray, layered Clayey SILT to SILT & CLAY, wet.
S15B (Bottom 4"): gray, fine to coarse GRAVEL, some fine to coarse Sand, little Silt, wet.

C1) Moderately hard, greenish gray with white banding, fresh to slightly weathered along fracture surfaces, closely to moderately jointed, excellent quality SCHIST. Bottom 12" grading into greenish charcoal gray with finer foliations and silkier luster PHYLLITE. Fractures typically along foliation planes at 70 degrees from horizontal. No reaction to dilute HCl.

C2) Moderately hard, dark greenish gray, fresh to slightly weathered along fracture surfaces, moderately jointed, good quality PHYLLITE. Fractures typically along foliation planes at 55 degrees from horizontal. Slickensides noted near top 8" and bottom 8" of core run. No reaction to dilute HCl.

C3) Moderately hard, dark greenish gray, fresh to slightly weathered along fracture surfaces, very closely jointed, very poor quality

**Remarks**

6) Added EZ-MUD (R) polymer after sampling S13.
7) Roller bit refusal @ 53.5 feet. Set 3" casing to 53.5 feet deep and began coring.
8) End C2 at 62.5 feet due to full barrel (recovered lost portion of C1).

Notes:
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3) Sample Type Coding: A=Auger; C=Core; D=Driven; G=Grab; [illegible]; SS=Split Barrel (Split Spoon); ST=Shelby Tube; [illegible];
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**Sample Information**

| Depth (ft) | Casing Blows/ft | Number | Type | Penetration (inches) | Recovery (inches) | Depth (ft) | Blows 0 - 6 | 6 - 12 | 12 - 18 | 18 - 24 | Coring Time (min/ft) | Moisture Content (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 75 | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 105 | | | | | | | | | | | | |

**Sample Description** (Classification System: Burmister)

PHYLLITE. No reaction to dilute HCl.

**Remarks**

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