APPENDIX B2.6

BORROW AREA DRILLING LOGS

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		DH-B1

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/10/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7040.7	FINISH: 12/11/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 5.25"	DEPTH TO BEDROCK (FT): ~7.0	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 60.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	30"				3	(0' - ~2.0') SILTY CLAY WITH SAND - Light yellowish brown, firm to hard, slightly moist, silty clay, few to little very fine sand, occasional medium to coarse sand.												
1																		
2						(~2.0' - ~3.5') SILTY SAND - Light yellowish brown, medium dense, slightly moist, silty very fine sand.												
	17"																	
3		CA 18"	1B	6					3.5	88.8	2.66							
			1A	11		(~3.5' - ~7.0') SILTY CLAY - Light yellowish brown, hard, slightly moist silty clay, few to little very fine to fine sand, occasional coarse sand to fine gravel.												
4				16														
5	24"	CA 16"		11		[Lab data at this depth are for 0-10' bulk sample.]	CL - ML		5.4		2.67	25/19/6	2.0	47.4	50.6			
			2B	14														
			2A	28														
6																		
7						(~7.0' - ~15.0') SANDSTONE - Pale yellow, very dense, very fine sand, moderately to strongly cemented, slightly moist.												
8																		
9																		
10	12"	CA 5"	4A	50/ 5"	6													
11																		
12																		
13																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **DH-B1**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	12"				6													
14																		
15	27"	CA 10"	5B 5A	40 50/4"	7	(~15.0' - ~20.0') SHALE - Dark grayish brown, silty clay shale, trace very fine sand, blocky structure, slightly moist.												
16																		
17																		
18																		
19																		
20	60"				8	(20.0' - 22.0') INTERBEDDED SANDSTONE AND SHALE - Pale yellow, weakly to moderately cemented, fissile, very fine sandstone interbedded with very dark gray, very hard, moderately cemented silty clay shale, approximately 1/4" to 1/2" sandstone interbeds.												
21																		
22						(22.0' - 25.0') SANDSTONE - Pale reddish yellow, moderately cemented, very fine sand, silty, slightly fissile, occasional 1 to 2 mm interbeds of shale.												
23																		
24																		
25	48"				9	(25' - 26.8') SHALE - Dark gray, very hard, moderately cemented, fissile, silty clay shale, few to little very find sand, dry to slightly moist.												
26																		
27						(26.8' - 30') SANDSTONE - Pale reddish yellow, moderately to strongly cemented, fissile, very fine sand, silty, 1-2 mm clay interbeds throughout, dry to slightly moist.												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **DH-B1**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
28	48"				9													
29	12"																	
30	54"					(30' - 41.5') SHALE - Dark gray, very hard, silty clay shale, fissile, trace to few very fine sand, moderately to strongly cemented, slightly moist.												
31																		
32																		
33																		
34																		
35	60"				10													
36																		
37																		
						[Lab data at this depth are for 35'-40' bulk sample.]	CL		10.3		2.38		1.5	20.9	77.6			
38																		
39																		
40	60"																	
41																		
						(41.5' - 43.3') COAL - Black, hard, brittle, dry.												
42																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **DH-B1**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
43	60"				10													
44						(43.3' - ~48') SHALE - Medium gray, very hard, very silty clay shale, weakly to moderately cemented, little to some very fine sand to 45.5', few very find sand from 45.5' to 48', dry to slightly moist.												
45	60"				11													
46																		
47																		
48						(48' - 51.6') COAL - Very dark gray to black, brittle, fissile, dry.												
49																		
50	60"																	
51																		
52						(51.6' - 56.4') SHALE - Medium gray, very hard, waxy, silty clay shale, trace very fine sand, slightly fissile, moderately cemented, slightly moist.												
53																		
54																		
55	60"																	
56																		
57						(56.4' - 57.8') COAL - Very dark gray, very hard, fissile and brittle, dry to slightly moist.												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **DH-B1**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	60"																	
58						(57.8' - 60') SHALE - See 51.6' - 56.4'												
59																		
60						E.O.B. = 60' at 10:30 am on 12/11/13.												
61																		
62																		
63																		
64																		
65																		
66																		
67																		
68																		
69																		
70																		
71																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		DH-B2

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/11/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7044.2	FINISH: 12/11/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 5.25"	DEPTH TO BEDROCK (FT): ~2.0	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 40.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	24"				4	(0' - ~2') SILTY CLAY WITH SAND - Yellowish brown, firm silty clay, little very fine to fine sand, occassional coarse sand to fine gravel, roots, moist.												
1																		
2						(~2' - 7.5') SANDSTONE - Pale yellowish gray, very fine sandstone, silty, strongly cemented.												
	24"	CA 7"	1A	28														
3				50/ 1"														
4																		
5	48"	NR		50/ 4"	5	[SS in shoe.]												
6																		
7																		
						(7.5' - ~15') SHALE - Pale yellowish gray to ~12.5', dark grayish brown to ~15', silty clay shale, trace very fine sand, mostly blocky structure, fissile in places, slightly moist.												
8																		
9																		
10	57"	CA 11"	2B	18	6													
			2A	50/ 5.5"														
11																		
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **DH-B2**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
14	57"				6													
15	56"	CA 6"	3	50/ 6"		(~15' - 22.5') SHALE WITH SANDSTONE INTERBEDS - Predominantly a dark grayish brown, silty clay shale, very hard, moderately to strongly cemented, fissile, with 1/4" to 1/2" interbeds of very fine, pale yellowish gray sandstone, slightly moist.	CL - ML		10.5	96.7	2.55	29/24/5	0	27.7	72.3			
16																		
17																		
18																		
19																		
20	60"				7													
21																		
22																		
23						(22.5' - 24.7') SANDSTONE - Pale yellow, very fine-grained sandstone, moderately to strongly cemented, dry to slightly moist.												
24																		
25	60"					(24.7' - 34.3') SHALE - Dark gray, silty clay shale, trace to few very fine sand, fissile, moderately to strongly cemented, occasional thin (<1/2") sandstone interbeds, slightly moist.												
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **DH-B2**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
28	60"				7													
29																		
30	54"					(~30' - 32') More sand (little to some), siltier, pale grayish yellow.												
31																		
32																		
33																		
34																		
						(34.3' - 36.5') COAL - Black, very hard, fissile, brittle, dry												
35	55"																	
36																		
						(36.5' - E.O.B.) SHALE - Medium gray, very silty clay shale, little to some very fine sand, weakly to moderately cemented, dry to slightly moist.												
37																		
38																		
39																		
40						E.O.B. = 40' at 13:40.												
41																		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		DH-B3

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/11/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7048.9	FINISH: 12/11/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 5.25"	DEPTH TO BEDROCK (FT): 2.5	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 40.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	27"				2	(0' - 2.5') SILTY CLAY WITH SAND - Yellowish brown, little very fine to fine sand, firm to hard silty clay, slightly moist.												
1																		
2																		
	18"	CA 9"	1	30		(2.5' - ~10') SANDSTONE - Pale yellowish gray, silty, very fine-grained, very hard, strongly cemented.												
3				50/ 3"														
4																		
5	30"	NR		50/ 4"		[SS in shoe.]												
6																		
7																		
8																		
9																		
10	24"	CA 17"		40	4	(~10' - 17.5') SHALE - Pale yellowish gray to ~11.5', dark grayish brown to 17.5', silty clay shale, mostly blocky, trace very fine sand, slightly moist.												
			3B	30														
11			3A	47														
12																		
13																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **DH-B3**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	24"				4													
14																		
15	60"																	
16																		
17																		
18						(17.5' - ~22.3') INTERBEDDED SANDSTONE AND SHALE - Pale, yellow, weakly to moderately cemented, fissile, very fine sandstone interbedded with very dark gray, very hard, moderately cemented, silty clay shale.												
19																		
20	33"				5													
21																		
22																		
23						(~22.3' - ~25') SANDSTONE - Pale yellowish gray, very fine-grained, strongly cemented, dry to slightly moist.												
24						[Lab data at this depth are for 20'-30' bulk sample.]												
25	48"					(~25' - 36.2') SHALE - Dark gray, silty clay shale, trace to few very fine sand, fissile, moderately to strongly cemented, occasional thin (<1.2") sandstone interbeds, slightly moist.	CL		7.3		2.66	29/18/11	2.5	34.6	62.9			
26																		
27						(~27' - 28.5') More sand (little to some), siltier, yellowish gray.												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **DH-B3**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
28	48"				5													
29																		
30	60"				6													
31						(~31 - 32.5) More sand (little to some), siltier, yellowish gray.												
32																		
33																		
34																		
35	60"																	
36																		
						(36.2' - 37.7') COAL - Black, very hard, fissile, brittle, dry.												
37																		
38						(37.7' - E.O.B.) SHALE - Medium gray, very silty clay shale, little to some very fine sand, weakly to moderately cemented, dry to slightly moist.												
39																		
40						E.O.B. = 40'												
41																		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**SB-B1**

CONTRACTOR INFORMATION	**DRILL RIG INFORMATION**		**BOREHOLE INFORMATION**	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/12/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7040.3	FINISH: 12/12/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 25.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	30"				4	(0' - 25') SANDY CLAY - Yellowish brown, stiff to very stiff, slightly moist sandy clay with varying amount of very fine sand ranging from few to some, occasional coarse sand to very fine gravel throughout.												
1																		
2																		
	20"	CA 17"		9														
3			1B	7														
			1A	6			CL		7.1	91.4	2.89		0.0	43.1	56.9			
4																		
5	9"	CA 17.5"		12														
			2B	9														
6			2A	9														
7																		
8																		
9																		
10	40"	CA 18"		10														
			3B	8		["B" sample is loose. Don't use for density testing.]												
11			3A	7			CL		6.6	82.6	2.69	31/15/16	0.0	46.7	53.3			
12																		
						[Lab data at this depth are for 0-25' bulk sample.]	CL				2.70	33/14/19	0.0	42.6	57.4			
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Very few cuttings came up during drilling. Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **SB-B1**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	40"				4													
14																		
15	54"																	
16						(~16.2' - ~18') Less sand (trace to few), dark yellowish brown, hard.												
17																		
18																		
19																		
20	51"																	
21																		
22																		
23																		
24																		
25						E.O.B. = 25' at 10:25												
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Very few cuttings came up during drilling. Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**SB-B2**

CONTRACTOR INFORMATION	**DRILL RIG INFORMATION**		**BOREHOLE INFORMATION**	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/12/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7003.5	FINISH: 12/12/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 14.1	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 15.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	28"				4	(0' - 14.1') CLAY WITH SAND - Yellowish brown, stiff to very stiff, slightly moist clay with varying amount of very fine sand ranging from trace to occasional zones with more sand (little to some), occasional coarse sand to very fine gravel throughout.												
1																		
2																		
	22"	CA 18"		6														
3			1B	8														
			1A	8														
4																		
5	31"	CA 18"		10														
			2B	9			CL		7.7	80.1	2.70	36/15/21	0.0	29.8	70.2			
6			2A	9														
7																		
8																		
9																		
10	60"	CA 16.5"		11	5													
			3B	11														
11			3A	11														
12						(~12' - 14.1') Less sand (trace to few), dark yellowish brown, roots.												
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Few cuttings came up during drilling. Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **SB-B2**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	60"				5													
14						(14.1' - 15') SANDSTONE - Pale yellowish gray, very hard, fissile, moderately to strongly cemented, very fine sand. [Few cuttings coming up.]												
15						E.O.B. = 15' at 11:40												
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Few cuttings came up during drilling. Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**SB-B3**

CONTRACTOR INFORMATION	**DRILL RIG INFORMATION**		**BOREHOLE INFORMATION**	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/12/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7018.6	FINISH: 12/12/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 7.8	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 15.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	30"				4	(0' - ~7.8') CLAY WITH SAND - Yellowish brown, medium stiff to stiff, slightly moist clay with varying amount of very fine sand ranging from trace to little, occasional zones with more sand (some), occasional coarse sand to very fine gravel throughout.												
1																		
2																		
	18"	CA 18"		5														
3			1B	6														
			1A	7														
4																		
5	36"	CA 18"		9														
			2B	7														
6			2A	8			CL		10.2	84.3	2.69	40/17/23	0.0	21.6	78.4			
7																		
8						(~7.8' - 13.2') SANDSTONE - Pale yellowish gray, very hard, dry to slightly moist, moderately cemented, very fine sand.												
9																		
10	52"	CA 12"		22	5													
			3A	50/6"														
11																		
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **SB-B3**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	52"				5	(13.2' - 13.7') COAL - Black, fissile, brittle.												
14						(13.7' - E.O.B.) SHALE - Dark grayish brown, very hard, dry to slightly moist, fissile, silty clay shale.												
15						E.O.B. = 15' at 13:00												
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**SB-B4**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/12/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7020.5	FINISH: 12/12/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 30.0	

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	36"	NA	NA	NA	1	(0' - 28.5') SANDY CLAY - Yellowish brown, stiff to very stiff, slightly moist sandy clay with varying amount of very fine sand ranging from few to little, occasional zones with more sand (some), occasional coarse sand to very fine gravel throughout.												
1																		
2																		
3																		
4																		
5	48"																	
6																		
7						[Lab results are for 0' - 15' bulk sample.]	CL		7.1		2.67	33/15/18	0.8	39.6	59.6			
8																		
9																		
10	54"																	
11																		
12																		
13																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Few cuttings came up during drilling. Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **SB-B4**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	54"	NA	NA		1													
14																		
15	51"				2													
16																		
						(16.5' - 16.8') Silty sand.												
17																		
						(~17.5' - 18.5') Color change to dark yellowish brown, very hard silty clay, trace to few sand.												
18																		
19																		
20	30"																	
21																		
22																		
23																		
24																		
25	50"																	
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Few cuttings came up during drilling. Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **SB-B4**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
28	50"	NA	NA		2													
29						(28.5' - E.O.B.) GRAVELLY CLAY - Yellowish brown, very hard, dry to slightly moist silty clay with abundant gravel to 1" comprised of sandstone fragments.												
30						E.O.B. = 30' at 17:10												
31																		
32																		
33																		
34																		
35																		
36																		
37																		
38																		
39																		
40																		
41																		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Few cuttings came up during drilling. Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**NB-B1**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/12/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7009.4	FINISH: 12/12/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 20.0	

FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	27"				4	(0' - ~7') SILTY CLAY WITH SAND - Yellowish brown, stiff, slightly moist, silty clay with varying amount of very fine sand ranging from few to little, occasional coarse sand to very fine gravel.												
1																		
2																		
	23"	CA 17.5"		7														
3			1B	6														
			1A	7														
4																		
5	32"	CA 18"		5														
			2B	6														
6			2A	7														
7						(~7' - 18') SILTY SAND - Yellowish brown, medium dense, slightly moist silty very fine to fine sand, occasional coarse sand to very fine gravel.												
8																		
9																		
10	22"	CA 17"		7			SM		5.4	84.4	2.68	25/22/3	0.0	55.6	44.4			
			3B	6														
11			3A	7														
12																		
13																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **NB-B1**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	22"				4													
14																		
15	49"				5													
16																		
17																		
18						(18' - 20') GRAVELLY SAND - Same as above, with abundant sandstone fragments up to 1" size.												
19																		
20						E.O.B. = 20' at 14:30												
21																		
22																		
23																		
24																		
25																		
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**NB-B2**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/12/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7037.8	FINISH: 12/12/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 20.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	30"				4	(0' - ~6.5') SILTY SAND - Yellowish brown, loose to medium dense, slighly moist, silty very fine to fine sand, occasional coarse sand to fine gravel.												
1																		
2																		
	20"	CA 18"		4														
3			1B	4			SM		4.9	81.9	2.64	27/23/4	0.0	51.2	48.8			
			1A	5														
4																		
5	42"	CA 18"		4		[Lab data at this depth are for 0-10' bulk sample.]	CL - ML					26/19/7	0.0	49.0	51.0			
			2B	5														
6			2A	5														
						(~6.5' - ~10') SILTY CLAY - Yellowish brown, hard, slightly moist silty clay, trace to few very fine sand.												
7																		
8																		
9																		
10	24"	CA 17"	3B	8	5	(~10' - 20') SANDY CLAY/CLAYEY SAND - Yellowish brown, stiff, slightly moist sandy clay/clayey sand, very fine to fine sand, occasional coarse sand to fine gravel, silty.												
			3A	5														
11				7														
12																		
13																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **NB-B2**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	24"				5													
14																		
15	36"																	
16																		
17																		
18																		
19																		
20						E.O.B. = 20' at 15:55												
21																		
22																		
23																		
24																		
25																		
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**WB-B1**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/14/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6969.9	FINISH: 11/14/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 5.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 36.5	

FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	30"					(0' - 1') SILTY CLAY - Dark brown, dry to slightly moist, silty clay, few to little very fine to fine sand.											
1						(1' - E.O.B.) CLAYEY SAND - Light brown, medium dense, dry to slightly moist clayey very fine to fine sand, occasional coarse sand and fine gravel, occasional zones of siltier material.											
2																	
	18"	CA 15"	1B	5													
3			1A	8				3.8	88.8	2.67							
				10													
4																	
5	30"	CA 16"	2B	5	6												
				6													
6			2A	8													
7							SC - SM										
	21"					[Lab data at this depth are for 5'-10' bulk sample.]				2.64	26/20/6	0.8	52.3	46.9			
8																	
9																	
10	37"	CA 16"	3B	5	7												
				6													
11			3A	10			SC	6.4	111	2.67	28/18/10	2.8	48.6	48.6			
12						(~12.5' - 15') Easier drilling.											
13																	

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **WB-B1**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	37"				7													
14																		
15	50"																	
16																		
17																		
18																		
19																		
20	60"				8													
21																		
22																		
23																		
24																		
25	48"	CA 16"		8														
			4B	9														
26			4A	14														
27						(27' - 27.5') Zone of fine to coarse sand and fine gravel.												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **WB-B1**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
28	48"				8													
29																		
30	42"																	
31																		
32						(32' - 35') Fine to coarse silty sand with sandstone fragments up to 3".												
33																		
34																		
35		CA 16"	5B	15														
				12														
36			5A	15														
37						36.5' E.O.B. at 14:49												
38						Note: Bucket samples (06, 07, 08) may not represent the formation. They appear to be more silty/clayey. Consider using core samples for lab testing.												
39																		
40																		
41																		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**WB-B2**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/14/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6974.9	FINISH: 11/14/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 5.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 35.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	22"				4	(0' - E.O.B.) CLAYEY SAND - Light brown, loose to medium dense, dry to slightly moist, clayey very fine to fine sand, occasional coarse sand and fine gravel throughout.												
1																		
2																		
	20"	CA 17"		3														
3			1B	6														
			1A	7														
4																		
5	48"	CA 13"	2B	4														
			2A	7			SC		5.6	87.1	2.67		8.6	53.5	37.9			
6				4														
7						(7.5' - 12') More coarse sand and fine gravel.												
8																		
9																		
10	48"	CA 16"		9	5													
			3B	11														
11			3A	14														
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **WB-B2**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	48"				5													
14																		
15	52"					[Lab data at this depth are for 10'-20' bulk sample.]	SC					26/17/9	9.9	46.3	43.8			
16																		
17																		
18																		
19																		
20	60"				6													
21																		
22																		
23																		
24																		
25	33"																	
26																		
27						(27' - 30') Zone of mottled red/gray/brown, fine to coarse sand and gravel to 1/2" size, hard, dry.												

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **WB-B2**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
28	33"				6													
29																		
30	48"																	
31																		
32																		
33																		
34																		
35						E.O.B. = 35' at 17:10 Note: Bucket samples appear more silty/clayey than the formation. Consider using core samples for lab testing.												
36																		
37																		
38																		
39																		
40																		
41																		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**WB-B3**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/15/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6994.0	FINISH: 11/15/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 5.25"	DEPTH TO BEDROCK (FT): 0.0	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 30.0	

FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	31"					(0' - 2.5') CLAYSTONE - Grayish brown, hard, fissile, dry to slightly moist, silty claystone, very thin sandy lenses throughout, weathered.												
1																		
2																		
	27"	NR		50/ 5"		(2.5' - 4') SANDSTONE - Pale yellow, cemented, fissile, weathered.												
3																		
4						(4' - 5') CLAYSTONE - See above.												
5	60"	14"	1B	25	2	(5' - 8') COAL - Black, hard to very hard, dry.												
			1A	50/ 6"														
6																		
7																		
8						(8' - 10.5') CLAYSTONE - Dark gray, very hard, dry to slightly moist, silty claystone, blocky, weathered.												
9																		
10	60"	NR		50/ 5.5"	3													
						(10.5' - 13.5') SILTY SANDSTONE - Very hard, dry to slightly moist, silty sandstone, fissile, weathered.												
11																		
12																		
13																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **WB-B3**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	60"				3													
14						(13.5' - 19.4') CLAYSTONE/SHALE - Dark gray, hard, dry to slightly moist, occasional vertical fractures with iron staining, fissile, weathered.												
15	60"																	
16																		
17																		
18																		
19																		
						(19.4' - 21.2') COAL - Black, hard, fissile, dry.												
20	60"				4													
21						(21.2' - E.O.B.) SILTY SANDSTONE - Mottled red/brown, gray, fissile, abundant iron staining, moist, weathered.												
22																		
23																		
24						(24.5' - 26.5') Increased clay content, gray.												
25	60"																	
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **WB-B3**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
28	60"				4													
29																		
30						E.O.B. = 30' at 10:30												
31																		
32																		
33																		
34																		
35																		
36																		
37																		
38																		
39																		
40																		
41																		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**WB-B4**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/15/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7003.8	FINISH: 11/15/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 1.0	
LOGGED BY: K. JOHNSON	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 38.7	

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	22"				3	(0' - 1') SILTY CLAY - Medium brown to gray, dry to slightly moist silty clay.												
1						(1' - 5') CLAYSTONE/SHALE - Dark brown grading to light gray with depth, dry, blocky from 1' - 2' becoming fissile.												
2																		
	20"	CA 12"	1B	9														
3			1A	17														
				20														
4																		
5	60"	CA 9"	2A	27		(5' - 17') SANDSTONE - Gray/yellow gray, dry to slightly moist, fine to very fine-grained sandstone, fissile in areas.												
				50 /3"														
6																		
7																		
8																		
9																		
10	40"	CA 2"		50 /4"	4													
11																		
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **WB-B4**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	40"				4													
14																		
15	24"	CA 3"		50 /4"		(~15') Difficult to drill.												
16																		
17						(17' - 17.5') COAL (per driller) - no return in barrel but visible in cuttings.												
	25"					(17.5' - 18') CLAYSTONE/SHALE - Dark brown, slightly moist, fissile, still difficult to drill.												
18						(18' - 38.7') SANDSTONE - Medium yellow to dark gray, very fine to fine sandstone, weathered, highly iron oxide stained.												
19																		
20	51"				5													
21																		
22																		
						(22.5' - 24') Very dark gray, very fine to fine-grained sandstone.												
23																		
24																		
25	26"					(25' - 27') Very fine-grained sandstone, weathered.												
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **WB-B4**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
28	26"				5													
29																		
30	23"																	
31																		
32						(32') 1" sandstone that is R3/R4 in strength.												
33																		
34																		
35	32"																	
36																		
37																		
38																		
39						E.O.B. = 38.7'												
40																		
41																		
42																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**WB-B5**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/18/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 6996.9	FINISH: 11/18/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 22.5	
LOGGED BY: K. JOHNSON	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 24.7	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	11"				5	(0' - 1') TOPSOIL - Medium brown, moist topsoil with organics present.												
1						(1' - 22.5') CLAYEY SAND - Yellow orange, loose to medium dense, slightly moist, very fine to fine-grained clayey sand, silty, some white weathered minerals, blocky, well sorted.												
2																		
	11"	CA 17"		6														
3			1B	5					3.7	92.5	2.66							
			1A	6														
4																		
5	40"	CA 18"		5		[Lab data at this depth are for 0-10' bulk sample.]	SC - SM						0.0	61.6	38.4			
			2B	6														
6			2A	9			SC - SM		5.1	86.9	2.66	24/17/7	0.0	56.3	43.7			
7																		
8																		
9																		
10	24"	CA 18"		5	6													
			3B	6														
11			3A	9														
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **WB-B5**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	24"				6													
14																		
15	48"	CA 17"	4B	11 9		(15' - 22.5') Very thin bedding visible.												
16			4A	10														
17																		
18																		
19																		
20	59"																	
21																		
22																		
23						(22.5' - E.O.B.) SANDSTONE - Yellow orange, dry sandstone, very thin bedding, weathered, iron oxide staining, poorly sorted with some larger (1") clasts present.												
24																		
25						E.O.B. = 24.7'												
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**EB-B1**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/18/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7024.4	FINISH: 11/18/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 0.0	
LOGGED BY: K. JOHNSON	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 11.2	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	28"				3	(0' - E.O.B.) SANDSTONE - Yellowish orange, moist sandstone, poor cementation, no plasticity, very weathered to 1.3', poorly sorted.												
1						(1.3' - 2.3') Sandstone is fissile, weathered.												
2																		
	29"	CA A 9"	1A	33		(2.3' - 10') Sandstone is yellow orange, slightly moist, fine to medium grained, well cemented, moderately weathered, R3/H4.												
3				50 /4"														
4																		
5	20"	3"		50 /5.5"		(5') 2" sandstone rock in CA barrel. (5' - 10') Pulverizing sandstone, recovery is very soft and torn up.												
6																		
7																		
8																		
9																		
10		CA 14"	2B	11														
			2A	26		(10' - 11.2') CA sampler - some dense plastic claystone present, laminated sandstone.												
11				50 /2"		E.O.B. = 11.2'												
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**EB-B2**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/18/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7037.8	FINISH: 11/18/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 3.0	
LOGGED BY: K. JOHNSON	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 15.5	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	24"				4	(0' - 3') SILTY SAND - Yellow orange, moist grading to slightly moist, blocky silty sand, well sorted.												
1																		
2																		
	19"	CA 13"	1B	27														
3			1A	50 /6"		(3' - 9') VERY WEATHERED SANDSTONE - Gray brown to medium brown, very weak and very soft, slightly moist, very fine to fine grained sandstone, weathered, thin bedding, no plasticity, generally well sorted.			5.8	107.1	2.67							
4																		
5	32"	CA 9"	2A	25														
				50 /4"														
6																		
7																		
8																		
9						(9' - E.O.B.) WEATHERED SANDSTONE - Very fine to fine-grained, sandstone, weathered, fissile in some areas, moderate cementation, R2/H6, iron oxide staining along some beds.												
10	22"	NR		50 /5"														
11																		
12																		
13																		

LEGEND:
CA = CALIFORNIA SAMPLE (2-INCH OD)
ST = SHELBY TUBE (3-INCH OD)
AC = ACRYLIC LINER
HSA = HOLLOW-STEM AUGER
CC = CONTINUOUS CORE
NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **EB-B2**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	22"																	
14																		
15			3A	50 /6"		E.O.B. = 15.5'												
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**EB-B3**

CONTRACTOR INFORMATION	**DRILL RIG INFORMATION**		**BOREHOLE INFORMATION**	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 11/18/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7030.2	FINISH: 11/18/2013
DRILLER'S HELPER: J. RAMIREZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 15.0	
LOGGED BY: K. JOHNSON	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 25.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	16"				5	(0' - 15') SANDY CLAY - Gray brown, very soft, slightly moist, very fine-grained sandy clay.												
1																		
2																		
	15"	CA 18"		5														
3			1B	6														
			1A	7														
4																		
5	40"	CA 16"		5														
			2B	6														
6			2A	6														
7																		
8																		
9																		
10	30"	CA 18"		5	6	(~7' - 15') Hard, blocky, still plastic.												
			3B	4			CL		6.0	83.1	2.70	26/15/11	0.0	46.3	53.7			
11			3A	6														
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT: NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **EB-B3**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
14	30"				6													
15	53"	CA 18"	4B	5		(15' - E.O.B.) SANDSTONE - Dry, very weathered sandstone, crumbly with very thin bedding in some areas, fine to coarse grained sand, very low plasticity, poorly sorted with gravel.												
			4A	5														
16				3														
17																		
18																		
19																		
20	58"																	
21																		
22																		
23						(23' - 25') Same as above, more cemented (moderate), no large clasts.												
24																		
25						E.O.B. = 25.0'												
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**EB-B4**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/10/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7023.3	FINISH: 12/10/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): N/A	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 20.0	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	18"				3	(0' - ~10') SANDY CLAY - Dark yellowish brown to 1.5', yellowish brown 1.5' - 10', stiff to very stiff, slightly moist sandy clay, sand is very fine to fine-grained.												
1																		
2																		
	12"	CA 18"		7														
3			1B	11														
			1A	11														
4																		
5	24"	CA 17"		5														
			2B	6														
6			2A	9			CL		5.4	80.7	2.65		0.0	48.5	51.5			
7																		
8																		
9																		
10	32"	CA 16"		12	6	(~10' - 20') SILTY, CLAYEY SAND - Yellowish brown, medium dense, dry to slightly moist silty, clayey sand, sand is very fine to fine-grained, trace coarse sand to fine gravel throughout, few to little gravel from ~10' - 11.5'.												
			4B	14														
11			4A	14														
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **EB-B4**

DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	FIELD SAMPLE RECOVERY DATA								LABORATORY TEST DATA									
	32"				6													
14																		
15	32"	CA 18"		7		[Lab data at this depth are for 10'-20' bulk sample.]	SC - SM				2.67	23/17/6	0.0	50.5	49.5			
			5B	7														
16			5A	10														
17																		
18																		
19																		
20						E.O.B. = 20'												
21																		
22																		
23																		
24																		
25																		
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**EB-B5**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/10/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7002.6	FINISH: 12/10/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 8.5	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 10.8	

FIELD SAMPLE RECOVERY DATA									LABORATORY TEST DATA									
DEPTH (FT)	CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	28"				3	(0' - ~4') SANDY CLAY - Yellowish brown, soft, slightly moist sandy clay with some very fine to fine sand, trace coarse sand to very fine gravel.												
1																		
2																		
	17"	CA 18"		2														
3			1B	2														
			1A	2														
4						(~4' - ~6.5') CLAYEY SAND WITH GRAVEL - Yellowish brown, slightly moist, clayey very fine to coarse sand with gravel to ~1/2".											
5	46"	CA 18"		6														
			2B	6			SC		6.7	93.8	2.71	**27/15/12**	8.8	45.7	45.5			
6			2A	10														
						(~6.5' - 8.5') SANDY CLAY - See above 0' - 4'.												
7																		
8																		
						(8.5' - 10.8') SHALE - Dark gray, hard clay shale, trace silt, trace very fine sand.												
9																		
10		CA 9"	4A	14														
				50/3"														
11						E.O.B. = 10.8'												
12																		
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH	CLIENT:	BORING LOG	BOREHOLE ID:
PROJ. LOC.: GALLUP, NM	NECR - PRE DESIGN STUDY INVESTIGATION		**EB-B6**

CONTRACTOR INFORMATION	DRILL RIG INFORMATION		BOREHOLE INFORMATION	
DRILLING COMPANY: NATIONAL	DRILLING RIG: CME 85 HD	BIT TYPE: N/A	CASING DEPTH: N/A	START: 12/10/2013
DRILLER: M. CAIN	DRILLING METHOD: HSA/CC	AUGER O.D.: 8.25"	SURFACE ELEV. (FT): 7013.5	FINISH: 12/10/2013
DRILLER'S HELPER: L. ALDAZ	HAMMER TYPE: AUTO	HOLE DIAM.: 8.25"	DEPTH TO BEDROCK (FT): 11.5	
LOGGED BY: R. SCHAUT	HAMMER WT: 140 lb	CORE DIAM.: 3.0"	TOTAL DEPTH (FT): 17.5	

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	29"				3	(0' - 11.5') SANDY CLAY - Yellowish brown, firm to hard, slightly moist sandy clay with very fine to fine sand, few coarse sand and very fine gravel.												
1																		
2																		
	18"	CA 17"		8														
3			1B	8					7.6	91.2	2.71							
			1A	10														
4																		
5	44"	CA 16"		9		[Lab data at this depth are for 0' - 10' bulk sample.]	CL						0.0	26.6	73.4			
			2B	7														
6			2A	9														
7																		
8																		
9																		
10	48"	CA 18"		10	5													
			4B	12														
11			4A	12			CL		8.6	95.2	2.69	31/13/18	0.0	31.1	68.9			
						(11.5' - 12.6') SHALE - Dark gray, very hard, slightly moist clay shale, trace silt, trace very fine sand.												
12																		
						(12.6' - 14') COAL - Very dark gray to black, fissile, brittle.												
13																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

MWH

PROJ. LOC.: GALLUP, NM

CLIENT:

NECR - PRE DESIGN STUDY INVESTIGATION

BORING LOG

BOREHOLE ID: **EB-B6**

DEPTH (FT)	FIELD SAMPLE RECOVERY DATA: CORE RECOV. (IN)	SAMPLES & RECOV.	SAMPLE NO.	BLOW COUNT	BULK SAMPLE NO.	MATERIAL DESCRIPTION	USCS CLASS	GRAPHIC	LABORATORY TEST DATA: WATER CONT. (%)	DRY DENSITY (PCF)	SPECIFIC GRAVITY	ATTERBERG LIMITS (LL/PL/PI)	% GRAVEL	% SAND	% FINES	SAT. HYD. COND. (cm/s)	CONSOLIDATION (Cc)	TRIAXIAL (PHI, C [PSF])
	48"																	
14						(14' - 17.5') SHALE - Medium gray, very hard, strongly cemented, fissile, sandy clay shale.												
15	30"																	
16																		
17																		
						E.O.B. = 17.5'												
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		
26																		
27																		

LEGEND:
- CA = CALIFORNIA SAMPLE (2-INCH OD)
- ST = SHELBY TUBE (3-INCH OD)
- AC = ACRYLIC LINER
- HSA = HOLLOW-STEM AUGER
- CC = CONTINUOUS CORE
- NR = NO RECOVERY

NOTES:
Hole backfilled with cuttings.

APPENDIX B2.7

BORROW AREA DRILLING PHOTOGRAPHS

DRILLING PHOTOGRAPHS

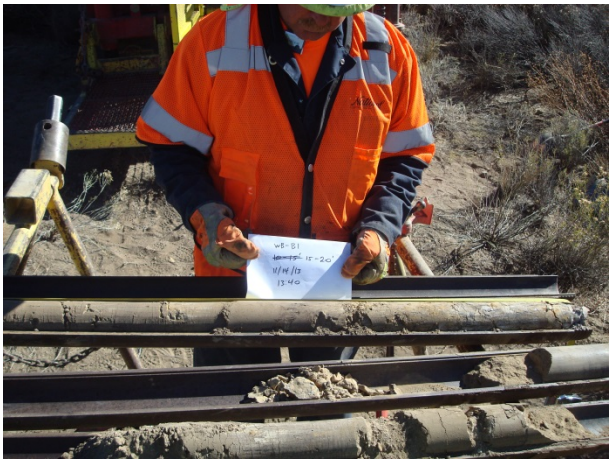
WEST BORROW AREA

WB-B1 Core (2.5' – 5' Interval)
11/14/13

WB-B1 Core (5' – 7.5' Interval)
11/14/13

WB-B1 Core (7.5' – 10' Interval)
11/14/13

WB-B1 Core (10' – 15' Interval)
11/14/13



WB-B1 Core (15' – 20' Interval)
11/14/13

WB-B1 Core (20' – 25' Interval)
11/14/13

WB-B1 Core (25' – 30' Interval)
11/14/13

WB-B1 Core (30' – 35' Interval)
11/14/13

WB-B1 Core Box #1 (0' – 6.5')
11/14/13

WB-B1 Core Box #2 (6.5' – 15')
11/14/13

WB-B1 Core Box #3 (15' – 20')
11/14/13

WB-B1 Core Box #4 (20' – 25')
11/14/13

WB-B1 Core Box #5 (25' – 30')
11/14/13

WB-B1 Core Box #6 (30' – 35')
11/14/13

WB-B2 Core (0' – 2.5' Interval)
11/14/13

WB-B2 Core (2.5' – 5' Interval)
11/14/13

WB-B2 Core (10' – 15' Interval)
11/14/13

WB-B2 Core (15' – 20' Interval)
11/14/13

WB-B2 Core (20' – 25' Interval)
11/14/13

WB-B2 Core (25' – 30' Interval)
11/14/13

WB-B2 Core (30' – 35' Interval)
11/14/13

WB-B2 Core Box #1 (0' – 5')
11/14/13

WB-B2 Core Box #2 (5' – 10')
11/14/13

WB-B2 Core Box #3 (10' – 15')
11/14/13

WB-B2 Core Box #4 (15' – 20')
11/14/13

WB-B2 Core Box #5 (20' – 25')
11/14/13

WB-B2 Core Box #6 (25' – 30')
11/14/13

WB-B2 Core Box #7 (30' – 35')
11/14/13

WB-B3 Core (0' – 2.5' Interval)
11/15/13

WB-B3 Core (2.5' – 5' Interval)
11/15/13

WB-B3 Core (5’ – 10’ Interval)
11/15/13

WB-B3 Core (10’ – 15’ Interval)
11/15/13

WB-B3 Core (15’ – 20’ Interval)
11/15/13

WB-B3 Core (20’ – 25’ Interval)
11/15/13

WB-B3 Core (25’ – 30’ Interval)
11/15/13

WB-B3 Core Box #1 (0’ – 5’)
11/15/13

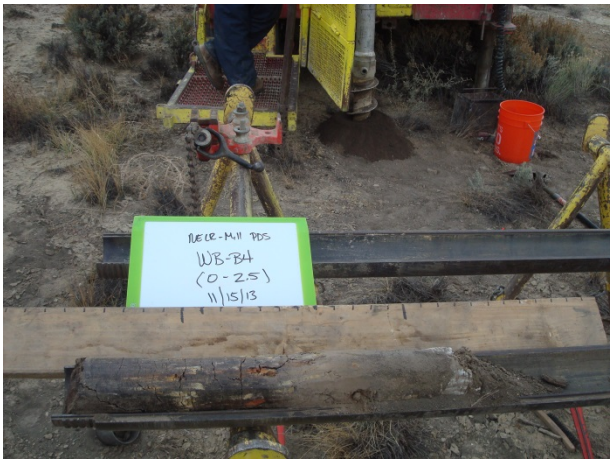
WB-B3 Core Box #2 (5' – 10')
11/15/13

WB-B3 Core Box #3 (10' – 15')
11/15/13

WB-B3 Core Box #4 (15' – 20')
11/15/13

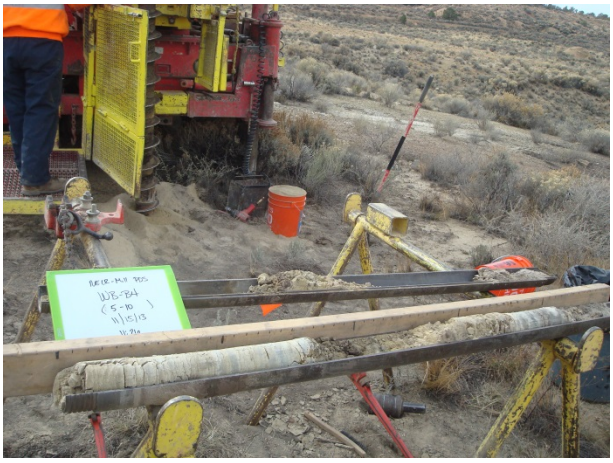
WB-B3 Core Box #5 (20' – 25')
11/15/13

WB-B3 Core Box #6 (25' – 30')
11/15/13



WB-B4 Core (0' – 2.5' Interval)
11/15/13

WB-B4 Core (2.5' –5' Interval)
11/15/13

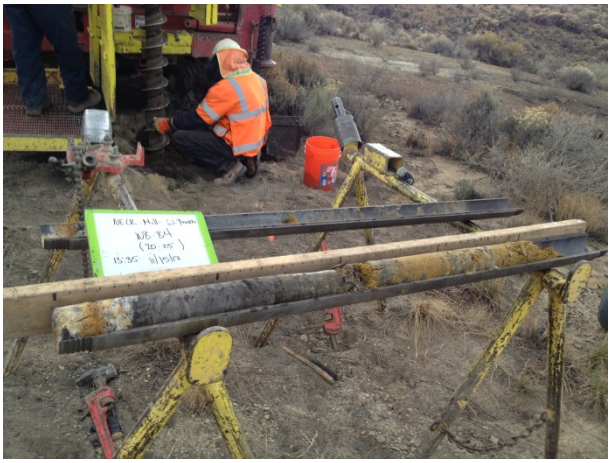


WB-B4 Core (5' – 10' Interval)
11/15/13

WB-B4 Core (10' – 15' Interval)
11/15/13

WB-B4 Core (15' – 17.5' Interval)
11/15/13

WB-B4 Core (17.5' – 20' Interval)
11/15/13



WB-B4 Core (20' – 25' Interval)
11/15/13

WB-B4 Core (25' – 30' Interval)
11/15/13

WB-B4 Core (30' – 35' Interval)
11/15/13

WB-B4 Core (35' – 40' Interval)
11/15/13

WB-B4 Core Box #1 (0' – 6')
11/15/13

WB-B4 Core Box #2 (6' – 11')
11/15/13

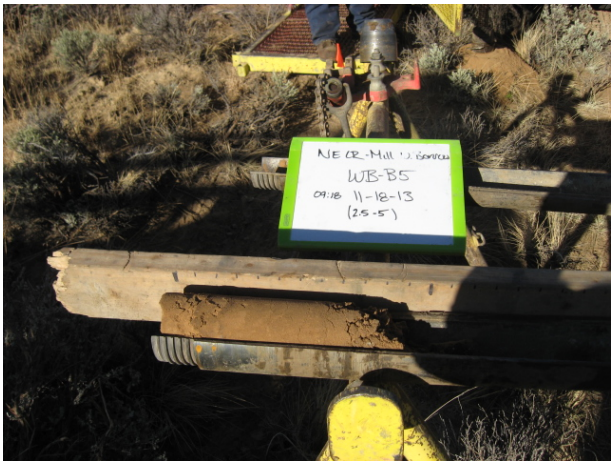
WB-B4 Core Box #3 (11' – 17.5')
11/15/13

WB-B4 Core Box #4 (17.5' – 22.5')
11/15/13

WB-B4 Core Box #5 (22.5' – 30')
11/15/13

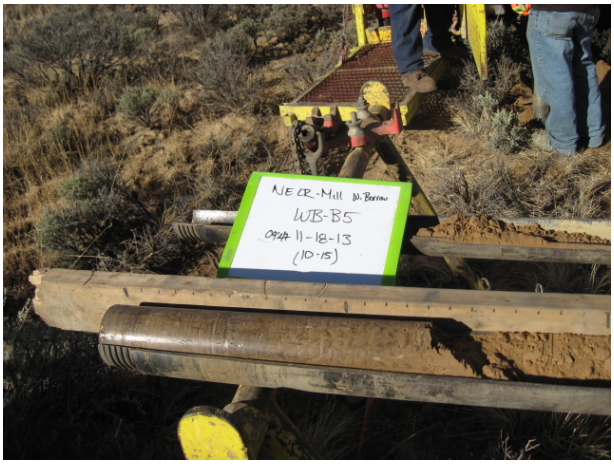
WB-B4 Core Box #6 (30' – 38.7')
11/15/13

WB-B5 Core (0' – 2.5' Interval)
11/18/13

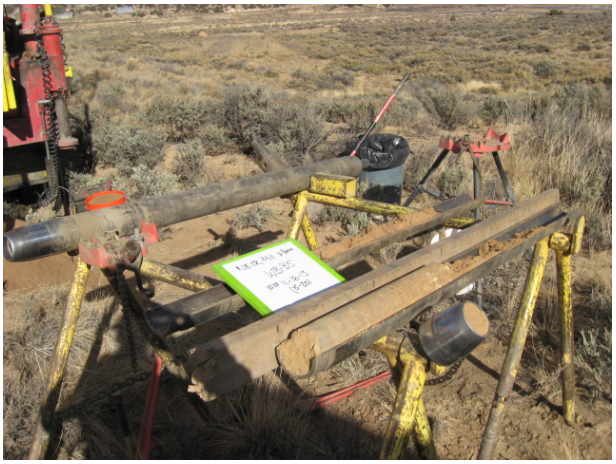


WB-B5 Core (2.5' – 5' Interval)
11/18/13

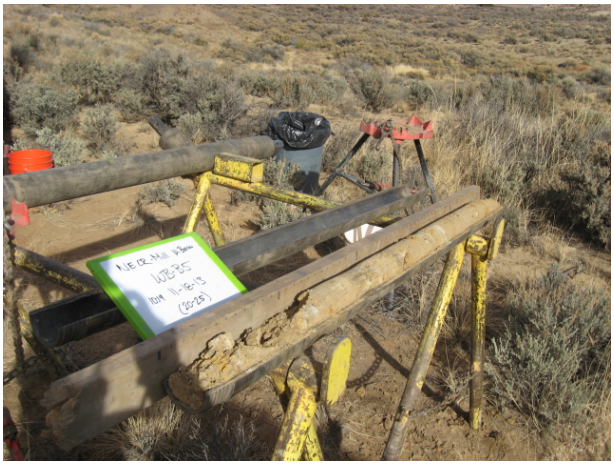
WB-B5 Core (5' – 10' Interval)
11/18/13



WB-B5 Core (10' – 15' Interval)
11/18/13



WB-B5 Core (15' – 20' Interval)
11/18/13



WB-B5 Core (20' – 25' Interval)
11/18/13

WB-B5 Core Box #1 (0' – 7.5')
11/18/13

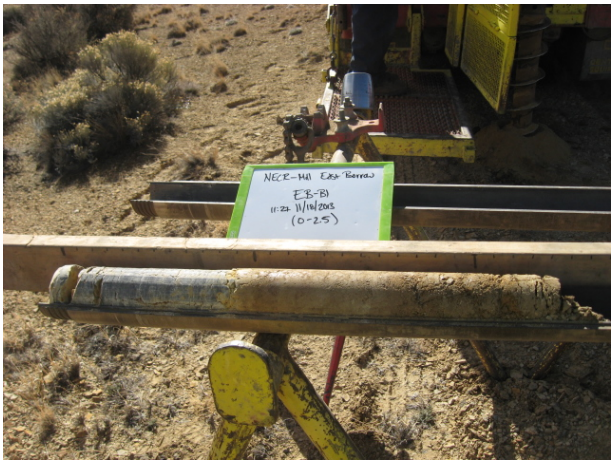
WB-B5 Core Box #2 (7.5' – 16.5')
11/18/13

WB-B5 Core Box #3 (16.5' – 22.5')
11/18/13

WB-B5 Core Box #4 (22.5’ – 24.7’)
11/18/13

DRILLING PHOTOGRAPHS

EAST BORROW AREA



EB-B1 Core (0' – 2.5' Interval)
11/18/13

EB-B1 Core (2.5" – 5' Interval)
11/18/13

EB-B1 Core (5' – 10' Interval)
11/18/13

EB-B1 Core Box #1 (0' – 5')
11/18/13

EB-B1 Core Box #2 (5' – 10')
11/18/13

EB-B2 Core (2.5' – 5' Interval)
11/18/13

EB-B2 Core (5' – 10' Interval)
11/18/13

EB-B2 Core (10' – 15' Interval)
11/18/13

EB-B2 Core Box #1 (0' – 6')
11/18/13

EB-B2 Core Box #2 (6' – 15')
11/18/13

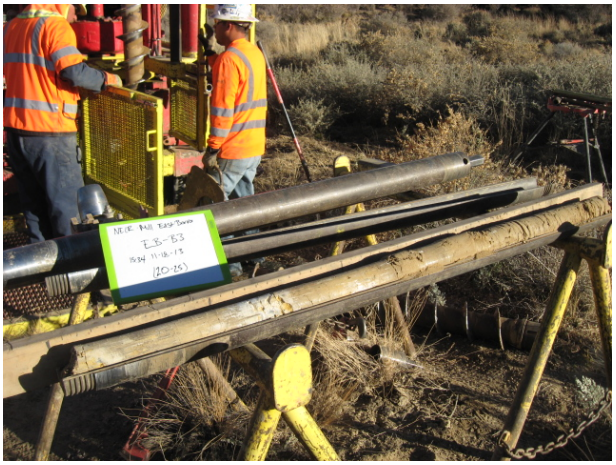
EB-B3 Core (0' – 2.5' Interval)
11/18/13

EB-B3 Core (2.5' – 5' Interval)
11/18/13

EB-B3 Core (5' – 10' Interval)
11/18/13

EB-B3 Core (10' – 15' Interval)
11/18/13

EB-B3 Core (15' – 20' Interval)
11/18/13



EB-B3 Core (20' – 25' Interval)
11/18/13

EB-B3 Core Box #1 (0' – 7')
11/18/13

EB-B3 Core Box #2 (7' – 15')
11/18/13

EB-B3 Core Box #3 (15' – 20.5')
11/18/13

EB-B3 Core Box #4 (20.5' – 25')
11/18/13

EB-B4 Core (0' – 2.5' Interval)
12/10/13

EB-B4 Core (5' – 10' Interval)
12/10/13

EB-B4 Core Box #1 (0' – 10')
12/10/13

EB-B4 Core Box #2 (10' – 20')
12/10/13

EB-B5 Core Box #1 (0' – 5')
12/10/13

EB-B5 Core Box #2 (5' – 10')
12/10/13

EB-B6 Core (10' – 15' Interval)
12/12/13

EB-B6 Core (15' – 17.5' Interval)
12/12/13

EB-B6 Core Box #1 (0' – 5')
12/12/13

EB-B6 Core Box #2 (5' – 11.5')
12/12/13

EB-B6 Core Box #3 (11.5’ – 17.5’)
12/12/13

DRILLING PHOTOGRAPHS

DILCO HILL BORROW AREA

DH-B1 Core (0' – 2.5' Interval)
12/10/13

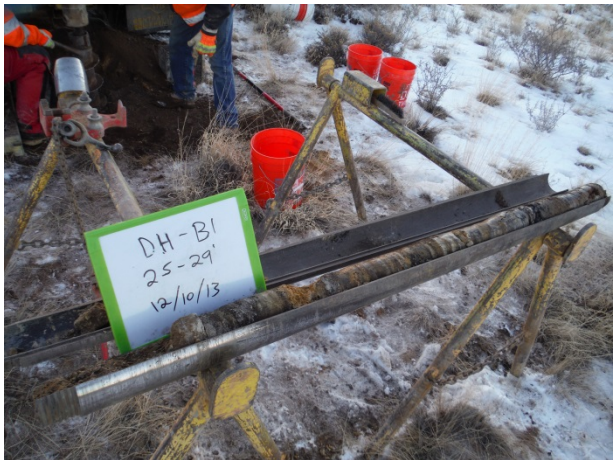
DH-B1 Core (2.5' – 5' Interval)
12/10/13

DH-B1 Core (5' – 10' Interval)
12/10/13

DH-B1 Core (10' – 15' Interval)
12/10/13

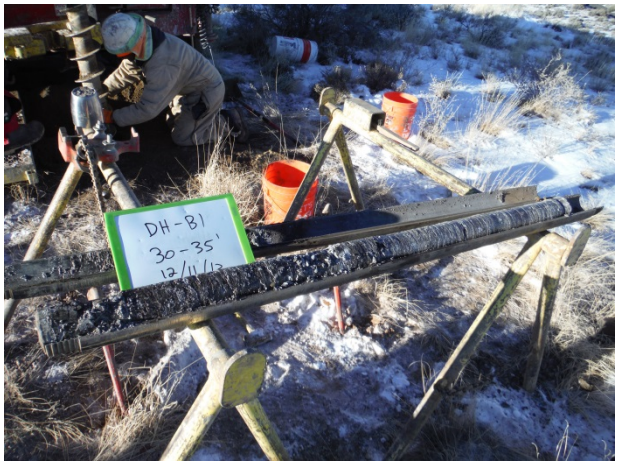
DH-B1 Core (15' – 20' Interval)
12/10/13

DH-B1 Core (20' – 25' Interval)
12/10/13

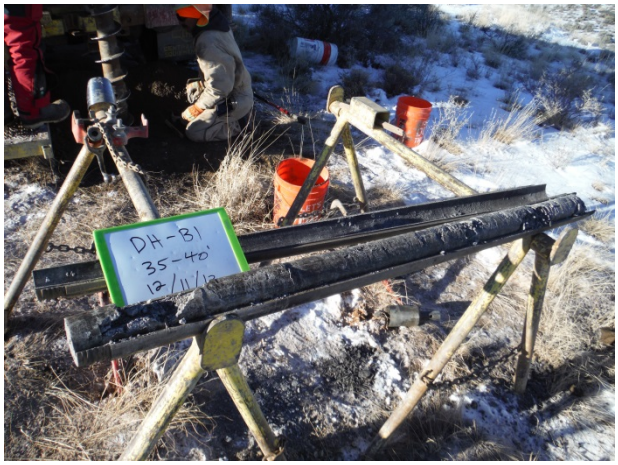


DH-B1 Core (25' – 29' Interval)
12/10/13

DH-B1 Core (29' – 30' Interval)
12/10/13



DH-B1 Core (30' – 35' Interval)
12/10/13

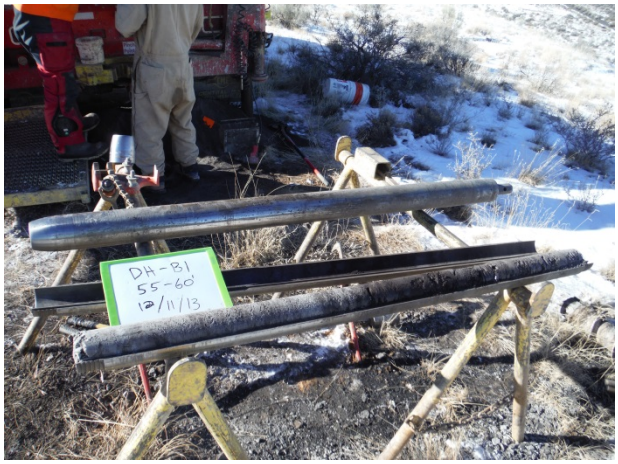


DH-B1 Core (35' – 40' Interval)
12/10/13

DH-B1 Core (40' – 45' Interval)
12/10/13

DH-B1 Core (45' – 50' Interval)
12/10/13

DH-B1 Core (50' – 55' Interval)
12/10/13



DH-B1 Core (55' – 60' Interval)
12/10/13

DH-B1 Core Box #1 (0' – 7.5')
12/10/13

DH-B1 Core Box #2 (7.5' – 18.5')
12/10/13

DH-B1 Core Box #3 (20' – 25')
12/10/13

DH-B1 Core Box #4 (25' – 30')
12/10/13

DH-B1 Core Box #5 (30’ – 35’)
12/10/13

DH-B1 Core Box #6 (35’ – 40’)
12/10/13

DH-B1 Core Box #7 (40’ – 45’)
12/10/13

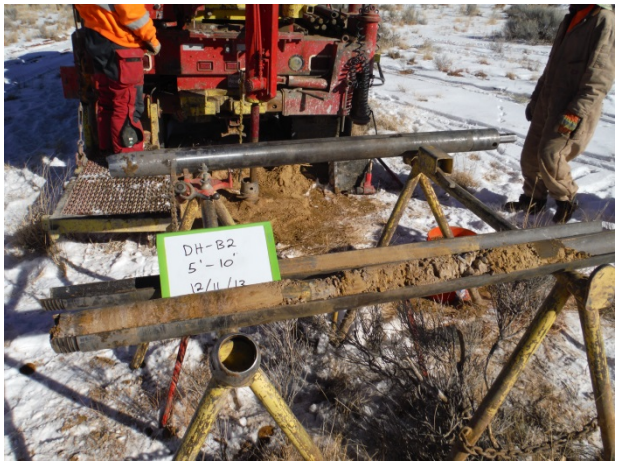
DH-B1 Core Box #8 (45’ – 50’)
12/10/13

DH-B1 Core Box #9 (50’ – 55’)
12/10/13

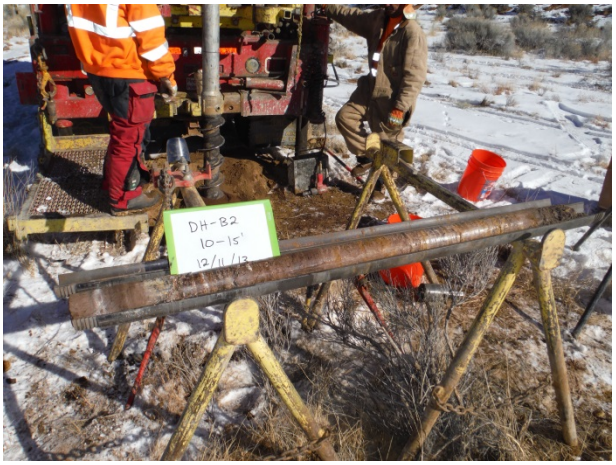
DH-B1 Core Box #10 (55’ – 60’)
12/10/13

DH-B2 Core (0' – 2.5' Interval)
12/11/13

DH-B2 Core (2.5' – 5' Interval)
12/11/13



DH-B2 Core (5' – 10' Interval)
12/11/13



DH-B2 Core (10' – 15' Interval)
12/11/13

DH-B2 Core (15' – 20' Interval)
12/11/13

DH-B2 Core (20' – 25' Interval)
12/11/13

DH-B2 Core (25' – 30' Interval)
12/11/13

DH-B2 Core (30' – 35' Interval)
12/11/13

DH-B2 Core (35' – 40' Interval)
12/11/13

DH-B2 Core Box #1 (0' – 5')
12/11/13

DH-B2 Core Box #2 (5' – 10')
12/11/13

DH-B2 Core Box #3 (10' – 15')
12/11/13

DH-B2 Core Box #4 (15’ – 20’)
12/11/13

DH-B2 Core Box #5 (20’ – 25’)
12/11/13

DH-B2 Core Box #6 (25’ – 30’)
12/11/13

DH-B2 Core Box #7 (30’ – 35’)
12/11/13

DH-B2 Core Box #8 (35’ – 40’)
12/11/13

DH-B3 Core (0’ – 2.5’ Interval)
12/11/13

DH-B3 Core (2.5' – 5' Interval)
12/11/13

DH-B3 Core (5' – 10' Interval)
12/11/13

DH-B3 Core (10' – 15' Interval)
12/11/13

DH-B3 Core (15' – 20' Interval)
12/11/13

DH-B3 Core (20' – 25' Interval)
12/11/13

DH-B3 Core (25' – 30' Interval)
12/11/13

DH-B3 Core (30' – 35' Interval)
12/11/13

DH-B3 Core (35' – 40' Interval)
12/11/13

DH-B3 Core Box #1 (0' – 5')
12/11/13

DH-B3 Core Box #2 (5' – 15')
12/11/13

DH-B3 Core Box #3 (0' – 5')
12/11/13

DH-B3 Core Box #4 (20' – 25')
12/11/13

DH-B3 Core Box #5 (25’ – 30’)
12/11/13

DH-B3 Core Box #6 (30’ – 35’)
12/11/13

DH-B3 Core Box #7 (35’ – 40’)
12/11/13

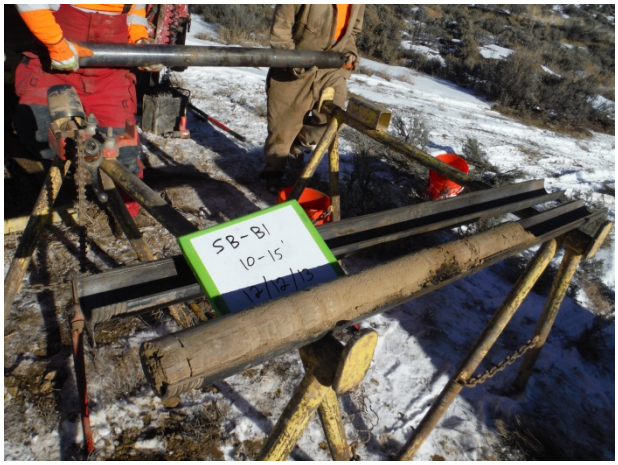
DRILLING PHOTOGRAPHS

SOUTH DRAINAGE BORROW AREA

SB-B1 Core (0' – 2.5' Interval)
12/12/13

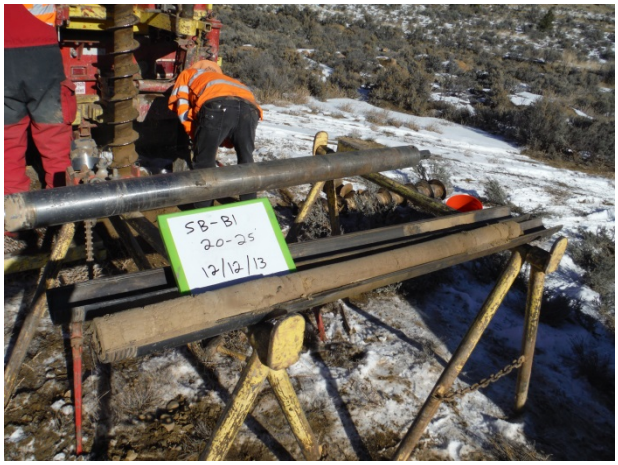
SB-B1 Core (2.5' – 5' Interval)
12/12/13

SB-B1 Core (5' – 10' Interval)
12/12/13



SB-B1 Core (10' – 15' Interval)
12/12/13

SB-B1 Core (15' – 20' Interval)
12/12/13



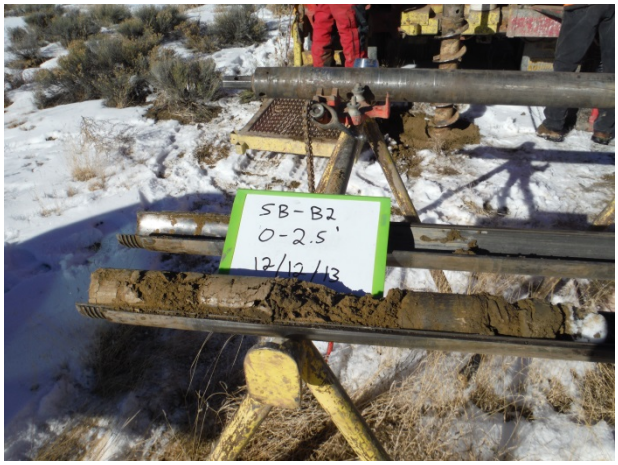
SB-B1 Core (20' – 25' Interval)
12/12/13

SB-B1 Core Box #1 (0' – 10')
12/13/13

SB-B1 Core Box #2 (10' – 15')
12/13/13

SB-B1 Core Box #3 (15' – 20')
12/13/13

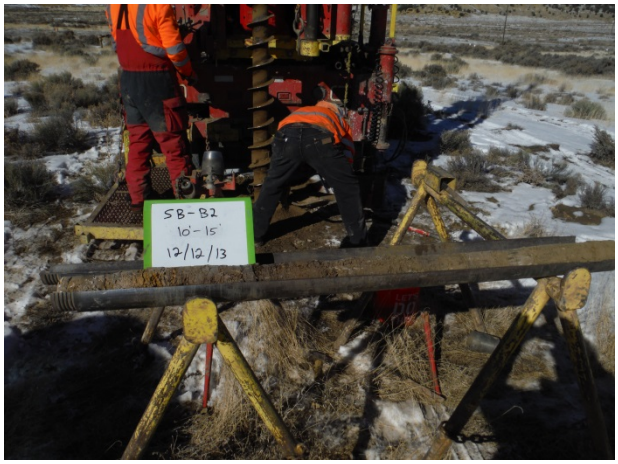
SB-B1 Core Box #4 (20' – 25')
12/13/13



SB-B2 Core (0' – 2.5' Interval)
12/12/13

SB-B2 Core (2.5' – 5' Interval)
12/12/13

SB-B2 Core (5' – 10' Interval)
12/12/13

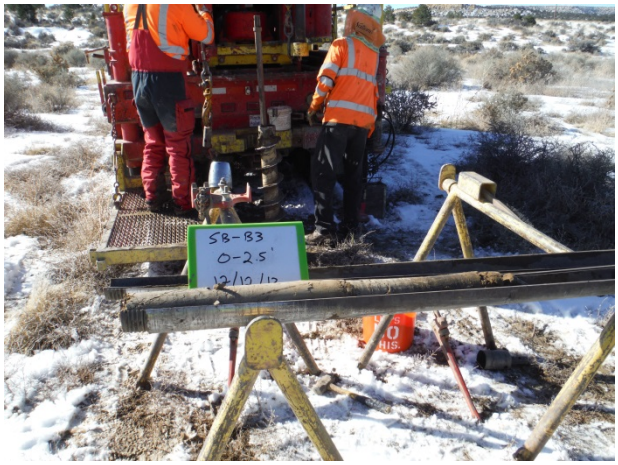


SB-B2 Core (10' – 15' Interval)
12/12/13

SB-B2 Core Box #1 (0' – 5')
12/13/13

SB-B2 Core Box #2 (5' – 10')
12/13/13

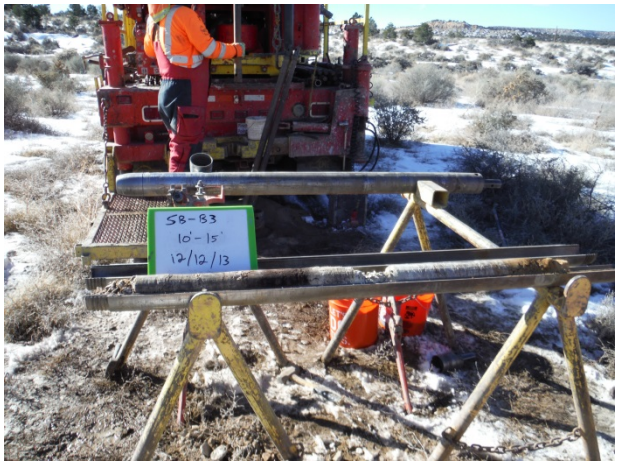
SB-B2 Core Box #3 (10' – 15')
12/13/13



SB-B3 Core (0' – 2.5' Interval)
12/12/13

SB-B3 Core (2.5' – 5' Interval)
12/12/13

SB-B3 Core (5' – 10' Interval)
12/12/13



SB-B3 Core (10' – 15' Interval)
12/12/13

SB-B3 Core Box #1 (0' – 5')
12/13/13

SB-B3 Core Box #2 (5' – 10')
12/13/13

SB-B3 Core Box #3 (10' – 15')
12/13/13

SB-B4 Core (0' – 5' Interval)
12/12/13

SB-B4 Core (5' – 10' Interval)
12/12/13

SB-B4 Core (10' – 15' Interval)
12/12/13

SB-B4 Core (15' – 20' Interval)
12/12/13

SB-B4 Core (20' – 25' Interval)
12/12/13

SB-B4 Core (25' – 30' Interval)
12/12/13

SB-B4 Core Box #1 (0' – 5')
12/13/13

SB-B4 Core Box #2 (5' – 10')
12/13/13

SB-B4 Core Box #3 (10' – 15')
12/13/13

SB-B4 Core Box #4 (15' – 20')
12/13/13

SB-B4 Core Box #5 (20' – 25')
12/13/13

SB-B4 Core Box #6 (25' – 30')
12/13/13

DRILLING PHOTOGRAPHS

NORTH DRAINAGE BORROW AREA

Rig at NB-B1
12/12/13

NB-B1 Core (0' – 2.5' Interval)
12/12/13

NB-B1 Core (2.5' – 5' Interval)
12/12/13

NB-B1 Core (5' – 10' Interval)
12/12/13

NB-B1 Core (10' – 15' Interval)
12/12/13

NB-B1 Core (15' – 20' Interval)
12/12/13

NB-B1 Core Box #1 (0' – 5')
12/13/13

NB-B1 Core Box #2 (5' – 15')
12/13/13

NB-B1 Core Box #3 (15' – 20')
12/13/13

NB-B2 Core (0' – 2.5' Interval)
12/12/13

NB-B2 Core (2.5' – 5' Interval)
12/12/13

NB-B2 Core (5' – 10' Interval)
12/12/13

NB-B2 Core (10' – 15' Interval)
12/12/13

NB-B2 Core (15' – 20' Interval)
12/12/13

NB-B2 Core Box #1 (0' – 5')
12/13/13

NB-B2 Core Box #2 (5' – 10')
12/13/13

NB-B2 Core Box #3 (10' – 20')
12/13/13