



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761**

LOG OF BORING NO. **1 (p. 1 of 1)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

SURFACE ELEVATION: **96.6**

COUNTY COORDINATES: **N 172073**

**E 516585**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	LEAN CLAY WITH SAND, slightly organic, trace roots, dark brown, soft (CL)	TOPSOIL					36				
2	LEAN CLAY WITH SAND, trace roots, gray, a little brown, soft, laminations of silty sand (CL)	FINE ALLUVIUM	2	M	SS	14	31				
3	CLAYEY SAND, a little gravel, trace roots, brownish gray, a little brown, firm, laminations of silty sand (SC)	TILL	5	M	SS	14	22				
4	SANDY LEAN CLAY, a little gravel, gray, a little brown, firm, laminations of silty sand (CL/SC)		8	M	SS	14	18				
5			5	M	SS	16	20				
6			6	M	SS	18	21				
7			10	M/W	SS	13	14				
8			9	M/W	SS	15	26				
9			14	M/W	SS	17	17				
10			20	M	SS	18	19				
11							15				
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26	END OF BORING										

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
0-14½'	3.25" HSA								
14½-24½'	RD w/DM	3/16/10	2:35	13.5	12.0	12.0			9.4
		3/16/10	2:40	13.5	12.0	12.0			7.1
BORING COMPLETED: 3/16/10									
DR: JM LG: GM Rig: 68C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **2 (p. 1 of 1)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **90.9** COUNTY COORDINATES: **N 172541 E 516499**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%#200	
1	FILL, mostly clayey sand, slightly organic, trace roots, dark brown and brown	FILL	4	M	SS	10	28					
2	ORGANIC CLAY, trace shells and roots, dark brown, soft (OH)	SWAMP DEPOSIT	3	M	SS	12	102					
4	SAND WITH SILT, a little gravel, medium to fine grained, gray, waterbearing, loose (SP-SM)	COARSE ALLUVIUM	5	M/W	SS	11						
7	SILTY SAND, fine grained, gray, wet, loose (SM)		8	M/W	SS	14						
9	LEAN CLAY, gray, soft to very stiff, lenses and laminations of silty sand (CL)	FINE ALLUVIUM	2	M	SS	13	22					
10							29					
13			3	M	SS	18	28			30	19	
15			17	M/W	SS	14	28					
16	SILTY SAND, a little gravel, fine to medium grained, gray, wet, medium dense (SM)	COARSE ALLUVIUM										
20	LEAN CLAY WITH SAND, gray, stiff, laminations of silty sand (CL)	FINE ALLUVIUM OR TILL	9	M/W	SS	15	25					
23	CLAYEY SAND, a little gravel, grayish brown, very stiff (SC)	TILL										
25			25	M	SS	16	15					
26	<b>END OF BORING</b>											

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-4½'	3.25" HSA								
4½-24½'	RD w/DM	3/16/10	12:31	6.0	4.5	4.8		2.8	
		3/16/10	12:36	6.0	4.5	4.8		2.7	
BORING COMPLETED: 3/16/10									
DR: JM LG: GM Rig: 68C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **3 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **90.7** COUNTY COORDINATES: **N 173531 E 516483**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
1	FILL, mostly lean clay with sand, slightly organic, trace roots, dark brown, a little brown	FILL	3	M	SS	9	41				
2	LEAN CLAY WITH SAND, slightly organic, trace shells and roots, dark brown, soft (CL)	TOPSOIL OR FINE ALLUVIUM	5	M/W	SS	13	49				
3							40				
4	ORGANIC CLAY, trace shells, light gray, a little white, firm, laminations of boglime (OL/OH)	SWAMP DEPOSIT	WH	M	SS	7	125				
5	ORGANIC CLAY, trace shells and roots, brownish gray, very soft (OH)										
6			WH	M	SS	18	121				
7			WH	M	SS	18	71				
8			WH	M	SS	16	50				
9			WH	M	SS	16	44				
10	FAT CLAY, slightly organic, trace shells, gray, very soft (CH/OH)	FINE ALLUVIUM	WH	M	SS	18	41	1.2			
11			WH	M	SS	18	41	1.2			
12	LEAN CLAY, slightly organic, trace shells, gray, very soft (CL/OL)		WH	M	SS	18	41	1.2			
13			WH	M	SS	18	41	1.2			
14			WH	M	SS	18	41	1.2			
15			WH	M	SS	18	41	1.2			
16			WH	M	SS	18	41	1.2			
17			WH	M	SS	18	41	1.2			
18	LEAN CLAY WITH SAND, slightly organic, gray, firm, a lens of gravel (CL/OL)		7	M	SS	8	19				
19			7	M	SS	8	19				
20			7	M	SS	8	19				
21	ORGANIC CLAY WITH SAND, gray and dark gray mottled, firm, laminations of silty sand (OL/OH)		5	M	SS	17	46	4.0			
22			5	M	SS	17	46	4.0			
23			5	M	SS	17	46	4.0			
24			5	M	SS	17	46	4.0			
25	LEAN CLAY WITH SAND, a little gravel, gray, firm, lenses and laminations of clayey sand and silty sand (CL)	TILL	10	M/W	SS	13	19				
26	SILTY SAND, a little gravel, fine to medium grained, wet, loose (SM)		10	M/W	SS	13	19				

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-19½'	3.25" HSA								
19½-29½'	RD w/DM	3/16/10	10:01	21.0	19.5	19.5		18.0	
		3/16/10	10:06	21.0	19.5	19.5		16.3	
BORING COMPLETED:	3/16/10								
DR: JM	LG: GM	Rig: 68C							



# SUBSURFACE BORING LOG

AET JOB NO: 01-04761 LOG OF BORING NO. 3 (p. 2 of 2)  
 PROJECT: Bottineau Transitway; Golden Valley/Robbinsdale, MN  
 COUNTY COORDINATES: N 173531 E 516483

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%-#200	
28	CLAYEY SAND, a little gravel, gray, stiff, laminations of silty sand (SC)		11	M/W	SS	14	19					
29	SANDY LEAN CLAY, a little gravel, grayish brown, stiff, laminations of silty sand (CL/SC)		13	M	SS	17	17					
30												
31	END OF BORING											



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **4 (p. 1 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **89.5** COUNTY COORDINATES: N **173968** E **516466**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
1	FILL, mostly sandy lean clay, slightly organic, trace roots, dark brown, frozen to 1.5'	FILL		F	SU		82					
2	FILL, mostly sandy lean clay, trace shells and roots, dark brown, a little gray and brown		4	M	SS	7	32					
3												
4	ORGANIC CLAY, trace roots, dark brown, soft, laminations of sapric peat (OL/OH) (may be fill) HEMIC PEAT, dark brown and brown (PT)	SWAMP DEPOSIT OR FILL	4	M	SS	14	90	419				
5												
6		SWAMP DEPOSIT										
7												
8			2	M	SS	18	560					
9												
10	ORGANIC CLAY, trace shells and roots, gray, very soft (OH)		1	M	SS	18	238					
11												
12												
13			WH	M	SS	14	229					
14												
15	ORGANIC CLAY, trace shells and roots, gray, a little dark brown, very soft, laminations of sapric peat (OH)		WH	M	SS	18	167					
16												
17												
18			WH	M	SS	18	149					
19												
20	ORGANIC CLAY, trace shells and roots, dark brown, a little dark gray, very soft (OH)		WH	M	SS	14	173					
21												
22												
23	ORGANIC CLAY, trace roots, dark brownish gray, very soft (OH)		WH	M	SS	15	247					
24												
25												
26			WH	M	SS	15	213					

DEPTH: 0-59½'	DRILLING METHOD: 3.25" HSA	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		3/16/10	2:45	61.0	59.5	61.0			None
BORING COMPLETED: 3/16/10									
DR: GH LG: EW Rig: 27C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761**

LOG OF BORING NO. **4 (p. 2 of 3)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **173968** E **516466**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
28	ORGANIC CLAY, trace roots, dark brownish gray, very soft (OH) <i>(continued)</i>		WH	M	SS	15	199				
29											
30				WH	M	SS	14	188			
31											
32	ORGANIC CLAY, trace shells and roots, dark brown, very soft (OH)			WH	M	SS	14	201			
33											
34											
35				WH	M	SS	16	200			
36											
37											
38				WH	M	SS	18	253			
39											
40			WH	M	SS	18	228				
41											
42											
43	ORGANIC CLAY, trace shells, gray, a little dark gray, very soft, laminations of fat clay (OH)	FINE ALLUVIUM									
44											
45				WH	M	SS	18	62			
46											
47											
48	LEAN CLAY WITH SAND, gray, very soft (CL)										
49											
50			WH	M	SS	16	28				
51											
52											
53	LEAN CLAY, grayish brown, very stiff (CL/CH)										
54											
55			16	M	SS	18	25				
56											
57											
58											




# SUBSURFACE BORING LOG

AET JOB NO: **01-04761**

LOG OF BORING NO. **4 (p. 3 of 3)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **173968** E **516466**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
60	LEAN CLAY, grayish brown, very stiff (CL/CH) (continued)		22	M	<del>CL</del> SS	18	25					
61	<b>END OF BORING</b>											



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **5 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **89.9** COUNTY COORDINATES: **N 174623 E 516370**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	FILL, mostly clayey sand with organic fines, trace roots, dark brown and gray	FILL	2	M/W	SS	9	42				
2	LEAN CLAY WITH SAND, trace roots, dark brown, a little brown, soft, laminations of silty sand (CL) (possible fill)	FINE ALLUVIUM OR FILL	4	▼	SS	7	46				
3											
4	LEAN CLAY, gray, a little dark brown, very soft, a lens of sapric peat (CL) (possible fill)	SWAMP DEPOSIT OR FILL	WH	M	SS	3	42				
5											
6	ORGANIC CLAY, trace shells and roots, dark brown, very soft (OH)	SWAMP DEPOSIT	WH	M	SS	10	297				
7											
8											
9											
10											
11											
12											
13											
14											
15											
16	ORGANIC CLAY, trace roots, brown, very soft (OH)	SWAMP DEPOSIT	WH	M	SS	18	178				
17											
18			WH	M	SS	18	204				
19											
20			WH	M	SS	18	184				
21											
22			WH	M	SS	18	192				
23											
24			WH	M	SS	18	186				
25											
26											

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-39½'	3.25" HSA								
39½-54½'	RD w/DM	3/17/10	9:24	6.0	4.5	4.5		3.1	
		3/17/10	10:35	41.0	39.5	40.0		11.8	
BORING COMPLETED: 3/17/10		3/17/10	10:42	41.0	39.5	40.0		11.3	
DR: JM LG: GM Rig: 68C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **5 (p. 2 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **174623** E **516370**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS						
							WC	DEN	LL	PL	%-#200		
28	ORGANIC CLAY, trace roots, brown, very soft (OH) (continued)		WH	M	SS	18	182						
29													
30			WH	M	SS	18	154						
31													
32													
33			WH	M	SS	18	106						
34													
35								111					
36	SANDY ORGANIC CLAY, trace roots, brownish gray, very soft (OH)	TILL	WH	M	SS	12	70						
37													
38			WH	M	SS	1	93						
39													
40	CLAYEY SAND, a little gravel, gray, very soft to stiff (SC)		FINE ALLUVIUM	WH	M	SS	18	22					
41													
42													
43				6	M	SS	14	19					
44													
45		9		M	SS	13	18						
46													
47													
48													
49	LEAN CLAY WITH SAND, brownish gray, very stiff (CL)												
50			19	M	SS	7	29						
51													
52													
53													
54	LEAN CLAY, grayish brown, stiff (CL)												
55			15	M	SS	18	23						
56	END OF BORING												



# SUBSURFACE BORING LOG

AET JOB NO: 01-04761 LOG OF BORING NO. 6 (p. 1 of 1)  
 PROJECT: Bottineau Transitway; Golden Valley/Robbinsdale, MN  
 SURFACE ELEVATION: 94.7 COUNTY COORDINATES: N 175057 E 516175

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	SILTY SAND, fine grained, dark brown, frozen to 2' (SM) (possible fill)	TOPSOIL OR FILL		F	SU						
2	SANDY LEAN CLAY, trace roots, dark brown to grayish brown, firm (CL)	TILL	5	M	SS	6	24				
3											
4											
5											
5	CLAYEY SAND, a little gravel, gray, a little brown, firm to stiff, laminations of silty sand (SC)		7	-	SS	0					
6											
7											
8											
9											
10	SAND WITH SILT AND GRAVEL, medium grained, brown, waterbearing, medium dense (SP-SM)	COARSE ALLUVIUM	12	W	SS	10					
11											
12											
13	SAND WITH SILT, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP-SM)	TILL	13	W/M	SS	17	21				
14											
15	LEAN CLAY WITH SAND, a little gravel, grayish brown, stiff (CL)										
16	<b>END OF BORING</b>										

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
0-14½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		3/17/10	9:00	6.0	4.5	4.5			3.5
BORING COMPLETED: 3/17/10									
DR: GH LG: EW Rig: 27C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **7 (p. 1 of 1)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **95.0** COUNTY COORDINATES: N **175455** E **515931**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	SANDY LEAN CLAY, slightly organic, trace roots, dark brown, very soft (CL) (possible fill)	TOPSOIL OR FILL	1	M	SS	15	28				
2	SANDY LEAN CLAY, trace roots, dark brown to grayish brown, firm (CL)	WEATHERED TILL	6	M	SS	16	20				
3											
4	LEAN CLAY WITH SAND, trace roots, dark brown to brown and gray mottled, firm (CL)	FINE ALLUVIUM	7	M	SS	13	31				
5								29			
6	SANDY LEAN CLAY, a little gravel, brown and gray mottled, firm, laminations of silty sand (CL)	TILL	5	M	SS	10	29				
7											
8	SILTY CLAY, trace roots, gray, a little brown, firm, lenses and laminations of silt (CL-ML)	FINE ALLUVIUM	8	M/W	SS	14	27				
9											
10	SANDY LEAN CLAY, gray, a little brown, stiff, lenses and laminations of sandy silt (CL)	FINE ALLUVIUM	6	M/W	SS	15	30	33	24		
11											
12	SANDY LEAN CLAY, gray, a little brown, stiff, lenses and laminations of sandy silt (CL)	FINE ALLUVIUM	15	M/W	SS	16	24				
13											
14	SANDY LEAN CLAY, gray, a little brown, stiff, lenses and laminations of sandy silt (CL)	FINE ALLUVIUM	15	M/W	SS	16	24				
15											
16	SILTY SAND, fine grained, brown, wet, medium dense (SM)	COARSE ALLUVIUM									
	<b>END OF BORING</b>										

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
0-14½'	3.25" HSA	3/16/10	5:00	8.5	7.0	8.0			7.5
		3/16/10	5:35	16.0	14.5	15.0			13.4
BORING COMPLETED: 3/16/10									
DR: GH LG: EW Rig: 27C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **8 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **92.1** COUNTY COORDINATES: **N 176788 E 514858**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
1	FILL, mixture of sandy lean clay and silty sand, a little gravel, trace roots, dark brown and gray	FILL	3	M	SS	10	27				
2	FILL, mostly clayey sand, a little gravel, trace roots, grayish brown		3	▼	SS	9	22				
3											
4	FILL, mixture of silty sand and clayey sand, a little gravel, trace roots, black and dark brown		8	M/W	SS	17	19				
5											
6	FILL, mostly gravelly sand with silt, pieces of concrete and porcelain, brownish gray		*	W	SS	8					
7	*13/0.5 + 12/0.5 + 50/0.4										
8	FILL, mostly pieces of concrete, gray		100/0.1	W	SS	1					
9											
10											
11	ORGANIC CLAY, trace shells and roots, brownish gray, very soft (OH)	SWAMP DEPOSIT	1	M/W	SS	24	103	3.5			
12											
13											
14											
15	FAT CLAY, slightly organic, gray, very soft to soft, a lens of silty sand at 21' (CH/OH)		WH	M	SS	18	57		62	25	
16											
17											
18			WH	M	SS	18	40	1.3			
19											
20			2	M	SS	8	29				
21							29				
22	CLAYEY SAND, gray, soft (SC)	TILL	3	M	SS	18	15				
23											
24	LEAN CLAY, gray, soft, laminations of silty sand (CL)	FINE ALLUVIUM	9	M/W	SS	18	21				
25	N=1/0.5 + 2/0.5 + 7/0.5						27				
26	SILTY CLAY, gray, stiff, lenses and laminations of silty sand (CL-ML)						28				

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
DEPTH	METHOD	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-29½'	3.25" HSA								
29½-39½'	RD w/DM	3/17/10	2:44	6.0	4.5	5.7		5.3	
		3/17/10	2:50	6.0	4.5	5.0		3.6	
BORING COMPLETED: 3/18/10		3/18/10	8:30	9.6	9.5	7.3		3.2	
DR: JM LG: GM Rig: 68C									



# SUBSURFACE BORING LOG

AET JOB NO: 01-04761 LOG OF BORING NO. 8 (p. 2 of 2)  
 PROJECT: Bottineau Transitway; Golden Valley/Robbinsdale, MN  
 COUNTY COORDINATES: N 176788 E 514858

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%-#200	
28	CLAYEY SAND, gray, firm, lenses and laminations of silty sand (SC)(continued)	MIXED ALLUVIUM	6	M/W	SS	11	21					
29	GRAVELLY SILTY SAND, medium to fine grained, gray, wet, medium dense (SM)	COARSE ALLUVIUM	16	M/W	SS	10						
30												
31												
32	CLAYEY SAND, a little gravel, gray, stiff (SC)	TILL	12	M/W	SS	8	12					
33												
34												
35	SAND WITH SILT, a little gravel, medium to fine grained, gray, waterbearing, medium dense (SP-SM)	COARSE ALLUVIUM	13	M	SS	6	14					
36												
37												
38	CLAYEY AND WITH GRAVEL, gray, stiff (SC)	TILL	13	M	SS	6	14					
39												
40												
41	END OF BORING											



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **9 (p. 1 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **90.8** COUNTY COORDINATES: **N 177248 E 514477**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	FILL, mixture of silty sand and clayey sand, with organic fines, a little gravel, trace roots, dark brown and brown	FILL	3	M	SS	8	48				
2	FILL, mixture of silty sand and clayey sand, trace roots, dark brown and light brown		72	M	SS	3	28				
3											
4	FILL, mostly lean clay with sand, a little gravel and silty sand, pieces of concrete, trace roots, dark gray, dark brown and light brownish gray		72	M	SS	10	31				
5											
6	FILL, mostly clayey sand, trace roots, dark brown and gray		11	M	SS	16	23				
7											
8	FILL, mixture of clayey sand and silty sand, with gravel, pieces of bituminous, dark brown and gray (petroleum-type odor)		16	W	SS	14	25				
9											
10	FILL, mostly sand with silt, a little gravel and clayey sand, pieces of concrete, brown and dark gray		25	W	SS	16					
11											
12	FILL, mostly silty sand with gravel, a little clayey sand, pieces of bituminous, dark brown (petroleum-type odor)		38	W	SS	14					
13											
14	FILL, mostly silty sand with gravel, pieces of concrete and brick, dark brown (petroleum-type odor)		*	W	SS	8					
15											
16	*33/0.5 + 50/0.2										
17											
18	ORGANIC CLAY, trace roots, dark brown, a little black, firm, lenses and laminations of sapric peat, laminations of hemic peat (OH)	SWAMP DEPOSIT	6	M	SS	16	276				
19											
20											
21	ORGANIC CLAY, trace shells and roots, brownish gray to dark brown, soft to firm (OH)		4	M	SS	18	173				
22											
23											
24											
25											
26											

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-49½'	3.25" HSA								
49½-80'	RD w/DM	3/23/10	10:14	11.0	9.5	10.0		9.1	
BORING COMPLETED: 3/23/10									
DR: SS LG: JM Rig: 68C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761**

LOG OF BORING NO. **9 (p. 2 of 3)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **177248** E **514477**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
28	ORGANIC CLAY, trace shells and roots, brownish gray to dark brown, soft to firm (OH) (continued)		4	M	SS	18	162					
29												
30			5	M	SS	18	128					
31												
32	ORGANIC CLAY, trace roots, dark grayish brown, a little brownish gray, soft, laminations of sand with silt (OL/OH)		4	M	SS	18	72					
33												
34												
35	ORGANIC CLAY, trace roots, dark brown, firm (OH)		5	W	SS	18	32					
36							129					
37												
38			5	M	SS	18	134					
39												
40	ORGANIC CLAY, trace roots, dark brown, a little brownish gray, soft, laminations of sand with silt (OH)		4	M/W	SS	18	100					
41												
42												
43			4	W/M	SS	18	35					
44	ORGANIC CLAY, trace roots, black, a little gray, soft, laminations of fat clay (OH)						79					
45	SILTY SAND, fine grained, brownish gray, a little gray and dark brown, wet, lenses and laminations of organic clay (SM)	COARSE ALLUVIUM TILL	3	M	SS	18	19					
46	SANDY LEAN CLAY, a little gravel, trace roots, gray, soft (CL)											
47		FINE ALLUVIUM										
48	FAT CLAY, trace roots, black and gray, soft, lenses and laminations of organic clay (CH)		4	M	SS	18	52					
49	SANDY LEAN CLAY, a little gravel, gray, a little light gray, firm, laminations of sand and lean clay (CL)	TILL/MIXED ALLUVIUM					33					
50												
51	CLAYEY SAND, a little gravel, gray, a little dark gray, laminations of lean clay and silty sand (SC)		7	M	SS	18	30					
52												
53	LEAN CLAY WITH SAND, gray, a little brownish gray, firm, laminations of fat clay (CL)	FINE ALLUVIUM										
54	LEAN CLAY, gray, a little dark gray, very soft, lenses and laminations of organic clay (CL/CH)		WH	M	SS	24	37					
55												
56	LEAN CLAY, gray, very soft (CL/CH)		WH	M	SS	24	41		50		23	
57												
58			WH	M	SS	24	35					
							30					



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761**

LOG OF BORING NO. **9 (p. 3 of 3)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **177248** E **514477**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
60	LEAN CLAY, gray, stiff to firm, laminations of silty sand (CL)		10	M	SS	18	31					
61												
62												
63												
64												
65												
66			7	M	SS	18	29					
67												
68												
69	CLAYEY SAND, a little gravel, gray, stiff to very stiff (SC)	TILL										
70												
71												
72			15	M	SS	18	15					
73												
74												
75												
76												
77												
78			17	M	SS	18	16					
79												
80												
81			25	M	SS	14	19					
<b>END OF BORING</b>												



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **10 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **91.9** COUNTY COORDINATES: N **17762** E **514041**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
1	FILL, mixture of clayey sand and silty sand, a little gravel, pieces of bituminous and concrete, trace roots, dark brown and brown	FILL	15	M	SS	24	15					
2			40	M		16	6					
3							3					
4	FILL, mixture of silty sand and clayey sand, a little gravel, pieces of concrete, bituminous and glass, dark brown and brown		15	M	SS	8	18					
5			17	M		6	14					
6							17	M	6	14		
7										14		
8	FILL, mixture of clayey sand and silty sand, a little gravel, pieces of bituminous, brown, gray and dark brown		6	M	SS	10	16					
9			6	M		10	16					
10	6	M			10		16					
11			6	M		10	16					
12	ORGANIC CLAY, trace shells and roots, black, stiff, lenses and laminations of sapric peat (OL/OH)	SWAMP DEPOSIT			14		M	SS	8	215		
13			14	M	8	215						
14						14	M		8	215		
15			6	M	18					166	163	145
16						6	M		18	166	163	145
17			1	M	18					90		
18						1	M		18	90		
19			1	M	18					90		
20						1	M		18	90		
21			1	M	18					90		
22	1	M				18	90					
23			1	M	18		90					
24	1	M				18	90					
25			1	M	18		90					
26	1	M				18	90					
27			1	M	18		90					
28	1	M				18	90					
29			1	M	18		90					
30	1	M				18	90					
31			1	M	18		90					
32	1	M				18	90					
33			1	M	18		90					
34	1	M				18	90					
35			1	M	18		90					
36	1	M				18	90					
37			1	M	18		90					
38	1	M				18	90					
39			1	M	18		90					
40	1	M				18	90					
41			1	M	18		90					
42	1	M				18	90					
43			1	M	18		90					
44	1	M				18	90					
45			1	M	18		90					
46	1	M				18	90					
47			1	M	18		90					
48	1	M				18	90					
49			1	M	18		90					
50	1	M				18	90					
51			1	M	18		90					
52	1	M				18	90					
53			1	M	18		90					
54	1	M				18	90					
55			1	M	18		90					
56	1	M				18	90					
57			1	M	18		90					
58	1	M				18	90					
59			1	M	18		90					
60	1	M				18	90					
61			1	M	18		90					
62	1	M				18	90					
63			1	M	18		90					
64	1	M				18	90					
65			1	M	18		90					
66	1	M				18	90					
67			1	M	18		90					
68	1	M				18	90					
69			1	M	18		90					
70	1	M				18	90					
71			1	M	18		90					
72	1	M				18	90					
73			1	M	18		90					
74	1	M				18	90					
75			1	M	18		90					
76	1	M				18	90					
77			1	M	18		90					
78	1	M				18	90					
79			1	M	18		90					
80	1	M				18	90					
81			1	M	18		90					
82	1	M				18	90					
83			1	M	18		90					
84	1	M				18	90					
85			1	M	18		90					
86	1	M				18	90					
87			1	M	18		90					
88	1	M				18	90					
89			1	M	18		90					
90	1	M				18	90					
91			1	M	18		90					
92	1	M				18	90					
93			1	M	18		90					
94	1	M				18	90					
95			1	M	18		90					
96	1	M				18	90					
97			1	M	18		90					
98	1	M				18	90					
99			1	M	18		90					
100	1	M				18	90					
101			1	M	18		90					
102	1	M				18	90					
103			1	M	18		90					
104	1	M				18	90					
105			1	M	18		90					
106	1	M				18	90					
107			1	M	18		90					
108	1	M				18	90					
109			1	M	18		90					
110	1	M				18	90					
111			1	M	18		90					
112	1	M				18	90					
113			1	M	18		90					
114	1	M				18	90					
115			1	M	18		90					
116	1	M				18	90					
117			1	M	18		90					
118	1	M				18	90					
119			1	M	18		90					
120	1	M				18	90					
121			1	M	18		90					
122	1	M				18	90					
123			1	M	18		90					
124	1	M				18	90					
125			1	M	18		90					
126	1	M				18	90					
127			1	M	18		90					
128	1	M				18	90					
129			1	M	18		90					
130	1	M				18	90					
131			1	M	18		90					
132	1	M				18	90					
133			1	M	18		90					
134	1	M				18	90					
135			1	M	18		90					
136	1	M				18	90					
137			1	M	18		90					
138	1	M				18	90					
139			1	M	18		90					
140	1	M				18	90					
141			1	M	18		90					
142	1	M				18	90					
143			1	M	18		90					
144	1	M				18	90					
145			1	M	18		90					
146	1	M				18	90					
147			1	M	18		90					
148	1	M				18	90					
149			1	M	18		90					
150	1	M				18	90					
151			1	M	18		90					
152	1	M				18	90					
153			1	M	18		90					
154	1	M				18	90					
155			1	M	18		90					
156	1	M				18	90					
157			1	M	18		90					
158	1	M				18	90					
159			1	M	18		90					
160	1	M				18	90					
161			1	M	18		90					
162	1	M				18	90					
163			1	M	18		90					
164	1	M				18	90					
165			1	M	18		90					
166	1	M				18	90					
167			1	M	18		90					
168	1	M				18	90					
169			1	M	18		90					
170	1	M				18	90					
171			1	M	18		90					
172	1	M				18	90					
173			1	M	18		90					
174	1	M				18	90					
175			1	M	18		90					
176	1	M				18	90					
177			1	M	18		90					
178	1	M				18	90					
179			1	M	18		90					
180	1	M				18	90					
181			1	M	18		90					
182	1	M				18						



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **10 (p. 2 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **17762** E **514041**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
28	CLAYEY SAND, a little gravel, gray, firm to stiff (SC) <i>(continued)</i>	TILL <i>(continued)</i>	6	M	SS	10	18				
29											
30			12	M	SS	18	15				
31											
32											
33	CLAYEY SAND, a little gravel, brownish gray, stiff to very stiff (SC)										
34											
35			12	M	SS	18	18				
36											
37											
38											
39											
40			20	M	SS	18	16				
41	END OF BORING										



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **11 (p. 1 of 1)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **94.1** COUNTY COORDINATES: N **178199** E **513804**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	FILL, mixture of clayey sand and silty sand, with gravel, pieces of bituminous, trace roots, brown and dark brown	FILL	28	M	SS	24	11				
2	CLAYEY SAND, a little gravel, dark brown, stiff (SC) (possible fill)	TILL OR FILL	12	M	SS	18	12				
3											
4	CLAYEY SAND, a little gravel, brown, stiff, laminations of sand (SC) (possible fill)						10				
5			11	M	SS	12	14				
6											
7	SANDY SILT, light gray, moist, medium dense, a lens of sand, laminations of sandy lean clay (ML)	FINE ALLUVIUM	17	M	SS	16	10				
8											
9	CLAYEY SAND, a little gravel, trace roots, gray, a little brown, lenses and laminations of silty sand (SC)	TILL	12	M	SS	16	8				
10							15				
11	CLAYEY SAND, a little gravel, grayish brown, a little brown, stiff, laminations of silty sand (SC)		13	M	SS	18	17				
12											
13	CLAYEY SAND, a little gravel, gray, stiff (SC)		11	M	SS	18	17				
14											
15											
16	<b>END OF BORING</b>										

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
0-14½'	3.25" HSA	3/19/10	10:25	16.0	14.5	16.0			None
BORING COMPLETED: 3/19/10									
DR: GH LG: GM Rig: 68C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **12 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **92.8** COUNTY COORDINATES: **N 178612 E 513651**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	FILL, mostly gravelly silty sand, pieces of concrete and crushed limestone, dark brown and brown	FILL	32	M	SS	15					
2	FILL, mixture of sandy lean clay, clayey sand and silty sand, with gravel, pieces of concrete and bituminous, dark brown and gray (petroleum-type odor)		47	M	SS	13	16				
3											
4											
5											
6											
7											
8											
9											
10											
11											
12	ORGANIC CLAY, trace roots, dark brown, soft (OH)	SWAMP DEPOSIT									
13			4	M	SS	18	129				
14	ORGANIC CLAY, trace roots, dark brown, a little gray, soft, laminations of silty sand (OH)										
15			2	M/W	SS	18	77				
16	HEMIC PEAT, brown, a little dark brown and gray, lenses and laminations of organic clay, laminations of silty sand (PT)										
17											
18	ORGANIC CLAY, trace shells and roots, dark brownish gray, very soft (OH)			WH	M	SS	18	118			
19											
20			WH	M	SS	18	103				
21											
22	ORGANIC CLAY, trace shells and roots, dark brown, a little brown, very soft (OH)		WH	M	SS	18	107				
23											
24											
25	ORGANIC CLAY, trace shells and roots, brown, a little light brown, very soft (OH)		WH	M	SS	18	105				
26											

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	
0-49½'	3.25" HSA	3/18/10	3:20	3.5	2.0	3.3		2.6
		3/18/10	3:32	8.5	7.0	6.9		3.9
BORING COMPLETED: 3/18/10		3/18/10	5:35	51.0	49.5	51.0		50.7
DR: GH LG: GM Rig: 68C		3/19/10	7:45	51.0	49.5	50.0		45.5



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **12 (p. 2 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **178612** E **513651**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%-#200	
28	ORGANIC CLAY, trace shells and roots, brown, a little light brown, very soft (OH) <i>(continued)</i>		WH	M	SS	18	101					
29												
30			WH	M	SS	18	98					
31												
32	ORGANIC CLAY, trace shells and roots, grayish brown, a little gray, very soft (OH)		WH	M	SS	18	93					
33												
34	ORGANIC CLAY, trace shells and roots, brownish gray, a little dark brown, very soft, laminations of sapric peat (OH)		WH	M	SS	18	78					
35												
36												
37	FAT CLAY, slightly organic, trace shells and roots, dark gray, soft (CH/OH)	FINE ALLUVIUM	4	M	SS	18	51					
38												
39	LEAN CLAY WITH SAND, a little gravel, gray, soft, lenses of silty sand (CL)	FINE ALLUVIUM OR TILL	2	M/W	SS	18	28					
40	SILT, gray, wet, very loose (ML)	FINE ALLUVIUM					32					
41		TILL										
42	CLAYEY SAND, a little gravel, grayish brown to brownish gray, firm to very stiff (SC/CL)		11	M	SS	18	20					
43												
44												
45			6	M/W	SS	18	22					
46												
47												
48												
49												
50			17	M	SS	18	17					
51	END OF BORING											



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **13 (p. 1 of 2)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

SURFACE ELEVATION: **93.4** COUNTY COORDINATES: **N 179031 E 513502**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
1	FILL, mixture of clayey sand and silty sand, a little gravel, trace roots, dark brown	FILL	3	M	SS	14	28				
2	FILL, mixture of clayey sand, silty sand and sandy lean clay, a little gravel, trace roots, brown and light brown		9	M	SS	12	14				
3	FILL, mixture of lean clay, fat clay and silty sand, pieces of bituminous and wood, trace roots, gray and brown		13	W	SS	4	29				
4	FILL, mostly sand with silt and gravel, pieces of bituminous and concrete, gray										
5	ORGANIC CLAY, trace roots, dark brown, firm, laminations of sapric peat (OH)		SWAMP DEPOSIT	5	W/M	SS	4	142			
6	ORGANIC CLAY, trace shells, dark brown, a little brown and light gray, soft, laminations of sapric peat and boglime (OH)			6	M	SS	14	237			
7	ORGANIC CLAY, trace roots, dark brown, a little light gray, very soft, laminations of boglime (OH)	4		M	SS	14	263				
8	ORGANIC CLAY, trace roots, dark brown, a little light gray, very soft, laminations of boglime (OH)	WH		W	SS	1/2	134				
9	BOGLIME WITH SAND, trace shells, light gray, very soft (CH/OH)	WH		W	SS	4	85				
10	BOGLIME WITH SAND, trace shells, light gray, very soft (CH/OH)	WR		W	SS	24	79				
11	BOGLIME WITH SAND, trace shells, light gray, very soft (CH/OH)	WH		W	SS	18	84	1.0			
12	BOGLIME WITH SAND, trace shells, light gray, very soft (CH/OH)						71				
13	BOGLIME, light gray and gray mottled, very soft (CH/OH)	MIXED ALLUVIUM		1	W/M	SS	24	20			
14	CLAYEY SAND, gray, very soft, a lens of sandy lean clay, laminations of silty sand (SC)										

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
0-44 1/2'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		3/22/10	12:30	6.0	4.5	5.8			3.5
		3/22/10	1:45	46.0	44.5	44.6			36.6
BORING COMPLETED:	3/22/10								
DR: SS	LG: JM	Rig: 68C							



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761**

LOG OF BORING NO. **13 (p. 2 of 2)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **179031** E **513502**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
28	CLAYEY SAND, a little gravel, gray, very soft, laminations of sand (SC)	TILL	1	M		24	18				
29	CLAYEY SAND, a little gravel, grayish brown, very soft to firm (SC)						21				
30											
31											
32											
33											
34											
35											
36											
37											
38											
39	CLAYEY SAND, a little gravel, grayish brown to brown, stiff, laminations of sand (SC)										
40											
41											
42											
43											
44											
45											
46	END OF BORING										



# SUBSURFACE BORING LOG

AET JOB NO: 01-04761 LOG OF BORING NO. 14 (p. 1 of 1)  
 PROJECT: Bottineau Transitway; Golden Valley/Robbinsdale, MN  
 SURFACE ELEVATION: 96.1 COUNTY COORDINATES: N 179359 E 513439

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS						
							WC	DEN	LL	PL	%-#200		
1	FILL, mixture of clayey sand and silty sand, a little gravel, pieces of concrete and bituminous, trace roots, dark brown	FILL	5	M		SS	24	13					
2			8	M		SS	5	20					
3													
4	SANDY LEAN CLAY, a little gravel, light brown, a little brown and light gray, stiff to very stiff, laminations of silty sand and silt (CL)	TILL	10	M		SS	18	17					
5			17	M		SS	17	17					
6													
7													
8	CLAYEY SAND, a little gravel, gray, a little brown mottled, very stiff to stiff, laminations of silty sand (SC)		16	M		SS	14	17					
9			11	M		SS	6	17					
10													
11													
12													
13													
14													
15													
16	END OF BORING												

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
0-14½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		3/18/10	2:36	16.0	14.5	16.0			15.7
BORING COMPLETED: 3/18/10									
DR: GH LG: GM Rig: 68C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **15 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **92.0** COUNTY COORDINATES: N **179540** E **513391**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
1	FILL, mixture of clayey sand and silty sand, pieces of bituminous and wood, trace roots, dark brown	FILL	9	M	SS	20	17				
2	FILL, mostly clayey sand, a little gravel, trace roots, brown		10	M	SS	4	17				
3	FILL, mixture of clayey sand and silty sand, a little gravel, pieces of brick and bituminous, trace roots, dark brown and brown		6	M	SS	16	10				
4	FILL, mostly silty sand, a little gravel, pieces of bituminous, dark brown		3	W	SS	3					
5			½	W	SS	½					
6	ORGANIC CLAY WITH SAND, trace roots, dark brown, a little gray, very soft to soft, laminations of silty sand (OH)		SWAMP DEPOSIT	3	W/M	SS	16	72	11.6		
7	ORGANIC CLAY, trace shells and roots, grayish brown, soft (OH)			4	W/M	SS	12	68			
8	CLAYEY SAND, with organic fines, a little gravel, trace roots, gray, soft (SC)		TILL	2	W/M	SS	6	23			
9	CLAYEY SAND, a little gravel, gray, firm to stiff (SC)			7	M	SS	16	19			
10				8	M	SS	18	18			

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
0-29½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		3/22/10	10:21	9.0	7.0	7.3			6.1
		3/22/10	11:20	31.0	29.5	29.9			19.8
BORING COMPLETED: 3/22/10									
DR: SS LG: JM Rig: 68C									



# SUBSURFACE BORING LOG

AET JOB NO: 01-04761 LOG OF BORING NO. 15 (p. 2 of 2)  
 PROJECT: Bottineau Transitway; Golden Valley/Robbinsdale, MN  
 COUNTY COORDINATES: N E

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%-#200	
28	CLAYEY SAND, a little gravel, gray, firm to stiff (SC) <i>(continued)</i>											
29												
30			10	M	SS	18	17					
31	<b>END OF BORING</b>											



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **16 (p. 1 of 1)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **82.2** COUNTY COORDINATES: **N 180535 E 513062**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	OC	LL	PL	%-#200			
1	FILL, mixture of silty sand and clayey sand, with organic fines, trace roots, dark brown	FILL	WH	M		SS	0	114						
2	FILL, mostly sandy lean clay, slightly organic, dark brown		1	M		SS	10	27						
4	FILL, mixture of clayey sand and silty sand, with organic fines, trace roots, dark brown and gray		1	M		SS	13	23						
6	FILL, mostly silty sand, gray		8	M		SS	14							
9														
10	SANDY LEAN CLAY, slightly organic, trace roots, gray, soft, lenses and laminations of silty sand (CL/OL) (possible fill)		MIXED ALLUVIUM OR FILL	2	M		SS	13	26					
11								29						
12	FAT CLAY, slightly organic, trace shells and roots, gray, soft (CH/OH)		FINE ALLUVIUM	2	M		SS	18	49	2.3				
13														
14	LEAN CLAY, slightly organic, trace shells and roots, gray, soft, laminations of sand (CL/OL)		4	M		SS	18	34	1.6					
15														
16														
17	CLAYEY SAND, a little gravel, gray, firm to stiff (SC)	TILL	7	M		SS	14	16						
18														
19														
20														
21														
22														
23														
24														
25														
26	END OF BORING		10	M		SS	15	15						

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
0-24½' 3.25" HSA		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		3/22/10	2:30	11.0	9.5	9.8			9.2
BORING COMPLETED: 3/22/10									
DR: GH LG: EW Rig: 27C									



# SUBSURFACE BORING LOG

AET JOB NO: 01-04761 LOG OF BORING NO. 16A (p. 1 of 1)  
 PROJECT: Bottineau Transitway; Golden Valley/Robbinsdale, MN

DEPTH IN FEET	SURFACE ELEVATION: <u>82.2</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	qu
1					TW						
2											
3											
4	FILL, mostly clayey sand with gravel and organic fines, a 3" cobble, trace roots, a little sandy lean clay	FILL					19	111			370
5					TW						
6											
7											
8					TW						
9											
10											
11					TW						
12											
13											
14					TW						
15	CLAYEY SAND, trace roots, grayish brown, a little brown mottled (SC)	MIXED ALLUVIUM									
16	SILTY SAND, a little gravel, gray, lenses and laminations of clayey sand (SM)						36	88			420
17	LEAN CLAY, slightly organic, trace shells, gray (CL/OL)				TW						
18											
19											
20	CLAYEY SAND, a little gravel, brownish gray (SC)	TILL			TW						
21	END OF BORING						15	119			2600

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
0-19½'	3.25" HSA								
BORING COMPLETED: 3/22/10									
DR: GH LG: EW Rig: 27C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-04761** LOG OF BORING NO. **17 (p. 1 of 1)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **87.1** COUNTY COORDINATES: **N 180788 E 513001**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS						
							WC	DEN	LL	PL	%-#200		
1	SANDY LEAN CLAY, a little gravel, trace roots, brown and gray mottled, a little dark brown, soft, laminations of silty sand (CL) (possible fill)	TILL OR FILL	3	M	SS	13	18						
2		TILL	10	M								15	18
3	SANDY LEAN CLAY, a little gravel, grayish brown, a little brown, stiff, laminations of silty sand (CL)		10	M	SS	15	18						
4			10	M								15	18
5			10	M								15	18
6	SANDY LEAN CLAY, a little gravel, dark grayish brown, stiff (CL)		14	M	SS	17	18						
7			14	M								17	16
8	SANDY LEAN CLAY, a little gravel, gray, a little brown, stiff, laminations of silty sand (CL)		10	M	SS	18	17						
9			10	M								18	17
10	CLAYEY SAND, a little gravel, dark gray, stiff (SC/CL)		11	M	SS	18	17						
11			11	M								18	17
12	LEAN CLAY WITH SAND, grayish brown, stiff (CL)		14	M	SS	18	20						
13			14	M								18	20
14	END OF BORING												
15													
16													

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
0-14½'	3.25" HSA	3/22/10	11:00	16.0	14.5	14.5			None
BORING COMPLETED: 3/22/10									
DR: GH LG: EW Rig: 27C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **18 (p. 1 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **91.9** COUNTY COORDINATES: **N 172990 E 516545**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS								
							WC	OC	LL	PL	%-#200				
0-1	3" Bituminous pavement	FILL			SU										
1-2	FILL, a mixture of sand with silt and silty sand with organic fines, pieces of bituminous, trace roots, brownish gray and black (A-2-4)			M/W	SU										
2-3	SANDY ORGANIC CLAY, trace roots, black, a little gray, soft, laminations of fine sand (OL/OH) (A-8)	SWAMP DEPOSIT	2	M	SS	7	39	6.0							
3-4															
4-5	ORGANIC CLAY, trace shells and roots, dark brownish gray, brownish gray and gray, very soft to soft, laminations of sand with gravel and fine sand (OL/OH) (A-8)			WH	SS	24	93	4.7							
5-6															
6-7															
7-8				WH	SS	24	42	3.0							
8-9															
9-10															
10-11															
11-12															
12-13	SANDY LEAN CLAY, a little gravel, grayish brown, very soft (CL) (A-6)	TILL	1	M	SS	22	23								
13-14	SANDY LEAN CLAY, brown, very soft (CL) (A-6)						18								
14-15	SANDY LEAN CLAY, a little gravel, brown, stiff (CL) (A-6)		9	M	SS	20	16								
15-16															
16-17															
17-18															
18-19															
19-20															
20-21			15	M	SS	18	13								

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-29½'	3.25" HSA							*	
29½-49½'	RD w/DM	7/28/11	11:00	31.0	29.5	18.0			
BORING COMPLETED: 7/28/11									
DR: TK LG: SB Rig: 1C									

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 8/15/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **18 (p. 2 of 3)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **172990** E **516545**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%-#200	
23	SANDY LEAN CLAY, a little gravel, brown, stiff (CL) (A-6) (continued)	TILL (continued)										
24												
25			14	M	SS	18	13					
26												
27												
28	No sample due to artesian water condition (likely sands)											
29												
30					-	-	SS	0				
31												
32												
33	SAND WITH GRAVEL, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)	COARSE ALLUVIUM										
34												
35			16	W	SS	12						
36												
37												
38	SAND, a little gravel, medium grained, brown, waterbearing, loose (SP) (A-1-b)											
39												
40			9	W	SS	10						
41												
42												
43												
44												
45			9	W	SS	0						
46												
47												

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 8/15/11




# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **18 (p. 3 of 3)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **172990** E **516545**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
49	GRAVEL WITH SAND, brown, waterbearing, loose (SP) (A-1-b)	 COARSE ALLUVIUM (continued)									
50			10	W	SS	10					
51	<b>END OF BORING</b>  <i>*Casing placed to measure artesian level, which was found to be 0.7' above the ground surface at this time.</i>										



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **19 (p. 1 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **90.0** COUNTY COORDINATES: **N 173753 E 516483**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
1	ORGANIC CLAY, trace roots, dark grayish brown and light brown, a little light gray, soft, laminations of silt (OL/OH) (A-8)	SWAMP DEPOSIT	4	M	SS	18	44				
2											
3	SAPRIC PEAT, black (PT) (A-8)		4	M	SS	8	138				
4											
5	ORGANIC CLAY, trace shells and roots, light brownish gray, soft to very soft (OL/OH) (A-8)		2	M/W	SS	22	101				
6											
7			WH	M/W	SS	22	134	8.4			
8			WH	M/W	SS	20	161				
9											
10			WH	M/W	SS	18	163	11.5			
11											
12	ORGANIC CLAY, dark brownish gray to brownish gray, very soft (OL/OH) (A-8)		1	M/W	SS	18	169	17.6			
13											
14											
15											
16											
17											
18			WH	M/W	SS	20	100				
19											
20	ORGANIC CLAY, grayish brown, very soft (OL/OH) (A-8)	WH	M/W	SS	18	74	4.4				
21											

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-39½'	3.25" HSA								
39½-59½'	RD w/DM	7/28/11	10:10	6.0	4.5	4.5		4.3	
BORING COMPLETED:	7/28/11								
DR: GH	LG: JMM	Rig: 1C							

AET CORP W-COORDINATES 01-05070.GPJ AET-CPT+WELL.GDT 8/15/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **19 (p. 2 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **17353** E **516483**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
23	LEAN CLAY, slightly organic, dark gray, a little light grayish brown, very soft, lenses and laminations of fat clay (CL/OL) (A-8) (continued)	SWAMP DEPOSIT (continued)	WH	M/W	SS	16	41	2.4			
24	ORGANIC CLAY, trace roots, brownish gray, a little black, very soft (OL/OH) (A-8)		WH	M/W	SS	24	53	4.0			
27	LEAN CLAY, trace roots, grayish brown, a little brown, soft, laminations of fat clay and silty sand (CL) (A-7-6)	FINE ALLUVIUM	3	M/W	SS	18	33				
29	LEAN CLAY, trace roots, brownish gray, very soft (CL) (A-7-6)		WH	M/W	SS	18	31				
32	SAND WITH SILT, a little gravel, fine to medium grained, grayish brown, waterbearing, loose (SP-SM) (A-2-4)	COARSE ALLUVIUM	8	W	SS	18					
34	LEAN CLAY WITH SAND, brownish gray, stiff (CL) (A-7-6)	FINE ALLUVIUM	10	M	SS	20	24				
38	SAND WITH SILT, a little gravel, medium to fine grained, brownish gray, waterbearing, loose (SP-SM) (A-1-b)	COARSE ALLUVIUM	8	W	SS	8					
43	LEAN CLAY, brownish gray, stiff (CL) (A-7-6)	FINE ALLUVIUM	9	M	SS	18	28				

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 8/15/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **19 (p. 3 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **173753** E **516483**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%-#200	
49	LEAN CLAY, trace roots, grayish brown, very stiff (CL) (A-7-6)	FINE ALLUVIUM <i>(continued)</i>	19	M		22	26					
50												
51												
52												
53	FAT CLAY, grayish brown, very stiff (CH) (A-7-6)	FINE ALLUVIUM <i>(continued)</i>	17	M		18	26					
54												
55												
56												
57												
58	SILTY SAND WITH GRAVEL, fine to medium grained, brownish gray, a little dark gray, wet, medium dense, a lens of organic clay (SM) (A-2-4)	COARSE ALLUVIUM	16	W		20						
59												
60												
61	END OF BORING											

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 8/15/11

# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **20 (p. 1 of 4)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

SURFACE ELEVATION: **89.5** COUNTY COORDINATES: **N 174276 E 516459**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	FILL, mostly organic clay, a little gravel and sand, trace roots and shells, gray and brownish gray, a little black (A-8)	FILL	1	M	SS	6	95				
2											
3			5	M	SS	16	23				
4											
5	ORGANIC CLAY, trace shells and roots, black and dark brownish gray, soft to very soft (OL/OH) (A-8)	SWAMP DEPOSIT	4	M	SS	18	98				
6											
7											
8			WH	M	SS	20	477				
9											
10			WH	M	SS	24	327				
11											
12											
13			WH	M	SS	24	191				
14											
15	ORGANIC CLAY, trace roots and shells, black, a little brown, very soft, laminations of hemic peat (OL/OH) (A-8)		WH	M	SS	8	241				
16											
17			WH	M	SS	14	227				
18											
19	ORGANIC CLAY, trace shells and roots, brownish gray, very soft (OL/OH) (A-8)										
20			WH	M	SS	14	159				
21											

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/6/11

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
<b>0-39½'</b>	<b>3.25" HSA</b>								
<b>39½-79½'</b>	<b>RD w/DM</b>	<b>9/14/11</b>	<b>11:00</b>	<b>36.5</b>	<b>34.5</b>	<b>36.1</b>		<b>26.8</b>	
		<b>9/14/11</b>	<b>11:10</b>	<b>41.0</b>	<b>39.5</b>	<b>37.9</b>		<b>29.7</b>	
BORING COMPLETED:	<b>9/14/11</b>	<b>9/14/11</b>	<b>11:30</b>	<b>41.0</b>	<b>39.5</b>	<b>26.8</b>		<b>17.4</b>	
DR: <b>DS</b>	LG: <b>JJ</b>	Rig: <b>33C</b>							



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **20 (p. 2 of 4)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **174276** E **516459**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
23	FIBRIC PEAT, brown and dark brown (PT) (A-8)	SWAMP DEPOSIT (continued)	1	W	SS	20	590				
24											
25											
26				1/2	W	SS	18	696			
27											
28				1	W	SS	20	720			
29											
30											
31			WH	W	SS	20	189				
32											
33	SAND WITH SILT, a little gravel, fine to medium grained, brownish gray and gray, a little black, waterbearing, very loose to loose, a lens of organic clay at about 40' (SP-SM) (A-3)	COARSE ALLUVIUM	2	W	SS	24					
34											
35				3	W	SS	24				
36											
37											
38											
39											
40			9	W	SS	18					
41											
42	ORGANIC CLAY, trace roots, dark grayish brown, soft (OL/OH) (A-8)	SWAMP DEPOSIT									
43											
44											
45				3	M	SS	24	127			
46											
47											

AET\_CORP W-COORDINATES 01-05070.GPJ\_AET+CPT+WELL.GDT 10/6/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **20 (p. 3 of 4)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **174276** E **516459**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
49	ORGANIC CLAY, trace roots, dark brownish gray, a little gray, very stiff, laminations of waterbearing sand (OL/OH) (A-8)	SWAMP DEPOSIT <i>(continued)</i>												
50			18	M/W	SS	18	47							
51	SAND WITH SILT, a little gravel, fine to medium grained, gray, waterbearing, medium dense (SP-SM) (A-3)	COARSE ALLUVIUM												
52														
53	LEAN CLAY WITH SAND, brown, very stiff (CL/CH) (A-7-6)	FINE ALLUVIUM												
54														
55			18	M	SS	18	21							
56														
57														
58	FAT CLAY, brown, very stiff (CH) (A-7-6)													
59														
60			19	M	SS	18	25							
61														
62														
63														
64														
65			22	M	SS	18	26							
66														
67														
68														
69														
70			20	M	SS	18	24							
71														
72														
73														

AET\_CORP\_W-COORDINATES\_01-05070.GPJ\_AET+CPT+WELL.GDT\_10/6/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **20 (p. 4 of 4)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **174276** E **516459**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
75	FAT CLAY, brown, very stiff (CH) (A-7-6) <i>(continued)</i>	FINE ALLUVIUM <i>(continued)</i>	19	M	SS	18	25					
76												
77												
78												
79												
80			22	M	SS	18	27					
81	<b>END OF BORING</b>											

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/6/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **20A (p. 1 of 2)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

DEPTH IN FEET	SURFACE ELEVATION: <u>89.4</u> MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
1												
2												
3												
4												
5												
6												
7	Vane shear test conducted at 7'									840	130	
8												
9												
10												
11					TW	14						
12												
13												
14	Vane shear test conducted at 14'									332	120	
15												
16												
17												
18												
19												
20												
21	Vane shear test conducted at 21'									675	290	

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-29½'	3.25" HSA	9/15/11	1:45	31.5	29.5	28.0		17.7	
BORING COMPLETED: 9/15/11									
DR: DS LG: JJ Rig: 27C									

AET CORP 01-05070.GPJ AET+CPT+WELL.GDT 10/6/11




# SUBSURFACE BORING LOG

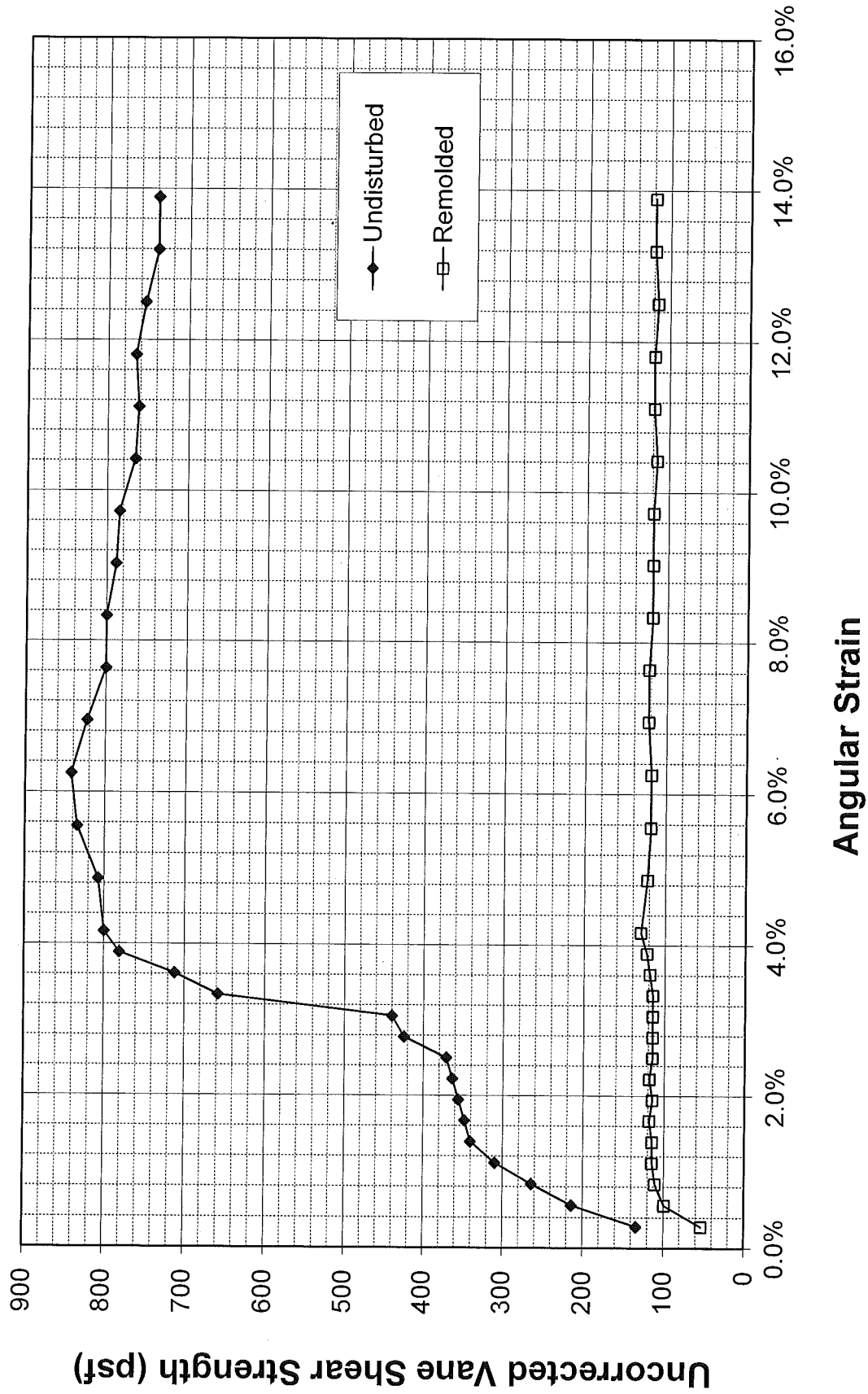
AET JOB NO: 01-05070

LOG OF BORING NO. 20A (p. 2 of 2)

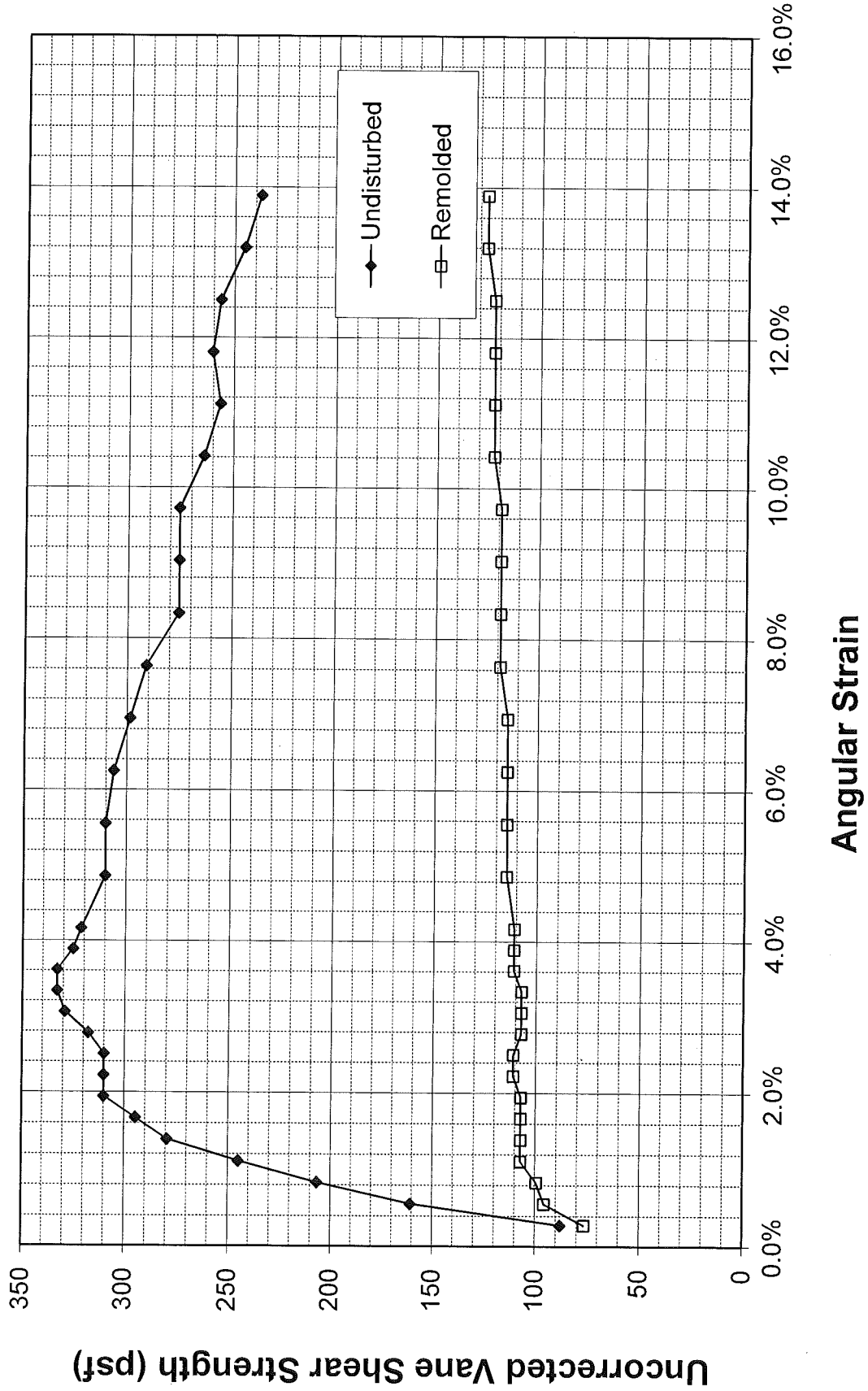
PROJECT: Bottineau Transitway; Golden Valley/Robbinsdale, MN

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
23											
24						TW	24				
25											
26											
27											
28	Vane shear test conducted at 28'								1020	1000	
29											
30	No recovery										
31						TW	0				
<b>END OF BORING</b>											

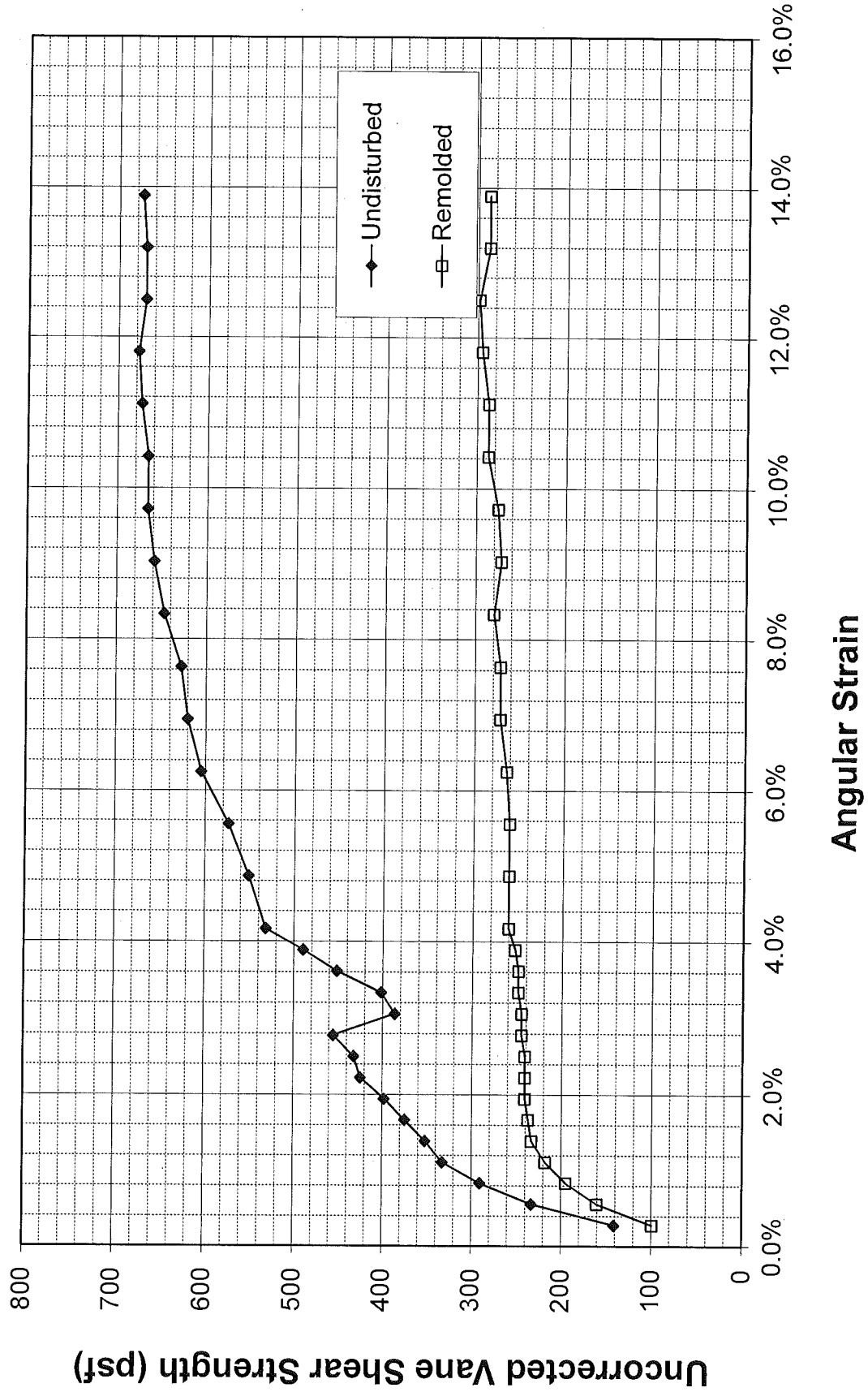
Field Vane Test - Bottineau Transitway  
Borehole No. 20, Test Depth = 7 feet; AET No. 01-05070



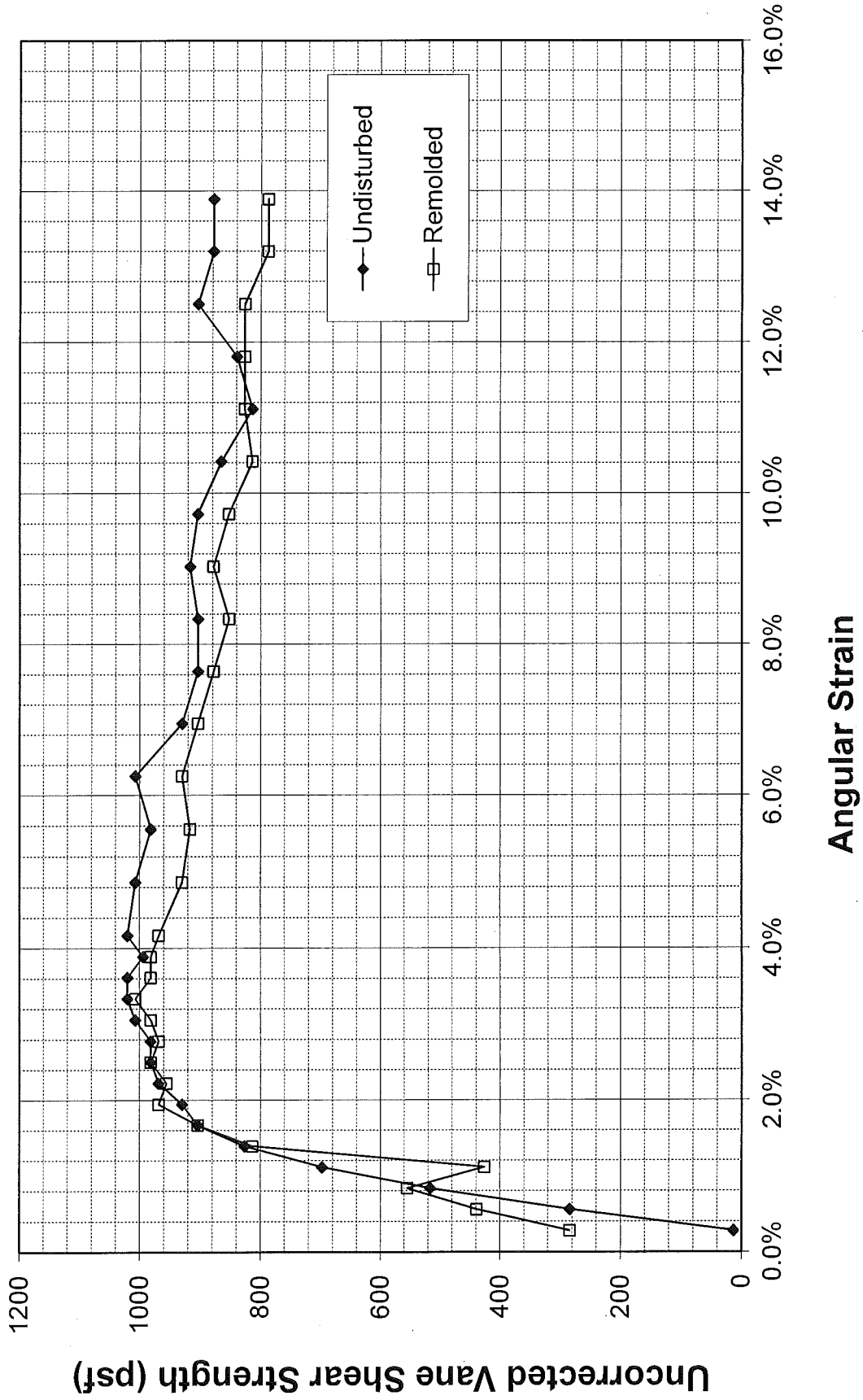
Field Vane Test - Bottineau Transitway  
Borehole No. 20, Test Depth = 14 feet; AET No. 01-05070



Field Vane Test - Bottineau Transitway  
Borehole No. 20, Test Depth = 21 feet; AET No. 01-05070



Field Vane Test - Bottineau Transitway  
Borehole No. 20, Test Depth = 28 feet; AET No. 01-05070





# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **21 (p. 1 of 2)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

SURFACE ELEVATION: **124.0** HENNEPIN CO. COORDINATES: N **176034** E **515536**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	FILL, mixture of clayey sand with organic fines, clayey sand and silty sand, with gravel, trace roots, dark brown and brown (A-6)	FILL	5	M	SS	18					
2	FILL, mostly sand with silt, a little gravel, brown (A-3)										
3	FILL, mostly sand, light brown (A-3)		5	M	SS	16					
4	FILL, mostly gravelly sand, brown (A-1-b)										
5			8	M	SS	12					
6											
7											
8			10	M	SS	5					
9	SAND, fine grained, light brown, moist, loose, lenses of fine to medium grained sand (SP) (A-3)	COARSE ALLUVIUM									
10			7	M	SS	16					
11											
12			8	M	SS	15					
13											
14	GRAVELLY SAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)										
15	SAND, a little gravel, brown, moist, medium dense (SP) (A-3)		12	M	SS	15					
16											
17											
18	GRAVELLY SAND, pieces of sandstone, fine to medium grained, brown, moist, medium dense, a lamination of lean clay (SP)										
19											
20											
21			11	M	SS	13					

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 7/5/11

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
0-29½'	3.25" HSA	6/16/11	10:45	31.5	29.5	31.0			None
BORING COMPLETED: 6/16/11									
DR: SG LG: SB Rig: 1C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **21 (p. 2 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 HENNEPIN CO. COORDINATES: N **176034** E **515536**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS											
							WC	DEN	LL	PL	%-#200							
23	SAND, fine to medium grained, light brown, moist, medium dense to loose (SP)	COARSE ALLUVIUM																
24																		
25															21	M	SS	1
26																		
27																		
28																		
29	END OF BORING																	
30															9	M	SS	22
31																		

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 7/5/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **23 (p. 1 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **90.6** HENNEPIN CO. COORDINATES: N **177015** E **514660**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	FILL, mixture of sand with silt and clayey sand, a little gravel, trace roots, dark brown, brown and black (A-2-4)	FILL	22	M	SS	24					
2	LEAN CLAY WITH SAND, slightly organic, trace roots, black, stiff (CL) (A-6)	TOPSOIL	10	M	SS	12	22				
3	LEAN CLAY WITH SAND, dark brown, stiff (CL) (A-6)	TILL									
4	LEAN CLAY WITH SAND, light brownish gray, a little brown, firm, laminations of fine sand (CL) (A-6)										
5	LEAN CLAY WITH SAND, light brownish gray, a little brown, firm, laminations of fine sand (CL) (A-6)		5	M	SS	14	21				
6											
7	LEAN CLAY, brownish gray, a little gray, firm, laminations of fine sand (CL/CH) (A-7-6)	FINE ALLUVIUM	7		SS	17	25				
8											
9	LEAN CLAY, trace roots, brownish gray, a little brown, firm, laminations of fine sand (CL) (A-7-6)		5	M/W	SS	18	32		37	18	
10	LEAN CLAY, trace roots, brownish gray, soft (CL) (A-6)										
11											
12	LEAN CLAY, trace roots, brownish gray, soft (CL) (A-6)		3	M	SS	18	26				
13											
14	SAND WITH SILT, a little gravel, fine to medium grained, gray and brownish gray, waterbearing, loose, lenses of lean clay (SP-SM) (A-2-4)	COARSE ALLUVIUM	6	W/M	SS	16					
15											
16											
17											
18	SANDY LEAN CLAY, a little gravel, brown, stiff (CL) (A-6)	TILL	12	M	SS	14					
19											
20											
21											

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 7/5/11

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-14½'	3.25" HSA								
14½-19½'	RD w/DM	6/16/11	12:50	16.0	14.5	14.9		13.1	
		6/16/11	1:00	16.0	14.5	14.6		8.1	
BORING COMPLETED: 6/16/11									
DR: SG LG: SB Rig: 1C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **23 (p. 2 of 3)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

HENNEPIN CO. COORDINATES: N **177015** E **514660**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
23	SANDY LEAN CLAY, a little gravel, brown, stiff (CL) (A-6) (continued)	TILL (continued)												
24	SAND WITH GRAVEL, possible cobbles, fine to medium grained, brown, waterbearing, loose to medium dense (SP) (A-1-b)	COARSE ALLUVIUM												
25			10	W	SS	1								
26														
27														
28														
29														
30			15	W	SS	8								
31														
32														
33	SAND, fine grained, light brown, waterbearing, medium dense (SP) (A-3)													
34														
35			17	W	SS	13								
36														
37														
38	SAND WITH SILT, fine grained, light brown, waterbearing, medium dense (SP-SM) (A-3)													
39														
40			18	W	SS	17								
41														
42														
43	SAND, fine to medium grained, light grayish brown, waterbearing, medium dense, a lens of fine grained sand (SP) (A-3)													
44														
45			14	W	SS	15								
46														
47														

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 7/5/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **23 (p. 3 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 HENNEPIN CO. COORDINATES: N **177015** E **514660**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS										
							WC	DEN	LL	PL	%-#200						
49	SAND WITH SILT, fine grained, light brown, waterbearing, medium dense (SP) (A-3)	COARSE ALLUVIUM															
50														20	W	SS	15
51																	
52	SAND WITH GRAVEL, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)		24	W													
53																	
54																	
55	SAND, fine grained, light brown, waterbearing, medium dense (SP) (A-3)																
56														24	W	SS	14
57																	
58	SAND, fine grained, light brown, waterbearing, medium dense (SP) (A-3)																
59														25	W	SS	12
60																	
61	<b>END OF BORING</b>																

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 7/5/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **24 (p. 1 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **93.5** HENNEPIN CO. COORDINATES: N **177500** E **514242**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	FILL, mostly clayey sand, a little clayey sand with organic fines, a little gravel, trace roots, brown, a little dark brown (A-6)	FILL	24	M	SS	22					
2	FILL, mostly sand with silt and gravel, apparent cobbles, brown (A-3)		24	M	SS	18	4				
3	FILL, mostly clayey sand, a little gravel and silty sand, pieces of bituminous and concrete, trace roots, dark brown and brown (A-6)		22	M	SS	17	10				
4											
5											
6											
7	FILL, mostly clayey sand, a little silty sand with organic fines, a little gravel, pieces of brick, metal, concrete and wood, trace roots, black, dark brown and gray (A-6)	SWAMP DEPOSIT	20	M	SS	15	13				
8											
9											
10				50/4	▼	SS	3	15			
11											
12											
13				27	M	SS	17	7			
14											
15				3	W	SS	5				
16											
17											
18			9	W	SS	10					
19											
19	ORGANIC CLAY, trace shells and roots, light brownish gray, soft (OL/OH) (A-8)		3	M	SS	24	124				
20											
21											

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-29½'	3.25" HSA	6/17/11	10:00	16.0	14.5	14.8		10.5	
29½-69½'	RD w/DM								
BORING COMPLETED: 6/17/11									
DR: SG LG: SB Rig: 1C									

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 7/5/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **24 (p. 2 of 3)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

HENNEPIN CO. COORDINATES: N **177500** E **514242**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
23	ORGANIC CLAY, trace shells and roots, light brownish gray, soft (OL/OH) (A-8) <i>(continued)</i>	SWAMP DEPOSIT <i>(continued)</i>	2	M	SS	18	121				
24											
25			3	M	SS	24	127				
26											
27	ORGANIC CLAY, trace shells, dark brownish gray, firm (OL/OH) (A-8)		5	M	SS	18	72				
28											
29	SANDY LEAN CLAY, a little gravel, gray, stiff, a lens of silty sand (CL) (A-6)	TILL	10	M/W	SS	18	17				
30											
31											
32											
33	SANDY LEAN CLAY, a little gravel, gray, firm (CL) (A-6)		7	M	SS	17	20				
34											
35											
36											
37											
38	SAND, a little gravel, fine to medium grained, light brown, waterbearing, medium dense, a lens of clayey sand (SP) (A-3)	COARSE ALLUVIUM	14	W	SS	14					
39											
40											
41											
42	GRAVEL WITH SAND, brown, a little gray, waterbearing, medium dense, a lens of fine grained silty sand (GP) (A-1-b)		13	W	SS	7					
43											
44											
45											
46											
47											

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 7/5/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **24 (p. 3 of 3)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 HENNEPIN CO. COORDINATES: N **177500** E **514242**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
49	SAND, a little gravel, medium to fine grained, light brown, waterbearing, medium dense (SP) (A-1-b)													
50														
51			14	W	SS	8								
52														
53	SAND, fine to medium grained, light grayish brown to light brown, waterbearing, medium dense (SP) (A-3)													
54														
55			28	W	SS	1								
56														
57														
58														
59														
60														
61			47	W	SS	0								
62														
63														
64														
65			27	W	SS	15								
66														
67														
68														
69	SAND, medium to fine grained, light brown, waterbearing, dense (SP) (A-1-b)													
70														
71			33	M	SS	18								
END OF BORING														

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 7/5/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **101 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **99.4** COUNTY COORDINATES: N **170668** E **517239**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS						
							WC	OC	LL	PL	%-#200		
1	FILL, mostly gravel, brown	FILL											
2	FILL, mostly sand with silt and gravel, brown												
3	FILL, mostly sand with silt and gravel, brown		18	M	SS	10							
4	FILL, mixture of clayey sand and silty sand, a little gravel, dark brown												
5	FILL, mixture of clayey sand and silty sand, a little gravel, dark brown												
6	FILL, mostly sand with silt, a little gravel, brown												
7	FILL, mostly sand with silt, a little gravel, brown												
8	FILL, mostly sand with silt, a little gravel, brown												
9	SANDY LEAN CLAY, a little gravel, gray, a little brown and dark gray, stiff to soft, lenses of clayey sand, laminations of slightly organic lean clay (CL)	TILL											
10	SANDY LEAN CLAY, a little gravel, gray, a little brown and dark gray, stiff to soft, lenses of clayey sand, laminations of slightly organic lean clay (CL)		12	M	SS	14	17						
11	SANDY LEAN CLAY, a little gravel, gray, a little brown and dark gray, stiff to soft, lenses of clayey sand, laminations of slightly organic lean clay (CL)												
12	SANDY LEAN CLAY, a little gravel, gray, a little brown and dark gray, stiff to soft, lenses of clayey sand, laminations of slightly organic lean clay (CL)		4	M	SS	10	26	0.8					
13	SANDY LEAN CLAY, a little gravel, gray, a little brown and dark gray, stiff to soft, lenses of clayey sand, laminations of slightly organic lean clay (CL)												
14	SANDY LEAN CLAY, a little gravel, gray, a little brown and dark gray, stiff to soft, lenses of clayey sand, laminations of slightly organic lean clay (CL)												
15	SANDY LEAN CLAY, a little gravel, gray, a little brown and dark gray, stiff to soft, lenses of clayey sand, laminations of slightly organic lean clay (CL)												
16	SANDY LEAN CLAY, a little gravel, gray, a little brown and dark gray, stiff to soft, lenses of clayey sand, laminations of slightly organic lean clay (CL)												
17	SANDY LEAN CLAY, gray, a little light gray and light brown, firm, lenses of slightly organic lean clay (CL)												
18	SANDY LEAN CLAY, gray, a little light gray and light brown, firm, lenses of slightly organic lean clay (CL)												
19	SANDY LEAN CLAY, gray, a little light gray and light brown, firm, lenses of slightly organic lean clay (CL)	6	M	SS	14	31	0.9						
20	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)	SWAMP DEPOSIT											
21	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)		4	M	SS	16	91						
22	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)												
23	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)		WH	M	SS	18	101						
24	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)												
25	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)		1	M	SS	18	113						
26	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)												
27	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)												
28	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)		WH	M	SS	18	82	6.4					
29	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)												
30	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)	WH	M	SS	18	74							
31	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)												
32	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)												
33	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)	WH	M	SS	18	74							
34	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)												
35	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)												
36	ORGANIC CLAY, trace shells and roots, light gray to light brownish gray, soft to very soft (OL/OH)	WH	M	SS	16	77							
37	ORGANIC CLAY, trace shells and roots, dark brownish gray, soft (OL/OH)												
38	ORGANIC CLAY, trace shells and roots, dark brownish gray, soft (OL/OH)												
39	ORGANIC CLAY, trace shells and roots, dark brownish gray, soft (OL/OH)	4	M	SS	18	75							

DEPTH: 0-54½'	DRILLING METHOD: 3.25" HSA	WATER LEVEL MEASUREMENTS					NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG		
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH		DRILLING FLUID LEVEL	WATER LEVEL
54½'-79½'	RD w/DM	10/11/11	11:05	56.5	54.5	56.5			None
BORING COMPLETED: 10/11/11									
DR: TA LG: TK Rig: 69C									

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **101 (p. 2 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **170668** E **517239**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%-#200	
41	FAT CLAY, gray, very soft to soft (CH)	FINE ALLUVIUM	4	M	SS	16	65	3.4				
42			WH	M	SS	18	39					
43												
44												
45												
46					3	M	SS	14	37			
47												
48					3	M	SS	16	38			
49												
50					5	M	SS	14	35			
51												
52												
53												
54												
55			3	M	SS	16	33					
56												
57												
58	FAT CLAY, gray, soft, laminations of silty sand (CH)											
59												
60					4	M	SS	24	32			
61												
62												
63	SANDY LEAN CLAY, a little gravel, gray, firm to very stiff (CL)	TILL										
64												
65												
66					7	M	SS	20	18			
67												
68												
69												
70												
71			16	M	SS	14	16					
72												
73												
74												
75												
76			24	M	SS	16	15					
77												
78	SILTY SAND, fine to medium grained, gray, wet, medium dense, lenses and laminations of sandy lean clay (SM)	COARSE ALLUVIUM										
79												
80					22	M	SS	16				
81	END OF BORING											

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **102 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **99.4** COUNTY COORDINATES: **N 171401 E 516889**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%-#200	
1	FILL, mostly gravel, brown	FILL		M								
2	FILL, mostly silty sand with gravel, brown			14	M	SS	14					
3	FILL, mixture of sand and sandy lean clay, a little gravel, brown and gray			10	M	SS	6	12				
4	ORGANIC CLAY WITH SAND, black, firm (OL/OH)	SWAMP DEPOSIT	7	M	SS	4	51	9.5				
5	LEAN CLAY, trace roots, gray, a little light brown, firm, laminations of silt (CL)	FINE ALLUVIUM	7	M	SS	10	33					
6	FAT CLAY, trace roots, gray and brown mottled, soft (CH)			4	M	SS	14	38				
7	FAT CLAY, gray, soft (CH)			3	M	SS	18	37				
8	SAND, a little gravel, medium to fine grained, gray, waterbearing, very loose (Sp)	COARSE ALLUVIUM TILL	3	W/M	SS	14	22					
9	SANDY LEAN CLAY, a little gravel, gray, soft (CL)			5	M	SS	16	17				
10	CLAYEY SAND, a little gravel, gray, stiff (SC)			9	M	SS	16	18				
11	SANDY LEAN CLAY, a little gravel, gray to brownish gray, stiff (CL)		11	M	SS	12	22					
12			12	M	SS	16	15					

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11

DEPTH: <b>0-52'</b>	DRILLING METHOD: <b>3.25" HSA</b>	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		<b>10/12/11</b>	<b>10:05</b>	<b>53.5</b>	<b>52.0</b>	<b>53.2</b>			<b>52.3</b>
BORING COMPLETED: <b>10/12/11</b>									
DR: <b>TA</b>	LG: <b>TK</b>	Rig: <b>69C</b>							



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **102 (p. 2 of 2)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **171401** E **516889**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS						
							WC	OC	LL	PL	%-#200		
41	SANDY LEAN CLAY, a little gravel, gray to brownish gray, stiff (CL) <i>(continued)</i>		15	M		SS	18	15					
42													
43													
44													
45	CLAYEY SAND, a little gravel, brownish gray, stiff, lenses and laminations of silty sand (SC)		15	M		SS	18	15					
46													
47													
48	SAND WITH SILT AND GRAVEL, medium to fine grained, brown, waterbearing, dense (SP-SM)		15	M/W		SS	18	15 16					
49													
50	SAND WITH SILT AND GRAVEL, medium to fine grained, brown, waterbearing, dense (SP-SM)		39	W		SS	18						
51													
52													
53													
	<b>END OF BORING</b>												

AET\_CORP W-COORDINATES 01-05070.GPJ AET-CPT+WELL.GDT 10/28/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **104 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **99.3** COUNTY COORDINATES: **N 173976 E 516555**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS						
							WC	OC	LL	PL	%-#200		
1	FILL, mostly gravel, brown	FILL		M									
2	FILL, mostly sand with silt and gravel, brown			33	M	SS	12						
3													
4													
5				25	M	SS	10						
6	FILL, mixture of silty sand and clayey sand, a little gravel, gray			5	W	SS	6	24					
7	FILL, mostly sandy lean clay, slightly organic, a little gravel, gray and dark gray			8	M	SS	6	21					
8		SWAMP DEPOSIT											
9	SAPRIC PEAT, black and dark brown (PT)			4	M	SS	10	200					
10													
11	ORGANIC CLAY, trace roots, black, soft (OL/OH)			4	M	SS	18	67					
12	ORGANIC CLAY, trace shells and roots, gray, soft (OL/OH)			2	M	SS	18	118					
13													
14				WH	M	SS	18	136					
15	ORGANIC CLAY, trace shells and roots, gray, a little dark brown, soft, lenses and laminations of hemic peat (OL/OH)			2	M	SS	18	89					
16	ORGANIC CLAY, trace shells, gray, very soft (OL/OH)			WH	M	SS	18	55					
17													
18	LEAN CLAY, slightly organic, gray, very soft (CL)		WH	M	SS	18	32	1.7					
19		FINE ALLUVIUM											
20	LEAN CLAY WITH SAND, gray, soft to stiff, lenses and laminations of silty sand (CL)			4	M/W	SS	16	26					
21													
22		COARSE ALLUVIUM											
23	GRAVELLY SILTY SAND, medium to fine grained, gray, wet, medium dense (SM)			15	M/W	SS	16	24					
24		FINE ALLUVIUM											
25													

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11

DEPTH: <b>0-49½'</b>	DRILLING METHOD: <b>3.25" HSA</b>	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		<b>10/14/11</b>	<b>10:30</b>	<b>51.0</b>	<b>49.5</b>	<b>51.0</b>			<b>37.4</b>
BORING COMPLETED: <b>10/14/11</b>									
DR: <b>TA</b>	LG: <b>TK</b>	Rig: <b>69C</b>							



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **104 (p. 2 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **173976** E **516555**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
41	LEAN CLAY, slightly organic, trace roots, dark brown, a little brownish gray, stiff, laminations of silty sand (CL) <i>(continued)</i>	FINE ALLUVIUM <i>(continued)</i>	10	M/W	SS	16	23	1.5			
42											
43	LEAN CLAY, brownish gray, very stiff (CL)				SS						
44											
45			18	M		14	19				
46											
47											
48											
49											
50			28	M	SS	18	22				
51	<b>END OF BORING</b>										

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **109 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **99.3** COUNTY COORDINATES: **N 177299 E 514536**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	OC	LL	PL	%-#200	
1	FILL, mostly gravel, brown and dark brown	FILL		M								
2				M								
3						M						
4	FILL, mostly silty sand, a little gravel and clayey sand, brown and dark brown			11		M	SS	10				
5				22		M	SS	12				
6				16		M	SS	14				
7	FILL, mostly sand with silt and gravel, brown			12		M	SS	10				
8				8		M	SS	12				
9	FILL, mostly sand with silt, a little gravel and clayey sand, brown			6		M/W	SS	14	22			
10	FILL, mixture of lean clay and silty sand, a little gravel, gray and brown			3		W	SS	16				
11	FILL, mostly silty sand with gravel, brown			5		W	SS	16				
12	FILL, mostly silty sand, a little gravel, brown			6		W	SS	18				
13	FILL, mostly sand with silt, a little gravel, brown			8		W	SS	18				
14				5		W	SS	8	63			
15	FILL, mostly silty sand, a little gravel and lean clay, gray, a little dark brown		3	M	SS	16	108					
16			4	M	SS	18	108					
17			4	M	SS	16	73					
18	ORGANIC CLAY, trace shells and roots, black to gray, firm to soft (OL/OH)	SWAMP DEPOSIT										
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
		COARSE ALLUVIUM										

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-29'	3.25" HSA								
29'-79'	RD w/DM	10/20/11	9:15	28.5	27.0	26.8		23.4	
BORING COMPLETED: 10/20/11									
DR: TA LG: TK Rig: 69C									

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **109 (p. 2 of 2)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **177299** E **514536**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
41	GRAVEL WITH SAND, gray, waterbearing, loose (GP) (continued)	COARSE ALLUVIUM (continued) SWAMP DEPOSIT	9	W	SS	2					
42	ORGANIC CLAY, trace shells and roots, gray, firm (OL/OH)										
43											
44											
45			6	M	SS	8	88				
46	ORGANIC CLAY, gray, firm (OL/OH)										
47			6	M	SS	18	45	2.9			
48											
49	CLAYEY SAND, a little gravel, trace roots, gray, soft, lenses and laminations of lean clay, fat clay and organic clay (SC)	TILL	4	M	SS	12	21				
50											
51				3	M	SS	16	34			
52											
53											
54			6	M	SS	14	24				
55											
56	LEAN CLAY, slightly organic, dark gray to gray, soft (CL/CH)	FINE ALLUVIUM	3	M	SS	18	33	1.4			
57											
58				3	M	SS	18	31			
59											
60											
61											
62											
63	LEAN CLAY, gray, stiff, lenses and laminations of sand (CL)										
64			9	W/M	SS	16	28				
65											
66											
67											
68	FAT CLAY, grayish brown, firm to stiff, lenses and laminations of sand with gravel (CH)	MIXED ALLUVIUM									
69				6	M	SS	14	39			
70											
71											
72	LEAN CLAY, grayish brown, stiff, lenses and laminations of fine silty sand (CL)										
73											
74											
75			15	M	SS	14	26				
76											
77											
78	SANDY LEAN CLAY, a little gravel, gray, very stiff, laminations of silty sand (CL)	TILL									
79				24	M	SS	20	19			
80											
81	<b>END OF BORING</b>										

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL\_GDT 10/28/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **112 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **99.3** COUNTY COORDINATES: **N 178616 E 513734**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
1	FILL, mostly gravel, brown and gray	FILL		M							
2	FILL, mostly sand with silt and gravel, brown		17	M	SS	14					
3											
4	SANDY LEAN CLAY, a little gravel, firm, brown to gray and brown, laminations of black lean clay (CL)	TILL	6	M	SS	16	20	20			
5											
6	SANDY ORGANIC CLAY, a little gravel, black, firm (OL/OH)	SWAMP DEPOSIT	9	M	SS	12	33	5.6			
7											
8			6	M	SS	14	24	1.8			
9											
10	SANDY LEAN CLAY, a little gravel, trace roots, gray, a little brownish gray, firm, laminations of silty sand (CL)	TILL	5	M	SS	16	21				
11											
12	SILT, gray, moist, medium dense (ML)	FINE ALLUVIUM	11	M	SS	16	27				
13											
14	SANDY LEAN CLAY, a little gravel, trace roots, gray, a little brown, firm, laminations of sandy silt (CL)	TILL	6	M	SS	14	21				
15											
16	SANDY LEAN CLAY, a little gravel, trace roots, gray, stiff (CL)		9	M/W	SS	14	17				
17											
18	SAND WITH SILT, fine to medium grained, gray, waterbearing, loose (SP-SM)	COARSE ALLUVIUM									
19											
20	SANDY LEAN CLAY, a little gravel, brownish gray, stiff (CL)	TILL	9	M	SS	12	18				
21											
22	CLAYEY SAND, a little gravel, gray, stiff (SC)		9	M	SS	14	19				
23											
24	SANDY LEAN CLAY, a little gravel, brownish gray, very stiff, laminations of silty sand around 45' (CL)		17	M	SS	16	15				
25											
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											


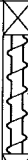


DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
0-49½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		10/19/11	9:15	21.0	19.5	20.5			19.0
		10/19/11	9:25	21.0	19.5	20.3			18.8
BORING COMPLETED:	10/19/11	10/19/11	11:00	51.0	49.5	30.1			29.7
DR:	TA LG: TK Rig: 69C								

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **112 (p. 2 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **178616** E **513734**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS						
							WC	OC	LL	PL	%-#200		
41	SANDY LEAN CLAY, a little gravel, brownish gray, very stiff, laminations of silty sand around 45' (CL) <i>(continued)</i>		16	M		SS	14	15					
42													
43													
44													
45			11	W/M		SS	16	16					
46													
47													
48	SAND WITH SILT, fine to medium grained, brown, waterbearing, medium dense (SP)		COARSE ALLUVIUM										
49													
50													
51	END OF BORING												

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **120 (p. 1 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **99.3** COUNTY COORDINATES: **N 174279 E 516533**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS								
							WC	OC	LL	PL	%-#200				
1	FILL, mostly gravel, brown	FILL		M											
2	FILL, mostly silty sand, a little gravel, brown			17	M		SS	14							
3	FILL, mostly sand with silt and gravel, brown				M		SS	8							
4	FILL, mostly sand with silt and gravel, brown				M		SS	8							
5	FILL, mixture of clayey sand and silty sand, a little gravel, grayish brown				M		SS	16	22						
6	FILL, mixture of clayey sand and silty sand, a little gravel, grayish brown				M		SS	16	22						
7	FILL, mostly sandy lean clay, a little gravel, grayish brown				M		SS	14	22						
8	FILL, mostly sandy lean clay, a little gravel, grayish brown				M		SS	14	22						
9	FILL, mostly sandy lean clay, a little gravel, grayish brown				M		SS	14	22						
10	FILL, mostly sandy lean clay, a little gravel, grayish brown				M		SS	14	22						
11	FILL, mostly sandy lean clay, a little gravel, grayish brown				M		SS	14	22						
12	FILL, mostly silty sand, a little gravel, gray				W		SS	14							
13	FILL, mostly silty sand, a little gravel, gray				W		SS	14							
14	FILL, mostly silty sand, a little gravel, gray				W		SS	14							
15	FILL, mostly silty sand, a little gravel, gray				W		SS	10							
16	FILL, mostly silty sand, a little gravel, gray				W		SS	10							
17	FILL, mostly silty sand, a little gravel, gray			WH	W		SS	14							
18	FILL, mostly silty sand, a little gravel, gray			WH	W		SS	18							
19	FILL, mostly silty sand, a little gravel, gray			WH	W		SS	18							
20	FILL, mostly silty sand, a little gravel, gray			WH	W		SS	18							
21	FILL, mostly silty sand, a little gravel, gray			WH	W		SS	18							
22	FAT CLAY, light brownish gray, very soft (CH)	FINE ALLUVIUM	1	M		SS	14	37							
23	HEMIC PEAT, dark brown, lenses of fibric peat (PT) (A-8)	SWAMP DEPOSIT						373							
24	HEMIC PEAT, dark brown, lenses of fibric peat (PT) (A-8)	SWAMP DEPOSIT	2	M		SS	18	219							
25	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													
26	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													
27	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT	WH	M		SS	18	127							
28	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													
29	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT	WH	M		SS	18	150							
30	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													
31	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT	WH	M		SS	18	142							
32	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													
33	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT	1	M		SS	18	179							
34	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													
35	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT	WH	M		SS	18	70	4.6						
36	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													
37	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													
38	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													
39	ORGANIC CLAY, trace shells and roots, dark brown to light brown to gray, soft to very soft (OL/OH)	SWAMP DEPOSIT													

AET CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-19½'	3.25" HSA								
19½-49½'	RD w/DM	10/13/11	11:00	18.5	17.0	13.5		12.4	
		10/13/11	11:15	18.5	17.0	12.0		10.4	
BORING COMPLETED: 10/13/11									
DR: TA LG: TK Rig: 69C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **120 (p. 2 of 2)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 COUNTY COORDINATES: N **174279** E **516533**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	OC	LL	PL	%-#200
41	LEAN CLAY, slightly organic, gray, very soft (CL/CH) <i>(continued)</i>	FINE ALLUVIUM <i>(continued)</i>	WH	M	SS	20	32	1.0			
42	SAND WITH SILT AND GRAVEL, medium to fine grained, grayish brown, waterbearing, medium dense (SP-SM)										
43	FAT CLAY, gray, stiff (CH/CL)	FINE ALLUVIUM	9	M	SS	16	36				
44											
45	LEAN CLAY WITH SAND, brownish gray, stiff (CL)		15	M	SS	20	23				
46											
47	END OF BORING										
48											
49											
50											
51											

AET\_CORP W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070** LOG OF BORING NO. **120A (p. 1 of 1)**  
 PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**  
 SURFACE ELEVATION: **99.3** COUNTY COORDINATES: **N 174276 E 516533**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	%-#200
1	No Sampling 0-21.5'										
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22		SWAMP DEPOSIT			TW	24					
23											
24											
25	Vane shear test conducted at 25'-25.5' (3" vane)				VANE				1300	480	
26											
27											
28					TW	24					
29											
30											
31	Vane shear test conducted at 30.5' to 31' (3" vane)				VANE				1020	700	
32											
33											
34					TW	23					
35											
36											
37	Vane shear test conducted at 37'-37.5' (3" vane)				VANE				1000	360	

AET CORP W-COORDINATES 01-05070.GPJ AET-CPT+WELL.GDT 10/28/11

DEPTH: <b>0-35½'</b>	DRILLING METHOD: <b>3.25" HSA</b>	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
BORING COMPLETED: <b>10/17/11</b>									
DR: <b>TA</b> LG: <b>TK</b> Rig: <b>69C</b>									



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **126 (p. 1 of 2)**

PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

SURFACE ELEVATION: **99.5**

COUNTY COORDINATES: **N 180212**

**E 513248**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS							
							WC	DEN	LL	PL	%-#200			
1	FILL, mostly gravel, brownish gray	FILL		M										
2				M										
3				M										
4	FILL, mostly sand with silt and gravel, brown			M										
5			21	M	SS	8								
6				M										
7	FILL, mixture of sand with silt and lean clay with gravel, brown and gray		6	M	SS	10	21							
8				M										
9	FILL, mostly sand with silt and gravel, brown			M										
10			8	M	SS	10								
11				M										
12			8	M	SS	6								
13				M										
14			5	M	SS	12								
15				M										
16				M										
17	FILL, mostly clayey sand, a little gravel and silty sand, gray and brown (possible mixed alluvium)	FILL OR ALLUVIUM	3	M/W	SS	10	16							
18				M/W										
19	FILL, mostly sand with silt, a little gravel, brownish gray (possible coarse alluvium)	TILL OR FILL	2	W/M	SS	14	21							
20	SANDY LEAN CLAY, a little gravel, brown, soft (CL) (possible fill)													
21														
22	SANDY LEAN CLAY, trace roots, gray and dark brownish gray, stiff, lenses of clayey sand, laminations of black lean clay (CL) (A-6)	TILL	10	M	SS	14	19							
23				M										
24			9	M	SS	12	20							
25				M										
26				M										
27				M										
28				M										
29				M										
30	HEMIC PEAT, dark brown and black (PT) (A-8)	SWAMP DEPOSIT	11	M	SS	14	21							
31				M										
32	SAPRIC PEAT, black (PT) (A-8)		37	M	SS	18	200							
33				M										
34	SAPRIC PEAT, trace shells, dark brown (PT) (A-8)		10	M	SS	18	125 91							
35				M										
36	ORGANIC CLAY, with shells, brownish gray, stiff to soft (OL/OH) (A-8)		8	M	SS	18	97							
37				M										
38				M										
39				M										

AET CORP W-COORDINATES 01-05070.GPJ AET-CPT+WELL.GDT 10/28/11

DEPTH:	DRILLING METHOD	WATER LEVEL MEASUREMENTS						NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG	
0-54½'	3.25" HSA	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL		WATER LEVEL
		10/18/11	10:30	21.0	19.5	19.2			18.2
		10/18/11	10:40	21.0	19.5	19.2			17.6
BORING COMPLETED: 10/18/11									
DR: TA LG: TK Rig: 69C									



# SUBSURFACE BORING LOG

AET JOB NO: **01-05070**

LOG OF BORING NO. **126 (p. 2 of 2)**

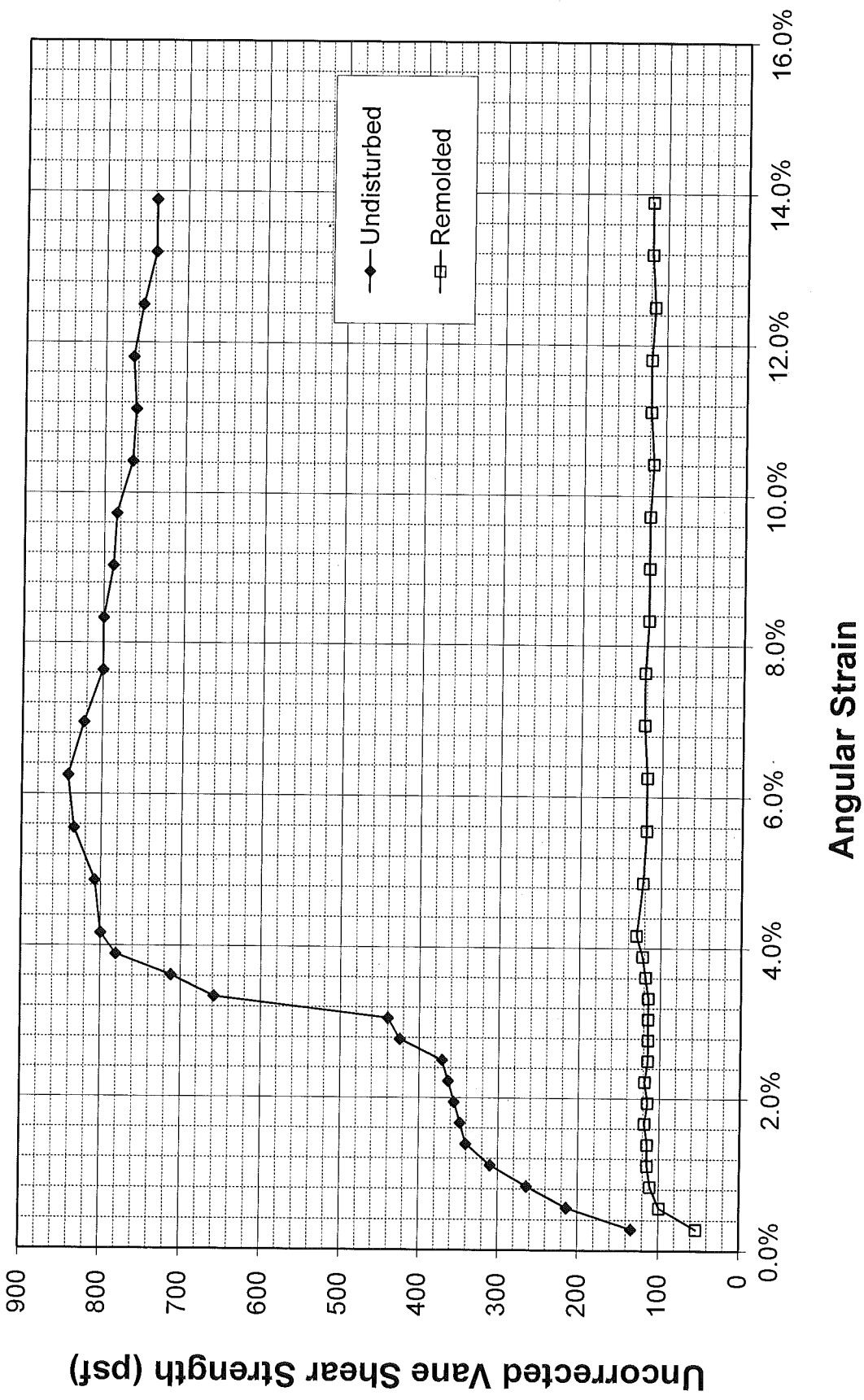
PROJECT: **Bottineau Transitway; Golden Valley/Robbinsdale, MN**

COUNTY COORDINATES: N **180212** E **513248**

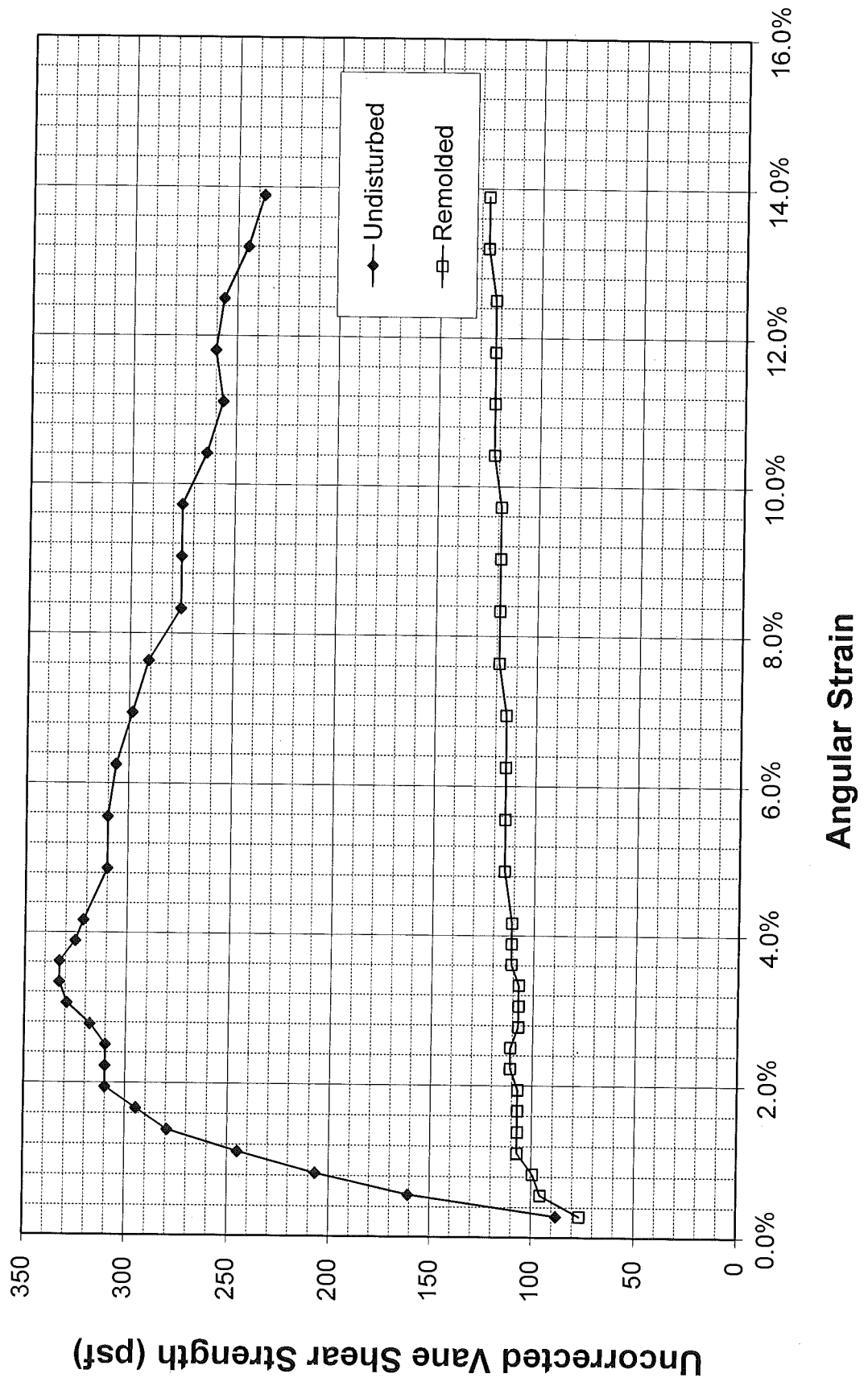
DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS					
							WC	DEN	LL	PL	%-#200	
41	ORGANIC CLAY, with shells, brownish gray, stiff to soft (OL/OH) (A-8) <i>(continued)</i>		6	M		SS	16	79				
42												
43	ORGANIC CLAY, trace shells, grayish brown, soft (OL/OH) (A-8)		4	M		SS	18	110				
44			80									
45			50									
46			7	M		SS	10	69				
47	SANDY LEAN CLAY, a little gravel, gray, firm to stiff (CL) (A-6)	TILL	7	M		SS	18	19				
48												
49												
50			10	W/M		SS	18	19				
51												
52												
53												
54												
55			12	W/M		SS	24	19				
56	<b>END OF BORING</b>											

AET\_CORP.W-COORDINATES 01-05070.GPJ AET+CPT+WELL.GDT 10/28/11

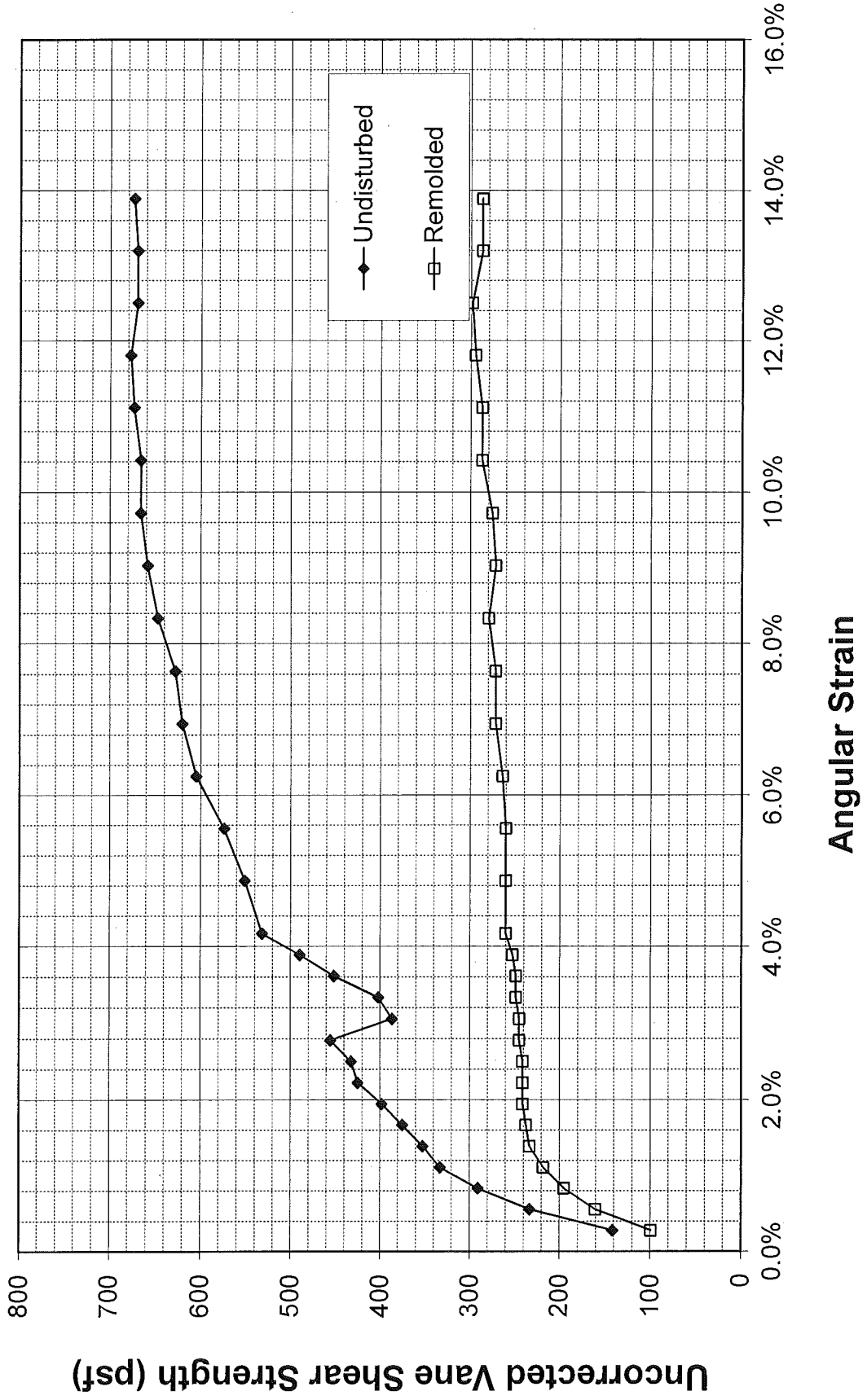
Field Vane Test - Bottineau Transitway  
Borehole No. 20, Test Depth = 7 feet; AET No. 01-05070



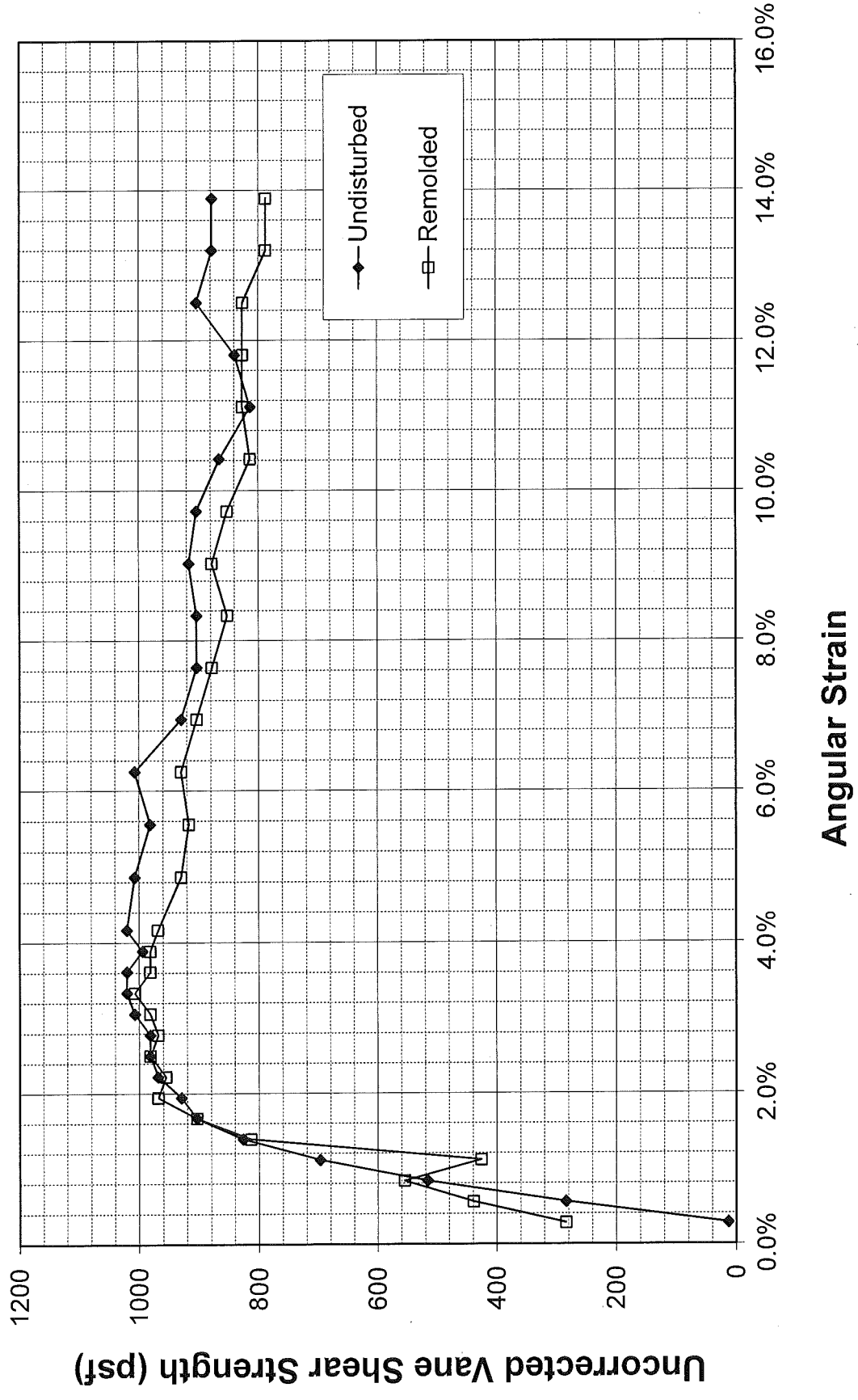
Field Vane Test - Bottineau Transitway  
Borehole No. 20, Test Depth = 14 feet; AET No. 01-05070



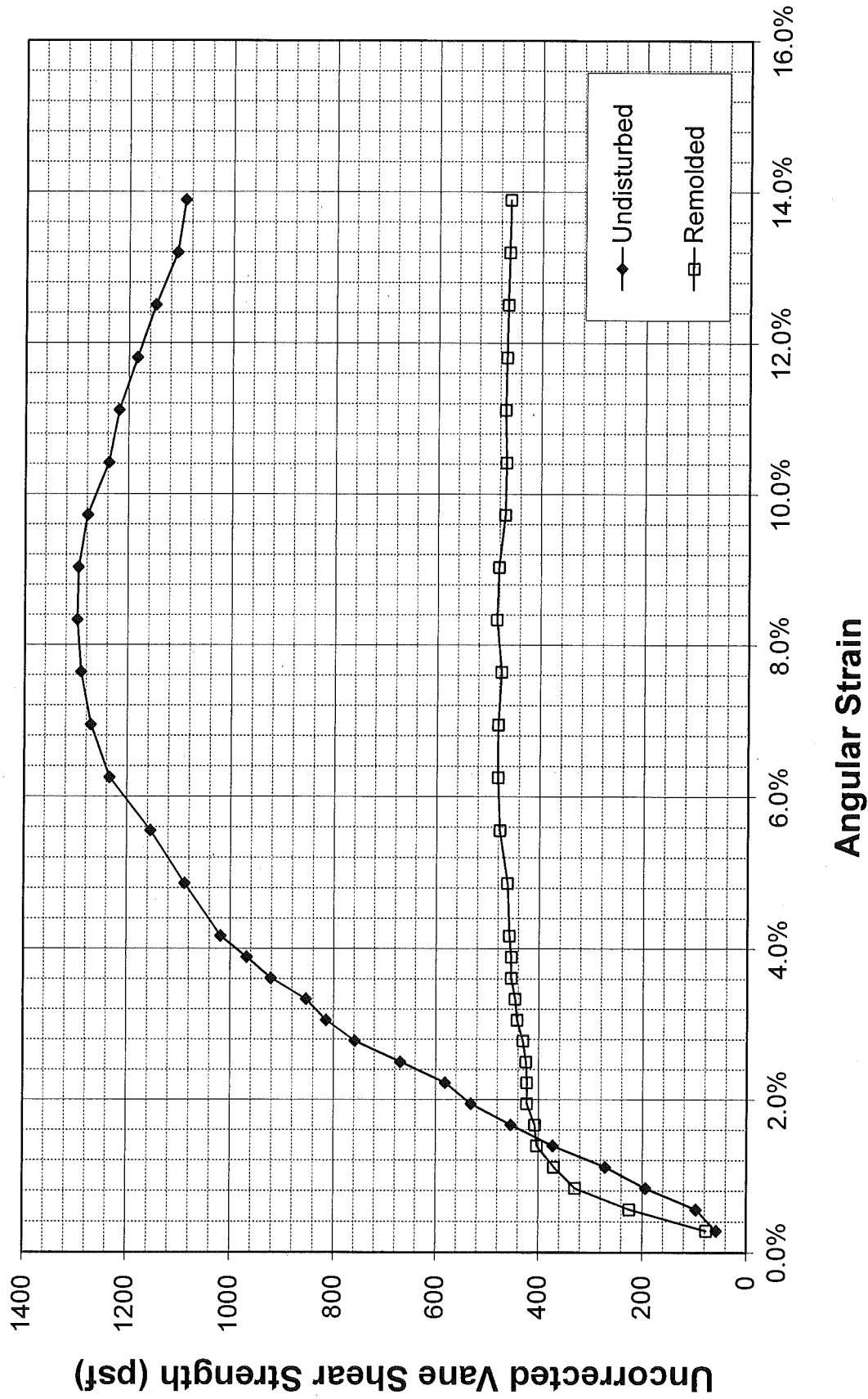
Field Vane Test - Bottineau Transitway  
Borehole No. 20, Test Depth = 21 feet; AET No. 01-05070



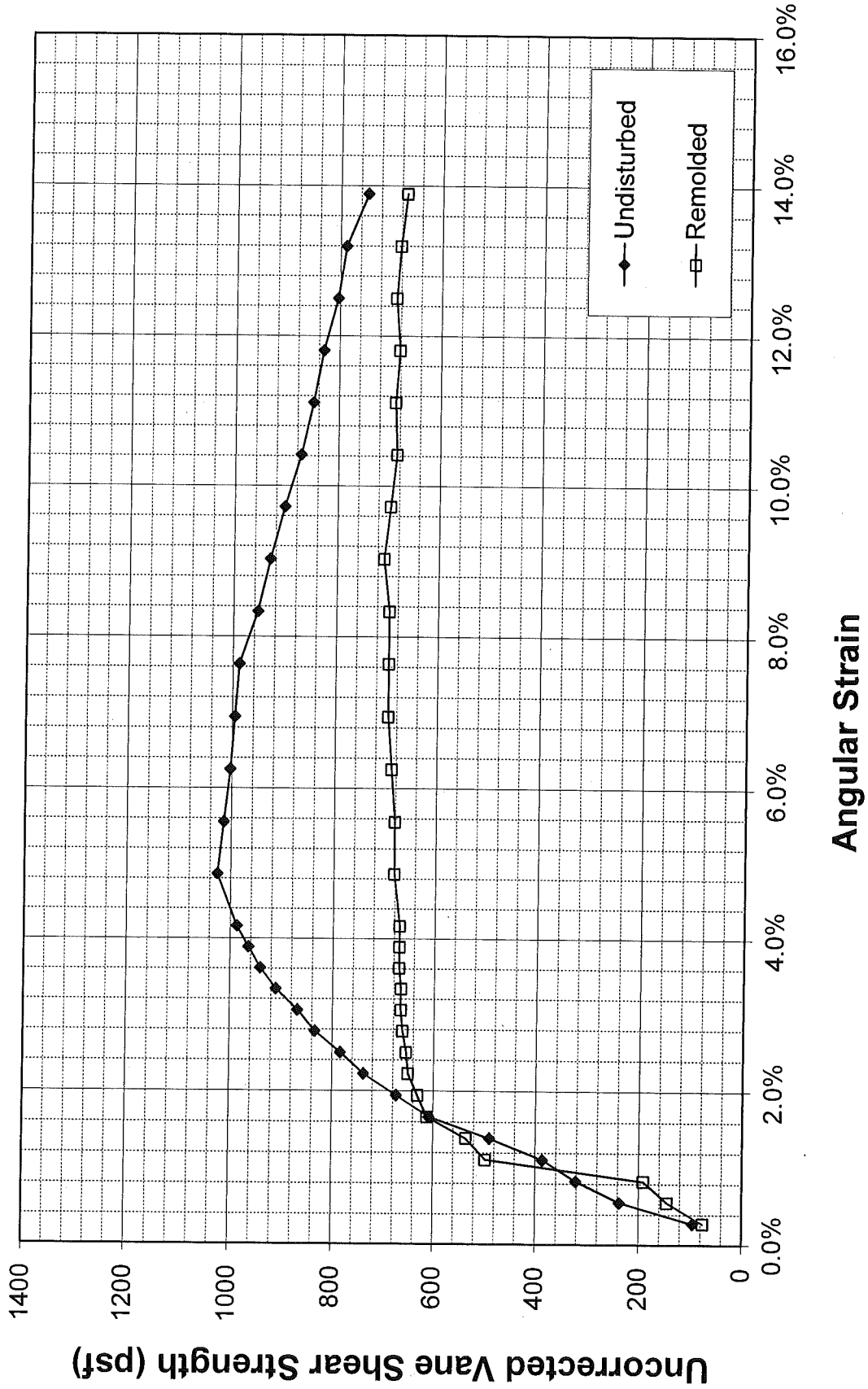
Field Vane Test - Bottineau Transitway  
 Borehole No. 20, Test Depth = 28 feet; AET No. 01-05070



Field Vane Shear Test - Bottineau Transitway  
Borehole No. 120A, Test Depth = 25.5 feet; AET No. 01-05070



Field Vane Shear Test - Bottineau Transitway  
Borehole No. 120A, Test Depth = 31 feet; AET No. 01-05070



Field Vane Shear Test - Bottineau Transitway  
Borehole No. 120A, Test Depth = 37.5 feet; AET No. 01-05070

