



NTI
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TECHNOLOGIES, LLC

3522 4th Avenue South
Fargo, ND 58103
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www.NTIgeo.com

Unearthing confidence™

August 21, 2019

Philip Rogers
2624 110th St.
Barnesville, MN 56514

Attn: Mr. Philip Rogers

Subject: Felton Gravel Exploration
County Road 26 and 170th Street N. – Rural Felton, Minnesota
NTI Project No. 19.FGO08089.000

Northern Technologies, LLC (NTI) has been contracted by Phillip Rogers to perform a gravel exploration of his properties near Felton, Minnesota. The exploration included geotechnical drilling and sampling using flight auger, and mechanical analysis testing of select samples.

Background Information and Exploration

Site geotechnical drilling was performed on June 17 & 18, 2019, and it included advancement of thirteen (13) flight auger borings extending to depths of 17 to 50 feet below grade. Borings were performed throughout Section 30, NW ½ of Section 31, NW ¼ of Section 29, and the west half of the SW ¼ of Section 29 of Keene Township. The boring locations were determined by Philip Rogers to provide coverage area of the properties. Borings were backfilled with bentonite grout per Minnesota Department of Health requirements.

Assumptions and Assignments

The boring coverage area is limited in relation to the total acreage of the property. NTI has arbitrarily assigned specific coverage areas for each soil boring. Soil types and depths exhibited at specific boring do not necessarily reflect the soils across individual assigned coverage area. Our estimated quantities are solely based on the assigned coverage area detailed on the attached Boring Plan, the samples obtained from specific borings, and mechanical analysis testing of select samples.

Site soils were visually classified, logged, and sampled by NTI field personnel. Samples were returned to the laboratory for further testing and classification per USGS criteria. NTI has assigned ratings of "Excellent", "Good", "Above Average", "Average", "Below Average", and "Poor" for soils obtained during this project. The ratings represent the following:

Precision · Expertise · Geotechnical · Materials

FARGO · BISMARCK · GRAND FORKS · MINOT · INVER GROVE HEIGHTS · RAMSEY



Excellent (A) – Poorly Graded Gravel (GP)
Above Average (B) – Sand, With/Some Gravel (SP)
Average (C) – Sand, Little / Trace Gravel (SP, SP-SM)
Below Average (D) – Silty Sand / Fine Sand (SP-SM, SM)
Poor (F) – Fat Clay / Lean Clay (CH, CL)
Topsoil (T) – Organic Surface Topsoil (OL)

Estimated Quantities

We estimate the following Total Quantities based on the samples obtained during the exploration, depth of boring, and the respective assigned coverage areas. A detailed breakdown of the quantities for individual coverage areas is provided within the attachments. Actual soil quantities likely exceed estimates listed below as select were terminated within specific soil layer. Reference specific boring location and soil type at depth of termination.

Soil Type	Estimated Total Cubic Yards	Estimated Total Acre-Ft
Topsoil	881,962	546
Gravel (GP)	1,345,171	834
Sand, With / Some Gravel (SP)	3,802,439	2,356
Sand, Little / Trace Gravel (SP, SP-SM)	8,239,609	5,104
Silty Sand / Fine Sand (SP-SM, SM)	9,853,082	6,106
Clay (CH, CL)	1,027,039	636

Standard of Care

The findings in this document represent our professional opinions, based on our interpretation of the site conditions and information provided to us by others at the time of issue. Other than this, no warranty is implied or intended. Please contact us immediately if you have questions concerning this correspondence. We may be reached at (701) 232-1822.

Northern Technologies, LLC

Josh Holmes, P.E.
Engineer

Dan Gibson, P.E.
Senior Engineer

Felton Gravel

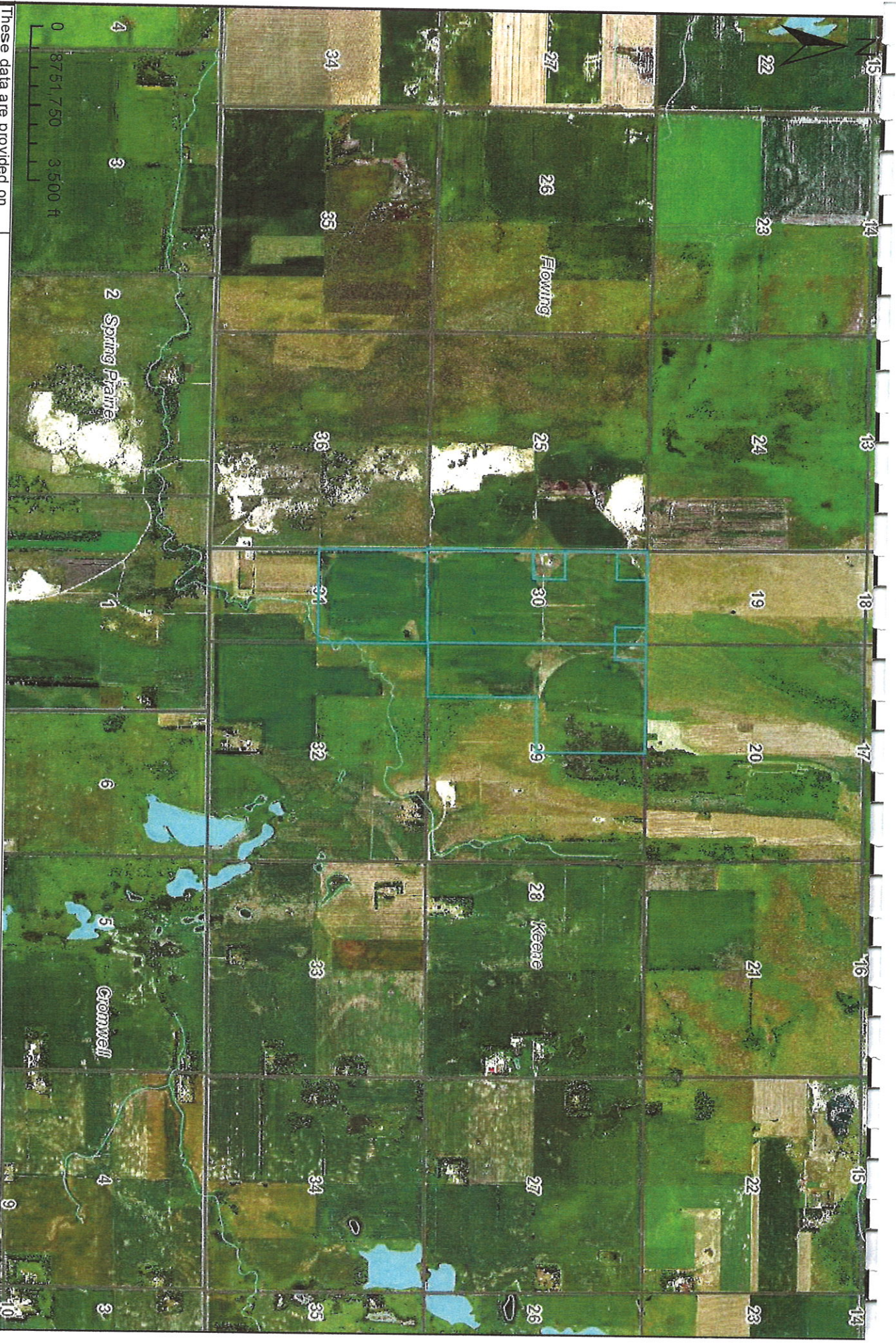
Write a description for your map.

- Legend**
- Section
 - Soil Boring
 - Wind Turbine Areas



Google Earth

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These data are provided on an "AS-IS" basis, without warranty of any type, expressed or implied, including but not limited to any warranty as to their performance, merchantability, or fitness for any particular purpose.

Date: 8/21/2019 /



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Felton Gravel Exploration
Rural Felton, Minnesota
NTI Project #19.FGO.08089

<i>Location</i>	<i>Estimated Acres</i>	<i>Estimated Square Feet</i>	<i>Estimated Square Yards</i>
SB-1	21.5	937,459	104,162
SB-2	19	830,657	92,295
SB-3	71	3,090,762	343,418
SB-4	73.3	3,194,030	354,892
SB-5	28.6	1,246,020	138,447
SB-6	32.6	1,421,815	157,979
SB-7	35.8	1,560,698	173,411
SB-8	31.7	1,382,609	153,623
SB-9	37.6	1,637,692	181,966
SB-10	53.5	2,330,675	258,964
SB-11	68.4	2,981,237	331,249
SB-12	66.7	2,905,569	322,841
SB-13	58.4	2,542,055	282,451

<i>Grade</i>	<i>Soil Type</i>	<i>Estimated Total Cubic Yards</i>	<i>Estimated Total Acre-Ft</i>
<i>T</i>	Topsoil	881,962	546
<i>A</i>	Gravel (GP)	1,345,171	834
<i>B</i>	Sand, With / Some Gravel (SP)	3,802,439	2,356
<i>C</i>	Sand, Little / Trace Gravel (SP, SP-SM)	8,239,609	5,104
<i>D</i>	Silty Sand / Fine Sand (SP-SM, SM)	9,853,082	6,106
<i>F</i>	Clay (CH, CL)	1,027,039	636



SB-1					
Depth	Soil Class	Grade	Layer (Ft)	Cubic Yd	Acre-Ft
0	TS	T	0.6	20,832	12.9
0.6	SP-SM	B	5.9	204,852	126.9
6.5	SP	C	3	104,162	64.5
9.5	SP-SM	D	7.5	260,405	161.3
17	SP	C	16.5	572,892	354.8
33.5	SM	D	9	312,486	193.5
42.5	SP-SM	C	7.5	260,405	161.3
50					

SB-2					
Depth	Soil Class	Grade	Layer (Ft)	Cubic Yd	Acre-Ft
0	TS	T	1.4	43,071	26.6
1.4	CL	F	6.6	203,049	125.4
8	SP-SM	C	27	830,657	513.0
35	SM	D	15	461,476	285.0
50					

SB-3					
Depth	Soil Class	Grade	Layer (Ft)	Cubic Yd	Acre-Ft
0	TS	T	1	114,473	71.0
1	SP-SM	D	4	457,891	284.0
5	SP-SM	D	30	3,434,180	2130.0
35					



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Felton Gravel Exploration
Rural Felton, Minnesota
NTI Project #19.FGO.08089

SB-4	
Depth	Soil Class
0	TS
1.5	SP-SM
16	SP
30	

Grade	Layer (Ft)
T	1.5
D	14.5
B	14

Cubic Yd	Acre-Ft
177,446	110.0
1,715,312	1062.9
1,656,164	1026.2

SB-5	
Depth	Soil Class
0	TS
0.7	SP
5	SP
19.5	CH
20	

Grade	Layer (Ft)
T	0.7
B	4.3
C	14.5
F	0.5

Cubic Yd	Acre-Ft
32,304	20.0
198,440	123.0
669,159	414.7
23,074	14.3

SB-6	
Depth	Soil Class
0	TS
0.5	SP-SM
9	SP-SM
14	SP-SM
22	SP-SM
25	

Grade	Layer (Ft)
T	0.5
B	8.5
C	5
C	8
C	3

Cubic Yd	Acre-Ft
26,330	16.3
447,608	277.1
263,299	163.0
421,279	260.8
157,979	97.8

SB-7	
Depth	Soil Class
0	TS
1.8	SP-SM
12	SP-SM
19.5	CH
20	

Grade	Layer (Ft)
T	1.8
D	10.2
D	7.5
F	0.5

Cubic Yd	Acre-Ft
104,047	64.4
589,597	365.2
433,527	268.5
28,902	17.9



SB-8			
Depth	Soil Class	Grade	Layer (Ft)
0	TS	T	1
1	SP-SM	C	16
17	CH	F	3
20			
Cubic Yd			
			51,208
			819,324
			153,623
Acre-Ft			
			31.7
			507.2
			95.1

SB-9			
Depth	Soil Class	Grade	Layer (Ft)
0	TS	T	0.5
0.5	SP	C	8.5
9	SP	B	8
17	CH	F	1.5
18.5			
Cubic Yd			
			30,328
			515,570
			485,242
			90,983
Acre-Ft			
			18.8
			319.6
			300.8
			56.4

SB-10			
Depth	Soil Class	Grade	Layer (Ft)
0	TS	T	0.7
0.7	SP-SM	C	6.3
7	SP-SM	D	10
17	SP-SM	C	3
20			
Cubic Yd			
			60,425
			543,824
			863,213
			258,964
Acre-Ft			
			37.5
			337.1
			535.0
			160.5

SB-11			
Depth	Soil Class	Grade	Layer (Ft)
0	TS	T	0.8
0.8	SP	C	7.7
8.5	SP	B	3.5
12	SP-SM	D	12
24	CH	F	1
25			
Cubic Yd			
			88,333
			850,205
			386,457
			1,324,994
			110,416
Acre-Ft			
			54.7
			526.7
			239.4
			820.8
			68.4



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NTI Project #19.FGO.08089

SB-12

Depth	Soil Class	Grade	Layer (Ft)	Cubic Yd	Acre-Ft
0	TS	T	0.8	86,091	53.4
0.8	SP-SM	C	4.7	505,784	313.5
5.5	SP	C	4	430,455	266.8
9.5	GP	A	12.5	1,345,171	833.8
22	CH	F	3	322,841	200.1
25					

SB-13

Depth	Soil Class	Grade	Layer (Ft)	Cubic Yd	Acre-Ft
0	TS	T	0.5	47,075	29.2
0.5	SP	B	4.5	423,676	262.8
5	SP	C	9	847,352	525.6
14	SP	C	2	188,300	116.8
16	CH	F	1	94,150	58.4
17					



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GRAIN SIZE DISTRIBUTION
ASTM C136 & D422

Report To:

Project:

Felton Gravel Exploration

Project Number:

19.FGO08089.000

Attention:

Location:

Rural Felton, Minnesota

Sample Information

Sample Number:

1

Date Sampled:

7/24/2019

Project Specifications:

Sampled By:

Drillers

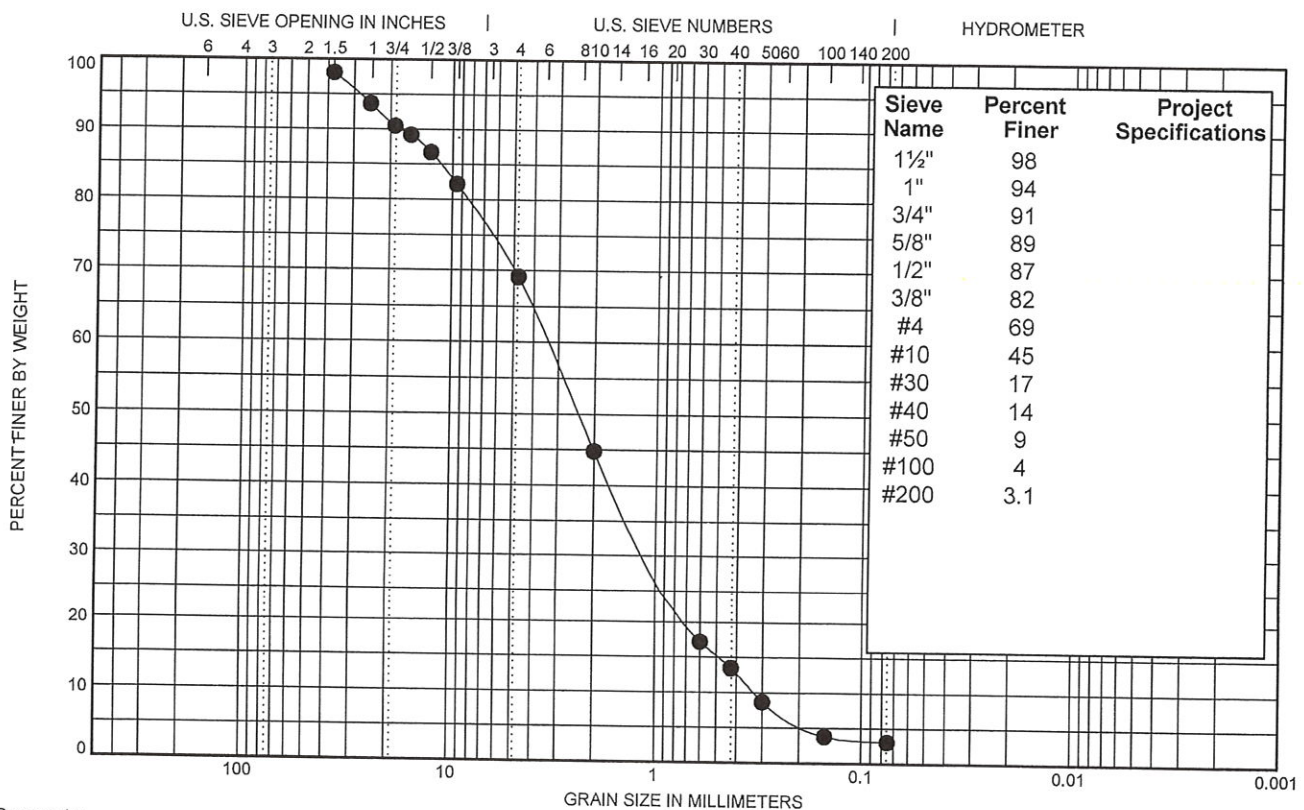
Aggregate Type:

Location Sampled:

Soil Boring #1 [1'-4']

Sample Data

Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
0.97	10.41	37.5	3.432	1.049	0.33	29.0	66.1		3.1



Comments:

Cc:

Submitted by,

Northern Technologies, LLC

Josh Holmes
(8/13/19)



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Report To:

Project:

Felton Gravel Exploration

Project Number:

19.FGO08089.000

Attention:

Location:

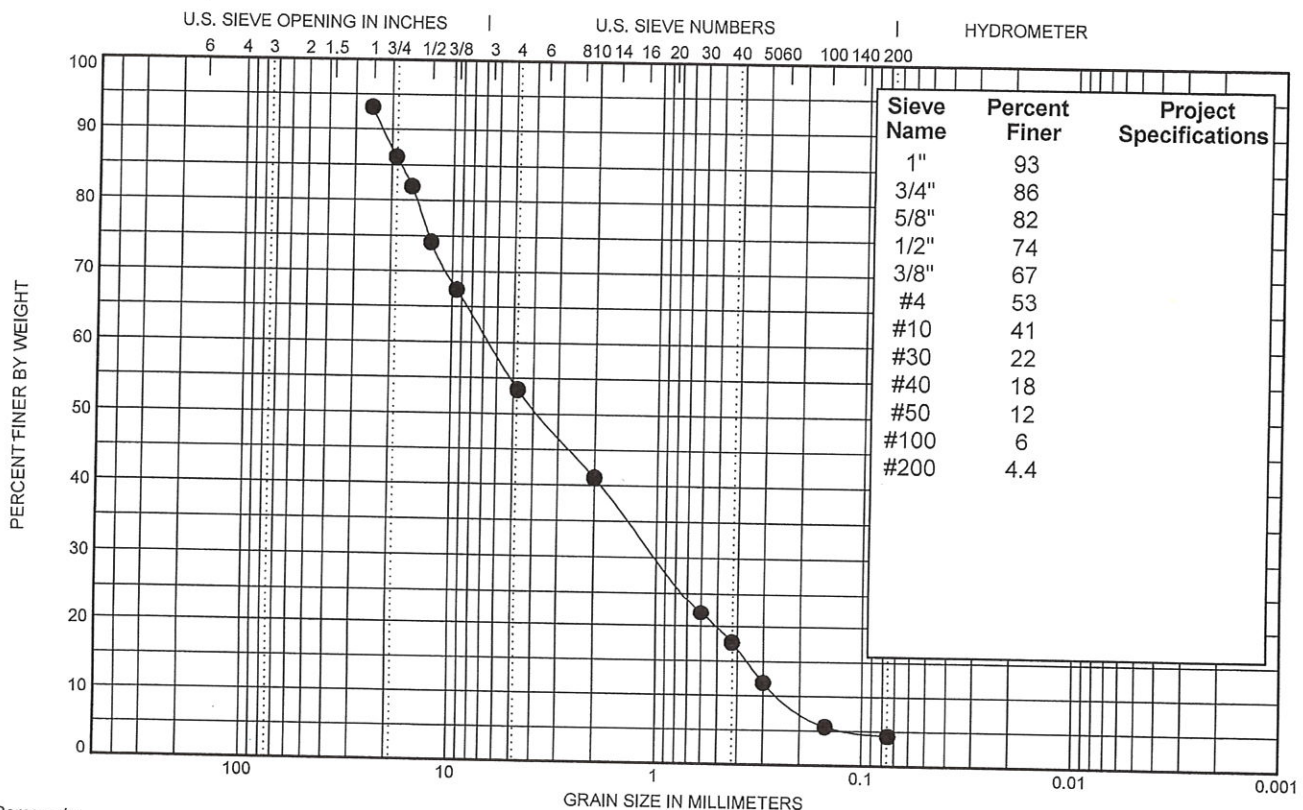
Rural Felton, Minnesota

Sample Information

Sample Number:	2	Date Sampled:	7/24/2019
Project Specifications:		Sampled By:	Drillers
Aggregate Type:			
Location Sampled:	Soil Boring #1 [4'-7']		

Sample Data

Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
0.62	27.05	25	6.579	0.995	0.243	39.8	49.1		4.4



Comments:

Cc:

Submitted by,

Northern Technologies, LLC

Josh Holmes
(8/13/19)



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Report To:

Project:

Felton Gravel Exploration

Project Number:

19.FGO08089.000

Location:

Rural Felton, Minnesota

Attention:

Sample Information

Sample Number:

3

Date Sampled:

7/24/2019

Project Specifications:

Sampled By:

Drillers

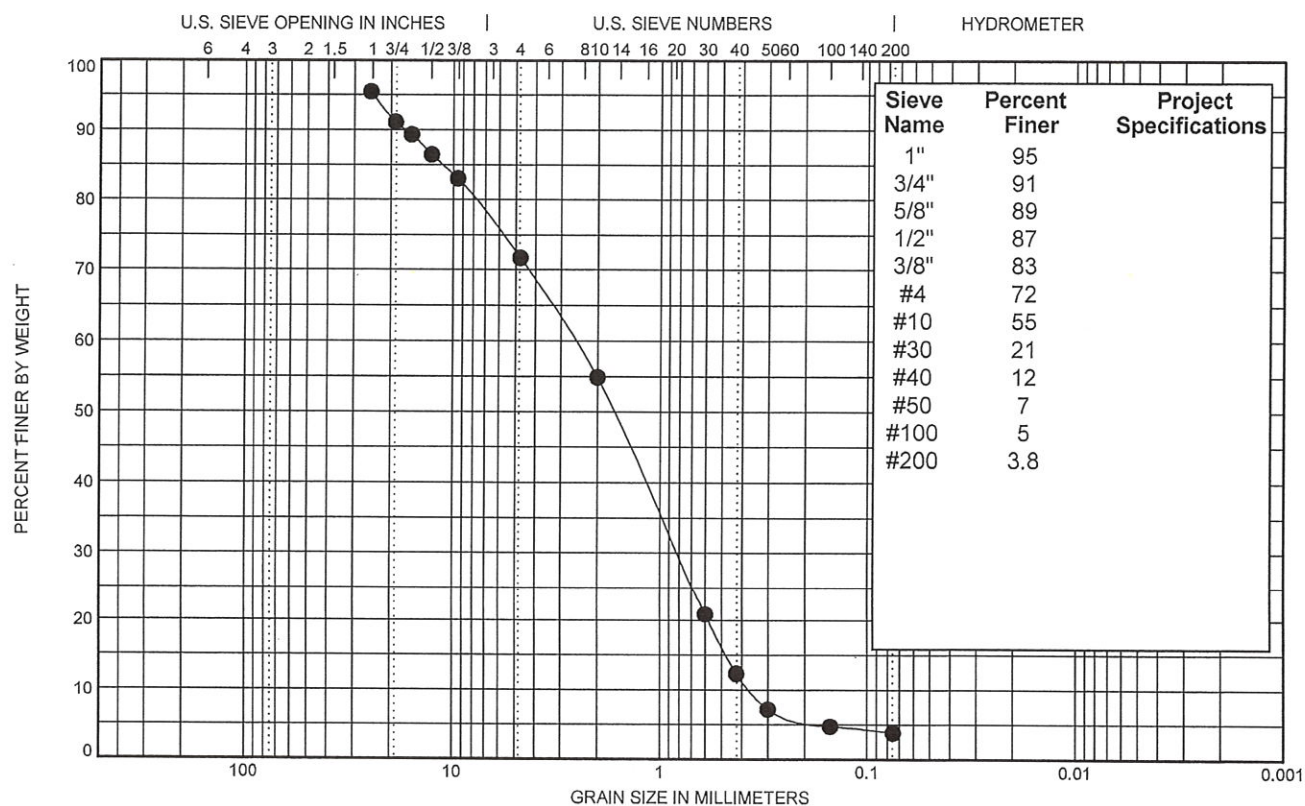
Aggregate Type:

Location Sampled:

Soil Boring #5 [1'-4']

Sample Data

Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
0.73	7.18	25	2.6	0.829	0.362	23.7	67.9		3.8



Comments:

Cc:

Submitted by,

Northern Technologies, LLC

Josh Holmes
(8/13/19)



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Project:

Felton Gravel Exploration

Project Number:

19.FGO08089.000

Location:

Rural Felton, Minnesota

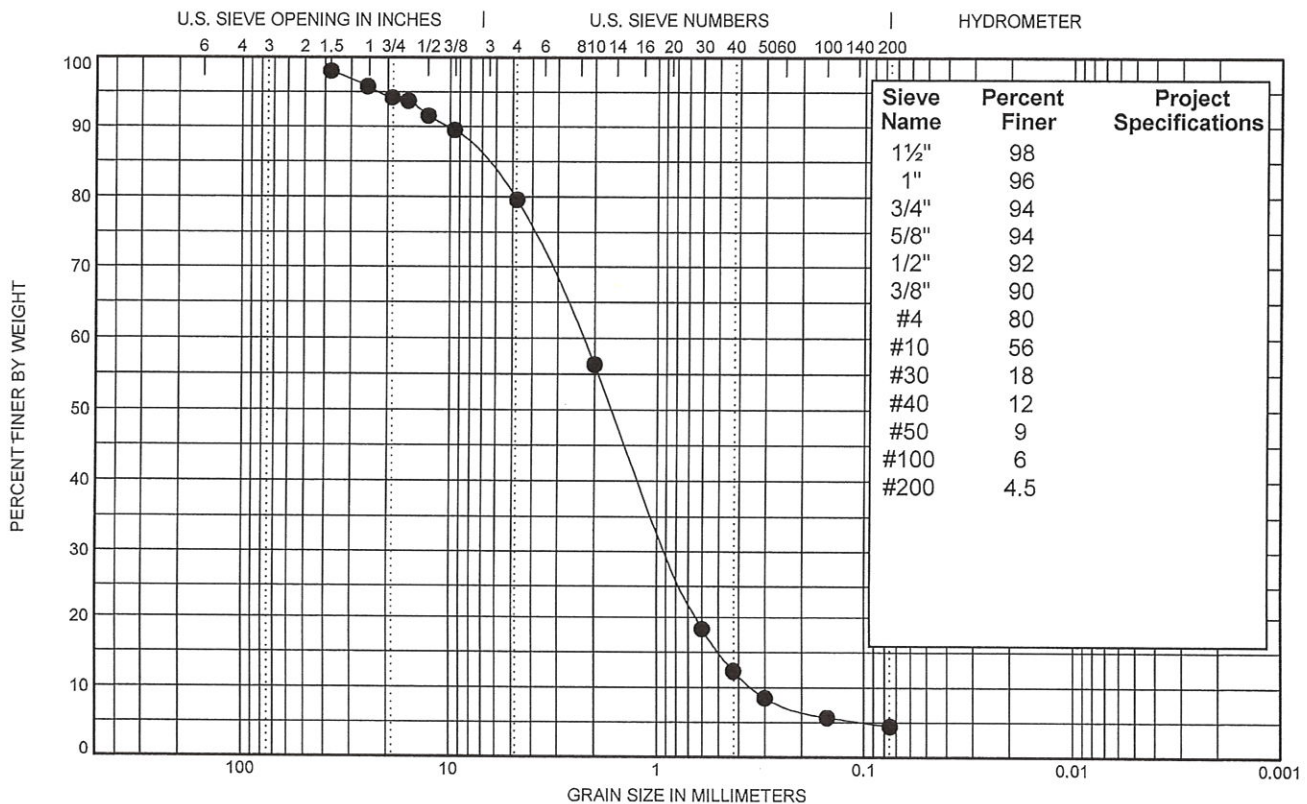
Attention:

Sample Information

Sample Number:	4	Date Sampled:	7/23/2019
Project Specifications:		Sampled By:	Drillers
Aggregate Type:			
Location Sampled:	Soil Boring #6 [1'-4']		

Sample Data

Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
0.96	6.67	37.5	2.29	0.868	0.343	18.4	75.2		4.5



Comments:

Cc:

Submitted by,

Northern Technologies, LLC

Josh Holmes
(8/13/19)



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GRAIN SIZE DISTRIBUTION

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Report To:

Project:

Felton Gravel Exploration

Project Number:

19.FGO08089.000

Location:

Rural Felton, Minnesota

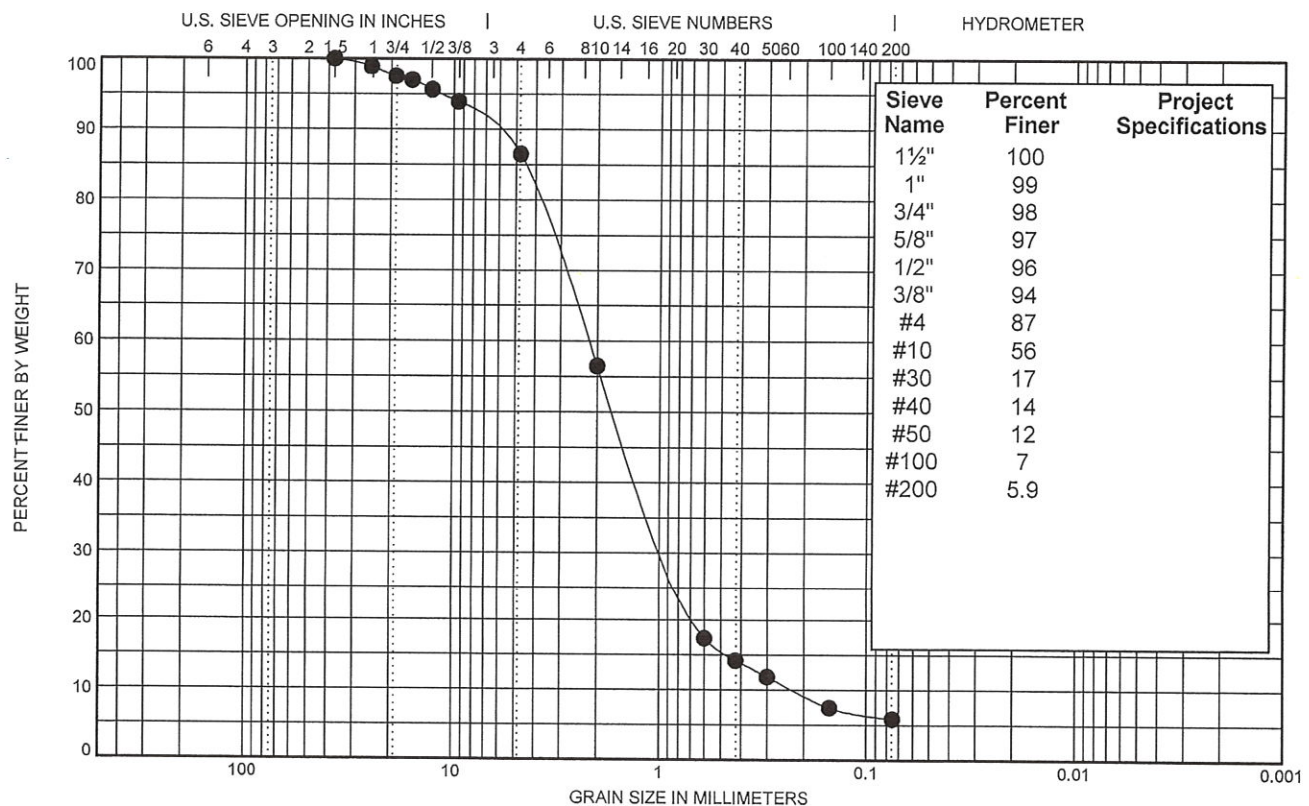
Attention:

Sample Information

Sample Number:	5	Date Sampled:	7/23/2019
Project Specifications:		Sampled By:	Drillers
Aggregate Type:			
Location Sampled:	Soil Boring #10 [1'-4']		

Sample Data

Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
1.59	9.91	37.5	2.213	0.885	0.223	13.5	80.6		5.9



Comments:

Cc:

Submitted by,

Northern Technologies, LLC

Josh Holmes
(8/13/19)



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ASTM C136 & D422

Report To:

Project:

Felton Gravel Exploration

Project Number:

19.FGO08089.000

Location:

Rural Felton, Minnesota

Attention:

Sample Information

Sample Number: 6

Date Sampled:	7/24/2019
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Project Specifications:

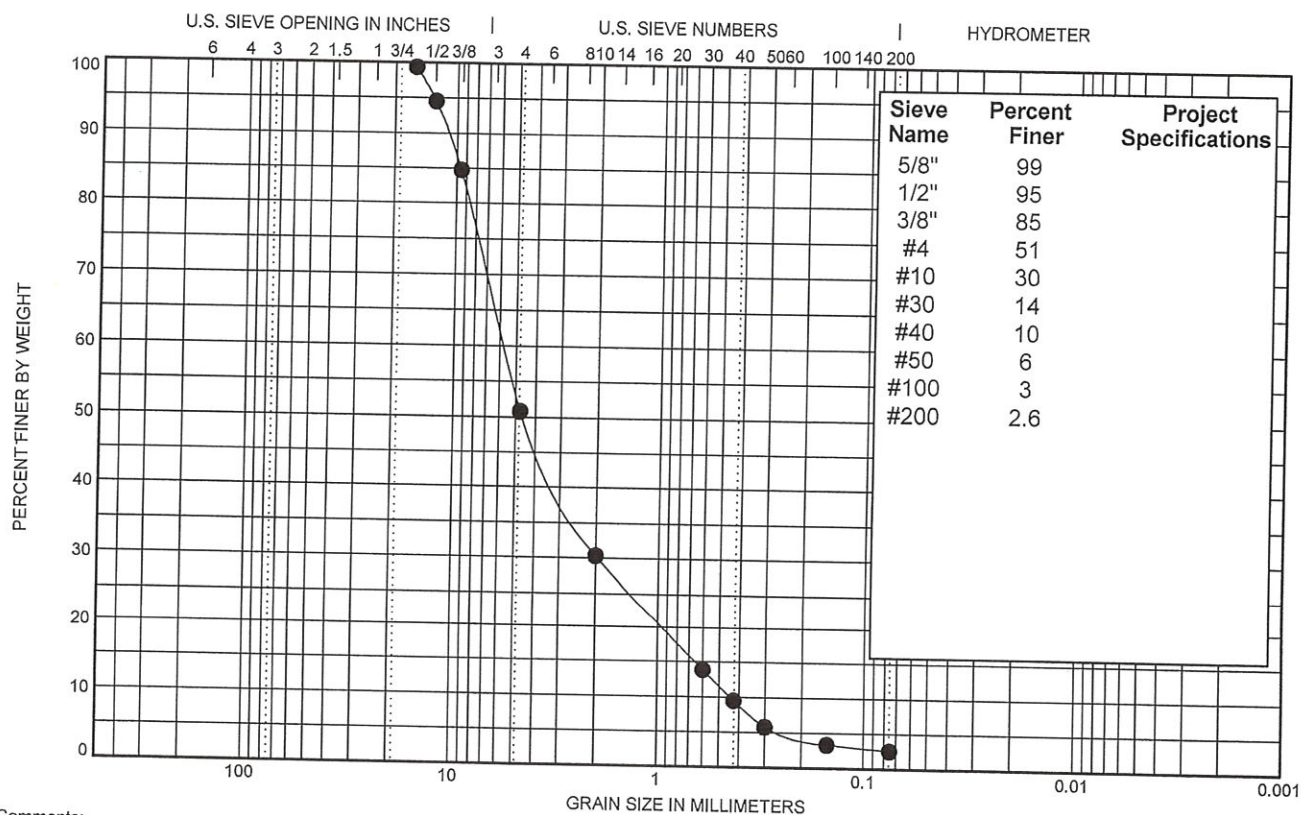
Sampled By: Drillers

Aggregate Type:

Location Sampled: Soil Boring #12 [9'-14']

Sample Data

Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
1.50	12.98	15.875	5.727	1.949	0.441	48.5	48.3	2.6	



Comments:

Cc:

Submitted by,
Northern Technologies, LLC

Paul F. Hahn

Josh Holmes
(8/13/19)

Felton Gravel

Write a description for your map.

Legend

- Sections 29, 30, & 31
- Soil Boring

SB-03

SB-01

SB-06

SB-02

SB-05

SB-04

SB-13

SB-07

SB-08

SB-09

SB-12

SB-10

SB-11

170th St N

100th Ave N



4000 ft

Google Earth

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BORING NUMBER SB-01

PAGE 1 OF 1
Long: -96° 26' 6.756"
Lat: 47° 0' 12.636"

CLIENT _____ PROJECT NAME Felton Gravel Exploration
PROJECT NUMBER 19.FGO08089.000 PROJECT LOCATION Rural Felton, Minnesota
DATE STARTED 6/17/19 COMPLETED 6/17/19 GROUND ELEVATION 1081 feet HOLE SIZE 6 1/2 in.
DRILLING CONTRACTOR NTI GROUND WATER LEVELS:
DRILLING METHOD 3 1/4 in H.S.A AT TIME OF DRILLING ---
LOGGED BY Chris Nelson CHECKED BY Josh Holmes AT END OF DRILLING ---
CAVE IN (ft) NR FROST DEPTH (ft) NA AFTER DRILLING ---

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.6		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)										3
		POORLY GRADED SAND WITH SILT AND GRAVEL, (SP-SM) fine grained										4
6.5												
		POORLY GRADED SAND, (SP) fine to medium grained										
9.5												
10		POORLY GRADED SAND, (SP-SM) fine grained										
17.0												
		POORLY GRADED SAND, (SP) fine to medium grained										
33.5												
		SILTY SAND, (SM) fine to coarse grained										
42.5												
		POORLY GRADED SAND WITH SILT AND GRAVEL, (SP-SM) fine to coarse grained										
50.0												

Bottom of borehole at 50.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-02

PAGE 1 OF 1
Long: -96° 26' 1.716"
Lat: 47° 0' 4.104"

CLIENT _____	PROJECT NAME <u>Felton Gravel Exploration</u>
PROJECT NUMBER <u>19.FGO08089.000</u>	PROJECT LOCATION <u>Rural Felton, Minnesota</u>
DATE STARTED <u>6/17/19</u> COMPLETED <u>6/17/19</u>	GROUND ELEVATION <u>1088 feet</u> HOLE SIZE <u>6 1/2 in.</u>
DRILLING CONTRACTOR <u>NTI</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>3 1/4 in H.S.A</u>	AT TIME OF DRILLING <u>---</u>
LOGGED BY <u>Chris Nelson</u> CHECKED BY <u>Josh Holmes</u>	AT END OF DRILLING <u>---</u>
CAVE IN (ft) <u>NR</u> FROST DEPTH (ft) <u>NA</u>	AFTER DRILLING <u>---</u>
NOTES _____	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
1.4		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)	1086.6									
		SANDY LEAN CLAY, (CL) brown, trace gravel										
8.0			1080.0									
10		POORLY GRADED SAND WITH SILT, (SP-SM) fine grained										
20												
30												
35.0			1053.0									
		SILTY SAND, (SM) fine grained										
40												
50			1038.0									
50.0												

Bottom of borehole at 50.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-03

PAGE 1 OF 1

Long: -96° 25' 24.528"

Lat: 47° 0' 15.48"

CLIENT _____ PROJECT NAME Felton Gravel Exploration

PROJECT NUMBER 19.FGO08089.000 PROJECT LOCATION Rural Felton, Minnesota

DATE STARTED 6/17/19 COMPLETED 6/17/19 GROUND ELEVATION 1108 feet HOLE SIZE 6 1/2 in.

DRILLING CONTRACTOR NTI GROUND WATER LEVELS:

DRILLING METHOD 3 1/4 in H.S.A AT TIME OF DRILLING ---

LOGGED BY Chris Nelson CHECKED BY Josh Holmes AT END OF DRILLING ---

CAVE IN (ft) NR FROST DEPTH (ft) NA AFTER DRILLING ---

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
1.0		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)	1107.0									
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine grained										
5.0			1103.0									
		POORLY GRADED SAND WITH SILT, (SP-SM) tan, fine grained										
10												
15												
20												
25												
30												
35			1073.0									

Bottom of borehole at 35.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-04

PAGE 1 OF 1
Long: -96° 25' 28.236"
Lat: 47° 0' 0.468"

CLIENT _____ PROJECT NAME Felton Gravel Exploration
PROJECT NUMBER 19.FGO08089.000 PROJECT LOCATION Rural Felton, Minnesota
DATE STARTED 6/17/19 COMPLETED 6/17/19 GROUND ELEVATION 1106 feet HOLE SIZE 6 1/2 in.
DRILLING CONTRACTOR NTI GROUND WATER LEVELS:
DRILLING METHOD 3 1/4 in H.S.A AT TIME OF DRILLING ---
LOGGED BY Chris Nelson CHECKED BY Josh Holmes AT END OF DRILLING ---
CAVE IN (ft) NR FROST DEPTH (ft) NA AFTER DRILLING ---
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
1.5		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)	1104.5									
5		POORLY GRADED SAND WITH SILT, (SP-SM) fine grained										
10												
15												
16.0		POORLY GRADED SAND WITH GRAVEL, (SP) fine to coarse grained	1090.0									
20												
25												
30												
30.0			1076.0									

Bottom of borehole at 30.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-05

PAGE 1 OF 1

Long: -96° 25' 51.24"

Lat: 47° 0' 3.96"

CLIENT _____

PROJECT NAME Felton Gravel Exploration

PROJECT NUMBER 19.FGO08089.000

PROJECT LOCATION Rural Felton, Minnesota

DATE STARTED 6/17/19

COMPLETED 6/17/19

GROUND ELEVATION 1101 feet

HOLE SIZE 6 1/2 in.

DRILLING CONTRACTOR NTI

GROUND WATER LEVELS:

DRILLING METHOD 3 1/4 in H.S.A

AT TIME OF DRILLING ---

LOGGED BY Chris Nelson

CHECKED BY Josh Holmes

AT END OF DRILLING --

CAVE IN (ft) NR

FROST DEPTH (ft) NA

AFTER DRILLING ---

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.7		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)										
		POORLY GRADED SAND, (SP) fine to coarse grained, some gravel, trace cobbles										4
5.0												
		POORLY GRADED SAND, (SP) fine to coarse grained, trace gravel										
19.5												
20.0		FAT CLAY, (CH)										

Bottom of borehole at 20.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-06

PAGE 1 OF 1

Long: -96° 25' 47.28"

Lat: 47° 0' 12.276"

CLIENT _____

PROJECT NAME Felton Gravel Exploration

PROJECT NUMBER 19.FGO08089.000

PROJECT LOCATION Rural Felton, Minnesota

DATE STARTED 6/17/19

COMPLETED 6/17/19

GROUND ELEVATION 1103 feet

HOLE SIZE 6 1/2 in.

DRILLING CONTRACTOR NTI

GROUND WATER LEVELS:

DRILLING METHOD 3 1/4 in H.S.A

▽ AT TIME OF DRILLING 14.00 ft / Elev 1089.00 ft

LOGGED BY Chris Nelson

CHECKED BY Josh Holmes

AT END OF DRILLING ---

CAVE IN (ft) NR

FROST DEPTH (ft) NA

AFTER DRILLING ---

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.5		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)										
		POORLY GRADED SAND WITH SILT, (SP-SM) fine to coarse grained, some gravel										4
5												
9.0												
10		POORLY GRADED SAND WITH SILT, (SP-SM) fine grained, little gravel										
14.0												
15		POORLY GRADED SAND WITH SILT, (SP-SM) fine to medium grained, wet, trace gravel										
20												
22.0												
25		POORLY GRADED SAND WITH SILT, (SP-SM) fine to medium grained, wet, trace gravel, trace cobbles										
25.0												

Bottom of borehole at 25.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-07

PAGE 1 OF 1

Long: -96° 25' 25.284"

Lat: 46° 59' 50.748"

CLIENT _____ PROJECT NAME Felton Gravel Exploration

PROJECT NUMBER 19.FGO08089.000 PROJECT LOCATION Rural Felton, Minnesota

DATE STARTED 6/17/19 COMPLETED 6/17/19 GROUND ELEVATION 1104 feet HOLE SIZE 6 1/2 in.

DRILLING CONTRACTOR NTI GROUND WATER LEVELS:

DRILLING METHOD 3 1/4 in H.S.A ☒ AT TIME OF DRILLING 13.00 ft / Elev 1091.00 ft

LOGGED BY Chris Nelson CHECKED BY Josh Holmes AT END OF DRILLING ---

CAVE IN (ft) NR FROST DEPTH (ft) NA AFTER DRILLING ---

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)										
1.8		POORLY GRADED SAND WITH SILT, (SP-SM) fine grained										
5												
10												
12.0		POORLY GRADED SAND WITH SILT, (SP-SM) fine grained, wet										
15												
19.5												
20.0		FAT CLAY, (CH)										

Bottom of borehole at 20.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-08

PAGE 1 OF 1

Long: -96° 25' 36.3"

Lat: 46° 59' 50.568"

CLIENT _____

PROJECT NAME Felton Gravel Exploration

PROJECT NUMBER 19.FGO08089.000

PROJECT LOCATION Rural Felton, Minnesota

DATE STARTED 6/17/19

COMPLETED 6/17/19

GROUND ELEVATION 1105 feet

HOLE SIZE 6 1/2 in.

DRILLING CONTRACTOR NTI

GROUND WATER LEVELS:

DRILLING METHOD 3 1/4 in H.S.A

AT TIME OF DRILLING ---

LOGGED BY Chris Nelson

CHECKED BY Josh Holmes

AT END OF DRILLING ---

CAVE IN (ft) NR

FROST DEPTH (ft) NA

AFTER DRILLING ---

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
1.0		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)	1104.0									
5		POORLY GRADED SAND WITH SILT, (SP-SM) fine to coarse grained, trace gravel										
10												
15												
17.0		FAT CLAY, (CH)	1088.0									
20.0			1085.0									

Bottom of borehole at 20.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-09

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Long: -96° 25' 41.484"

Lat: 46° 59' 40.416"

CLIENT _____ PROJECT NAME Felton Gravel Exploration
PROJECT NUMBER 19.FGO08089.000 PROJECT LOCATION Rural Felton, Minnesota
DATE STARTED 6/17/19 COMPLETED 6/17/19 GROUND ELEVATION 1106 feet HOLE SIZE 6 1/2 in.
DRILLING CONTRACTOR NTI GROUND WATER LEVELS:
DRILLING METHOD 3 1/4 in H.S.A AT TIME OF DRILLING ---
LOGGED BY Chris Nelson CHECKED BY Josh Holmes AT END OF DRILLING ---
CAVE IN (ft) NR FROST DEPTH (ft) NA AFTER DRILLING ---
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.5		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)										
		POORLY GRADED SAND, (SP) fine to coarse grained, trace gravel										
5												
9.0												
10		POORLY GRADED SAND, (SP) fine to coarse grained, some gravel										
15												
17.0												
18.5		FAT CLAY, (CH)										

Bottom of borehole at 18.5 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-10

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Long: -96° 25' 44.292"

Lat: 46° 59' 28.932"

CLIENT _____

PROJECT NAME Felton Gravel Exploration

PROJECT NUMBER 19.FGO08089.000

PROJECT LOCATION Rural Felton, Minnesota

DATE STARTED 6/17/19

COMPLETED 6/17/19

GROUND ELEVATION 1107 feet

HOLE SIZE 6 1/2 in.

DRILLING CONTRACTOR NTI

GROUND WATER LEVELS:

DRILLING METHOD 3 1/4 in H.S.A

▽ AT TIME OF DRILLING 12.00 ft / Elev 1095.00 ft

LOGGED BY Chris Nelson

CHECKED BY Josh Holmes

AT END OF DRILLING ---

CAVE IN (ft) NR

FROST DEPTH (ft) NA

AFTER DRILLING ---

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.7		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)										
		POORLY GRADED SAND WITH SILT, (SP-SM) fine to coarse grained, little gravel										6
5												
7.0		POORLY GRADED SAND WITH SILT, (SP-SM) fine to medium grained, wet										
10												
15												
17.0		POORLY GRADED SAND WITH SILT, (SP-SM) fine to medium grained, trace cobbles										
20												
20.0												

Bottom of borehole at 20.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-11

PAGE 1 OF 1

Long: -96° 26' 20.76"

Lat: 46° 59' 8.484"

CLIENT _____

PROJECT NUMBER 19.FGO08089.000

PROJECT NAME Felton Gravel Exploration

DATE STARTED 6/17/19

COMPLETED 6/17/19

PROJECT LOCATION Rural Felton, Minnesota

DRILLING CONTRACTOR NTI

GROUND ELEVATION 1103 feet

HOLE SIZE 6 1/2 in.

DRILLING METHOD 3 1/4 in H.S.A

GROUND WATER LEVELS:

LOGGED BY Chris Nelson

CHECKED BY Josh Holmes

AT TIME OF DRILLING ---

CAVE IN (ft) NR

FROST DEPTH (ft) NA

AT END OF DRILLING --

NOTES _____

AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.8		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)	1102.2									
		POORLY GRADED SAND, (SP) fine to coarse grained, trace gravel										
5												
8.5			1094.5									
		POORLY GRADED SAND, (SP) fine to coarse grained, some gravel										
10												
12.0			1091.0									
		POORLY GRADED SAND WITH SILT, (SP-SM) fine grained										
15												
20												
24.0			1079.0									
25.0		FAT CLAY, (CH)	1078.0									

Bottom of borehole at 25.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-12

PAGE 1 OF 1

Long: -96° 25' 59.844"

Lat: 46° 59' 30.984"

CLIENT _____

PROJECT NUMBER 19.FGO08089.000

PROJECT NAME Felton Gravel Exploration

DATE STARTED 6/17/19

COMPLETED 6/17/19

PROJECT LOCATION Rural Felton, Minnesota

DRILLING CONTRACTOR NTI

GROUND ELEVATION 1102 feet

HOLE SIZE 6 1/2 in.

DRILLING METHOD 3 1/4 in H.S.A

GROUND WATER LEVELS:

▽ AT TIME OF DRILLING 18.00 ft / Elev 1084.00 ft

LOGGED BY Chris Nelson

CHECKED BY Josh Holmes

AT END OF DRILLING ---

CAVE IN (ft) NR

FROST DEPTH (ft) NA

AFTER DRILLING ---

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.8		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)	1101.3									
5		POORLY GRADED SAND WITH SILT, (SP-SM) fine to medium grained, trace gravel										
5.5		POORLY GRADED SAND, (SP) fine to coarse grained, trace gravel	1096.5									
10		POORLY GRADED GRAVEL WITH SAND, (GP)	1092.5									3
22.0		FAT CLAY, (CH)	1080.0									
25.0			1077.0									

Bottom of borehole at 25.0 feet.
Borehole backfilled with auger cuttings.



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BORING NUMBER SB-13

PAGE 1 OF 1

Long: -96° 25' 56.532"

Lat: 46° 59' 52.728"

CLIENT _____

PROJECT NUMBER 19.FGO08089.000

PROJECT NAME Felton Gravel Exploration

DATE STARTED 6/17/19 COMPLETED 6/17/19

PROJECT LOCATION Rural Felton, Minnesota

DRILLING CONTRACTOR NTI

GROUND ELEVATION 1103 feet HOLE SIZE 6 1/2 in.

DRILLING METHOD 3 1/4 in H.S.A

GROUND WATER LEVELS:

LOGGED BY Chris Nelson CHECKED BY Josh Holmes

AT TIME OF DRILLING ---

CAVE IN (ft) NR FROST DEPTH (ft) NA

AT END OF DRILLING ---

AFTER DRILLING ---

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.5		TOPSOIL, ORGANIC CLAY WITH SAND, (OL)										
		POORLY GRADED SAND WITH GRAVEL, (SP) fine to coarse grained										
5												
5.0		POORLY GRADED SAND, (SP) fine to coarse grained, trace gravel										
10												
14.0												
14.0		POORLY GRADED SAND, (SP) fine to coarse grained, wet, trace gravel										
16.0												
16.0		FAT CLAY, (CH)										
17.0												

Bottom of borehole at 17.0 feet.
Borehole backfilled with auger cuttings.