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Engineers and Scientists

Wolverine World Wide, Inc.

Area 19 - RAP Implementation

Rockford, Michigan

Boring No.: AREA19-MW-7

Page: 1 of 3

File No.: 16.0062961.11

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Cooper

Logged by: C. Melby

Date Start/Finish: 3-29-22 / 4-11-22

Boring Location: 602,368.1310 N; 12,803,602.3874 E

GS Elev.: 703.45' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: NA

NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab
4/9/22	-3.1	(artesian)	Augers	12 hrs

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1									None	
2										
3										
4	1	24/18	4-6	11-3 3-2		Loose, black and brown, fine to coarse SAND and Peat, trace Silt, some Organic Matter (wood), dry.	SAND			
5										
6										
7										
8										
9	2	24/8	9-11	14-10 6-13		Medium dense, brown and orange, GRAVEL and fine to coarse Sand, trace Silt, wet.	9' GRAVEL		1	
10									2	
11										
12										
13										
14	3	24/24	14-16	20-6 10-6		Medium dense, brown and orange, GRAVEL and fine to coarse Sand, trace Silt, wet.				
15										
16										
17										
18										
19	4	24/14	19-21	17-5 7-8		Medium dense, brown and gray, fine to coarse SAND, trace Silt, wet.	19' SAND		3	
20										
21										
22										
23										
24	5	24/12	24-26	20-14 6-8		Very stiff, gray, Silty CLAY, some fine to medium Sand embedded, moist.	24' Silty CLAY		4	
25										
26										
27										
28										
29	6	24/18	29-31	13-14 17-17		Dense, gray, fine to medium SAND, some Silt, wet.	29' SAND		5	
30										
31										
32										
33										
34	7	24/18	34-36	10-22 20-18		Dense, gray, fine to medium SAND, some Silt, wet.				
35										
36										
37										
38										
39	8	24/20	39-41	5-14 27-54		Dense, gray, fine to medium SAND, some Silt, wet.			6	
40										
41										
42										
43										
44	9	24/20	44-46	3-13		Dense, gray, fine to medium SAND, some				

**REMARKS**

1. Groundwater was encountered at approximately 9.0 feet below ground surface.
2. VAP groundwater sample was collected from approximately 9.0 to 14.0 feet below ground surface and submitted for analytical laboratory testing.
3. VAP groundwater sample was collected from approximately 19.0 to 24.0 feet below ground surface and submitted for analytical laboratory testing.
4. 10-inch casing installed from ground surface to approximately 25.0 feet below ground surface and grouted in place.
5. VAP groundwater sample was collected from approximately 29.0 to 34.0 feet below ground surface and submitted for analytical laboratory testing.
6. VAP groundwater sample was collected from approximately 39.0 to 44.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-7

BORING WELL 62961.11 AREA19.GPJ GZA CORP GDT 2/6/23



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Area 19 - RAP Implementation

Rockford, Michigan

Boring No.: AREA19-MW-7

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File No.: 16.0062961.11

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
46				25-36		Silt, wet.	SAND		
47	10	24/24	47-49	14-29 43-63		Hard, gray, Silty CLAY, trace fine to medium Sand, moist to dry.	47'		
48							Silty CLAY		
49	11	24/24	49-51	13-37 42-50		Hard, gray and brown, SILT, some Clay interbedded, moist.	49'		
50							SILT	7	
51									
52									
53									
54	12	24/24	54-56	5-10 12-16		Medium dense, gray and brown, fine to coarse SAND, trace Silt, wet.	54'		
55							SAND	8	
56									
57									
58									
59	13	18/18	59-60.5	24-44-61/6"		Very dense, gray and brown, fine to coarse SAND, trace Silt, wet. Rock in spoon tip.			
60									
61									
62									
63									
64	14	18/18	64-65.5	22-45-67		Very dense, gray and brown, fine to medium SAND, trace Silt, wet.			
65								9	
66									
67									
68									
69	15	15/15	69-70.3	28-59-50/3"		Very dense, gray and brown, fine to medium SAND, trace Silt, wet.			
70									
71									
72									
73									
74	16	24/24	74-76	12-19 27-41		Dense, gray and brown, fine to medium SAND, trace Silt, wet.			
75								10	
76									
77									
78									
79	17	24/24	79-81	11-17 30-55		Dense, gray and brown, fine to medium SAND, trace Silt, wet.			
80									
81									
82									
83									
84	18	18/18	84-85.5	15-22-60		Very dense, gray and brown, fine to medium SAND, trace Silt, wet.			
85								11	
86									
87									
88									
89	19	20/20	89-90.7	12-27 39-50/2"		Very dense, gray and brown, fine to medium SAND, trace Silt, wet.			
90									
91									
92									
93									
94	20	24/24	94-96	9-20 41-60		Very dense, gray and brown, fine to medium SAND, trace Silt, wet.			
95								12	
96									
97								13	
<b>REMARKS</b> 7. Original borehole was grouted and the location was offset approximately 15.0 feet northeast to resume drilling. 10-inch casing installed from ground surface to approximately 49.0 feet below ground surface and grouted in place. 8. VAP groundwater sample was collected from approximately 54.0 to 59.0 feet below ground surface and submitted for analytical laboratory testing. 9. VAP groundwater sample was collected from approximately 64.0 to 69.0 feet below ground surface and submitted for analytical laboratory testing. 10. VAP groundwater sample was collected from approximately 74.0 to 79.0 feet below ground surface and submitted for analytical laboratory testing. 11. VAP groundwater sample was collected from approximately 84.0 to 89.0 feet below ground surface and submitted for analytical laboratory testing. 12. VAP groundwater sample was collected from approximately 94.0 to 99.0 feet below ground surface and submitted for analytical laboratory testing. 13. Drilled noted a change in drilling at approximately 96.0 feet below ground surface, potentially a strata change from clay to sand.									
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									Boring No.: AREA19-MW-7

BORING WELL: 62961.11 AREA19.GPJ GZA CORP.GDT 2/6/23



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Rockford, Michigan

Boring No.: AREA19-MW-7

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File No.: 16.0062961.11

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
98							SAND		
99									
100	21	22/22	99-100.8	6-18 30-50/4"		Dense, gray and brown, fine to medium SAND, trace Silt, wet.			
101									
102									
103									
104	22	24/24	104-106	8-12 19-28		Dense, gray and brown, fine to medium SAND, trace Silt, wet.		14	
105									
106									
107									
108									
109	23	21/21	109-110.8	18-25 52-50/3"		Very dense, gray and brown, fine to medium SAND, little Silty Clay seams, wet.			
110									
111									
112									
113									
114	24	11/7	114-114.9	185-128/5"		Very dense, gray, GRAVEL and fine to coarse Sand, some Silt, wet.	114' GRAVEL	15	
115									
116									
117									
118	25	12/12	118-119	24-80		Hard, gray, Silty CLAY and fine to coarse Sand embedded, moist to dry.	118' 119' Silty CLAY	16	
119						Bottom of Borehole at 119.0 Feet			
120									
121									
122									
123									
124									
125									
126									
127									
128									
129									
130									
131									
132									
133									
134									
135									
136									
137									
138									
139									
140									
141									
142									
143									
144									
145									
146									
147									
148									
149									
<b>REMARKS</b> 14. VAP groundwater sample was collected from approximately 104.0 to 109.0 feet below ground surface and submitted for analytical laboratory testing. 15. VAP groundwater sample was collected from approximately 114.0 to 119.0 feet below ground surface and submitted for analytical laboratory testing. 16. Artesian conditions were noted from approximately 54.0 feet below ground surface to the end of the boring. Borehole was backfilled with grout upon completion.									
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									Boring No.: AREA19-MW-7

BORING WELL 62961.11 AREA19.GPJ GZA CORP.GDT 2/6/23



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RAP GSI

Rockford, Michigan

Boring No.: AREA19-MW-7A

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Daryll

Logged by: N. Kampfschulte

Date Start/Finish: 9-8-22 / 9-8-22

Boring Location: 602,370.8363 N; 12,803,599.8330 E

GS Elev.: 703.44' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 703.09'

NA

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 2/24/2023

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1						See AREA19-MW-7 for soil and stratum descriptions.			<p>PROTECTIVE COVER</p> <p>Backfill/Cement</p> <p>Bentonite Grout</p> <p>Bentonite Chips</p> <p>Filter Sand Pack</p> <p>Top of Well Screen</p> <p>2-Inch Dia. 5-Foot PVC Screen (0.010" Slot)</p> <p>Bottom of Well Screen</p>	
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15						Bottom of Borehole at 14.0 Feet				
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										

REMARKS

1. Monitoring well installed in borehole upon completion. Well screen was set from approximately 9.0 to 14.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-7A

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 4/24/23



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Rockford, Michigan

Boring No.: AREA19-MW-221A

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: D. Watt

Date Start/Finish: 2-14-22 / 2-16-22

Boring Location: 600,210.3531 N; 12,804,596.5319 E

GS Elev.: 709.08' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

Type: Hollow Stem Auger Split Spoon

O.D. / I.D.: 8.0" / 4.25" 2.0" / 1 3/8"

Hammer Wt.: 140lbs NA

Hammer Fall: 30.0" NA

TOC Elev.: 708.66' NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab
2/14/22	1145	17.0'	Augers	0
2/15/22	0830	14.1'	Augers	Overnight

Surveyed By: EXXEL Survey Date: 3/30/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1	1	24/18	4-6	1-2 2-2		Brown, TOPSOIL and Organic Material, moist. Changing at 4.2 feet to: Very loose, brown, fine to medium SAND, trace Silt, moist.	4.2' TOPSOIL SAND			
2										
3										
4										
5	2	24/24	9-11	2-4 6-7		Loose, brown, fine to medium SAND, little Clay & Silt, moist.				
6										
7										
8										
9	3	24/24	14-16	3-7 12-13		Medium dense, fine to coarse SAND, some Clay, trace Gravel, trace Silt, moist.		1		
10										
11										
12										
13	4	24/12	19-21	5-13 5-6		Medium dense, fine to medium SAND, trace Gravel, wet.		2		
14										
15										
16										
17	5	24/24	24-26	3-5 7-8		Medium dense, brown, fine to medium SAND, trace Silt, wet.		3		
18										
19										
20										
21	6	24/24	29-31	4-5 8-13		Medium dense, brown, fine to medium SAND, some Clay & Silt, wet. Changing at 30.0 feet to: Medium dense, brown, fine to medium SAND, some Clay & Silt, moist.				
22										
23										
24										
25	7	24/8	34-36	3-7 5-10		Medium dense, brown, fine to coarse SAND, trace Silt, wet.		4		
26										
27										
28										
29	8	24/20	39-41	3-5		Medium dense, brown, fine to medium				
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

**REMARKS**

1. VAP groundwater sample was collected from approximately 14.0 to 19.0 feet below ground surface and submitted for analytical laboratory testing.
2. Groundwater was encountered at approximately 17.0 feet below ground surface.
3. VAP groundwater sample was collected from approximately 24.0 to 29.0 feet below ground surface and submitted for analytical laboratory testing.
4. VAP groundwater sample was collected from approximately 34.0 to 39.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-221A

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/9/23



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Wolverine World Wide, Inc.

RAP GSI

Rockford, Michigan

Boring No.: AREA19-MW-221A

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
41	9	24/24	44-46	7-11		SAND, trace Silt, wet.	SAND		
42									
43									
44									
45									
46	10	24/18	49-51	2-5 9-11		Medium dense, brown, fine to medium SAND, trace Silt, wet.		5	
47									
48									
49									
50									
51	11	12/6	54-55	5-5 9-14		Medium dense, brown, fine to medium SAND, trace Silt, wet.			
52									
53									
54								6	
55									
56	12	5/0	58-58.4	16-31		Dense, brown, fine to coarse SAND, some Gravel, trace Silt, wet.		7	
57									
58									
59									
60									
61				50/5"		NO RECOVERY.	58' 58.5' NO RECOVERY	8	
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									
73									
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83									
84									
85									
86									
<b>REMARKS</b> 5. VAP groundwater sample was collected from approximately 34.0 to 39.0 feet below ground surface and submitted for analytical laboratory testing. 6. VAP groundwater sample was collected from approximately 53.0 to 58.0 feet below ground surface and submitted for analytical laboratory testing. 7. Driller noted a change in drilling (potentially clay) at approximately 56.0 feet below ground surface. 8. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 15.0 to 20.0 feet below ground surface.									
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									Boring No.: AREA19-MW-221A

BORING WELL 62961.52 GSI/GPI GZA CORP GDT 1/9/23



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RAP GSI

Rockford, Michigan

Boring No.: AREA19-MW-221B

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File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Bryan

Logged by: N. Kampfschulte

Date Start/Finish: 7-7-22 / 7-8-22

Boring Location: 600,203.6210 N; 12,804,600.2161 E

GS Elev.: 709.30' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 708.81'

NA

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				PROTECTIVE COVER	
1						See AREA19-MW-221A for soil and stratum descriptions.				
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
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25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

REMARKS

1. Bentonite grout settled overnight on 7/7/2022. Bentonite chips, bentonite grout, and sand were added to the annular space from approximately 1.0 to 10.0 feet below ground surface on 7/8/2022.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-221B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/31/23



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RAP GSI

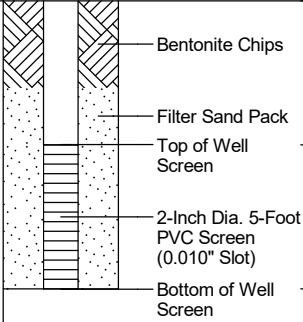
Rockford, Michigan

Boring No.: AREA19-MW-221B

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File No.: 16.0062961.52

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51						Bottom of Borehole at 50.5 Feet		2	
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									
85									
86									

REMARKS

2. Monitoring well was installed in borehole upon completion. Well screen set from approximately 45.0 to 50.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-221B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/31/23





**GZA**  
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RAP GSI

Rockford, Michigan

Boring No.: AREA19-MW-222

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File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: D. Watt

Date Start/Finish: 2-18-22 / 2-21-22

Boring Location: 598,820.7026 N; 12,805,960.4008 E

GS Elev.: 696.52' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

**GROUNDWATER READINGS**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 699.41'

NA

Date	Time	Depth	Casing	Stab
2/18/22	0921	3.3'	Augers 9'	

Surveyed By: EXXEL Survey Date: 3/30/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1										
2										
3										
4	1	24/2	4-6	1-1		Very loose, Sandy TOPSOIL and Organic Matter, moist.	TOPSOIL	1		
5				2-2				2		
6										
7										
8										
9	2	24/12	9-11	6-12		Medium dense, brown, fine to coarse SAND and Gravel, trace Silt, wet. Changing at 10.7 feet to: Gray, fine to medium SAND, some Silt, trace Gravel, wet.	9' SAND	3		
10				14-30				4		
11										
12										
13										
14	3	11/7	14-14.9	25-50/5"		Very dense, gray, medium to coarse SAND and Gravel, trace Silt, wet.		5		
15								6		
16										
17										
18										
19	4	18/4	19-20.5	14-39-50/5"		Hard, gray, SILT & CLAY, some Sand, trace Gravel, moist.	19' SILT & CLAY			
20										
21										
22										
23										
24	5	18/12	24-25.5	10-25-40		Hard, gray, Clayey SILT, trace fine Sand, trace Gravel, moist with lens of gray, Silty Sand at 25.5 feet.	24' Clayey SILT			
25										
26										
27										
28										
29	6	10/0	29-29.8	35-50/4"		NO RECOVERY. 3.0" split spoon: Hard, gray, Clayey SILT, trace fine Sand, trace Gravel, moist.	29.8'	7		
30						Bottom of Borehole at 29.8 Feet		8		
31										
32										
33										
34										
35										
36										
37										
38										
39										

**REMARKS**

- Groundwater was encountered at approximately 3.3 feet below ground surface.
- VAP groundwater sample was collected from approximately 4.0 to 9.0 feet below ground surface and submitted for analytical testing.
- Cobble encountered at approximately 6.0 feet below ground surface. Drillers augered past cobble and resumed sampling.
- Cobble encountered at approximately 10.0 feet below ground surface. Drillers augered past cobble and resumed sampling.
- Cobble encountered at approximately 14.0 feet below ground surface. Drillers augered past cobble and resumed sampling.
- VAP groundwater sample was collected from approximately 14.0 to 19.0 feet below ground surface and submitted for analytical laboratory testing.
- Original borehole was plugged with grout from 0.0 to 30.0 feet below ground surface. Permanent monitoring well was offset approximately 5.0 feet to the east.
- Monitoring well was installed in offset borehole upon completion. Well screen was set from approximately 6.0 to 11.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-222

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/9/23



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RAP GSI

Rockford, Michigan

Boring No.: AREA19-MW-223

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: D. Watt

Date Start/Finish: 2-16-22 / 2-17-22

Boring Location: 596,990.3353 N; 12,804,834.3475 E

GS Elev.: 692.82' Datum: NAD83/NAVD88

Auger/  
Casing

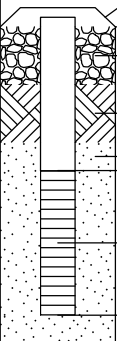
Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger Split Spoon  
O.D. / I.D.: 8.0" / 4.25" 2.0" / 1 3/8"  
Hammer Wt.: 140lbs NA  
Hammer Fall: 30.0" NA  
TOC Elev.: 695.85' NA

Date	Time	Depth	Casing	Stab
2/16/22	1100	2.2'	Augers	0

Surveyed By: EXXEL Survey Date: 3/30/2022

Sample Information						TOC Elev.: 695.85	NA	Surveyed By: EXXEL	Survey Date: 3/30/2022
Depth	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
1	1	24/2	4-6	2-1 1-0		Very loose, black, TOPSOIL, some Sand, little Silt & Clay, moist.	TOPSOIL	1	
2									
3									
4									
5									
6	2	24/10	9-11	0-1 7-8		Very loose, black, TOPSOIL, some Sand, little Silt & Clay, wet. Changing at 9.2 feet to: Medium stiff, gray, SILT, trace fine Sand, trace Organic Matter, moist.	9.2' SILT	2	
7									
8									
9									
10									
11	3	24/14	14-16	1-12 17-24		Very stiff, gray, SILT, little fine Sand, trace Organic Matter, moist. Changing at 14.8 feet to: Medium dense, gray, fine to medium SAND, trace Silt, wet.	14.8' SAND	3	
12									
13									
14									
15									
16	4	24/24	19-21	5-17 31-34		Dense, gray, fine to medium SAND, trace Silt, wet. Changing at 19.3 feet to: Hard, gray, SILT, trace fine Sand, trace Organic Matter, wet.	19.3' SILT		
17									
18									
19									
20									
21	5	24/24	24-26	14-31 37-50		Hard, gray, SILT, little fine Sand, trace Gravel, moist.			
22									
23									
24									
25									
26	6	24/18	29-31	7-17 20-22		Hard, gray, SILT & CLAY, trace fine Sand, trace Gravel, moist.	29' SILT & CLAY		
27									
28									
29									
30									
31	7	18	34-35.5	9-23->50/6"		Hard, gray, SILT & CLAY, trace fine to coarse Sand, moist.	35.5'	4	
32									
33									
34									
35									
36						Bottom of Borehole at 35.5 Feet			
37									
38									
39									

REMARKS

1. Groundwater was encountered at approximately 2.2 feet below ground surface.
2. VAP groundwater sample was collected from approximately 4.0 to 9.0 feet below ground surface and submitted for analytical laboratory testing.
3. VAP groundwater sample was collected from approximately 14.0 to 19.0 feet below ground surface and submitted for analytical laboratory testing.
4. Upon completion, artesian conditions were observed and the original borehole was plugged with a portland cement slurry. Offset approximately 6.0 feet to the south to install the monitoring well. Well screen was set from approximately 5.0 to 10.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-223

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/7/22



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RAP GSI

Rockford, Michigan

Boring No.: AREA19-MW-224

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: C. Martin

Date Start/Finish: 2-10-22 / 2-11-22

Boring Location: 595,199.2719 N; 12,804,662.6069 E

GS Elev.: 695.46' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

**GROUNDWATER READINGS**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 698.37'

NA

Date	Time	Depth	Casing	Stab
2/11/22	0845	0.5'	Augers	16 hrs

Surveyed By: EXXEL Survey Date: 3/30/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
1									
2									
3									
4	1	24/22	4-6	2-3 5-8		Loose, light brown, SAND, trace Silt, trace Gravel, wet.	SAND	1	
5									
6									
7									
8									
9	2	24/17	9-11	1-8 11-16		Soft, gray, CLAY, trace Silt, wet. Changing at 9.7 feet to: Medium dense, gray, Silty SAND, wet.	9' 9.7' CLAY Silty SAND	2	
10									
11									
12									
13									
14	3	24/21	14-16	5-8 12-17		Soft, gray, Silty CLAY, trace fine Sand, moist.	14' Silty CLAY		
15									
16									
17									
18									
19	4	24/22	19-21	3-14 10-12		Very stiff, gray, Silty CLAY, little fine to medium Sand, trace Gravel, moist.			
20									
21									
22									
23									
24	5	24/24	24-26	6-9 13-22		Very stiff, gray, Silty CLAY, little fine to medium Sand, trace Gravel, moist.			
25									
26									
27									
28									
29	6	24/24	29-31	6-10 15-29		Very stiff, gray, Silty CLAY, little fine to medium Sand, trace Gravel, moist.			
30									
31									
32									
33									
34	7	24/24	34-36	7-16 24-33		Hard, gray, SILT & CLAY, little fine to coarse Sand, moist.	34' SILT & CLAY		
35									
36									
37									
38									
39	8	24/24	39-41	9-27 36-48		Hard, gray, SILT & CLAY, little fine to coarse Sand, moist.			
40									
41									
42									
43									
44									
45	9	24/24	44-46	10-13 41-53		Hard, gray, SILT & CLAY, little fine to coarse Sand, moist.			
46									
47									
48									
49	10	17/17	49-50.4	25-44-50/5"		Hard, gray, SILT & CLAY, little fine to coarse Sand, moist.	50.4'		
50									
51									
52						Bottom of Borehole at 50.4 Feet			
53									
54									

**REMARKS**

1. Groundwater was encountered at approximately 0.5 feet below ground surface.
2. VAP groundwater sample was collected from approximately 4.0 to 9.0 feet below ground surface and submitted for analytical laboratory testing.
3. Original borehole was plugged with grout from 0.0 to 50.0 feet below ground surface. Permanent monitoring well offset approximately 5.0 feet to the east.
4. Monitoring well was installed in offset borehole upon completion. Well screen was set from approximately 4.0 to 9.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-224

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/7/22



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RAP GSI

Rockford, Michigan

Boring No.: AREA19-MW-225 VAP

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: N. Kampfschulte

Date Start/Finish: 9-16-22 / 9-16-22

Boring Location: 603,871.9538 N; 12,802,519.6578 E

GS Elev.: 701.99' Datum: NAD83/NAVD88

**Auger/ Casing**      **Sampler**  
**Type:** Hollow Stem Auger      Split Spoon  
**O.D. / I.D.:** 8.0" / 4.25"      2.0" / 1 3/8"  
**Hammer Wt.:** 140lbs      NA  
**Hammer Fall:** 30.0"      NA  
**TOC Elev.:** NA      NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 7/10/2023

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (6")	Test Data					
1										
2										
3										
4	1	24/18	4-6	4-8		Medium dense, brown, fine to medium SAND, some fine to medium Gravel, some Silt, wet.	SAND	1		
5				6-7				2		
6										
7										
8										
9	2	24/12	9-11	1-1		Very loose, brown, fine to medium SAND, trace Organic Clay, wet.				
10				2-3						
11										
12										
13								3		
14	3	24/6	14-16	5-8		Medium dense, brown, fine to medium SAND, some shards of coarse Gravel, wet.				
15				10-10						
16										
17										
18										
19	4	24/12	19-21	3-3		Loose, brown, fine to medium SAND, some shards of coarse Gravel, wet. Changing at 20.0 feet to: Soft, light brown, Silty CLAY, some fine to medium Gravel, wet.	20' Silty CLAY			
20				5-7						
21										
22										
23										
24	5	24/18	24-26	4-8		Soft, light brown, Silty CLAY, some fine to medium Gravel, wet (interbedded with brown, fine to medium Sand, wet).		4		
25				18-15						
26										
27										
28										
29	6	24/22	29-31	4-7		Stiff, light brown, CLAY, some Silt, wet. Changing at 30.5 feet to: Stiff, brown, SILT, some fine Sand, wet.	30.5' SILT			
30				16-18				5		
31										
32										
33										
34	7	24/12	34-36	8-12		Stiff, brown, SILT, some fine Sand, trace Clay, wet.				
35				18-20						
36										
37										

**REMARKS**

1. Groundwater was encountered at approximately 4.0 feet below ground surface.
2. VAP groundwater sample was collected from approximately 5.0 to 10.0 feet below ground surface and submitted for analytical laboratory testing.
3. VAP groundwater sample was collected from approximately 12.5 to 17.5 feet below ground surface and submitted for analytical laboratory testing.
4. A temporary well was set from approximately 25.0 to 30.0 feet below ground surface but did not produce enough volume to collect samples for analytical laboratory testing.
5. VAP groundwater sample was collected from approximately 30.0 to 35.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-225 VAP

BORING WELL 62961.52 GSI/GPJ GZA CORP.GDT 1/17/24



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Rockford, Michigan

**Boring No.:** AREA19-MW-225 VAP

**Page:** 2 of 2

**File No.:** 16.0062961.52

**Check:** J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
39	8	24/24	39-41	6-12 14-15		Stiff, brown, CLAY, trace fine Sand, moist.	39' SILT		
40							CLAY		
41									
42									
43	9	24/24	44-46	3-3 6-8		Medium stiff, brown, CLAY, little interbedded Silty Sand, moist.			
44									
45									
46									
47	10	24/24	49-51	4-8 11-16		Stiff, brown, CLAY, moist.			
48									
49									
50									
51	11	24/24	54-56	3-4 7-11		Stiff, brown, CLAY, trace interbedded Silty fine Sand, moist.			
52									
53									
54									
55						Bottom of Borehole at 56.0 Feet	56'	6	
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									
81									
82									
6. Borehole was backfilled with drill cuttings and bentonite grout upon completion.									
<b>REMARKS</b>									
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									<b>Boring No.:</b> AREA19-MW-225 VAP

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/17/24



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Rockford, Michigan

Boring No.: AREA19-MW-225A

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: N. Kampfschulte

Date Start/Finish: 2-2-23 / 2-2-23

Boring Location: 603,866.1632 N; 12,802,517.4310 E

GS Elev.: 702.13' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

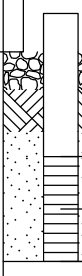
TOC Elev.: 704.40'

NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 7/10/2023

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1						See AREA19-MW-225 VAP for soil and stratum descriptions.		1		PROTECTIVE CASING Sand / Cement Pad Bentonite Chips Filter Sand Pack Top of Well Screen 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) Bottom of Well Screen
2										
3										
4										
5										
6										
7										
8										
9										
10										
11						Bottom of Borehole at 10.0 Feet				
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
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46										
47										
48										
49										
50										
51										
52										
53										
54										

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 5.0 to 10.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-225A

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/17/24



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Rockford, Michigan

Boring No.: AREA19-MW-225B

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: N. Kampfschulte

Date Start/Finish: 2-1-23 / 2-2-23

Boring Location: 603,871.9538 N; 12,802,519.6578 E

GS Elev.: 701.99' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 704.71'

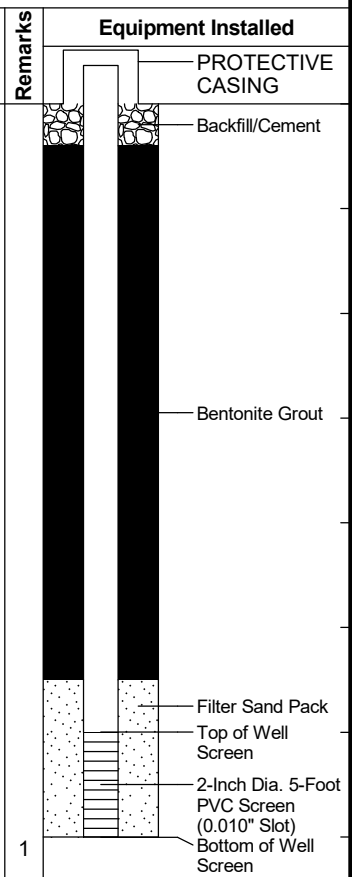
NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 7/10/2023

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				PROTECTIVE CASING	Backfill/Cement
1						See AREA19-MW-225 VAP for soil and stratum descriptions.				
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35						Bottom of Borehole at 35.0 Feet				
36										
37										
38										
39										
40										
41										
42										
43										
44										
45										
46										
47										
48										
49										
50										
51										
52										
53										
54										



**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 30.0 to 35.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-225B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/17/24



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Rockford, Michigan

Boring No.: AREA19-MW-226A

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: T. Hawking

Logged by: C. Melby

Date Start/Finish: 5-11-23 / 5-11-23

Boring Location: 605,358.8437 N; 12,798,631.6385 E

GS Elev.: 705.73' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 708.69'

NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 8/23/2023

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1						See AREA19-MW-226B for soil and stratum descriptions.				
2										
3										
4										
5										
6										
7										
8										
9						Bottom of Borehole at 8.0 Feet		1		
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										

**REMARKS**

1. Monitoring well installed in borehole upon completion. Well screen was set from approximately 3.0 to 8.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-226A

BORING WELL 62961.52 GSI/GPJ GZA CORP.GDT 1/17/24





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Rockford, Michigan

Boring No.: AREA19-MW-226B

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Gary

Logged by: N. Kampfschulte

Date Start/Finish: 3-23-23 / 3-24-23

Boring Location: 605.364.6064 N; 12.798.625.0732 E

GS Elev.: 705.56' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger Split Spoon

O.D. / I.D.: 8.0" / 4.25" 2.0" / 1 3/8"

Hammer Wt.: 140lbs NA

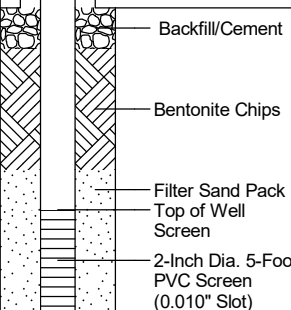
Hammer Fall: 30.0" NA

TOC Elev.: 708.32' NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab
3/23/23	-	3.25'	-	-

Surveyed By: EXXEL Survey Date: 8/23/2023

Sample Information						TOC Elev.:	708.32	NA	Surveyed By:	EXXEL	Survey Date:	8/23/2023						
Depth	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (6")	Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed									
1	1	24/24	3-5	1-1 1-1		Very loose, brown and gray, fine to medium SAND, little Organic Matter, moist to wet.	SAND	1		PROTECTIVE CASING								
2											2	24/12	8-10	7-7 10-10	Medium dense, fine GRAVEL, moist. Changing at 9.5 feet to: Medium dense, light brown, fine to medium SAND, wet.	8' GRAVEL 9.5' SAND	2	Bentonite Chips
3																		
4																		
5	2	24/12	8-10	7-7 10-10		Medium dense, fine GRAVEL, moist. Changing at 9.5 feet to: Medium dense, light brown, fine to medium SAND, wet.	8' GRAVEL 9.5' SAND	3	Filter Sand Pack Top of Well Screen 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) Bottom of Well Screen									
6																		
7																		
8																		
9	3	24/20	13-15	13-19 23-24		Dense, brown, fine to medium SAND, trace fine Gravel, wet.		3										
10																		
11																		
12																		
13	4	24/20	18-20	12-22 23-19		Dense, brown, fine SAND, wet. Changing at 19.0 feet to: Very stiff, gray and brown, SILT, trace fine Gravel, wet.	19' SILT	4										
14																		
15																		
16																		
17	5	24/24	23-25	13-18 22-30		Very stiff, gray, Clayey SILT, moist.	23' Clayey SILT	5										
18																		
19																		
20																		
21	6	24/24	28-30	15-24 32-45		Very stiff, gray, Clayey SILT, trace fine Sand, moist.		5										
22																		
23																		
24																		
25	7	24/22	33-35	12-14 28-30		Very stiff, gray, Clayey SILT, trace fine Sand, moist.		5										
26																		
27																		
28																		
29	8	24/24	38-40	9-20 27-50		Very stiff, gray, Clayey SILT, little fine to medium Sand, trace fine Gravel, moist.		5										
30																		
31																		
32																		
33	9	24/24	43-45	20-30 41-44		Hard, gray, SILT, little fine to medium Sand, trace fine Gravel, moist.	43' SILT	5										
34																		
35																		
36																		
37	10	17/17	48-49.4	19-45-50/5"		Hard, gray, SILT, little fine to medium Sand, trace fine Gravel, moist.	54.4'	5										
38																		
39																		
40																		
41	11	17/17	53-54.4	26-35-50/5"		Hard, gray, SILT, little fine to medium Sand, trace fine Gravel, moist.	54.4'	5										
42																		
43																		
44																		
45																		
46																		
47																		
48																		
49																		
50																		
51																		
52																		
53																		
54																		
55																		
56																		

**REMARKS**

- VAP groundwater sample was collected from approximately 3.0 to 8.0 feet below ground surface and submitted for analytical laboratory testing.
- Groundwater was encountered at approximately 3.25 feet below ground surface.
- VAP groundwater sample was collected from approximately 13.0 to 18.0 feet below ground surface and submitted for analytical laboratory testing.
- Cobble encountered at approximately 46.0 feet below ground surface. Driller augered past cobble and continued sampling.
- Monitoring well was installed approximately 5.0 feet north of original borehole upon completion. Well screen was set from approximately 10.0 to 15.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: AREA19-MW-226B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/17/24



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Rockford, Michigan

Boring No.: HS-MW-260

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: D. Watt

Date Start/Finish: 6-17-22 / 6-21-22

Boring Location: 579,304.2840 N; 12,795.521.7306 E

GS Elev.: 630.64' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 633.66'

NA

# GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
6/17/22	-	4.1'	Augers	5 min
6/20/22	-	3.12'	PVC	60 hrs

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1	1	24/14	0-2	2-2 2-3		Soft, black, SILT, trace to little Clay, trace fine Sand, trace Organic Matter, moist. Changing at 1.0 foot to: Soft, brown, SILT & CLAY, little fine to coarse Sand, moist.	1' SILT SILT & CLAY			PROTECTIVE CASING
2										Backfill/Cement
3										Bentonite Chips
4	2	24/6	4-6	3-4 5-5		Loose, gray, fine to coarse SAND, trace Silt, trace Gravel, wet.	4' SAND	1		Filter Sand Pack
5								2		Top of Well Screen
6								3		2-Inch Dia. 5-Foot PVC Screen (0.010" Slot)
7										Bottom of Well Screen
8										
9	3	24/12	9-11	1-2 1-2		Very loose, brown, fine to medium SAND, wet.				
10										
11										
12										
13										
14	4	24/10	14-16	1-1 1-2		Very loose, brown, fine to coarse SAND, trace Silt, wet.		4		
15										
16										
17										
18										
19	5	24/14	19-21	2-4 5-4		Loose, brown, fine to medium SAND, trace Silt, wet.				
20										
21										
22										
23										
24	6	24/12	24-26	2-3 8-8		Medium dense, brown, fine to medium SAND, trace Silt, wet.		5		
25										
26										
27										
28										
29	7	24/9	29-31	3-7 8-9		Medium dense, brown, fine to medium SAND, trace Silt, wet.				
30										
31										
32										
33										
34	8	24/8	34-36	2-7 12-18		Medium dense, brown, fine to medium SAND, trace Silt, wet.		6		
35										
36										
37										
38										
39	9	24/10	39-41	5-9		Medium dense, brown, fine to medium				

## REMARKS

1. Groundwater was encountered at approximately 4.0 feet below ground surface.
2. VAP groundwater sample was collected from approximately 5.0 to 10.0 feet below ground surface and submitted for analytical testing.
3. Cobble encountered at approximately 6.0 feet below ground surface. Driller augered past cobble and continued sampling.
4. VAP groundwater sample was collected from approximately 15.0 to 20.0 feet below ground surface and submitted for analytical testing.
5. VAP groundwater sample was collected from approximately 25.0 to 30.0 feet below ground surface and submitted for analytical testing.
6. VAP groundwater sample was collected from approximately 35.0 to 40.0 feet below ground surface and submitted for analytical testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: HS-MW-260

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-260

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File No.: 16.0062961.52

Check: J. Groenleer

ROCKFORD, MICHIGAN										Check:	J. Groenleer
Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed		
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data						
41	10	24/6	44-46	15-17		SAND, trace Silt, wet.	SAND	7			
42											
43											
44											
45						3-7 15-22				Medium dense, brown, fine to medium SAND, trace Silt, wet.	
46											
47											
48											
49	11	24/8	49-51	3-7 13-16		Medium dense, brown, fine to medium SAND, trace Silt, wet.	51'	8			
50											
51						Bottom of Borehole at 51.0 Feet					
52											
53											
54											
55											
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
69											
70											
71											
72											
73											
74											
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76											
77											
78											
79											
80											
81											
82											
83											
84											
85											
86											
REMARKS	7. VAP groundwater sample was collected from approximately 45.0 to 50.0 feet below ground surface and submitted for analytical testing. 8. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 5.0 to 10.0 feet below ground surface.										
	Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.										
Boring No.: HS-MW-260											

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22

Boring No.: HS-MW-260



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Rockford, Michigan

Boring No.: HS-MW-261

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: D. Watt

Date Start/Finish: 6-21-22 / 6-23-22

Boring Location: 579,110.9177 N; 12,794,886.3750 E

GS Elev.: 628.42' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 631.19'

NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1	1	24/20	0-2	1-1 2-2		Soft, dark brown, Organic SILT, trace Clay, trace Sand, moist. Changing at 1.5 feet to: Very loose, gray, fine to medium SAND, trace Silt, wet.	SILT 1.5' SAND	1		PROTECTIVE CASING Backfill/Cement Bentonite Chips Filter Sand Pack Top of Well Screen 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) Bottom of Well Screen
2										
3										
4	2	24/6	4-6	5-4 4-5		Loose, brown, fine GRAVEL, little coarse Sand, trace Silt, wet.	4' GRAVEL	2		
5										
6										
7										
8										
9	3	24/18	9-11	2-2 2-2		Very loose to loose, brown, fine to medium SAND, trace Silt, wet.	9' SAND			
10										
11										
12										
13										
14	4	24/12	14-16	2-2 3-4		Loose, brown, fine to medium SAND, trace Silt, wet.		3		
15										
16										
17										
18										
19	5	24/13	19-21	3-4 6-6		Loose, brown, fine to medium SAND, trace Silt, wet.				
20										
21										
22										
23										
24	6	24/14	24-26	2-7 9-10		Medium dense, brown, fine to medium SAND, trace Silt, wet.		4		
25										
26										
27										
28										
29	7	24/14	29-31	4-6 9-9		Medium dense, brown, fine to medium SAND, trace Silt, wet.				
30										
31										
32										
33										
34	8	24/11	34-36	3-8 12-12		Medium dense, brown, fine to medium SAND, trace Silt, wet.		5		
35										
36										
37										
38										
39	9	24/14	39-41	4-8		Medium dense, brown, fine to medium				

**REMARKS**

1. Groundwater was encountered at approximately 1.5 feet below ground surface.
2. VAP groundwater sample was collected from approximately 5.0 to 10.0 feet below ground surface and submitted for analytical testing.
3. VAP groundwater sample was collected from approximately 15.0 to 20.0 feet below ground surface and submitted for analytical testing.
4. VAP groundwater sample was collected from approximately 25.0 to 30.0 feet below ground surface and submitted for analytical testing.
5. VAP groundwater sample was collected from approximately 35.0 to 40.0 feet below ground surface and submitted for analytical testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: HS-MW-261

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-261

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File No.: 16.0062961.52

Check: J. Groenleer

ROCKFORD, MICHIGAN										Check:	J. Groenleer
Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed		
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data						
41	10	23/11	44-45.9	14-17		SAND, trace Silt, wet.	SAND	6			
42											
43											
44											
45				8-20		Very dense, brown, fine to medium SAND, trace Silt, wet.					
46				31-50/5"							
47											
48											
49	11	24	49-51	4-7	22-31	Dense, brown, fine to medium SAND, trace Silt, wet.	51'	7			
50											
51						Bottom of Borehole at 51.0 Feet					
52											
53											
54											
55											
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
69											
70											
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72											
73											
74											
75											
76											
77											
78											
79											
80											
81											
82											
83											
84											
85											
86											
REMARKS											
6. VAP groundwater sample was collected from approximately 45.0 to 50.0 feet below ground surface and submitted for analytical testing.											
7. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 4.0 to 9.0 feet below ground surface.											
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.											
Boring No.: HS-MW-261											

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-262

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File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: D. Watt

Date Start/Finish: 6-24-22 / 6-27-22

Boring Location: 578,883.9593 N; 12,794,660.6982 E

GS Elev.: 628.53' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

**GROUNDWATER READINGS**

Type: Hollow Stem Auger Split Spoon  
O.D. / I.D.: 8.0" / 4.25" 2.0" / 1 3/8"  
Hammer Wt.: 140lbs NA  
Hammer Fall: 30.0" NA  
TOC Elev.: 631.60' NA

Date	Time	Depth	Casing	Stab
6/24/22	-	4.5'	Augers	5 min

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1	1	24/8	0-2	2-2 3-2		Medium stiff, dark brown, Organic SILT, trace Clay, trace Sand, moist.	SILT			
2										
3										
4	2	24/10	4-6	4-12 13-50/5"		Medium dense, brown, GRAVEL and coarse Sand, trace Silt, wet.	4' GRAVEL	1		
5								2		
6								3		
7										
8										
9	3	24/16	9-11	3-2 1-2		Very loose, brown, fine to medium SAND, trace Silt, wet.	9' SAND			
10										
11										
12										
13										
14	4	24/13	14-16	2-2 3-1		Loose, brown, fine to medium SAND, trace Silt, wet.		4		
15										
16										
17										
18										
19	5	24/15	19-21	3-4 4-6		Loose, brown, fine to medium SAND, trace Silt, wet.				
20										
21										
22										
23										
24	6	24/10	24-26	1-1 2-2		Very loose, brown, fine to medium SAND, trace Silt, wet.		5		
25										
26										
27										
28										
29	7	24/18	29-31	4-8 10-10		Medium dense, brown, fine to medium SAND, trace Silt, wet.				
30										
31										
32										
33										
34	8	24/15	34-36	2-5 8-10		Medium dense, brown, fine to medium SAND, trace Silt, wet.		6		
35										
36										
37										
38										
39	9	24/13	39-41	3-3		Loose, brown, fine to medium SAND, trace				

**REMARKS**

1. Groundwater was encountered at approximately 4.0 feet below ground surface.
2. VAP groundwater sample was collected from approximately 5.0 to 10.0 feet below ground surface and submitted for analytical laboratory testing.
3. Cobbles encountered between approximately 5.5 and 7.5 feet below ground surface. Driller augered past cobbles and continued sampling.
4. VAP groundwater sample was collected from approximately 15.0 to 20.0 feet below ground surface and submitted for analytical laboratory testing.
5. VAP groundwater sample was collected from approximately 25.0 to 30.0 feet below ground surface and submitted for analytical laboratory testing.
6. VAP groundwater sample was collected from approximately 35.0 to 40.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: HS-MW-262

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-262

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

ROCKFORD, MICHIGAN										Check:	J. Groenleer
Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed		
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data						
41	10	24/14	44-46	6-8		Silt, wet.	SAND	7			
42											
43											
44											
45			1-3		Loose, brown, fine to medium SAND, trace Silt, wet.						
46			6-8								
47											
48	11	24/21	48-50	8-19			48'				
49				38-50/6"		SILT & CLAY					
50							50'				
51										8	
52						Bottom of Borehole at 50.0 Feet					
53											
54											
55											
56											
57											
58											
59											
60											
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75											
76											
77											
78											
79											
80											
81											
82											
83											
84											
85											
86											
REMARKS	7. VAP groundwater sample was collected from approximately 43.0 to 48.0 feet below ground surface and submitted for analytical laboratory testing.										
	8. Monitoring well was installed in offset borehole upon completion. Well screen was set from approximately 4.0 to 9.0 feet below ground surface.										
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.										Boring No.: HS-MW-262	

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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RAP GSI

Rockford, Michigan

Boring No.: HS-MW-263A

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Huntoon

Logged by: D. Watt

Date Start/Finish: 2-22-22 / 2-24-22

Boring Location: 576,721.1736 N; 12,794,459.3933 E

GS Elev.: 626.74' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 630.00'

NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab
2/22/22	1455	5.5'	Augers 9'	0
2/23/22	1317	9.0'	Augers 44'	0

Surveyed By: EXXEL Survey Date: 3/30/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1							SAND		1	
2										
3									2	
4	1	24/0	4-6	10-8 4-3		NO RECOVERY. Soil cuttings: SAND, some Gravel, trace Silt, wet.			3	
5										
6										
7										
8										
9	2	24/12	9-11	10-14 26-14		Dense, brown, medium to coarse SAND, some Gravel, trace Silt, wet.				
10										
11										
12										
13										
14	3	24/8	14-16	16-10 11-12		Medium dense, brown, fine to medium SAND, trace Silt, wet.			4	
15										
16										
17										
18										
19	4	24/24	19-21	7-8 9-13		Medium dense, brown, fine to medium SAND, trace Silt, wet. Changing at 20.5 feet to: Stiff, gray, Clayey SILT and Sand, trace Gravel, moist.	20.5' Clayey SILT			
20										
21										
22										
23										
24	5	24/20	24-26	10-28 41-44		Very dense, gray, fine SAND and Silt, little Clay, trace Gravel, moist.	24' SAND		5	
25										
26										
27										
28										
29	6	24/18	29-31	12-40 36-41		Very dense, gray, fine SAND and Silt, little Clay, trace Gravel, moist.				
30										
31										
32										
33										
34	7	23/23	34-35.9	14-20 34-50/5"		Hard, gray, SILT & CLAY, some fine to medium Sand, trace Gravel, moist.	34' SILT & CLAY			
35										
36										
37										
38										
39	8	20/20	39-40.7	10-24-37		Very dense, gray, fine SAND and Silt, little	39' SAND			

**REMARKS**

1. Cobble encountered at approximately 2.0 feet below ground surface. Drillers augered past cobble and resumed sampling.
2. VAP groundwater sample was collected from approximately 3.0 to 8.0 feet below ground surface and submitted for analytical testing.
3. Groundwater was encountered at approximately 5.5 feet below ground surface.
4. VAP groundwater sample collected from approximately 13.0 to 18.0 feet below ground surface and submitted for analytical testing.
5. Cobble encountered at approximately 23.0 feet below ground surface. Drillers augered past cobble and resumed sampling.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: HS-MW-263A

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22





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RAP GSI

Rockford, Michigan

Boring No.: HS-MW-263A

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

ROCKFORD, MICHIGAN										Check:	J. Groenleer
Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed		
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data						
41	9	24/18	44-46	15-2 1-1		Clay, trace Gravel, moist.	SAND	6			
42											
43											
44											
45	10	24/20	49-51	6-5 13-21		Very loose, brown, fine to medium SAND, trace Silt, wet.					
46											
47											
48											
49						Medium dense, fine to medium SAND, trace Silt, embedded lens of Clay, wet.	51'	7			
50											
51											
52											
53						Bottom of Borehole at 51.0 Feet		8			
54											
55											
56											
57											
58											
59											
60											
61											
62											
63											
64											
65											
66											
67											
68											
69											
70											
71											
72											
73											
74											
75											
76											
77											
78											
79											
80											
81											
82											
83											
84											
85											
86											
REMARKS	6. VAP groundwater sample was collected from approximately 42.0 to 47.0 feet below ground surface and submitted for analytical testing. 7. Original borehole was plugged with grout from 0.0 to 49.0 feet below ground surface. Permanent monitoring well was offset 5.0 feet to the east. 8. Monitoring well was installed in offset borehole upon completion. Well screen was set from approximately 5.0 to 10.0 feet below ground surface.										
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.										Boring No.: HS-MW-263A	

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-263B

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Bryan

Logged by: N. Kampfschulte

Date Start/Finish: 7-12-22 / 7-13-22

Boring Location: 576,718.2746 N; 12,794,456.3563 E

GS Elev.: 626.95' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 629.18'

NA

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 8/25/2022

Sample Information						TOC Elev.:	629.18'	NA	Surveyed By:	EXXEL	Survey Date:	8/25/2022
Depth	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed			
1						See HS-MW-263A for soil and stratum descriptions.		1				
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												
47						Bottom of Borehole at 47.0 Feet						
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												

REMARKS

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 42.0 to 47.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: HS-MW-263B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-264

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: D. Watt

Date Start/Finish: 2-24-22 / 2-24-22

Boring Location: 574,868.3681 N; 12,794,561.2971 E

GS Elev.: 638.61' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 638.18'

NA

# GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
2/24/22	1401	22.0'	Augers 24'	

Surveyed By: EXXEL Survey Date: 3/30/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1							TOPSOIL		PROTECTIVE COVER	
2									Backfill/Cement	
3									Sand	
4	1	24/24	4-6	1-2		Dark brown, TOPSOIL and Organic Matter, dry. Changing at 4.2 feet to: Very loose, brown, fine to medium SAND, some Clay & Silt, trace Gravel, moist. Changing at 5.0 feet to: Very loose, brown, fine to medium SAND, little Clay & Silt, moist.	4.2'			
5				2-2			SAND			
6										
7										
8										
9	2	24/24	9-11	5-14		Dense, brown, fine to medium SAND, some Clay & Silt, trace Gravel, moist.				
10				18-18						
11										
12									Bentonite Chips	
13										
14	3	24/18	14-16	8-40		Very dense, brown, fine to medium SAND, some Clay & Silt, trace Gravel, moist. Changing at 15.5 feet to: Very dense, brown, fine to medium SAND, trace Clay & Silt, trace Gravel, moist.				
15				35-37						
16										
17										
18										
19	4	24/20	19-21	10-38		Very dense, brown, medium to coarse SAND, trace Gravel, trace Silt, moist.				
20				31-50						
21										
22										
23										
24	5	18/18	24-25.5	8-19-25		Dense, brown, fine to medium SAND, trace Silt, wet.		1	Filter Sand Pack	
25								2	Top of Well Screen	
26										
27										
28										
29	6	18/10	29-30.5	8-18-35		Very dense, brown, fine to medium SAND, trace Silt, wet.			2-Inch Dia. 5-Foot PVC Screen (0.010" Slot)	
30										
31									Bottom of Well Screen	
32										
33										
34	7	12/12	34-35	26-50/6"		Very dense, gray, fine to medium SAND, some Silt & Clay, trace Gravel, moist.	35'	3		
35						Bottom of Borehole at 35.0 Feet		4		
36										
37										
38										
39										

## REMARKS

- Groundwater was encountered at approximately 24.0 feet below ground surface. Static groundwater measured within augers at approximately 22.0 feet below ground surface.
- VAP groundwater sample was collected from approximately 24.0 to 29.0 feet below ground surface and submitted for analytical laboratory testing.
- Cobble encountered at approximately 35.0 feet below ground surface with auger refusal. Original borehole was plugged with grout from 0.0 to 35.0 feet below ground surface. Permanent monitoring well was offset approximately 10.0 feet to the east.
- Monitoring well was installed in offset borehole upon completion. Well screen was set from approximately 25.0 to 30.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: HS-MW-264

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-265

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: C. Martin

Date Start/Finish: 1-31-22 / 2-1-22

Boring Location: 571,010.2633 N; 12,792,622.2240 E

GS Elev.: 612.2' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 614.96'

NA

# GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
1/31/22	1141	6.35'	Augers	5 min
2/1/22	0826	5.0'	Augers	15 hrs

Surveyed By: EXXEL Survey Date: 3/30/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1							Clayey SILT			
2										
3										
4	1	24/17	4-6	1-1		Loose, brown, Clayey SILT, little fine Sand, damp.		1		
5				1-2						
6										
7										
8										
9	2	24/13	9-11	2-1		Very loose, light brown, fine to medium SAND, trace Silt, wet.	9' SAND	2		
10				2-4						
11										
12										
13										
14	3	24/24	14-16	4-8		Medium dense, light brown, fine to medium SAND, trace Silt, trace Gravel, wet.		3		
15				9-11						
16										
17										
18										
19	4	24/14	19-21	2-2		Very loose, light brown, fine to medium SAND, trace Silt, trace Gravel, wet.				
20				1-2						
21										
22										
23										
24	5	24/24	24-26	3-4		Loose, light brown, fine to medium SAND, trace Silt, trace Gravel, wet with 2 inches of light brown CLAY at 25.4 feet.		4		
25				4-7						
26										
27										
28										
29	6	24/24	29-31	2-3		Loose, light brown, fine to medium SAND, trace Silt, trace Gravel, wet.				
30				3-4						
31										
32										
33										
34	7	24/13	34-36	11-14		Medium dense, light brown, fine to medium SAND, trace Silt, trace Gravel, wet with coarse Gravel in spoon tip.		5		
35				14-13						
36										
37										
38										
39	8	24/20	39-41	11-3		Loose, light brown, fine to medium SAND,				

## REMARKS

- VAP groundwater sample was collected from approximately 4.0 to 9.0 feet below ground surface and submitted for analytical laboratory testing.
- Groundwater was encountered at approximately 6.4 feet below ground surface.
- VAP groundwater sample was collected from approximately 14.0 to 19.0 feet below ground surface and submitted for analytical laboratory testing.
- VAP groundwater sample was collected from approximately 24.0 to 29.0 feet below ground surface and submitted for analytical laboratory testing.
- VAP groundwater sample was collected from approximately 34.0 to 39.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: HS-MW-265

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-265

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Sample Information						ROCKFORD, MICHIGAN				Check: J. Groenleer		
Depth	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed			
41	9	24/14	44-46	5-6		trace Silt, trace Gravel, dry. Changing at 40.4 feet to: Light brown, Silty CLAY, wet.	40.4' Silty CLAY	6				
42												
43												
44												
45						3-7					Brown, Silty CLAY, wet. Changing at 44.8 feet to: Medium dense, brown, medium GRAVEL, wet. Changing at 45.0 feet to: Brown, Silty CLAY, wet.	44.8' GRAVEL
46						5-7						45' Silty CLAY
47	10	24/11	49-51					7				
48												
49						2-2					Very loose, light brown, fine to medium SAND, trace Silt, trace Gravel, wet.	49' SAND
50						1-1						51'
51						Bottom of Borehole at 51.0 Feet						
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64												
65												
66												
67												
68												
69												
70												
71												
72												
73												
74												
75												
76												
77												
78												
79												
80												
81												
82												
83												
84												
85												
86												
REMARKS												
6. VAP groundwater sample was collected from approximately 44.0 to 49.0 feet below ground surface and submitted for analytical laboratory testing. 7. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 10.0 to 15.0 feet below ground surface.												
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.										Boring No.: HS-MW-265		

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-266A

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: D. Watt

Date Start/Finish: 6-15-22 / 6-20-22

Boring Location: 579,706.4161 N; 12,794.679.0174 E

GS Elev.: 633.73' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 636.69'

NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab
6/15/22	-	6.61'	Augers	2 min
6/16/22	-	1.2'	PVC	16 hrs

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1	1	24/10	0-2	1-1 1-2		Very soft to soft, black, SILT, trace fine Sand, trace Clay, moist. Changing at 1.0 foot to: Gray, SILT, trace Sand, moist.	SILT		PROTECTIVE COVER	
2									Backfill/Cement	
3										
4	2	24/6	4-6	1-1 3-10		Soft, gray, SILT, some Gravel, trace fine Sand, moist.		1	Bentonite Chips	
5								2		
6										
7										
8										
9	3	24/12	9-11	11-7 3-3		Loose, brown, fine to coarse SAND, trace Silt, wet.	9' SAND	3	Filter Sand Pack	
10									Top of Well Screen	
11										
12										
13										
14	4	24/18	14-16	1-2 2-2		Loose, brown, fine to medium SAND, trace Silt, wet.			2-Inch Dia. 5-Foot PVC Screen (0.010" Slot)	
15										
16									Bottom of Well Screen	
17										
18										
19	5	24/18	19-21	1-3 3-3		Loose, brown, fine to medium SAND, trace Silt, wet.		4		
20										
21										
22										
23										
24	6	24/20	24-26	5-7 8-10		Medium dense, brown, fine to medium SAND, trace Silt, wet.				
25										
26										
27										
28										
29	7	24/12	29-31	4-8 10-12		Medium dense, brown, fine to medium SAND, trace Silt, wet.		5		
30										
31										
32										
33										
34	8	24/24	34-36	4-7 11-12		Medium dense, brown, fine to medium SAND, trace Silt, wet.				
35										
36										
37										
38										
39	9	24/10	39-41	1-6		Medium dense, brown, fine to medium				

**REMARKS**

1. Cobble encountered at approximately 5.0 feet below ground surface. Driller augered past cobble and continued sampling.
2. Groundwater encountered at approximately 6.5 feet below ground surface.
3. VAP groundwater sample was collected from approximately 10.0 to 15.0 feet below ground surface and submitted for analytical laboratory testing.
4. VAP groundwater sample was collected from approximately 20.0 to 25.0 feet below ground surface and submitted for analytical laboratory testing.
5. VAP groundwater sample was collected from approximately 30.0 to 35.0 feet below ground surface and submitted for analytical laboratory testing.
6. VAP groundwater sample was collected from approximately 40.0 to 45.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: HS-MW-266A

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-266A

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File No.: 16.0062961.52

Check: J. Groenleer

Sample Information						ROCKFORD, MICHIGAN				Check:	J. Groenleer
Depth	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed		
41	10	24/10	44-46	8-11		SAND, trace Silt, wet.	SAND	6			
42											
43											
44											
45											
46	11	24/12	49-51	1-5 10-12		Medium dense, brown, fine to medium SAND, trace Silt, wet.					
47											
48											
49											
50											
51	12	24/22	54-56	2-5 8-10		Medium dense, brown, fine to medium SAND, trace Silt, wet.					
52											
53											
54											
55											
56	13	24/18	59-61	4-5 9-12		Medium dense, brown, fine to medium SAND, trace Silt, wet.					
57											
58											
59											
60											
61	14	24/10	64-66	2-3 5-10		Loose, brown, fine to medium SAND, trace Silt, wet.					
62											
63											
64											
65											
66	15	24/10	69-71	2-3 8-10		Medium dense, brown, fine to medium SAND, trace Silt, wet.					
67											
68											
69											
70											
71	16	24/8	74-76	2-3 2-2		Loose, brown, fine to medium SAND, trace Silt, wet.					
72											
73											
74											
75											
76				4-2 1-2		Very loose, gray and brown, fine to coarse SAND, trace Silt, wet.	76'	7			
77						Bottom of Borehole at 76.0 Feet					
78											
79											
80											
81											
82											
83											
84											
85											
86											
REMARKS											
7. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 10.0 to 15.0 feet below ground surface.											
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.										Boring No.: HS-MW-266A	

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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Rockford, Michigan

Boring No.: HS-MW-266B

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: N. Kampfschulte

Date Start/Finish: 9-13-22 / 9-14-22

Boring Location: 579,711.5286 N; 12,794,680.0811 E

GS Elev.: 633.71' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 636.69'

NA

Surveyed By: EXXEL Survey Date: 11/18/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				PROTECTIVE COVER	Backfill/Cement
1						See HS-MW-266A for soil and stratum descriptions.				
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										

Bentonite Grout

REMARKS

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: HS-MW-266B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/10/23





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RAP GSI

Rockford, Michigan

Boring No.: HS-MW-266B

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55						Bottom of Borehole at 55.0 Feet		1	
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									
81									
82									
<b>REMARKS</b> 1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 50.0 to 55.0 feet below ground surface.									
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									

Boring No.: HS-MW-266B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/10/23



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RAP GSI

Rockford, Michigan

Boring No.: WV/CH-MW-240

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: C. Martin

Date Start/Finish: 2-3-22 / 2-8-22

Boring Location: 591,991.6064 N; 12,804,009.7742 E

GS Elev.: 714.70' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

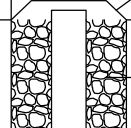
TOC Elev.: 714.28'

NA

# GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
2/3/22	1230	24.34'	Augers	5 min
2/4/22	1045	24.7'	Augers	19 hrs

Surveyed By: EXXEL Survey Date: 3/30/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1	1	24/9	4-6	3-4 6-10		Loose, light brown, SAND, little Gravel, trace Silt, dry.	SAND			PROTECTIVE COVER
2										
3										
4										
5	2	24/12	9-11	4-4 6-11		Loose, light brown, SAND, little Gravel, trace Silt, dry.				Backfill/Cement
6										
7										
8										
9	3	24/13	14-16	7-9 12-15		Medium dense, light brown, SAND and Gravel, trace Silt, dry.				
10										
11										
12										
13	4	24/15	19-21	5-11 15-24		Medium dense, light brown, SAND and Gravel, trace Silt, dry.				
14										
15										
16										
17	5	24/21	24-26	6-17 38-37		Very dense, light brown, coarse SAND, trace Gravel, wet. Changing at 24.3 feet to: Hard, light brown, CLAY, trace Silt, trace Gravel, dry.	24.3' CLAY	1		
18										
19										
20										
21	6	24/24	29-31	44-33 27-22		Hard, light brown, SILT, trace Clay, trace Gravel, dry.	29' SILT			
22										
23										
24										
25	7	24/22	34-36	10-17 22-31		Hard, gray, CLAY, trace Silt, trace Gravel, moist.	34' CLAY			
26										
27										
28										
29	8	24/23	39-41	10-17		Hard, gray, CLAY, trace Silt, trace Gravel,				Bentonite Grout
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										

## REMARKS

1. Groundwater was encountered at approximately 24.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-240

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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RAP GSI

Rockford, Michigan

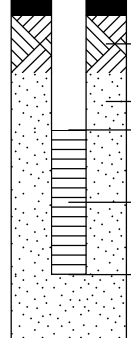
Boring No.: WV/CH-MW-240

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
41				23-34		moist.	CLAY		
42									
43									
44	9	12/12	44-45	39-52		Hard, gray, Silty CLAY, trace fine Gravel, moist.			
45									
46									
47									
48									
49	10	8/1	49-49.7	52-50/2"		NO RECOVERY.		2	
50									
51									
52									
53									
54	11	18/18	54-55.5	7-36-54		Hard, gray, CLAY, trace Silt, trace fine Gravel, moist.			
55									
56									
57									
58									
59	12	18/15	59-60.5	4-7-21		Hard, gray, Silty CLAY, trace fine Gravel, moist.			
60									
61									
62									
63									
64	13	14/14	64-65.2	19-34-50/2"		Very dense, light brown, SAND, trace Silt, trace Gravel, wet.	64' SAND		
65									
66									
67									
68									
69	14	15/12	69-70.3	22-47-50/3"		Hard, gray, CLAY, trace Silt, trace Gravel, moist.	69' CLAY		
70							70.3'		
71						Bottom of Borehole at 70.3 Feet		3	
72									
73									
74									
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									
85									
86									



Bentonite Chips

Filter Sand Pack

Top of Well Screen

2-Inch Dia. 5-Foot PVC Screen (0.010" Slot)

Bottom of Well Screen

REMARKS

- Pushed Rock. Driller noted that it still drilled like clay.
- Monitoring well was installed in borehole upon completion. Well screen was set from approximately 63.0 to 68.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-240

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/2/22



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RAP GSI

Rockford, Michigan

Boring No.: WV/CH-MW-241

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: D. Watt

Date Start/Finish: 6-28-22 / 6-29-22

Boring Location: 589,655.3007 N; 12,804,025.7209 E

GS Elev.: 699.94' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: NA

NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 11/18/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
1						See WV/CH-MW-241A for soil and stratum descriptions from 0.0-29.0 feet below ground surface.			None
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29	1	18/14	29-30.5	18-29-42		Hard, gray, SILT & CLAY, little fine to coarse Sand, moist.	SILT & CLAY	1	
30									
31									
32									
33									
34							34'		
35	2	12/12	34-35	16-22		Dense, brown, fine to medium SAND, little Silt, wet.	SAND	2	
36								3	
37								4	
38									
39							39.4'		
40	3	5/5	39-39.4	50/5"		Very dense, brown, medium to coarse SAND, trace Silt, wet. Tip of spoon: Gray, SILT & CLAY, trace fine to coarse Sand, moist.	SILT & CLAY	5	
41									
42									
43									
44							44'		
45	4	24/16	44-46	40-14 11-14		Dense, brown, fine SAND, little Silt, wet.	SAND	6	
46									
47									
48									
49									
50	5	18/18	49-50.5	15-34-50/6"		Very dense, brown, fine to medium SAND, little Silt, wet with lens of Clay at 49.5 feet.			
51									
52									
53									
54									
55	6	22/13	54-55.8	7-9 40-50/4"		Dense, brown, fine to medium SAND, little Silt, wet.		7	
56									
57									
58									
59									
60	7	22/18	59-60.8	9-15 41-50/4"		Very dense, brown, fine to coarse SAND, little Silt, wet.			
61							61'		
62						Bottom of Borehole at 61.0 Feet		8	

**REMARKS**

- Previously characterized by GZA on 2/8/2022 and 2/9/22. Borehole offset 5.0 feet north from previous boring location and monitoring well.
- Groundwater was encountered at approximately 34.0 feet below ground surface.
- VAP groundwater sample was collected from approximately 34.0 to 39.0 feet below ground surface and submitted for analytical laboratory testing.
- Cobble encountered approximately 37.0 below ground surface. Driller augered past and continued sampling.
- Cobble encountered at approximately 39.5 feet below ground surface. Driller augered past cobble and continued sampling. Driller noted soils below the cobble felt like silt/clay with interbedded sands.
- VAP groundwater sample was collected from approximately 44.0 to 49.0 feet below ground surface and submitted for analytical laboratory testing.
- VAP groundwater sample was collected from approximately 54.0 to 59.0 feet below ground surface and submitted for analytical laboratory testing.
- Borehole was backfilled with grout upon completion.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-241

BORING WELL: 62961.52 GSI/GPJ GZA CORP GDT 4/24/23



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RAP GSI

Rockford, Michigan

Boring No.: WV/CH-MW-241A

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: C. Martin

Date Start/Finish: 2-8-22 / 2-9-22

Boring Location: 589,654.1053 N; 12,804,029.7239 E

GS Elev.: 699.52' Datum: NAD83/NAVD88

Auger/  
Casing Sampler

Type: Hollow Stem Auger Split Spoon

O.D. / I.D.: 8.0" / 4.25" 2.0" / 1 3/8"

Hammer Wt.: 140lbs NA

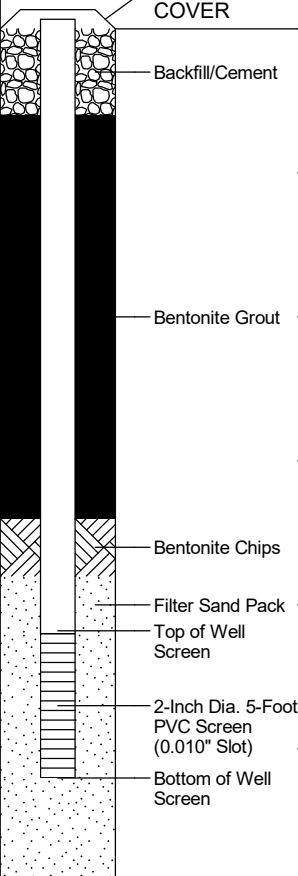
Hammer Fall: 30.0" NA

TOC Elev.: 702.05' NA

# GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 3/30/2022

Sample Information						TOC Elev.: 702.05'	NA	Surveyed By: EXXEL	Survey Date: 3/30/2022		
Depth	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed		
									PROTECTIVE COVER		
1	1	24/7	3-5	3-9 10-12		Medium dense, brown, fine to medium SAND, trace Silt, trace Gravel, dry.	SAND				
2											
3											
4											
5	2	24/14	8-10	11-18 16-15		Medium dense, brown, fine to medium SAND, trace Silt, trace Gravel, dry. Changing at 8.3 feet to: Medium dense, light brown, SAND, trace Silt, trace Gravel, dry.			Bentonite Grout		
6											
7											
8											
9	3	24/18	13-15	18-14 16-22		Dense, light brown, fine to medium SAND, trace Silt, trace Gravel, dry.					
10											
11											
12											
13	4	24/24	18-20	14-19 25-31		Dense, light brown, Clayey SILT, trace Sand, wet.	18' Clayey SILT		1	Bentonite Chips	
14											
15											
16											
17	5	24/24	23-25	8-18 15-21		Medium dense, light brown, fine to coarse SAND, trace Silt, trace Clay, trace Gravel, wet.	23' SAND		2	Filter Sand Pack	
18											
19											
20											
21	6	18/18	28-29.5	18-25-50/2"		Hard, gray, CLAY, trace Silt, trace Gravel, dry.	28' CLAY		3	Top of Well Screen	
22											
23											
24											
25						Bottom of Borehole at 29.5 Feet	29.5'			2-Inch Dia. 5-Foot PVC Screen (0.010" Slot)	
26											
27											
28											
29										Bottom of Well Screen	
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											

## REMARKS

- VAP groundwater sample was collected from approximately 18.0 to 23.0 feet below ground surface and submitted for analytical laboratory testing.
- Groundwater was encountered at approximately 18.0 feet below ground surface.
- Monitoring well was installed in borehole upon completion. Well screen was set from approximately 21.0 to 26.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-241A

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/1/22



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Rockford, Michigan

Boring No.: WV/CH-MW-241B

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: N. Kampfschulte

Date Start/Finish: 9-9-22 / 9-12-22

Boring Location: 589,655.3007 N; 12,804,025.7209 E

GS Elev.: 699.94' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 702.25'

NA

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 11/18/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				PROTECTIVE COVER	Backfill/Cement
1						See WV/CH-MW-241A for soil and stratum descriptions from 0.0 to 29.0 feet below ground surface. See WV/CH-MW-241 for soil and stratum descriptions from 29.0 to 61.0 feet below ground surface.				
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										

REMARKS

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-241B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/31/23



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Rockford, Michigan

Boring No.: WV/CH-MW-241B

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59						Bottom of Borehole at 59 Feet		1	
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									
81									
82									

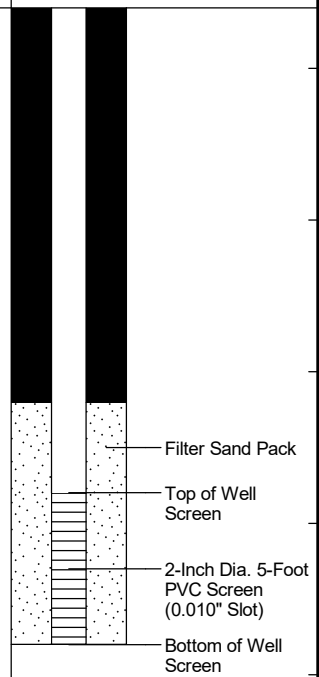
REMARKS

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 54.0 to 59.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-241B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/31/23





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Rockford, Michigan

Boring No.: WV/CH-MW-242A

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: T. Litwiler/M. Myers

Date Start/Finish: 3-28-22 / 3-31-22

Boring Location: 588,547.6747 N; 12,801,456.0694 E

GS Elev.: 715.02' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

**GROUNDWATER READINGS**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 714.61'

NA

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 5/20/2022

Sample Information						TOC Elev.:	714.61'	NA	Surveyed By:	EXXEL	Survey Date:	5/20/2022
Depth	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed			
1	1	24/24	4-6	2-2 2-3		Loose, brown, fine to medium, SAND, little Clay, moist.	SAND			PROTECTIVE COVER		
2									Backfill/Cement			
3									Bentonite Chips			
4												
5												
6	2	24/24	9-11	2-3 5-21		Loose, light brown, medium SAND, trace Gravel, dry.						
7												
8												
9												
10												
11	3	24/14	14-16	2-3 6-7		Loose, light brown, medium SAND, trace Gravel, dry.						
12												
13												
14												
15												
16	4	24/12	19-21	8-22 26-28		Dense, brown, medium to coarse SAND, some Gravel, dry. Changing at 20.0 feet to: Dense, light brown, fine to medium SAND, dry.						
17												
18												
19												
20												
21	5	17/4	24-25.4	6-16-50/5"		Very dense, brown, medium to coarse SAND, some coarse Gravel, dry. Changing at 25.0 feet to: Very dense, black, medium SAND, dry.						
22												
23												
24												
25												
26	6	4/4	29-29.3	50/4"		Very dense, brown, medium to coarse SAND and Gravel, dry.						
27												
28												
29												
30												
31	7	15/10	34-35.3	29-29-50/3"		Very dense, light brown and gray, medium to coarse SAND, some coarse Gravel, dry. Changing at 35.0 feet to: Stiff, brown, CLAY, trace Gravel, dry.	35'	CLAY	1	Bentonite Chips		
32												
33												
34												
35												
36	8	15/14	39-40.3	22-36-50/3"		Very dense, brown, fine to medium SAND, trace Gravel, wet.	39'	SAND	2	Filter Sand Pack		
37												
38												
39												
40												
41	9	18/11	44-45.5	36-37-50/6"		Very dense, brown, fine SAND, wet.				Top of Well Screen		
42												
43												
44												
45												
46										2-Inch Dia. 5-Foot PVC Screen (0.010" Slot)		
										Bottom of Well Screen		

**REMARKS**

- VAP groundwater sample was collected from approximately 38.0 to 43.0 feet below ground surface and submitted for analytical laboratory testing.
- Groundwater was encountered at approximately 39.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-242A

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/9/23





**GZA**  
GeoEnvironmental, Inc.  
Engineers and Scientists

Wolverine World Wide, Inc.

RAP GSI

Rockford, Michigan

Boring No.: WV/CH-MW-242A

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Sample Information						ROCKFORD, MICHIGAN			Check:	J. Groenleer	
Depth	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed		
48	10	24/24	49-51	16-12 40-50/6"		Stiff, gray, SILT, little fine Sand, wet.	SAND	3			
49							49'				SILT
50											
51											
52	11	18/16	54-55.5	21-38-50/6"		Hard, gray, CLAY, some Silt, moist to dry.	54'				
53											CLAY
54											
55											
56	12	17/14	59-60.4	2-17-50/5"		Hard, gray, CLAY, some Silt, moist to dry.					
57											
58											
59											
60	13	24/24	64-66	6-8 21-29		Gray, SILT, little fine Sand, wet. Changing at 64.3 feet to: Medium dense, gray, fine SAND and Silt, wet.	64'	4			
61							64.3'				SILT
62											SAND
63											
64	14	19/19	69-70.6	9-40-50/7"		Very dense, gray, fine SAND with interbedded Clay, wet.					
65											
66											
67											
68	15	17/14	74-75.4	5-29-50/5"		Medium stiff, gray, CLAY, some fine Sand, moist to wet.	74'	5			
69											CLAY
70											
71											
72	16	16/4	79-80.3	3-27-50/4"		Medium stiff, Gray, CLAY, some fine Sand, moist to wet.					
73											
74											
75											
76	17	11/8	84-84.9	5-50/5"		Medium stiff, gray, CLAY, some fine Sand, moist to wet.		6			
77											
78											
79											
80	18	15/15	89-90.3	54-20-50/3"		Very dense, gray, fine SAND, some Clay, some Silt, wet.	89'				
81							90.3'				SAND
82											
83											
84						Bottom of Borehole at 90.3 Feet		7			
85											
86											
87											
88											
89											
90											
91											
92											
93											
94											
95											
96											
97											
98											
99											
100											
101											

REMARKS	3. VAP groundwater sample was collected from approximately 48.0 to 53.0 feet below ground surface and submitted for analytical laboratory testing.
	4. VAP groundwater sample was collected from approximately 63.0 to 68.0 feet below ground surface and submitted for analytical laboratory testing.
	5. VAP groundwater sample was collected from approximately 73.0 to 78.0 feet below ground surface and submitted for analytical laboratory testing.
	6. VAP groundwater sample was collected from approximately 83.0 to 88.0 feet below ground surface and submitted for analytical laboratory testing.
	7. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 40.0 to 45.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.	Boring No.: WV/CH-MW-242A
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BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/9/23

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-242A



**GZA**  
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Engineers and Scientists

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RAP GSI

Rockford, Michigan

Boring No.: WV/CH-MW-242B

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Daryll

Logged by: N. Kampfschulte

Date Start/Finish: 6-30-22 / 6-30-22

Boring Location: 588,539.7444 N; 12,801,452.2187 E

GS Elev.: 714.84' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 714.43'

NA

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				PROTECTIVE COVER	Backfill / Cement
1						See WVNW-MW-242A for soil and stratum descriptions.				
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										

REMARKS

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-242B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/10/23



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Rockford, Michigan

Boring No.: WV/CH-MW-242B

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
71						Bottom of Borehole at 71.0 Feet		1	
72									
73									
74									
75									
76									
77									
78									
79									
80									
81									
82									

**REMARKS**

1. Monitoring well installed in borehole upon completion. Well screen was set from approximately 65.0 to 70.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WV/CH-MW-242B

BORING WELL 62961.52 GSI.GPJ GZA CORP.GDT 1/10/23

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RAP GSI

Rockford, Michigan

Boring No.: WVNW-MW-200

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: M. Myers/D. Watt

Date Start/Finish: 4-1-22 / 4-6-22

Boring Location: 596,054.203 N; 12,788,597.1508 E

GS Elev.: 732.39' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger Split Spoon

O.D. / I.D.: 8.0" / 4.25" 2.0" / 1 3/8"

Hammer Wt.: 140lbs NA

Hammer Fall: 30.0" NA

TOC Elev.: NA NA

Date	Time	Depth	Casing	Stab
4/4/22	0930	15.4'	Augers 19'	72 hrs
4/5/22	0815	15.4'	Augers 49'	16 hrs

Surveyed By: EXXEL Survey Date: 5/20/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1							SAND		None	
2										
3										
4	1	24/19	4-6	2-2 3-2		Loose, dark brown, fine SAND, some Silt, trace Gravel, moist.				
5										
6										
7										
8										
9	2	24/9	9-11	1-1 1-WOH		Very loose, brown, fine to medium SAND, some Silt, moist.				
10										
11										
12										
13										
14	3	24/18	14-16	2-3 5-7		Loose, light brown, fine to medium SAND, little Silt, moist to wet.		1		
15								2		
16										
17										
18										
19	4	24/12	19-21	1-1 8-12		Loose, light brown, fine to medium SAND, little Silt, wet.				
20										
21										
22										
23										
24	5	24/18	24-26	2-3 5-5		Loose, brown, fine to coarse SAND, trace Gravel, wet.		3		
25										
26										
27										
28										
29	6	12/8	29-30	2-8		Loose, brown, fine to coarse SAND, trace Gravel, wet.				
30										
31										
32										
33										
34	7	18/12	34-35.5	1-2-3		Loose, brown, fine to coarse SAND, little Gravel, wet.		4		
35										
36										
37										
38										
39	8	24/8	39-41	9-5		Loose to medium dense, brown, coarse				

REMARKS

1. VAP groundwater sample was collected from approximately 14.0 to 19.0 feet below ground surface and submitted for analytical laboratory testing.
2. Groundwater was encountered at approximately 15.0 feet below ground surface.
3. VAP groundwater sample was collected from approximately 24.0 to 29.0 feet below ground surface and submitted for analytical laboratory testing.
4. VAP groundwater sample was collected from approximately 34.0 to 39.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-200

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 6/2/22

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
41	9	24/12	44-46	13-12 8-10		SAND and Gravel, wet.	SAND	5	
42									
43									
44									
45						Medium dense, brown, fine to coarse SAND, little Gravel, wet.			
46	10	24/12	49-51	8-7 7-9					
47									
48									
49						Medium dense, brown, fine to coarse SAND, little Gravel, wet.			
50									
51	11	18/10	54-55.5	38-23-28				6	
52									
53									
54						Very dense, brown, medium to coarse SAND, little Gravel, wet.			
55									
56	12	18/18	59-60.5	17-16-24					
57									
58									
59						Very dense, brown, medium to coarse SAND, little Gravel, wet. Changing at 60.0 feet to: Brown, fine SAND, some Silt, wet.			
60									
61	13	24/6	64-66	9-5 9-13				7	
62									
63									
64						Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet.			
65									
66	14	12/10	69-70	50-50/6"			69' 70' Clayey SILT	8	
67									
68									
69						Hard, brown and gray, Clayey SILT, little fine to coarse Sand, moist.			
70						Bottom of Borehole at 70.0 Feet			
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									
85									
86									
<b>REMARKS</b> 5. VAP groundwater sample was collected from approximately 44.0 to 49.0 feet below ground surface and submitted for analytical laboratory testing. 6. VAP groundwater sample was collected from approximately 54.0 to 59.0 feet below ground surface and submitted for analytical laboratory testing. 7. VAP groundwater sample was collected from approximately 64.0 to 69.0 feet below ground surface and submitted for analytical laboratory testing. 8. Borehole was backfilled with bentonite chips upon completion.									
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									Boring No.: WVNW-MW-200



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Rockford, Michigan

Boring No.: WVNW-MW-200A

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Bryan

Logged by: N. Kampfschulte

Date Start/Finish: 7-8-22 / 7-8-22

Boring Location: 596,050.4140 N; 12,788,597.9895 E

GS Elev.: 732.55' Datum: NAD83/NAVD88

**Auger/Casing**  
Type: Hollow Stem Auger  
O.D. / I.D.: 8.0" / 4.25"  
Hammer Wt.: 140lbs  
Hammer Fall: 30.0"  
TOC Elev.: 732.22'

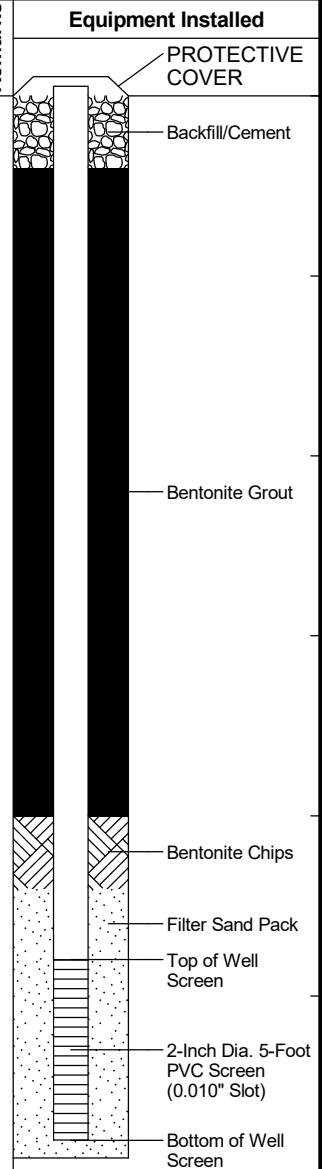
**Sampler**  
Split Spoon  
2.0" / 1 3/8"  
NA  
NA  
NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				PROTECTIVE COVER	Backfill/Cement
1						See WVNW-MW-200 for soil and stratum descriptions.				
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31						Bottom of Borehole at 29.5 Feet				



**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 24.0 to 29.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-200A

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 2/6/23



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RAP GSI

Rockford, Michigan

Boring No.: WVNW-MW-200B

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Bryan

Logged by: N. Kampfschulte

Date Start/Finish: 7-11-22 / 7-11-22

Boring Location: 596,045.2180 N; 12,788,597.9699 E

GS Elev.: 732.66' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

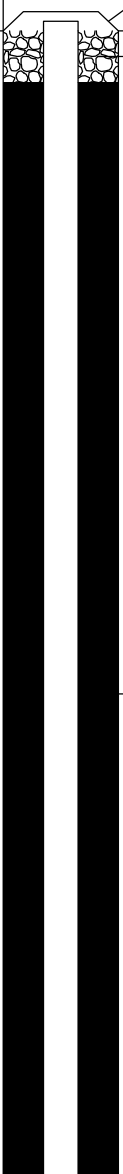
NA

TOC Elev.: 732.35'

NA

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1						See WVNW-MW-200 for soil and stratum descriptions.				PROTECTIVE COVER
2										Backfill/Cement
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
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40										
41										
42										
43										
44										

REMARKS

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-200B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/16/22



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Rockford, Michigan

Boring No.: WVNW-MW-200B

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60						Bottom of Borehole at 59.5 Feet		1	
61									
62									
63									
64									
65									
66									
67									
68									
69									
70									
71									
72									
73									
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96									
97									

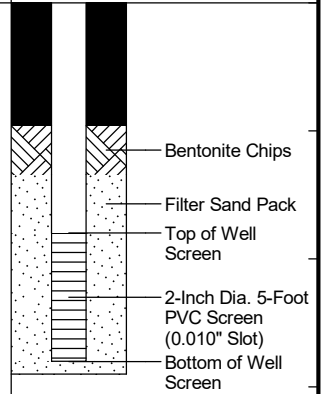
REMARKS

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 54.0 to 59.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-200B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/16/22







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Wolverine World Wide, Inc.

RAP GSI

Rockford, Michigan

Boring No.: WNNW-MW-201A

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: D. Watt

Date Start/Finish: 4-6-22 / 4-8-22

Boring Location: 596,993.111 N; 12,788,464.6804 E

GS Elev.: 723.49' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

Type: Hollow Stem Auger Split Spoon

O.D. / I.D.: 8.0" / 4.25" 2.0" / 1 3/8"

Hammer Wt.: 140lbs NA

Hammer Fall: 30.0" NA

TOC Elev.: 722.89' NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab
4/6/22	1315	8.7'	Augers 9'	10 min

Surveyed By: EXXEL Survey Date: 5/20/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1							TOPSOIL			
2										
3										
4	1	24/12	4-6	1-1		Very loose, dark brown, TOPSOIL. Changing at 4.2 feet to: Very loose, brown, fine to coarse SAND, trace Gravel, moist.	4.2' SAND			
5				1-1						
6										
7										
8										
9	2	24/18	9-11	1-1		Very loose, brown, fine to coarse SAND, trace Gravel, wet. Changing at 9.5 feet to: Very loose, brown, fine to medium SAND, trace Gravel, wet.				
10				2-3						
11										
12										
13										
14	3	24/20	14-16	1-7		Medium dense, brown, fine to medium SAND, trace Gravel, wet. Changing at 15.0 feet to: Medium dense, brown, fine to coarse SAND and Gravel, wet.				
15				15-13						
16										
17										
18										
19	4	24/2	19-21	2-2		Loose, brown, fine to coarse SAND and Gravel, wet.				
20				3-6						
21										
22										
23										
24	5	24/12	24-26	2-1		Loose, medium dense, brown, fine to medium SAND, wet.				
25				7-3						
26										
27										
28										
29	6	24/24	29-31	3-5		Medium dense, brown, fine to medium SAND, wet.				
30				5-8						
31										
32										
33										
34	7	24/24	34-36	1-1		Very loose, brown, fine to medium SAND, wet.				
35				2-1						
36										
37										
38										
39	8	24/16	39-41	8-12		Medium, brown, fine to medium SAND, wet.				

**REMARKS**

1. Cobble noted at 7.0 feet below ground surface.
2. Groundwater was encountered at approximately 9.0 feet below ground surface.
3. VAP groundwater sample was collected from approximately 9.0 to 14.0 feet below ground surface and submitted for analytical laboratory testing.
4. VAP groundwater sample was collected from approximately 29.0 to 34.0 feet below ground surface and submitted for analytical laboratory testing.
5. VAP groundwater sample was collected from approximately 39.0 to 44.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WNNW-MW-201A

BORING WELL 62961.52 GSI/GPJ GZA CORP.GDT 10/28/22



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RAP GSI

Rockford, Michigan

Boring No.: WNNW-MW-201A

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
41	9	24/20	44-46	12-13		Loose, brown, fine to medium SAND, wet.	SAND	6	
42									
43									
44	10	24/18	49-51	3-3		Medium dense, brown, fine to medium SAND, wet. Changing at 50.0 feet to: Medium dense, brown, fine to coarse SAND, some Gravel, wet.			
45				4-6					
46									
47	11	24/18	54-56	10-11		Hard, gray and brown, CLAY & SILT, trace fine to medium Sand, trace Gravel, moist.	54' CLAY & SILT	7	
48				16-20					
49									
50				7-15		Bottom of Borehole at 56.0 Feet	56'		
51				29-36					
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									
63									
64									
65									
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74									
75									
76									
77									
78									
79									
80									
81									
82									
83									
84									
85									
86									
<b>REMARKS</b> 6. VAP groundwater sample was collected from approximately 49.0 to 54.0 feet below ground surface and submitted for analytical laboratory testing. 7. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 12.0 to 17.0 feet below ground surface.									
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.									Boring No.: WNNW-MW-201A

BORING WELL 62961.52 GSI/GPJ GZA CORP.GDT 10/28/22



**GZA**  
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Engineers and Scientists

Wolverine World Wide, Inc.

RAP GSI

Rockford, Michigan

Boring No.: WVNW-MW-201B

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Daryll

Logged by: N. Kampfschulte

Date Start/Finish: 7-1-22 / 7-1-22

Boring Location: 596,993.1506 N; 12,788,469.1734 E

GS Elev.: 723.44' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

GROUNDWATER READINGS

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 723.09'

NA

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1						See WVNW-MW-201A for soil and stratum descriptions.				
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
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37										
						Bottom of Borehole at 36.0 Feet		1		

REMARKS

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 30.0 to 35.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-201B

BORING WELL 62961.52 GSI.GPJ GZA CORP.GDT 1/9/23



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Rockford, Michigan

Boring No.: WVNW-MW-201C

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Bryan

Logged by: N. Kampfschulte

Date Start/Finish: 7-6-22 / 7-6-22

Boring Location: 596,989.1015 N; 12,788,467.2068 E

GS Elev.: 723.49' Datum: NAD83/NAVD88

Auger/ Casing	Sampler
Type: Hollow Stem Auger	Split Spoon
O.D. / I.D.: 8.0" / 4.25"	2.0" / 1 3/8"
Hammer Wt.: 140lbs	NA
Hammer Fall: 30.0"	NA
TOC Elev.: 723.08'	NA

#### GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 8/25/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				PROTECTIVE COVER	Backfill/Cement
1						See WVNW-MW-201A for soil and stratum descriptions.				
2										
3										
4										
5										
6										
7										
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54										
55										
56										
57										
58										
59										
						Bottom of Borehole at 54.3 Feet		1		

#### REMARKS

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 49.0 to 54.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-201C

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 11/7/22



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Rockford, Michigan

Boring No.: WVNW-MW-202 VAP

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: Daryll

Logged by: N. Kampfschulte

Date Start/Finish: 9-6-22 / 9-8-22

Boring Location: 598,115.0000 N; 12,788,800.8890 E

GS Elev.: 722.06' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger Split Spoon

O.D. / I.D.: 8.0" / 4.25" 2.0" / 1 3/8"

Hammer Wt.: 140lbs NA

Hammer Fall: 30.0" NA

TOC Elev.: NA NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 7/10/2023

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (6")	Test Data				
1									None
2									
3									
4	1	24/18	4-6	3-2 3-3		Loose, light brown, medium SAND, dry.	SAND		
5									
6									
7									
8									
9	2	24/18	9-11	2-3 3-3		Loose, light brown, medium SAND, moist. Changing at 9.5 feet to: Loose, light brown, medium SAND, wet.		1 2	
10									
11									
12									
13									
14	3	24/12	14-16	3-4 5-8		Loose, light brown, medium SAND, wet.			
15									
16									
17									
18									
19	4	24/12	19-21	4-5 5-7		Loose, light brown, medium SAND, wet.		3	
20									
21									
22									
23									
24	5	24/12	24-26	3-4 8-8		Medium dense, light brown, medium SAND, little fine Gravel, wet.			
25									
26									
27									
28									
29	6	24/8	29-31	2-2 3-3		Loose, light brown, medium SAND, little fine to medium Gravel, wet.		4	
30									
31									
32									
33									
34	7	24/18	34-36	4-7 10-10		Medium dense, light brown, fine to medium SAND, some fine to medium Gravel, trace Clay, wet.			
35									
36									
37									

**REMARKS**

1. Groundwater was encountered at approximately 9.5 feet below ground surface.
2. VAP groundwater sample was collected from approximately 10.0 to 15.0 feet below ground surface and submitted for analytical laboratory testing.
3. VAP groundwater sample was collected from approximately 20.0 to 25.0 feet below ground surface and submitted for analytical laboratory testing.
4. VAP groundwater sample was collected from approximately 30.0 to 35.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-202 VAP

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/17/24



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Rockford, Michigan

Boring No.: WVNW-MW-202 VAP

Page: 2 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Rockford, Michigan										Check: J. Groenleer	
Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed		
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data						
39	8	24/18	39-41	3-4 5-4		Loose, light brown, fine to medium SAND, little fine to medium Gravel, wet.	SAND	5			
40											
41											
42											
43	9	24/18	44-46	2-3 4-9		Loose, light brown, fine to medium SAND, little fine to medium Gravel, wet.					
44											
45											
46											
47	10	24/20	49-51	5-9 13-11		Medium dense, light brown, medium SAND, some fine to medium Gravel, trace Clay, wet.		6			
48											
49											
50											
51	11	24/18	54-56	6-9 13-10		Medium dense, light brown, medium SAND, some fine to coarse Gravel, wet.					
52											
53											
54											
55	12	24/14	59-61	4-5 7-8		Medium dense, light brown, medium SAND, some fine Gravel, wet.		7			
56											
57											
58											
59	13	24/12	64-66	3-7 10-11		Medium dense, light brown, fine to medium SAND, some fine Gravel, wet.					
60											
61											
62											
63	14	24/18	69-71	2-2 3-3		Loose, light brown, fine to medium SAND, some fine Gravel, wet.		8			
64											
65											
66											
67	15	24/18	74-76	6-10 12-11		Medium dense, light brown, fine to medium SAND, some fine to medium Gravel, wet.	76'	9			
68											
69											
70											
71						Bottom of Borehole at 76.0 Feet					
72											
73											
74											
75											
76											
77											
78											
79											
80											
81											
82											
REMARKS	5. VAP groundwater sample was collected from approximately 40.0 to 45.0 feet below ground surface and submitted for analytical laboratory testing. 6. VAP groundwater sample was collected from approximately 50.0 to 55.0 feet below ground surface and submitted for analytical laboratory testing. 7. VAP groundwater sample was collected from approximately 60.0 to 65.0 feet below ground surface and submitted for analytical laboratory testing. 8. VAP groundwater sample was collected from approximately 70.0 to 75.0 feet below ground surface and submitted for analytical laboratory testing. 9. Borehole was backfilled with drill cuttings and bentonite grout upon completion.										
	Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.										
									Boring No.: WVNW-MW-202 VAP		

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/17/24



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Rockford, Michigan

Boring No.: WVNW-MW-202A

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: N. Kampfschulte

Date Start/Finish: 1-31-23 / 1-31-23

Boring Location: 598,120.5637 N; 12,788,806.0907 E

GS Elev.: 721.93' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger Split Spoon

O.D. / I.D.: 8.0" / 4.25" 2.0" / 1 3/8"

Hammer Wt.: 140lbs NA

Hammer Fall: 30.0" NA

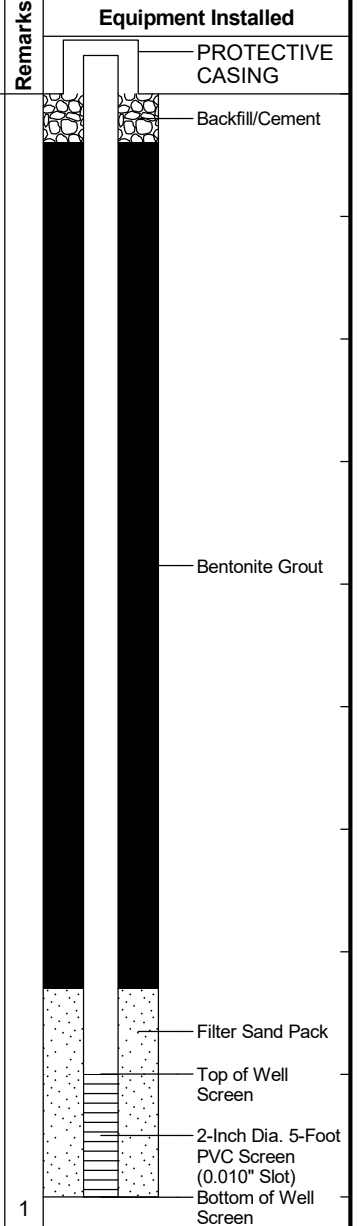
TOC Elev.: 724.40' NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 7/10/2023

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1						See WVNW-MW-202 VAP for soil and stratum descriptions.				
2										
3										
4										
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43										
44										
45										
46						Bottom of Borehole at 45.0 Feet				



**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 40.0 to 45.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-202A

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 2/16/24



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Rockford, Michigan

Boring No.: WVNW-MW-202B

Page: 1 of 2

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: D. Krause

Logged by: N. Kampfschulte

Date Start/Finish: 1-30-23 / 1-31-23

Boring Location: 598,115.0000 N; 12,788,800.8890 E

GS Elev.: 722.06' Datum: NAD83/NAVD88

**Auger/  
Casing**

**Sampler**

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 724.57'

NA

**GROUNDWATER READINGS**

Date	Time	Depth	Casing	Stab

Surveyed By: EXXEL Survey Date: 7/10/2023

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1						See WVNW-MW-202 VAP for soil and stratum descriptions.				
2										
3										
4										
5										
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**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-202B

BORING WELL 62961.52 GSI/GPJ GZA CORP GDT 1/17/24





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Rockford, Michigan

**Boring No.:** WVNW-MW-202B

**Page:** 2 of 2

**File No.:** 16.0062961.52

**Check:** J. Groenleer

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data				
56									<p>Filter Sand Pack Top of Well Screen 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) Bottom of Well Screen</p>
57									
58									
59									
60									
61									
62									
63									
64									
65						Bottom of Borehole at 65.0 Feet		1	
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
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118									

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen was set from approximately 60.0 to 65.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WVNW-MW-202B

BORING WELL 62961.52 GSI/GPJ GZA CORP.GDT 1/17/24



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Rockford, Michigan

Boring No.: WVNW-MW-203

Page: 1 of 1

File No.: 16.0062961.52

Check: J. Groenleer

Contractor: Stearns Drilling Company

Foreman: J. Gryska

Logged by: C. Martin

Date Start/Finish: 2-2-22 / 2-2-22

Boring Location: 597,341.413 N; 12,788,600.3613 E

GS Elev.: 729.32' Datum: NAD83/NAVD88

Auger/  
Casing

Sampler

Type: Hollow Stem Auger

Split Spoon

O.D. / I.D.: 8.0" / 4.25"

2.0" / 1 3/8"

Hammer Wt.: 140lbs

NA

Hammer Fall: 30.0"

NA

TOC Elev.: 728.91'

NA

# GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
2/2/22	1225	16.2'	Augers	10 min
2/2/22	1610	16.2'	Augers	2 hrs

Surveyed By: EXXEL Survey Date: 3/30/2022

Depth	Sample Information					Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed	
	No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Test Data					
1							SAND			
2										
3										
4	1	48/48	4-8			Light brown, SAND, trace Silt, trace Gravel, dry.		1		PROTECTIVE COVER
5										Backfill/Cement
6										Bentonite Grout
7										
8	2	48/48	8-12			Light brown, SAND, trace Silt, trace Gravel, dry.				Bentonite Chips
9										
10										
11										
12	3	48/48	12-16			Light brown, SAND, trace Silt, trace Gravel, dry.				Filter Sand Pack
13										Top of Well Screen
14										
15										
16	4	48/48	16-20			Light brown, SAND, trace Silt, trace Gravel, wet.		2		2-Inch Dia. 5-Foot PVC Screen (0.010" Slot)
17										Bottom of Well Screen
18										
19							20'			
20						Bottom of Borehole at 20.0 Feet		3		
21										
22										
23										
24										
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39										

## REMARKS

- Soil descriptions based on auger cuttings.
- Groundwater was encountered at approximately 16.2 feet below ground surface.
- Monitoring well was installed in borehole upon completion. Well screen was set from approximately 14.0 to 19.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: WVNW-MW-203

BORING WELL 62961.52 GSI.GPJ GZA CORP.GDT 5/9/22