

GEOSCIENCE

Project: MPWSP

Project No.

LOG OF BORING

SHEET 1 OF 14

Location	MW-9D	Date(s) Drilled	5-15-2015	Drilling Contractor	CASCADE	Bearing (Azimuth)
Ground Surface Elevation (ft)		Logged by	AZAD KHALIL	Drill Rig Type	ProSonic 600T	Plunge (Degrees)
Horizontal/Vertical Datum		Reviewed by		Borehole Diameter (in)	10 3/4" - 9.88" - 8"	Total Depth (ft)
Sample Information						
Depth (ft)	Not 25	Type and Use	First 10' 10' - 20'	Recovery (in)	MATERIAL DESCRIPTION	
	Penetration Rate	Overburden		Geologic Unit		Color CODE WELL CONSTRUCTION

5	SP	Top Soil w/ Vegetation & ASPHALT FRAGMENTS	10YR 4/4 DARK YELLOWISH BROWN
10	SP	SAND w/ SILT: SAME AS ABOVE	10.5'
10	SM	SILTY SAND; 80% SAND + 20% SILT; VF-F SAND; L. PLASTICITY; UNCONSOLIDATED; QFMA; SATURATED;	10.5' DARK OLIVE BROWN
10	SM (10 3/4")	SILTY SAND; 80% SAND + 20% SILT; F. SAND; Poorly Graded; L. Plasticity; Unconsolidated; QFMA; SATURATED;	11.5'
15	SP	SAND; 100% SAND; F. GRAINED; Poorly Graded; Unconsolidated; QFMA; SATURATED;	14.0' COLEY 1 2/10 Very DARK GREENISH BLACK
15	SP (10 3/4")	SAND; 100% SAND; F. GRAINED; Poorly Graded; Unconsolidated; QFMA; SATURATED;	14.0' COLEY 1 2/10 Very DARK GREENISH GRAY
20	SP	SAND; 100% SAND; F. GRAINED; Poorly Graded; Unconsolidated; QFMA; MOIST.	17.0' 10YR 4/6 DARK YELLOWISH BROWN
20	SP	SAND w/ SILT; 90% SAND + 10% SILT; F. SAND; Poorly Graded; L. Plasticity; Unconsolidated QFMA; SATURATED;	19.5' COLEY 1 2.5/EGY GREENISH BLACK
25		NOTE: INCLUDES THIN BEDS OF MUD & SAND.	

HAND AUGER
TO 5 ft BGS

No
Soil

17'-7"

17'-7"

25

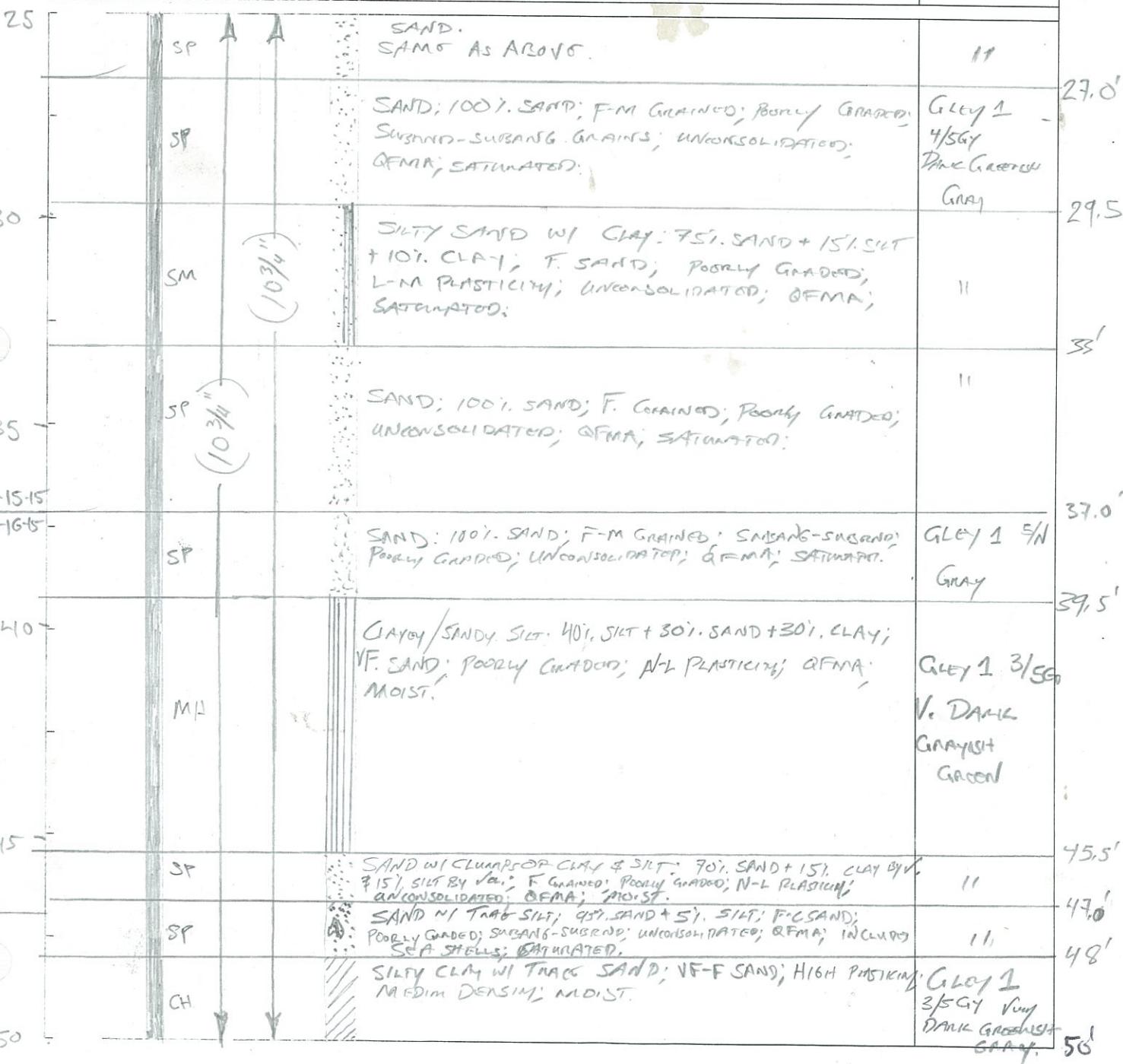
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Project: MPWSP

LOG OF BORING

SHEET 2 OF 14

Location	MW-9D	Date(s) Drilled	5-16-2015	Drilling Contractor	CASCADE	Bearing (Azimuth)
Ground Surface Elevation (ft)		Logged by	AZAD KHALIGI	Drill Rig Type	Pro Sonic 600T	Plunge (Degrees)
Horizontal/Vertical Datum		Reviewed by		Borehole Diameter (in)	10 3/4" → 9.88"	Total Depth (ft)
Sample Information					2"	
Depth (ft)	Notes Description (Graphs) Type and No. Test Date Time (hr)	Over-Dark Penetration (in)	Recovery (in)	Geologic Unit	MATERIAL DESCRIPTION	WELL CONSTRUCTION



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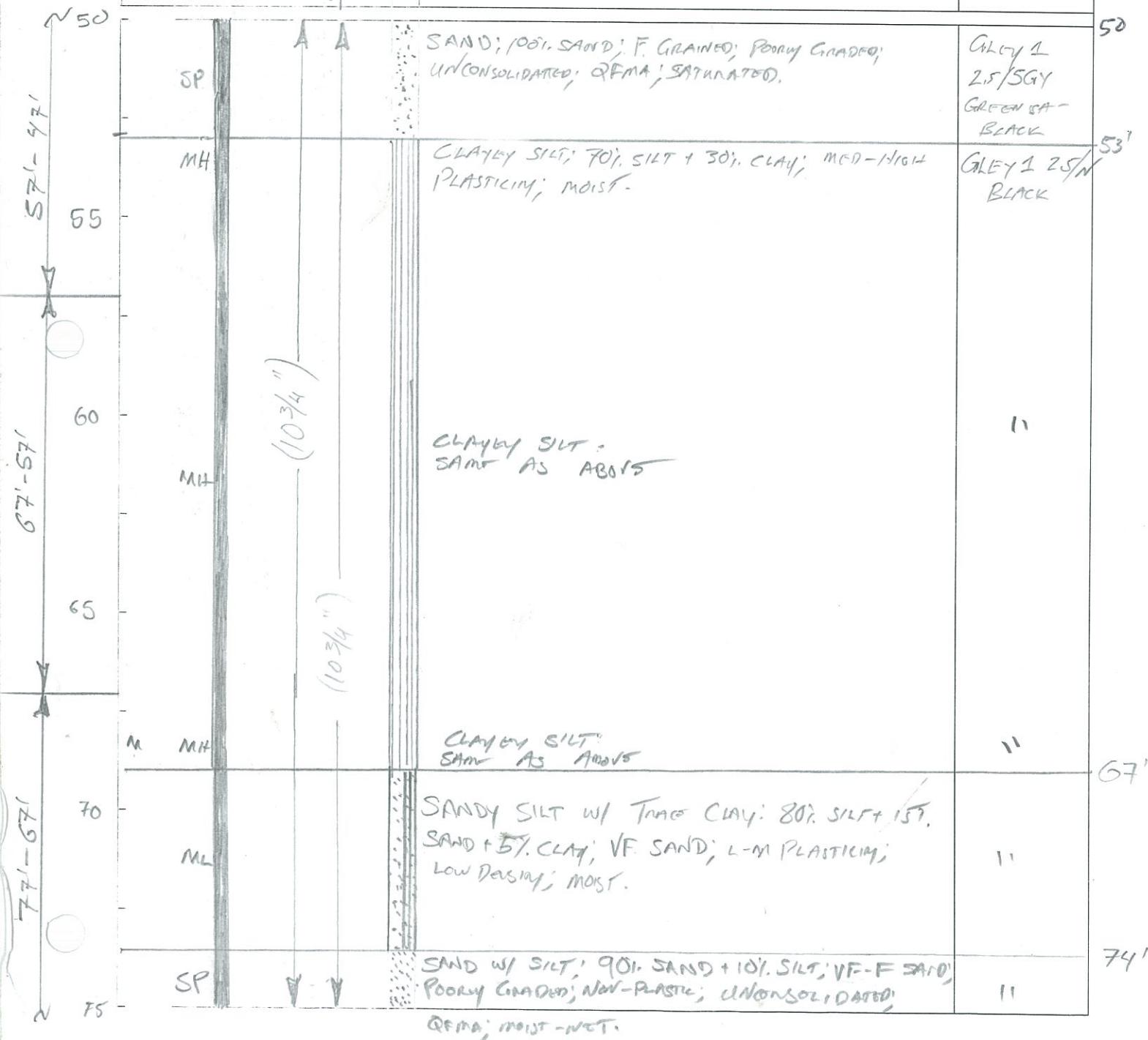
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Project No. MPWSP

LOG OF BORING

SHEET 3 OF 14

Location	Date(s) Drilled	Drilling Contractor	Bearing (Azimuth)
Ground Surface Elevation (ft.)	Logged by	Drill Rig Type	Plunge (Degrees)
Horizontal Datum	Reviewed by	Borehole Diameter (in)	Total Depth (ft.)
		10 3/4	360
Depth (ft)	Sample Information		
	Method (Core or Cut)	Type (Cutting)	
	Face Pipe	Core-Pipe	
	Recovery (in)	Geologic Unit	
	MATERIAL DESCRIPTION		WELL CONSTRUCTION



GEO SCIENCE

Project: MPWSP

Project No. MPWSP

LOG OF BORING

SHEET 4 OF 14

Location	MW-9D	Date(s) Drilled	5-16-15	Drilling Contractor	CASCADE	Bearing (Azimuth)
Ground Surface Elevation (ft)		Logged by	AZAD KHALI/HU	Drill Rig Type	Pro Sonic 600T	Plunge (Degrees)
Horizontal Vertical Datum		Reviewed by		Borehole Diameter (in)	10 3/4" → 9 1/2"	Total Depth (ft)
					→ 8'	
Sample Information			MATERIAL DESCRIPTION			WELL CONSTRUCTION
Depth (ft)	75-76	75	Geologic Unit			
Material	GRANITE	Penetration (in)				
Condition	Very Hard	Recovery (in)				
Time (min)						
Start Date						
End Date						
77 - 67'						
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Project: MPNSP

LOG OF BORING

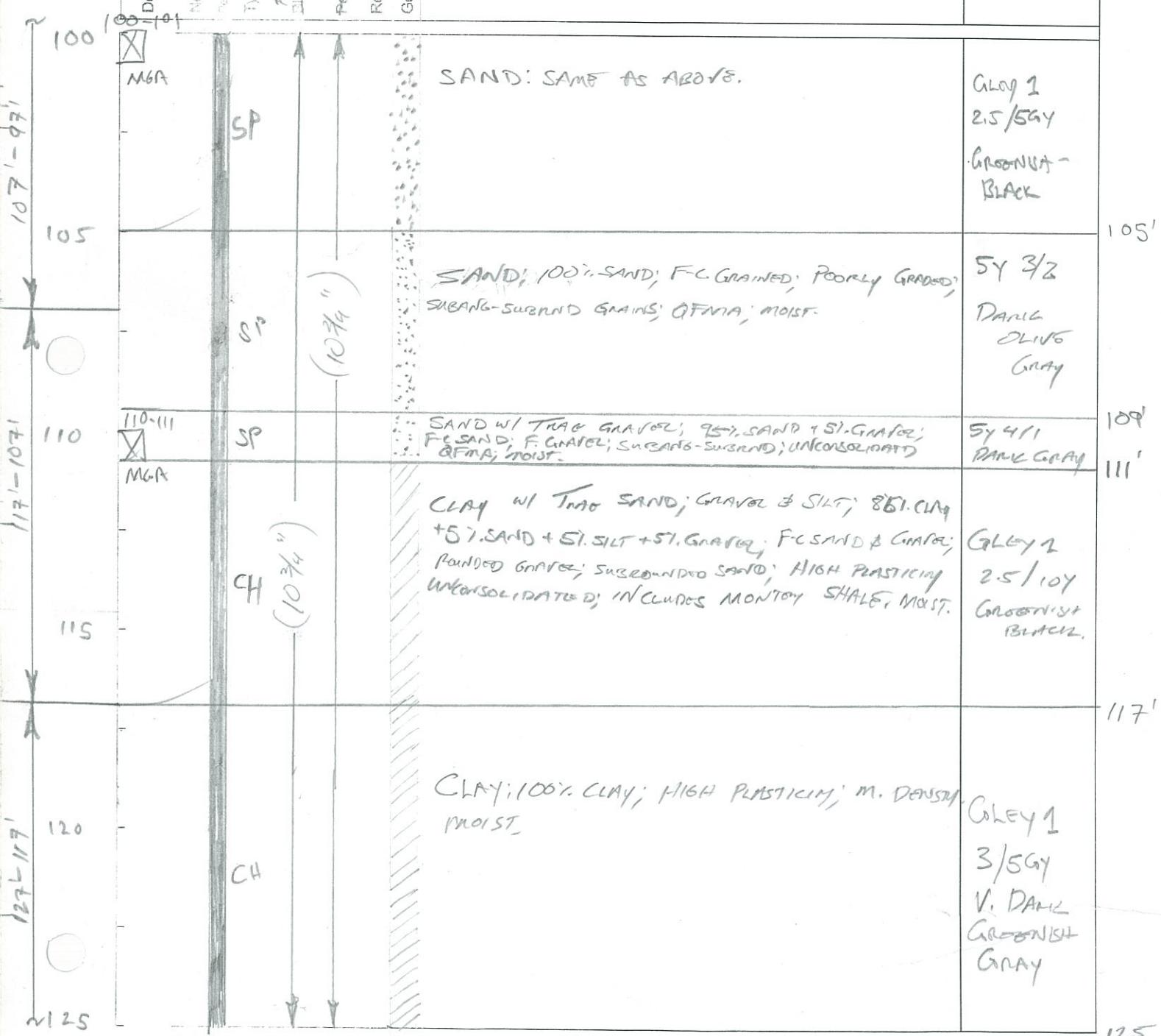
SHEET 5 OF 14

Location	MN-9D	Date(s) Drilled	5-16-15	Drilling Contractor	CASCADE	Bearing (Azimuth)	
Ground Surface Elevation (ft)		Logged by	AZAD KHALIGHI	Drill Rig Type	Pno Soni & 600T	Plunge (Degrees)	
Horizontal/Aerial Datum		Reviewed by		Borehole Diameter (in)	10 3/4" - 9 5/8" - 8"	Total Depth (ft)	360

Sample Information

Depth (ft)	Notch	Condition	Type	Penetration (ft)	Recovery (in)	Geologic Unit
	X	Faint-Dark	Black			

MATERIAL DESCRIPTION

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WELL
CONSTRUCTION

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LOG OF BORING

SHEET 6 OF 14

Location	MW-9D	Date(s) Drilled	5-17-15	Drilling Contractor	CASCADe	Bearing (Azimuth)
Ground Surface Elevation (ft)		Logged by	Azad Karalight	Drill Rig Type	SONIC	Plunge (Degrees)
Horizontal/Vertical Datum		Reviewed by		Borehole Diameter (in)	10 3/4 - 9 1/2 - 8"	Total Depth (ft)
						360

Sample Information

Depth (ft)

Fast Drill

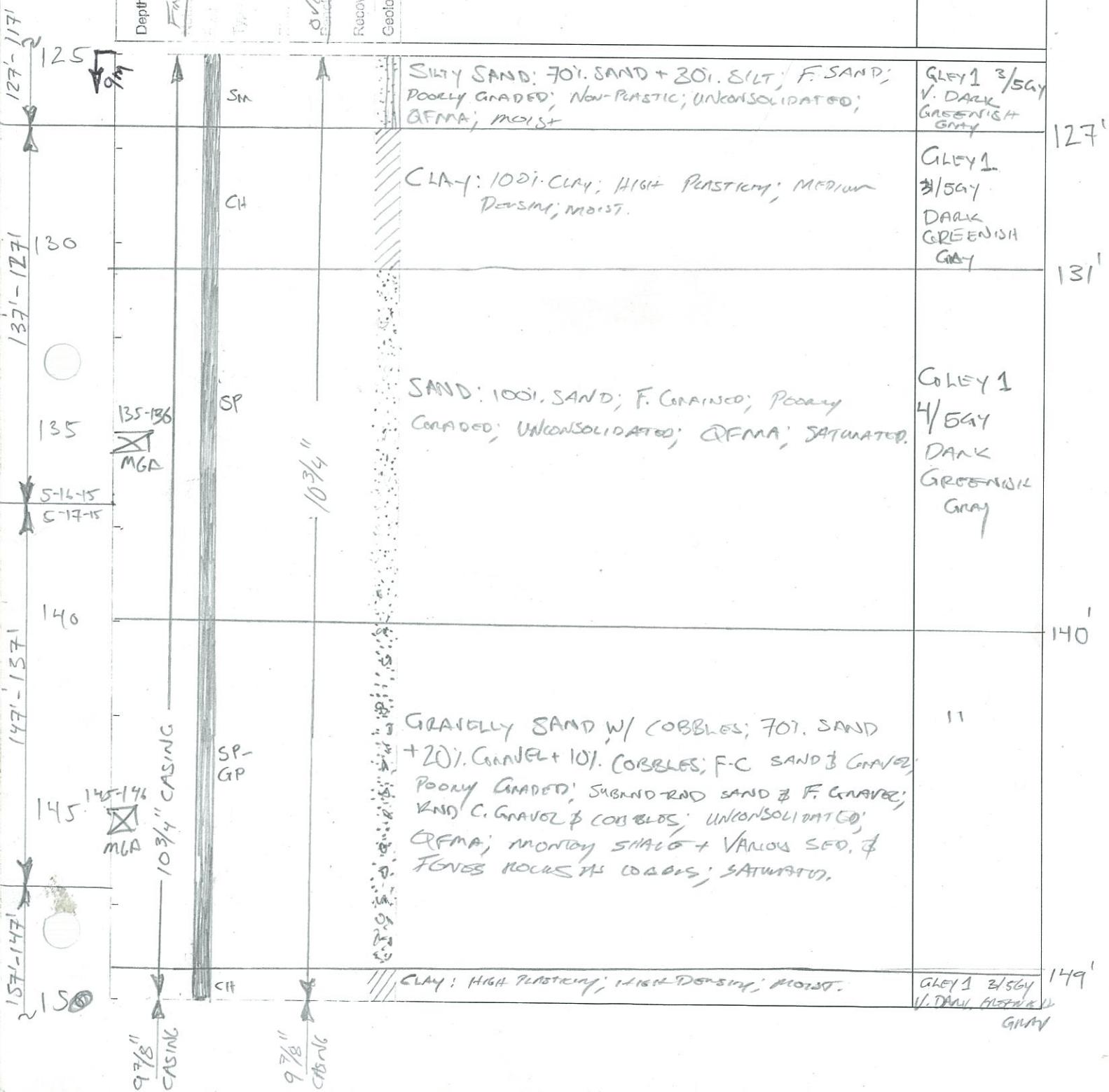
Percussion

Open Hole

Recovery (ft)

Geologic Unit

MATERIAL DESCRIPTION

Coring
WELL CONSTRUCTION

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Project: MPWSP

LOG OF BORING

SHEET 7 OF 14

Location	MW-9D	Date(s) Drilled	5-17-15	Drilling Contractor	CASCADE	Bearing (Azimuth)	
Ground Surface Elevation (ft)		Logged by	AZAD KHAN	Drill Rig Type	Pico Sonic 600T	Plunge (Degrees)	
Horizontal/Vertical Datum		Reviewed by		Borehole Diameter (in)	10 3/4" - 9 7/8" - 8"	Total Depth (ft)	360
Sample Information						Color	
Depth (ft)	Notes	Friction (lb/in)	Type (mud, air, etc.)	Bottom Hole Pressure (psi)	Over-Press (psi)	Geologic Unit	WELL CONSTRUCTION

MATERIAL DESCRIPTION

150							150'
157-157.1	SP				SAND w/ GRAVEL; 95% SAND + 5% GRAVEL; F-C SAND; F. GRAVEL; POORLY GRADED; SUBANG-SUBANO; UNCONSOLIDATED; QFA; SATURATED;	GRAY 1 4/5 GY DARK GREENISH GRAY	
156-157	X MGA		SP-CP	(9 7/8")	GRAVELY SAND w/ COBBLES; 65% SAND + 25% GRAVEL + 10% COBBLES; FC SAND & GRAVEL; POORLY GRADED; SUBANG-SUBANO SAND; RND GRAVEL; UNCONSOLIDATED; QFA; MONTEY SHALE & ANHYD. SED & LG. ROCKS AS COBBLES; SATURATED.	11	155'
160			GP-SP		SANDY GRAVEL w/ COBBLES; 70% GRAVEL + 15% SAND + 15% COBBLES; F-C SAND & GRAVEL; POORLY GRADED; SUBANG-SUBANO; GRAINS; UNCONSOLIDATED; QFA; INCLUDES MONTEY SHALE & VARIOUS IG. & SEP. ROCKS AS COBBLES & GRAVEL; SATURATED.	11	159'
165	X MGA		SP		SAND w/ GRAVEL; 90% SAND + 10% GRAVEL; FC SAND; F. GRAVEL; POORLY GRADED; SUBANG-SUBANO SAND; RND GRAVEL; UNCONSOLIDATED; QFA; SATURATED.	2.5 Y 5/2 GRAYISH BROWN	163'
166-167	X MGA		GP-SP		SANDY GRAVEL w/ COBBLES; 70% GRAVEL + 20% SAND + 10% COBBLES; FC SAND & GRAVEL; POORLY GRADED; SUBANG-SUBANO SAND; RND GRAVEL & COBBL; QFA; INCLUDES MONTEY SHALE & IG. & SEP. ROCKS AS COBBLES.	2.5 Y 4/3 OLIVE BROWN	164.5'
170			SP-GR	(9 7/8" CASING)	GRAVELY SAND; 70% SAND + 30% GRAVEL; F-C SAND & GRAVEL; POORLY GRADED; SUBANG-SUBANO SAND; RND GRAVEL; UNCONSOLIDATED; QFA; SATURATED; INCLUDES MONTEY SHALE & IG. & SEP. ROCKS AS COBBLES.	GRAY 1 3/5 GY V. DARK GREENISH GRAY	172'
177-177.1			GR-SP		SANDY GRAVEL; SAME AS ABOVE w/ 70% GRAVEL + 30% SAND.		
175			SP		SAND; 100% SAND; F-M SAND; POORLY GRADED; SUBANG-SUBANO; UNCONSOLIDATED; QFA; SATURATED.	2.5 Y 4/2 DARK GRAYISH BROWN	174.5'
			GP-SP		SEE BELOW		

GEO SCIENCE

Project:

Project No. MPWSP

LOG OF BORING

SHEET 8 OF 14

Location MW-9D	Date(s) Drilled 5-17-2015	Drilling Contractor ASCADO	Bearing (Azimuth)	
Ground Surface Elevation (ft)	Logged by AZAD KHALIGHI	Drill Rig Type ProSonic 600T	Plunge (Degrees)	
Horizontal Datum	Reviewed by	Borehole Diameter (in) 10 3/4" - 9 7/8" - 7 8"	Total Depth (ft) 360	
Sample Information				
Depth (ft)	Vibes	Geological Unit	MATERIAL DESCRIPTION WELL CONSTRUCTION COLOR	
35-176	<input checked="" type="checkbox"/> MGA	GP-SP	SANDY GRAVEL w/ TRACE COBBLES; 75% GRAVEL + 20% SAND + 5% COBBLES; F-C SAND & GRAVEL; POORLY GRADED; SUBANG-SUBROUND SAND & RND GRAVEL; UNCONSOLIDATED; QFMA; MONTOMY SHALE & IRREGULAR ROCKS; SATURATED.	2.5Y 3/3 DARK OLIVE BROWN

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175	<input checked="" type="checkbox"/> MGA	SP	SAND; 100% SAND; F-C GRAINED; POORLY GRADED; SUBANG-SUBROUND GRAINS; UNCONSOLIDATED; QFMA; SATURATED.	2.5Y 5/1 GRAY
180				
185	85-186'	<input checked="" type="checkbox"/> MGA	GRAVEL w/ SAND & COBBLES; 70% GRAVEL + 15% SAND + 15% COBBLES; F-C SAND & GRAVEL; POORLY GRADED; SUBANG-SUBROUND SAND; RND GRAVEL; UNCONSOLIDATED; QFMA; INCLUDES MONTOMY SHALE w/ VARIOUS IRREG. & SED. ROCKS. AS GRAVEL & COBBLES; SATURATED.	2.5Y 5/1 GRAY
190				
195	195-196'	<input checked="" type="checkbox"/> MGA	GRAVEL w/ COBBLES; 70% GRAVEL + 30% COBBLES; F-C GRAVEL; SUBANG-SUBROUND TO ROUND GRAVEL; ROUND COBBLES; UNCONSOLIDATED; INCLUDES MONTOMY SHALE w/ VARIOUS SED & IRREG. ROCKS; SATURATED.	2.5Y 4 1/2 DARK GRAYISH BROWN
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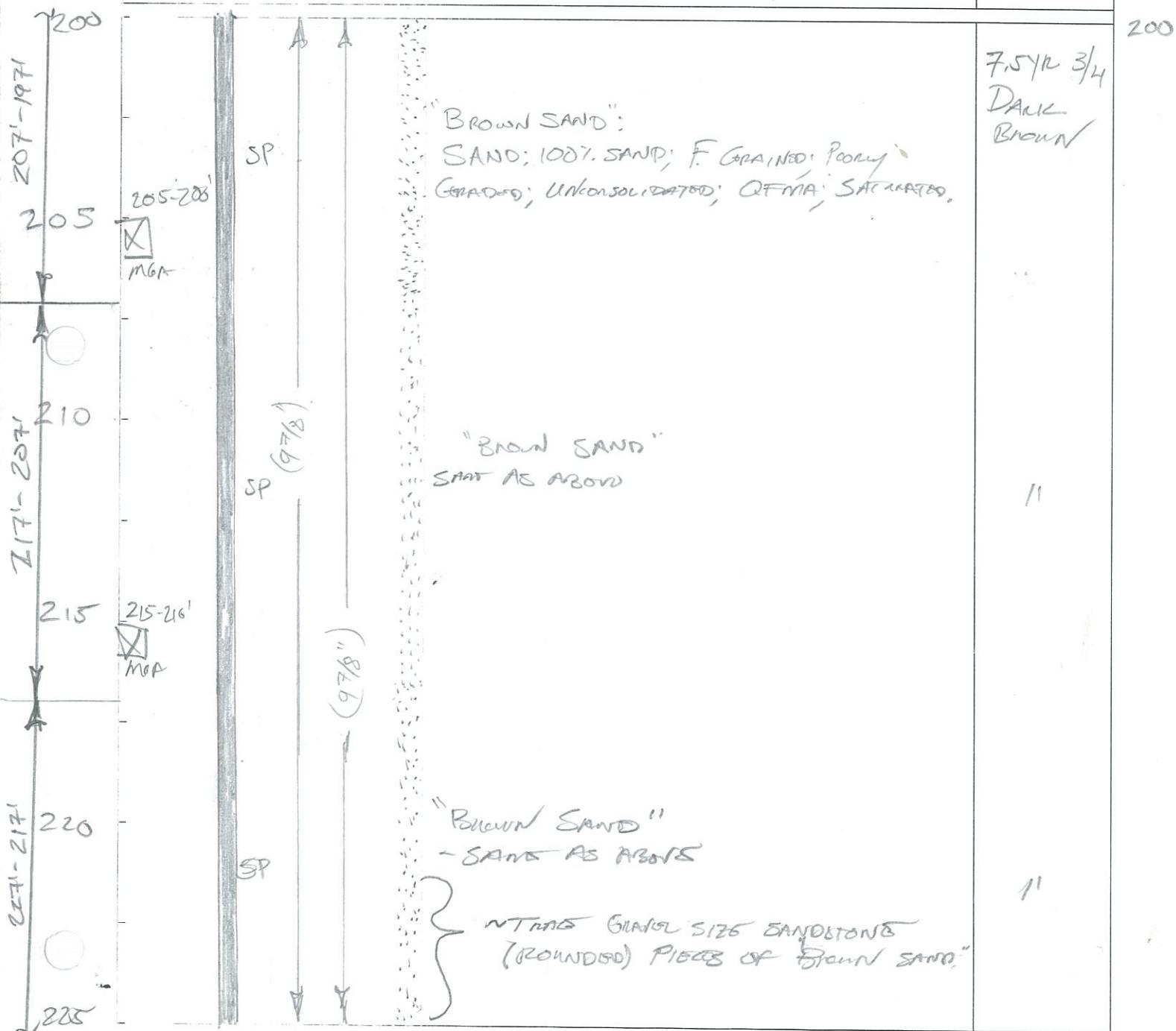
Project:

Project No. MPWSP

LOG OF BORING

SHEET 9 OF 14

Location MW-9D	Date(s) Drilled 5-17-15	Drilling Contractor CASCADE	Bearing (Azimuth)
Ground Surface Elevation (ft)	Logged by AZAD KHALIGHI	Drill Rig Type Pro Sonic 600T	Plunge (Degrees)
Horizontal/Vertical Datum	Reviewed by	Borehole Diameter (in)	Total Depth (ft) 360
Sample Information		MATERIAL DESCRIPTION	
Depth (ft)	Mass Description	Geologic Unit	Color WELL CONSTRUCTION
	Fast Drill		
	Over-Drill		
	Recovery (in)		



GEO SCIENCE

Project:

Project No. MPWSP

LOG OF BORING

SHEET 10 OF 14

Location	MW-9D	Date(s) Drilled	5-18-15	Drilling Contractor	CASCADE	Bearing (Azimuth)	
Ground Surface Elevation (ft.)		Logged by	AZAD KHALIGHI	Drill Rig Type	PROSONIC 600T	Plunge (Degrees)	
Horizontal Vertical Datum		Reviewed by		Borehole Diameter (in)	10 ³ / ₄ → 9 ³ / ₈ → 8"	Total Depth (ft)	360

Depth (ft)	Sample Information				Geologic Unit	MATERIAL DESCRIPTION	Core WELL CONSTRUCTION
	Notes	Color	Texture	Precipitation (in)			
225							

224'-227'	226-227	SP		"Brown SAND" SAME AS ABOVE		227
227'	227	CL		CLAY w/ SILT; 85% CLAY + 15% SILT; M. PLASTICITY; Very DENSE; Moist.	2.5y 4 ¹ / ₂ DARK GRAYISH BROWN	227
230		SP		SANDY CLAY; 95% SAND + 5% SILT; F. GRAINED; POORLY GRADED; UNCONSOLIDATED; QFM; MOIST.	2.5y 3 ¹ / ₃ DARK OLIVE BROWN	231
235		CL		CLAY w/ SILT; 90% CLAY + 10% SILT; L-NO PLASTICITY; Very DENSE; MOIST-DRY.	2.5y 3 ¹ / ₃ GREENISH-GRAY	232
240		CH	9 ³ / ₈ " CASING	SANDY CLAY w/ SILT; 65% CLAY + 30% SAND + 5% SILT; VFF SAND; M-H PLASTICITY; QFM; MOIST-DRY. INCLUDES SOME SANDSTONES/CLAYSTONE CHUNKS (CORRODED)	2.5y 5 ¹ / ₂ GRAYISH-BROWN	238.5
245		SL		CLAYEY SAND w/ SILT; 80% SAND + 15% CLAY + 5% SILT; F. SAND; POORLY GRADED; SLURRY; L. PLASTICITY; UNCONSOLIDATED; QFM; MOIST-DRY. INCLUDES SOME SANDSTONES/CLAYSTONE CHUNKS (CORRODED)	11 LIGHT OLIVE BROWN	241
250		SM		SILTY SAND w/ TRAC CLAY; 80% SAND + 15% SILT + 5% CLAY; VFF SAND; POORLY GRADED; LOW PLASTICITY; LOW DENSITY; UNCONSOLIDATED; QFM; MOIST-DRY.	2.5y 5 ¹ / ₃ LIGHT OLIVE BROWN	245
257'-247'		CH		SANDY CLAY; M-TRAC SILT; 70% CLAY + 25% SAND + 5% SILT; M-H PLASTICITY; HIGH DENSITY; MOIST.	2.5y 4 ¹ / ₃ DARK GREENISH GRAY	247
250		SM	8" Casing	SILY SAND; 90% SAND + 10% SILT; F-M GRAINS; POORLY GRADED; SUBANG-SUBANG; UNCONSOLIDATED; QFM; MOIST.	5y 3 ¹ / ₂ DARK OLIVE GRAY	249.5

GEORGE SCOTT

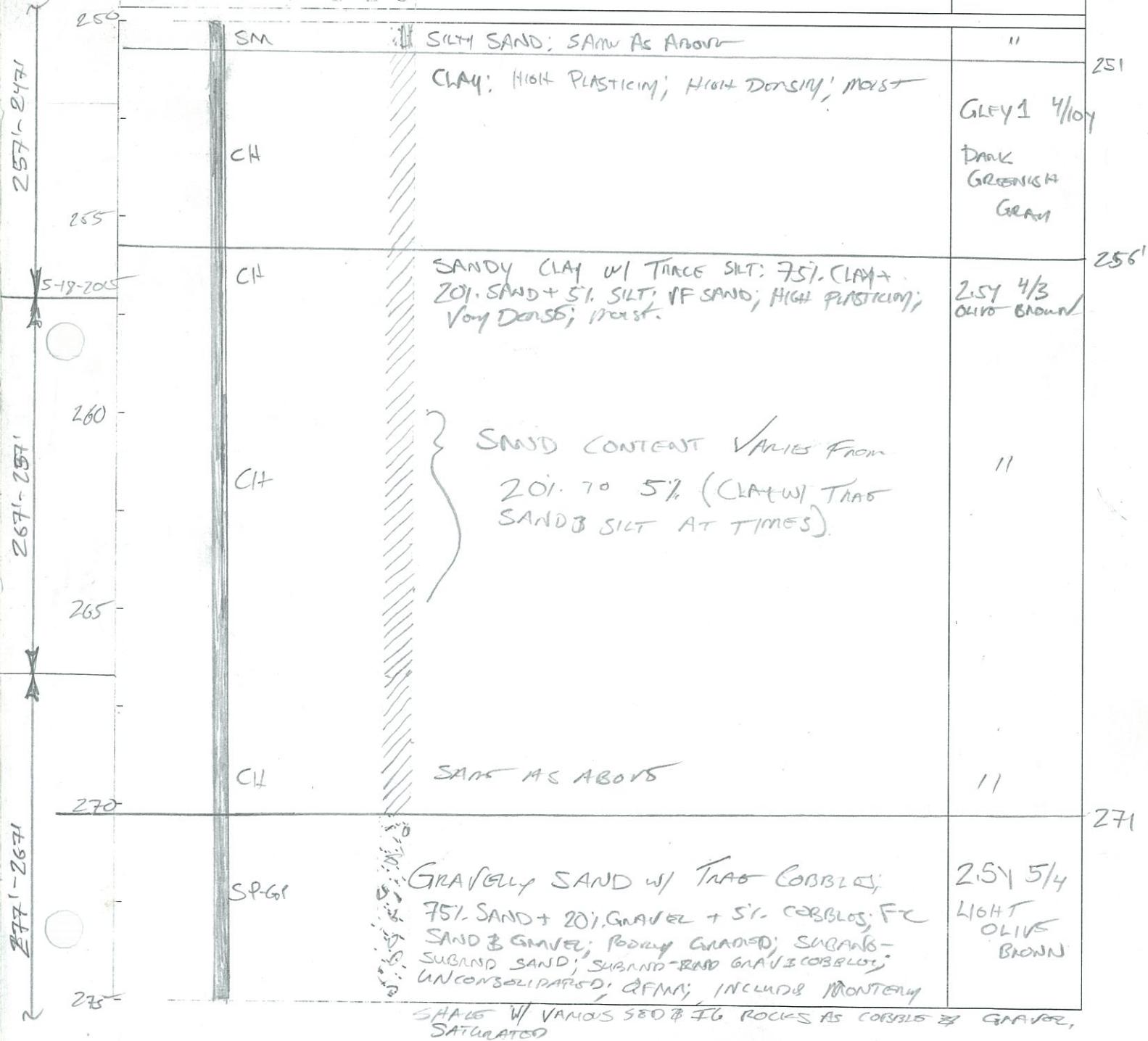
Project:

LOG OF BORING

SHEET 11 OF 14

Location	MW-9D	Date(s) Drilled	5-18-15	Drilling Contractor	CASCADE	Bearing (Azimuth)
Ground Surface Elevation (ft)		Logged by	AZAD KHALIGHI	Drill Rig Type	ProSonic 600T	Plunge (Degrees) 0°
Horizontal/Vertical Datum		Reviewed by		Borehole Diameter (in)	10 3/4" - 9 7/8" - 8"	Total Depth (ft) 360
Sample Information						

Depth (ft)	Material	Thickness (in)	Penetration (in)	Recovery (%)	Cedigic Unit	MATERIAL DESCRIPTION	WELL CONSTRUCTION Code
0 - 100	Clay	1/2	1/2	100			
100 - 200	Sand	1/2	1/2	100			
200 - 300	Sand	1/2	1/2	100			
300 - 400	Sand	1/2	1/2	100			
400 - 500	Sand	1/2	1/2	100			
500 - 600	Sand	1/2	1/2	100			
600 - 700	Sand	1/2	1/2	100			
700 - 800	Sand	1/2	1/2	100			
800 - 900	Sand	1/2	1/2	100			
900 - 1000	Sand	1/2	1/2	100			
1000 - 1100	Sand	1/2	1/2	100			
1100 - 1200	Sand	1/2	1/2	100			
1200 - 1300	Sand	1/2	1/2	100			
1300 - 1400	Sand	1/2	1/2	100			
1400 - 1500	Sand	1/2	1/2	100			
1500 - 1600	Sand	1/2	1/2	100			
1600 - 1700	Sand	1/2	1/2	100			
1700 - 1800	Sand	1/2	1/2	100			
1800 - 1900	Sand	1/2	1/2	100			
1900 - 2000	Sand	1/2	1/2	100			
2000 - 2100	Sand	1/2	1/2	100			
2100 - 2200	Sand	1/2	1/2	100			
2200 - 2300	Sand	1/2	1/2	100			
2300 - 2400	Sand	1/2	1/2	100			
2400 - 2500	Sand	1/2	1/2	100			
2500 - 2600	Sand	1/2	1/2	100			
2600 - 2700	Sand	1/2	1/2	100			
2700 - 2800	Sand	1/2	1/2	100			
2800 - 2900	Sand	1/2	1/2	100			
2900 - 3000	Sand	1/2	1/2	100			
3000 - 3100	Sand	1/2	1/2	100			
3100 - 3200	Sand	1/2	1/2	100			
3200 - 3300	Sand	1/2	1/2	100			
3300 - 3400	Sand	1/2	1/2	100			
3400 - 3500	Sand	1/2	1/2	100			
3500 - 3600	Sand	1/2	1/2	100			
3600 - 3700	Sand	1/2	1/2	100			
3700 - 3800	Sand	1/2	1/2	100			
3800 - 3900	Sand	1/2	1/2	100			
3900 - 4000	Sand	1/2	1/2	100			
4000 - 4100	Sand	1/2	1/2	100			
4100 - 4200	Sand	1/2	1/2	100			
4200 - 4300	Sand	1/2	1/2	100			
4300 - 4400	Sand	1/2	1/2	100			
4400 - 4500	Sand	1/2	1/2	100			
4500 - 4600	Sand	1/2	1/2	100			
4600 - 4700	Sand	1/2	1/2	100			
4700 - 4800	Sand	1/2	1/2	100			
4800 - 4900	Sand	1/2	1/2	100			
4900 - 5000	Sand	1/2	1/2	100			
5000 - 5100	Sand	1/2	1/2	100			
5100 - 5200	Sand	1/2	1/2	100			
5200 - 5300	Sand	1/2	1/2	100			
5300 - 5400	Sand	1/2	1/2	100			
5400 - 5500	Sand	1/2	1/2	100			
5500 - 5600	Sand	1/2	1/2	100			
5600 - 5700	Sand	1/2	1/2	100			
5700 - 5800	Sand	1/2	1/2	100			
5800 - 5900	Sand	1/2	1/2	100			
5900 - 6000	Sand	1/2	1/2	100			
6000 - 6100	Sand	1/2	1/2	100			
6100 - 6200	Sand	1/2	1/2	100			
6200 - 6300	Sand	1/2	1/2	100			
6300 - 6400	Sand	1/2	1/2	100			
6400 - 6500	Sand	1/2	1/2	100			
6500 - 6600	Sand	1/2	1/2	100			
6600 - 6700	Sand	1/2	1/2	100			
6700 - 6800	Sand	1/2	1/2	100			
6800 - 6900	Sand	1/2	1/2	100			
6900 - 7000	Sand	1/2	1/2	100			
7000 - 7100	Sand	1/2	1/2	100			
7100 - 7200	Sand	1/2	1/2	100			
7200 - 7300	Sand	1/2	1/2	100			
7300 - 7400	Sand	1/2	1/2	100			
7400 - 7500	Sand	1/2	1/2	100			
7500 - 7600	Sand	1/2	1/2	100			
7600 - 7700	Sand	1/2	1/2	100			
7700 - 7800	Sand	1/2	1/2	100			
7800 - 7900	Sand	1/2	1/2	100			
7900 - 8000	Sand	1/2	1/2	100			
8000 - 8100	Sand	1/2	1/2	100			
8100 - 8200	Sand	1/2	1/2	100			
8200 - 8300	Sand	1/2	1/2	100			
8300 - 8400	Sand	1/2	1/2	100			
8400 - 8500	Sand	1/2	1/2	100			
8500 - 8600	Sand	1/2	1/2	100			
8600 - 8700	Sand	1/2	1/2	100			
8700 - 8800	Sand	1/2	1/2	100			
8800 - 8900	Sand	1/2	1/2	100			
8900 - 9000	Sand	1/2	1/2	100			
9000 - 9100	Sand	1/2	1/2	100			
9100 - 9200	Sand	1/2	1/2	100			
9200 - 9300	Sand	1/2	1/2	100			
9300 - 9400	Sand	1/2	1/2	100			
9400 - 9500	Sand	1/2	1/2	100			
9500 - 9600	Sand	1/2	1/2	100			
9600 - 9700	Sand	1/2	1/2	100			
9700 - 9800	Sand	1/2	1/2	100			
9800 - 9900	Sand	1/2	1/2	100			
9900 - 10000	Sand	1/2	1/2	100			



GEOSCIENCE

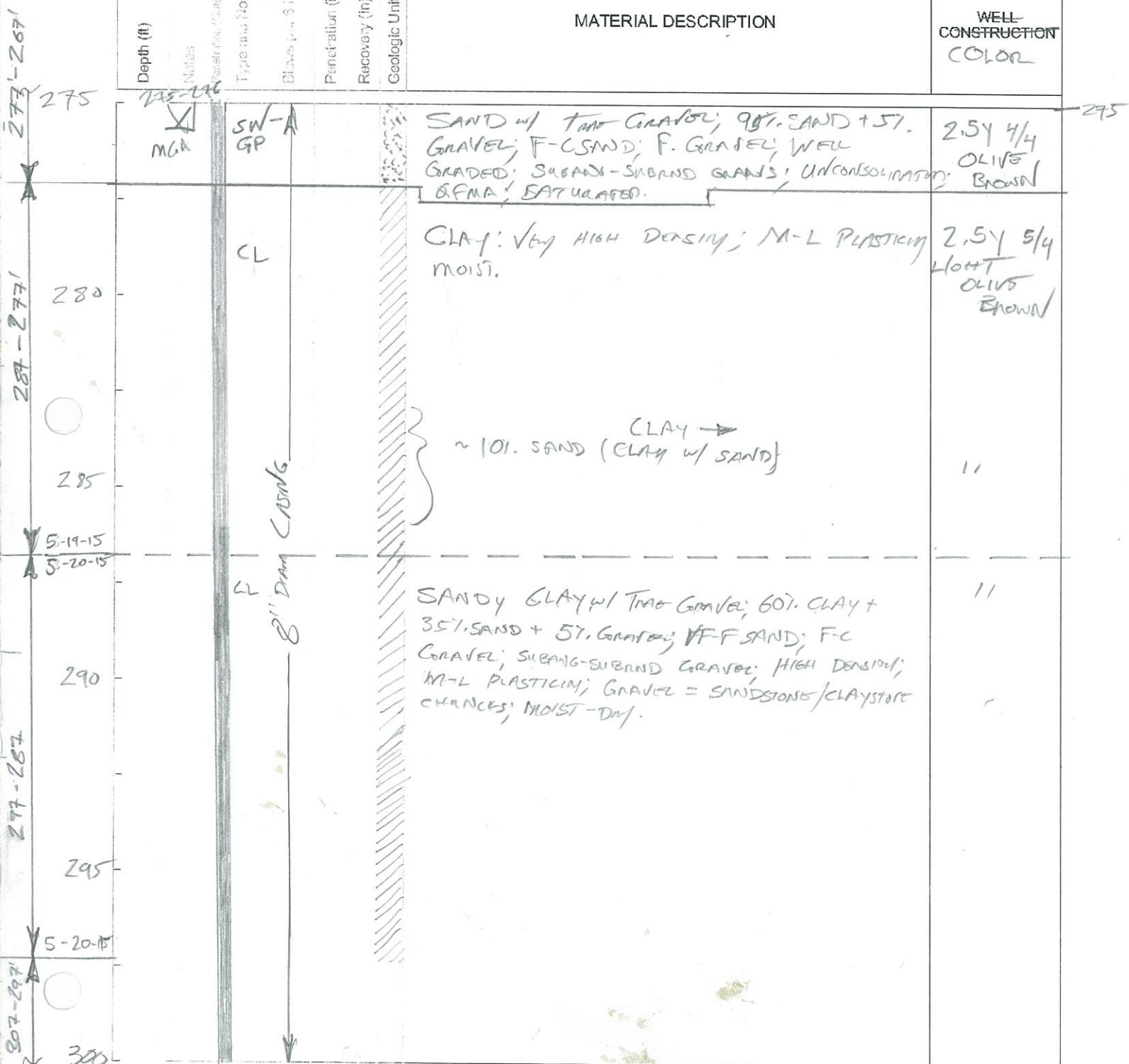
Project:

Project No. MPNSP

LOG OF BORING

SHEET 12 OF 14

Location NW - 90	Date(s) Drilled 5-19-2015	Drilling Contractor CASCADe	Bearing (Azimuth)
Ground Surface Elevation (ft)	Logged by AZAD KHALLY	Drill Rig Type SONIC	Plunge (Degrees)
Horizontal/Vertical Datum	Reviewed by	Borehole Diameter (in) 10 ³ / ₄ 9 ⁷ / ₈ +8	Total Depth (ft) 360
Sample Information			
Depth (ft)	Notes Type and 1/8. Blows per 5 in.	Penetration (in) Recovery (in)	Geologic Unit MATERIAL DESCRIPTION WELL CONSTRUCTION COLOR



GEOSCIENCE

Project: RBF/MPWSP
Monitoring Well 9D
Project No.: 13027-14

LOG OF BORING

SHEET 11 OF 14

Location Marina			Date(s) Drilled 5/26 - 5/27	Drilling Contractor Cascade Drilling	Bearing (Azimuth)
Ground Surface Elevation (ft)			Logged by ECW	Drill Rig Type	Plunge (Degrees) Vert
Horizontal/Vertical Datum			Reviewed by	Borehole Diameter (in)	Total Depth (ft)

CONFIDENTIAL DRAFT

Subject to Revision

MATERIAL DESCRIPTION

Depth (ft)	Notes	Penetration (Graphic)	Sample Information	Geologic Unit	SOIL COLOR
	Type and No.	Blows per 6 in.	Penetration (in)	Recovery (in)	
300					
301					
302				/	
303				302.5	
304				(SC) Clayey Sand: 85% v.f. to f. grained sand sub-subR	2.5x
305				15% high plast clay	5/3
306					light olive brown
307				307	
308				(CH) FAT CLAY. 100% High Plast.	"
309				Fat clay. Tr fine sand	
310				SA-SR. (MA)	
311				Mudstone.	
312				Progressively harder/more cemented from 307-314.	
313				314	
314				(CH) FAT CLAY W/SAND: 60% High Plast	1'
315				Fat clay. 40% fine sand SA-SR, more	
316				f. sand @ 315.5-316 ft bgs. Mod. cementation	
317				(QFMA)	
318				(CH) FAT CLAY W/SAND: 60% High Plast	2.5y 5/3
319				fat clay 40% fine sand ST-SR	light olive
320				moderate cementation.	brown
321				320.5 (QFMA) 2 clay colors →	+ 2.5y 5/2
322					grayish brown
323				(SC) CLAYEY SAND: 60% f. sand	
324				SA-SR 40% high plast clay	
325				moderate cementation	"
326				(QFMA) tr shells	
327				tr medium sand	
328				2 clay colors	
329				327 more clay from 326-327	
330				(CH) FAT CLAY. med-high plast.	GLEY 1
				tr f sand & silt 334.4-335 ft bgs.	10GY 5/1
				Strong Cementation.	greenish gray

Biotite
Clay

to

GLEY 2 10B 4/1
dark bluish gray

GEOSCIENCE

Project: RBF/MPWSP
Monitoring Well
Project No.: 13027-14

LOG OF BORING

SHEET 12 OF 14

Location	MW-9D	Date(s) Drilled	5/26/15	Drilling Contractor	Cascade Drilling	Bearing (Azimuth)
Ground Surface Elevation (ft)		Logged by	ECW	Drill Rig Type		Plunge (Degrees) Vert
Horizontal/Vertical Datum		Reviewed by		Borehole Diameter (in)		Total Depth (ft)

CONFIDENTIAL DRAFT

Subject to Revision

MATERIAL DESCRIPTION

SOIL COLOR

Depth (ft)	Notes	Penetration (Graphic)	Sample Information	Geologic Unit		
		Type and No.	Blows per 6 in.	Penetration (in)	Recovery (in)	
330						
331						
332						
333						
334						
335						
336						
337						
338						
339						
340						
341						
342						
343						
344						
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353						
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355						
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357						
358						
359						
360						

GEOSCIENCE

Project: RBF/MPWSP
Monitoring Well
Project No.: 13027-14

LOG OF BORING

SHEET 13 OF 14

Location	MN-9D	Date(s) Drilled	5-27-15	Drilling Contractor	Cascade Drilling	Bearing (Azimuth)
Ground Surface Elevation (ft)		Logged by	E.C.W	Drill Rig Type	Pro Sonde GOSI	Plunge (Degrees) Vert
Horizontal/Vertical Datum		Reviewed by		Borehole Diameter (in)	10 3/4 → 9 7/8 → 8"	Total Depth (ft)

CONFIDENTIAL DRAFT

Subject to Revision

MATERIAL DESCRIPTION

Depth (ft)	Notes	Penetration (Graphic)	Sample Information			SOIL COLOR
	Type and No.	Blows per 6 in.	Penetration (in)	Recovery (in)	Geologic Unit	
360						
361						
362						
363					362 (SP) 90% FMC sand A-SR, 5% FC gravel to 35mm. 363.1 5% clay.	2.5Y 5/3 light olive brown
364					(CH) 50% Fat Clay, Strong cement, med plast.	2.5Y
365					365.2	5/3 light olive brown
366					(CH) 100% Fat clay. Strong cementation, High plasticity	2.5Y 5/4 light olive brown
367					366.2 (SP) 90% FMC sand 10% clay tr FC gravel to 28mm	2.5Y 5/3 light olive brown
368					(SP) SAND: 95% FMC sand A-SUBR. 5% FC gravel to 70mm. Tr clay.	2.5Y
369					Mudstone	4/3
370					(QFMAD)	light yellowish
371						brown
372						
373						
374						
375						
376						
377					377 (SP) SAND w/GRANULAR, 80% FMC sand A-SUBR, 20% FC Gravel to 45mm.	"
378					(QFMAD)	
379						
380						
381					381.2 (CH) FAT CLAY w/sand and gravel. 50% (QFMAD) Strongly cemented clay. 30% FMC sand A-SR. 283.2 20% FC gravel to 70mm. Mudstone	2.5Y 5/4 light olive brown
382						
383						
384					(SPSC) SAND w/CLAY & gravel 70% FMC sand A-SUBR. 20% FC Gravel to 65mm. 10% clay QFMAD	2.5Y 4/3 light yellowish brown
385					387. mud stone	
386						
387					SAND w/ GRANULE & CLAY: 70% SAND + 20% Gravel + 10% CLAY; F-C SAND & Gravel; POORLY GRADED; ANG - SUBROUND GRAINS; QFMAD, MOIST	2.5Y 5/3 LIGHT OLIVE BROWN
388						
389						
390						

GEOSCIENCE

Project: RBF/MPWSP
Monitoring Well
Project No.: 13027-14

LOG OF BORING

SHEET 14 OF 14

Location MW-9D		Date(s) Drilled 5-27-15	Drilling Contractor Cascade Drilling	Bearing (Azimuth)
Ground Surface Elevation (ft)		Logged by ECW	Drill Rig Type Pro Sonic 600T	Plunge (Degrees) Vert
Horizontal/Vertical Datum		Reviewed by	Borehole Diameter (in) 10 3/4 > 9 7/8	Total Depth (ft) 395

Depth (ft)	Notes	Sample Information			Geologic Unit	MATERIAL DESCRIPTION	SOIL COLOR
		Type and No.	First Drill Blows per 6 in.	Open Hole Penetration (in)			
390							
391		SP-SC	↑	↑		SAME AS ABOVE.	11
392							
393		SP	(6")	(8")		SAND: 80%, SAND + 10%, GRAVEL + 10%; CLAY; F-C SANDY GRAVEL; MEDIUM GRADING ANGULAR-SUBANGULAR; QFM, MOIST	2.5 5/4 LIGHT OLIVE BROWN
394							
395		SP	↓	↓		SAND: 70%, SAND + 30%; GRAVEL; F-C. GRAINS POORLY GRADED; ANGULAR-SUBANGULAR; QFM, MOIST.	2.5 5/4 LIGHT OLIVE BROWN
396							
397							
398							
399						T.D. = 395 ft RGS	
400							
401						* GEOPHYSICAL LOG ON 3/28/15	
402						* OVER-DRILL ON 3/29 & 3/30	
403						• 10 3/4" CASING ⇒ 0ft - 150ft	
404						• 9 7/8" CASING ⇒ 150ft - 300ft	
405						• 8" CASING ⇒ 300ft - 400ft	
406							
407							
408							
409							
410							
411							
412							
413							
414							
415							
416							
417							
418							
419							
420							