

MONITORING WELL INSTALLATION LOG
 NYSDEC OHMS Document No. 201460232-00043

JOB NO. <u>B53-3051</u>	PROJECT <u>GWM / WELLS / MODEL CITY</u>	WELL NO. <u>P10-13</u>	SHEET <u>1</u> OF <u>1</u>
SA INSP. <u>GR</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS - 4 1/4" ID</u>	GROUND ELEV. <u>321.2 FT</u>	WATER DEPTH <u>3.89 FT</u>
WEATHER <u>CLEAR</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS, INC.</u>	COLLAR ELEV. <u>322.47 FT</u>	DATE/TIME <u>9-22-86</u>
TEMP. <u>65°F</u>	DRILL RIG <u>CME 45</u>	DRILLER <u>K SWINNICH</u>	STARTED <u>9:52</u> <u>5/13/86</u> COMPLETED <u>9:36</u> <u>5/13/86</u>
LOCATION/COORDINATES <u>N 8214 09 E 11442 35</u>			

WELL CASING <u>2.0</u> IN DIA. <u>8.0</u> LT	WELL SCREEN <u>2.0</u> IN DIA. <u>10.6</u> LT	BENTONITE SEAL <u>PELLETS</u> <u>4.2'</u> DEEP
CASING TYPE <u>304 STAINLESS STEEL</u>	SCREEN TYPE <u>304 STAINLESS STEEL</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>
JOINT TYPE <u>FLUSH TAPERED</u> <u>TAPED</u> <u>IRON O-RINGS</u>	SLOT SIZE <u>0.006</u> INCH	FILTER PACK QTY <u>12.4 L.F.</u> <u>310</u> LBS
GROUT QUANTITY <u>NA</u>	CENTRALIZERS <u>NONE</u>	FILTER PACK TYPE <u>#1-Q SAND</u>
GROUT TYPE <u>NA</u>	DRILLING MUD TYPE <u>NONE</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>

ELEV./DEPTH (Ft)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
321.1	GROUND SURFACE		<p>AUGERED TO 17.0 FT. ADDED #1-Q SAND TO 17.2 FT. BELOW GROUND SURFACE (TOOK SAMPLE). INSTALLED WELL PIPE (1-10' SCREEN, 1-3' RISER, 1-5' RISER) 1.4 FT. STICKUP. ADDED #1-Q SAND TO 9.5 FT. BELOW GROUND SURFACE. ADDED PELLETS TO 1.3 FT. REMOVED AUGERS. MIXED CEMENT GROUT. FILLED TO GROUND SURFACE. PUT ON 8" ALUMINUM PROTECTIVE CASING. WEEP HOLES WERE PUT IN CASING FOR DRAINAGE. FILLED INTERIOR OF CASING WITH #4-Q SAND. PROTECTIVE POSTS WERE PUT AROUND WELL. A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING. A DEDICATED STAINLESS STEEL BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.</p>	
0.0	VERY DARK GRAY FINE SAND SOME F TO C TO SOME BROWN CLAYEY SILT			
319.1				
2.0	UPPER CLAY TILL VERY STIFF, BROWN, CLAYEY SILT TO FIRM, BROWN SILTY CLAY, SOME F TO C SAND, LITTLE TO TRACE F GRAVEL GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 6.0 FT.			
307.1				
14.0	UPPER SILT TILL COMPACT BROWN SILT, AND TO SOME F TO C SAND, GRAY CLASTS			
304.1				
17.00	GLACIOLACUSTRINE CLAY VERY SOFT GRAY CLAY LITTLE F SAND			
303.1				
18.0	END OF SAMPLING AUGERED TO 17.9 FT			
			<p>WELL DEVELOPMENT NOTES</p> <p>DATE DEVELOPED: 4-14-86 TO 6-11-86</p> <p>DEVELOPMENT METHOD: AIR LIFT</p> <p>VOLUME PURGED: 34 GAL.</p> <p>FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT TABLE.</p>	
			<p>NOTE: A 8 1/2 FT. END CAP WAS PLACED AT THE BOTTOM OF THE SCREEN SECTION 2.5 AND 10 FT. SCREEN SECTIONS ARE ACTUALLY 2.35, 9.325, 10.325 FT IN LENGTH, RESPECTIVELY.</p>	

MONITORING WELL INSTALLATION LOG

NY SDEC O.R.M.S. Document No. 201409252-00043

JOB NO. <u>853-3051</u>	PROJECT <u>CWM / WELLS / MODEL CITY</u>	WELL NO. <u>P10-25</u>	SHEET <u>1</u> OF <u>1</u>
GA INSP. <u>GR</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS - 4 1/4" ID</u>	GROUND ELEV. <u>322.2 FT.</u>	WATER DEPTH <u>3.51 FT.</u>
WEATHER <u>CLEAR</u>	DRILLING COMPANY <u>EMPIRE GHS INVESTIGATIONS, INC.</u>	COLLAR ELEV. <u>323.76 FT.</u>	DATE/TIME <u>9-22-86</u>
TEMP. <u>70° F</u>	DRILL RIG <u>CME 45</u>	DRILLER <u>K. SWINNIGH</u>	STARTED <u>11:05</u> <u>5-12-86</u> COMPLETED <u>11:57</u> <u>5-12-86</u>
LOCATION/COORDINATES <u>N 8221.40</u> <u>E 11649.47</u>		TIME / DATE	TIME / DATE

MATERIALS INVENTORY

WELL CASING <u>2.0</u> IN DIA. <u>100</u> LF	WELL SCREEN <u>2.0</u> W. DIA. <u>10.6</u> LF	BENTONITE SEAL <u>PELLETS 4.3' DEEP</u>
CASING TYPE <u>304 STAINLESS STEEL</u>	SCREEN TYPE <u>304 STAINLESS STEEL</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>
JOINT TYPE <u>RUSH</u> <u>TEFLON</u> <u>VITON</u>	SLOT SIZE <u>0.006 INCH</u>	FILTER PACK QTY <u>12.7 L.F. ; 300 LBS</u>
GRUNT QUANTITY <u>NA</u>	CENTRALIZERS <u>NONE</u>	FILTER PACK TYPE <u>#1-Q SAND</u>
GRUNT TYPE <u>NA</u>	DRILLING MUD TYPE <u>NONE</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>

ELEV./DEPTH (Ft)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS SEE BOREHOLE LOG P10-25		
322.2	GROUND SURFACE		AUGERED TO 200 FT. ADDED #1-Q SAND TO 90 FT. BELOW GROUND SURFACE (TOOL SAMPLES)
0.0	FILL VERY STIFF GRAY F.C. SAND, SOME GRAVEL		INSTALLED WELL PIPE (1-10' SCREEN, 1-10' RISER) 16 FT. STICKUP. ADDED #1-Q SAND TO 7.3 FT. BELOW GROUND SURFACE. ADDED PELLETS TO 3.0 FT. ADDED BENTONITE POWDER TO 2.0 FT. BELOW GROUND SURFACE. REMOVED AUGERS. MIXED CEMENT GROUT. FILLED TO GROUND SURFACE. PUT ON 8" Ø ALUMINUM PROTECTIVE CASING. FILLED INTERIOR OF CASING WITH #4-Q SAND. KEEP HOLE. WERE PUT IN CASING FOR DRAINAGE. PROTECTIVE POSTS WERE PUT AROUND WELL. A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEED HOLES WERE PUT IN CASING. A DEDICATED STAINLESS STEEL BAILEY WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.
321.2			WELL DEVELOPMENT NOTES
1.0	UPPER CLAY TILL VERY DENSE, BROWN, CLAYEY SILT, SOME F-C SAND, TO SOFT TO FIRM BROWN GRAY, SILTY CLAY GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 8.0-10.0 FT.		DATE DEVELOPED: 5-14-86 TO 6-13-86
			DEVELOPMENT METHOD: AIR LIFT
			VOLUME PURGED: 8.7 GAL.
			FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT TABLE.
304.2	UPPER SILT TILL VERY LOOSE, GRAY BROWN SILT, AND F-C SAND TO F-C SAND, SOME SILT AND F-C GRAVEL		
18.0	GLACIOLACUSTRINE CLAY VERY SOFT, GRAY CLAY LITTLE F-M SAND		
301.9	END OF SAMPLING AUGERED TO 200 FT.		
20.3			
300.2			
22.0			

Boring Log

JOB NO. <u>853-3051</u>	GA. INSP. <u>DJM</u>	PROJECT <u>CWM/WELLS/MODEL CITY</u>	BORING NO. <u>MW11-1D</u>
DEPTH HOLE <u>42.3 FT</u>	DEPTH WL. <u>8.35 FT.</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS -4 1/4" ID</u>	SHEET <u>1</u> OF <u>1</u>
TEMP <u>37° F</u>	TIME WL. <u>9/22/86</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS, INC.</u>	SURFACE ELEV. <u>318.1 FT.</u>
WEATHER <u>PARTLY SUNNY</u>		DRILL RIG <u>CME 45</u>	DRILLER <u>J. GENOVESE</u>
COORDINATES <u>N106°22.45 E 11134.49</u>		WT. SAMPLER HAMMER <u>140 LBS.</u>	DROP <u>30 IN.</u>
LOCATION <u>3.0 FT. S OF MW11-1S</u>		WT. CASING HAMMER <u>300 LBS.</u>	DROP <u>30 IN.</u>
			STARTED <u>8:30 / 11-15-85</u>
			COMPLETED <u>2:45 / 11-15-85</u>

ELEV. DEPTH (FT.)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES				REMARKS
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN.	REC/ATT	
318.1 0.0	GROUND SURFACE							GROUND SURFACE
	VERY STIFF TO STIFF, BROWN MOTTLED, CLAYEY SILT TO SILTY CLAY, SOME F TO C SAND, TRACE F GRAVEL. PREDOMINANTLY AS GRAY SUBROUNDED CLASTS	CL	27	1	DO	15-15-12-16	21/24	UPPER CLAY TILL
			63	2	DO	15-18-45-24	16/24	0.0-0.2 FT. TOPSOIL OR FILL
			64	3	DO	70-27-37-47	21/24	AT 2.8 FT., 0.5 IN. THICK LAYER OF LIGHT GRAY SANDY LIMESTONE OR DOLOSTONE
			88	4	DO	27-40-48-58	23/24	4.0-8.0 FT., TRACE OF GRAY WEATHERING ALONG VERTICAL FRACTURES.
			83	5	DO	25-35-48-60	22/24	AT 9.1 FT., POCKET OF WHITE AND CLEAR QUARTZ SAND-SIZE.
308.6 9.5	DENSE TO COMPACT, BROWN, F-C SAND LITTLE F GRAVEL, LITTLE TO TRACE SILT, BECOMING LOOSE TO COMPACT, BROWN TO GRAY BROWN, F SAND, SOME SILT, TO SILT AND F SAND, LITTLE M-C SAND, LITTLE F GRAVEL, DILATANT	SM/ML	90	7	DO	18-30-60-100	21/24	UPPER SILT TILL
			50	9	DO	18-20-30-30	24/24	9.5-9.7 FT., HARD GREEN GRAY LIMESTONE LAYER.
			10	11	DO	4-4-6-6	15/24	10.0-10.3 FT., SOIL IS SATURATED
			20	12	DO	6-8-12-18	24/24	10.5-12.0 FT. CLAYEY SILT LAYER
			26	13	DO	11-12-14-9	8/24	10.3-23.8 FT., F GRAVEL AS GRAY SUBANGULAR TO SUBROUNDED DROPSTONES
			24	14	DO	10-10-14-14	26/24	
			9	15	DO	4-4-5-6	26/24	
			17	16	DO	4-4-5-6	26/24	
294.3 23.8	VERY SOFT TO SOFT, GRAY, CLAY, LITTLE TO SOME F SAND, LITTLE SILT	CH	27	17	DO	5-18-9-8	21/24	GLACIOLACUSTRINE CLAY
			14	18	DO	4-8-6-6	26/24	24.5-25.1 FT., COMPACT BROWN SILT, WET, DILATANT
			38	20	DO	1-3-35-35	21/24	
288.8 29.3	COMPACT TO DENSE, BROWN, SILT AND F SAND, LITTLE F GRAVEL, CLASTS AS GRAY SUBROUNDED DROPSTONES. INTERLAYERED WITH SOFT, GRAY, CLAY, TO 34.0 FT. BECOMING COMPACT TO DENSE, GRAY BROWN, SILT, SOME F-C SAND	SM/ML	22	21	DO	27-12-10-10	24/24	GLACIOLACUSTRINE SILT/SAND
			44	22	DO	5-17-27-24	19/24	
			34	23	DO	16-18-16-16	11/24	36.0-37.5 FT., SUBROUNDED BECOMING ANGULAR SHALEY LIMESTONE FRAGMENTS
			75	24	DO	12-18-57-125	19/24	
280.6 37.5	VERY DENSE, RED BROWN, SILT TO F SAND, TRACE TO LITTLE M TO C SAND AS RED BROWN AND GRAY SUBROUNDED TO SUBANGULAR DROPSTONES, OPEN SHALEY OR SHALEY LIMESTONE	ML	2150	25	DO	150	6/6	BASAL RED TILL
			2150	27	DO	135	6/6	38.5-40.0 FT., NO SAMPLE
276.1 42.0	VERY DENSE, RED BROWN, WEATHERED SHALE MIXED WITH GREEN GRAY SHALEY LIMESTONE (WEATHERED), DRY CRUMBLY	-	2100	28	DO	100/3	4/4	40.5-42.0 FT., NO SAMPLE
275.8 42.3								
	END OF SAMPLING AUGERED TO 42.0 FT.							END OF SAMPLING
								INSTALLED MW11-1D SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986

MONITORING WELL INSTALLATION LOG

NYS DEC OHMS Document No. 201469232-00043

JOB NO. 853-3051 PROJECT CWM / WELLS / MOORE CITY WELL NO. MW11-1D SHEET 1 OF 2
 GA INSP. DJM DRILLING METHOD HOLLOW STEM AUGERS - 4 1/2" I.D. GROUND ELEV. -318.1 WATER DEPTH 8.55 FT.
 WEATHER SUNNY DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. COLLAR ELEV. 318.89 DATE/TIME 9-22-85
 TEMP. 46°F DRILL RIG CME 45 DRILLER J. GENOVESE STARTED 9:00 11-18-85 COMPLETED 3:30 11-18-85
 LOCATION/COORDINATES 3.0 FT. SOUTH OF MW11-1S / N 10692.45 E 11134.49

MATERIALS INVENTORY

WELL CASING <u>2.0</u> in. dia. <u>3.0</u> in. dia.	WELL SCREEN <u>2.0</u> in. dia. <u>2 3/4</u> in. dia.	BENTONITE SEAL <u>PELLETS</u> <u>40 DEEP</u>
CASING TYPE <u>PVC</u>	SCREEN TYPE <u>PVC</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>
JOINT TYPE <u>FLUSH TAPERED</u> <u>TEFLON TAPE</u> <u>WITON</u> <u>2-SLINGS</u>	SLOT SIZE <u>0.006</u> INCH	FILTER PACK QTY. <u>85 L.F.</u>
GROUT QUANTITY <u>29.0</u> L.F.	CENTRALIZERS <u>NA</u>	FILTER PACK TYPE <u>#1-Q SAND</u>
GROUT TYPE <u>VOLCLAY BENTONITE SLURRY @ 100</u>	DRILLING MUD TYPE <u>NA</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
318.1	GROUND SURFACE	<p style="font-size: small;">8" Ø ALUMINUM CASING WITH LOCK 1.0 FT. STICKUP 2" Ø PVC RISER PIPE #4-Q SAND BENTONITE GROUT #1-Q SAND BENTONITE PELLET SEAL 2" Ø PVC SCREEN</p>	<p>AUGERED TO 42.0 FT. PULLED UP AUGERS - 2 FT AND TREMIED DOWN SAND (#1-Q) TO 41.0 FT. B.G.S. (TOOK SAMPLE); INSTALLED WELL PIPE (-S' SCREEN 36' OF RISER) 0.8 FT STICKUP. #1-Q SAND WAS TREMIED TO 33.5 FT. B.G.S.; TREMIED PELLETS TO 29.5 FT. B.G.S.; ADDED #1-Q SAND TO 29.0 FT. B.G.S.; MIXED GROUT 40 LB BENTONITE/ 32 GAL H₂O. FILLED TO GROUND SURFACE. PULLED AUGERS; FILLED VOID WITH GROUT TO GROUND SURFACE. PUT ON 8" Ø ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-Q SAND; WEED HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE JOISTS WERE PUT AROUND WELL.</p>	
0.0	UPPER CLAY TILL VERY STIFF TO STIFF, BROWN MOTTLED, CLAYEY SILT TO SILTY CLAY, SOME F TO C SAND, TRACE F GRAVEL			(CONTINUED ON NEXT PAGE)
308.6 9.5	UPPER SILT TILL DENSE TO COMPACT, BROWN, F-C SAND, LITTLE F GRAVEL, LITTLE TO TRACE SILT, BECOMING LOOSE TO COMPACT, BROWN TO GRAY BROWN, F SAND, SOME SILT, TO SILT AND F SAND, LITTLE M-C SAND, LITTLE F GRAVEL,			WELL DEVELOPMENT NOTES
294.3 23.8	GLACIOLACUSTRINE CLAY VERY SOFT TO SOFT, GRAY, CLAY, LITTLE TO SOME F SAND, LITTLE SILT			11-26-85: PUMPED WITH RIG 4 TIMES
288.8 29.3	GLACIOLACUSTRINE SILT/SAND COMPACT TO DENSE, BROWN, SILT, AND F SAND, LITTLE F GRAVEL			12-19-85: PURGED WITH N ₂ GAS 4 TIMES SC = 1300 VERY CLOUDY
280.6 37.5	BASAL RED TILL VERY DENSE, RED BROWN SILT TO F SAND, TRACE TO LITTLE M TO C SAND			12-23-85: N ₂ GAS PURGE 12-24-85: N ₂ GAS PURGE -6-86: N ₂ GAS PURGE SC = 1000 SILTY
276.1 42.0	WEATHERED SHALE VERY DENSE, RED BROWN WEATHERED, SHALE LAYERED WITH GREEN GRAY SHALEY LIMESTONE (WEATHERED)			1-7-86: N ₂ GAS PURGE 1-8-86: N ₂ GAS PURGE
275.8 42.3	END OF SAMPLING AUGERED TO 42.0 FT.			

**Golder
Associates**

SUBJECT CWM/WELLS/MODEL CITY		MW11-1D
Job No. 853-3051	Made by DJM	Date 11-18-85
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

A CONCRETE PAD WAS LATER INSTALLED AROUND WELL BY THE SITE AND NEW KEEP HOLES WERE PUT IN CASING; A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT; THE BAILER WAS LATER REPLACED BY A WELL WIZARD.

Blank lined area for additional notes or drawings.

Boring Log

NYSDEC OHMS Document No. 201460232-00043

JOB NO. <u>B53-3051</u>	GA. INSP. <u>DJM</u>	PROJECT <u>CWM/WELLS/MODEL CITY</u>	BORING NO. <u>MW11-15</u>
DEPTH HOLE <u>26.0 FT.</u>	DEPTH WL. <u>4.46 FT.</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS - 4 1/4" ID.</u>	SHEET <u>1</u> OF <u>1</u>
TEMP <u>46/54°F</u>	TIME WL. <u>9/22/86</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS, INC.</u>	SURFACE ELEV. <u>-316.8 FT.</u>
WEATHER <u>CLOUDY - PARTLY CLOUDY</u>	DRILL RIG <u>CME 45</u>	DRILLER <u>J. GENOVESE</u>	DATUM <u>MSL</u>
COORDINATES <u>N 12.695 49 E 11.134 37</u>	WT. SAMPLER HAMMER <u>140 LBS</u>	DROP <u>30 IN.</u>	STARTED <u>3:30/11-18-86</u>
LOCATION <u>3.0 FT. N. OF MW 11-1D</u>	WT. CASING HAMMER <u>300 LBS</u>	DROP <u>30 IN.</u>	COMPLETED <u>12:30/11-18-86</u>

ELEV. DEPTH (FT.)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN. REC./ATT		
	FOR COMPLETE SOILS DESCRIPTION AT THIS LOCATION ALSO SEE BORING LOG MW11-1D						AUGERED TO 22.0 FEET, NO SAMPLING	
22.0	COMPACT GRAY BROWN SILT AND FINE SAND AS GRAY SUBANGULAR CLASTS, TRACE CLAY, SLIGHTLY DILATANT	ML	22	1/2	DO	14-11-11-9	24/24	UPPER SILT TILL GLACIOLACUSTRINE CLAY F TO M SAND LENS AT 24.5 FEET, 25.5-26.0 FT.
23.0	VERY SOFT GRAY CLAY SOME FINE SAND AS GRAY SUBANGULAR DROP STONES, STICKY, PLASTIC.	CH	28	3/4	DO	8-12-16-8	12/24	COMPACT BROWN SILT TRACE CLAY AND SAND, DILATANT
26.0	END OF SAMPLING AUGERED TO 25.0 FT.							END OF SAMPLING

INSTALLED MW11-15
SEE ACCOMPANYING
MONITORING WELL
INSTALLATION LOG.

NOTE REVISED FROM
MARCH 7, 1986

MONITORING WELL INSTALLATION LOG

NYS DEC CMMS Document No. 20140923200043

JOB NO. 853-3051 PROJECT CWM/WELLS/MODEL CITY WELL NO. MW11-15 SHEET 1 OF 1
 GA INSP DJM DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" I.D. GROUND ELEV -316.8 FT. WATER DEPTH 4.46 FT.
 WEATHER P. CLOUDY DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. COLLAR ELEV 318.99 FT. DATE/TIME 7-22-86
 TEMP 55°F DRILL RIG CME 45 DRILLER J. GENOVESE STARTED 9:15 11-19-85 COMPLETED 3:30 11-19-85
 LOCATION/COORDINATES 3.0 FT. NORTH OF MW11-10 / N 10695.49' E 11134.37 TIME / DATE TIME / DATE

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 10.0 ft. WELL SCREEN 2.0 in. dia. 16.2 ft. BENTONITE SEAL PELLETS 5.0 DEEP
 CASING TYPE PVC SCREEN TYPE PVC INSTALLATION METHOD THROUGH AUGERS
 JOINT TYPE FLUSH THREADED, TEFLON TAPE, O-RINGS SLOT SIZE 0.006 INCH FILTER PACK QTY 180 L.F.
 GROUT QUANTITY _____ CENTRALIZERS NA FILTER PACK TYPE #1-0 SAND
 GROUT TYPE VOLCLAY #200 BENTONITE SLURRY DRILLING MUD TYPE NA INSTALLATION METHOD THROUGH AUGERS

ELEV./DEPTH (FT)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS SEE BORING LOG MW11-1		AUGERED TO 25.0 FT.; PULLED BACK AUGERS - 2 FEET AND TREMIED SAND TO 24.0 FT. (TOOK #1-0 SAND SAMPLE); INSTALLED WELL PIPE (1-5" SCREEN, 1-10" SCREEN 10' OF RISER) 2.2 FT. STICKUP. AUGERS WERE PULLED BACK IN STEPS OF ABOUT 2 FT. AND #1-0 SAND TREMIED TO 7.0 FT. B.G.S.; PULLED AUGERS; PELLETS TO 2.0 FT. B.G.S.; MIXED GROUT, FILLED TO GROUND SURFACE; PUT ON 3" φ ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-0 SAND; WEEP HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PUT AROUND WELL AND NEW WEEP HOLES WERE PUT IN CASING; A DEDICATED BAILEE WAS INSTALLED	
316.8	GROUND SURFACE			
0.0	UPPER CLAY TILL VERY STIFF TO STIFF, BROWN MOTTLED, CLAYEY SILT TO SILTY CLAY, SOME F TO C SAND, TRACE F GRAVEL		2.0'	
307.3 9.5	UPPER SILT TILL DENSE TO COMPACT, BROWN, E-C SAND, LITTLE F GRAVEL, LITTLE TO TRACE SILT, BECOMING LOOSE TO COMPACT, BROWN TO GRAY BROWN, E SAND, SOME SILT, TO SILT AND F SAND, LITTLE M-C SAND, LITTLE F GRAVEL,		7.0' 7.8'	
293.8 23.0	GLACIOLACUSTRINE CLAY SOFT TO VERY SOFT, GRAY, CLAY, INTERLAYERED WITH F SAND AND SILT LENSES		24.0' 25.0'	
290.8 26.0	END OF SAMPLING AUGERED TO 25.0 FT.		WELL DEVELOPMENT NOTES 11-26-85: PUMPED WITH RG 4 TIMES 12-19-85: N ₂ GAS PURGE 4 TIMES SC 2000 VERY CLOUDY 12-23-85: N ₂ GAS PURGE 12-24-85: N ₂ GAS PURGE 1-6-86: N ₂ GAS PURGE SC = 2100, SILTY 1-7-86: N ₂ GAS PURGE 1-8-86: N ₂ GAS PURGE	

Boring Log

JOB NO. 852-3051 QA. INSP. DJM PROJECT CWM/WEELS/MODEL CITY BORING NO. MW11-2D
 DEPTH HOLE 41.0 FT DEPTH WL. 9.97 FT DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" ID SHEET 1 OF 1
 TEMP 36° F TIME WL. 9/22/86 DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. 317.6 FT
 WEATHER OVERCAST DRILL RIG CME 45 DRILLER J. GENOVESE DATUM MSL
 COORDINATES N10854.02 E11130.44 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 9:00 / 12/24
 LOCATION 3.5 FT. S OF MW11-2D WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 3:00 / 12/24

ELEV. DEPTH (FT.)	DESCRIPTION	UNIFIED CLASS	BLOW/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 8 IN. REC/ATT		
317.6	GROUND SURFACE						AUGERED AND SAMPLED TO 8.0 FT. INSTALLED 10 INCH STEEL SURFACE CASING TO 7.9 FT. CONTINUED AUGERING AND SAMPLING BOREHOLE	
309.6	COMPACT, BROWN SLIGHTLY MOTTLED, CLAYEY SILT TO FIRM TO STIFF, GRAY BROWN, SILTY CLAY AND F TO C SAND	CL	16	1	DO	4-6-10-11	24/24	UPPER CLAY TILL 0.0-0.2 FT., TOPSOIL, LOOSE
			32	2	DO	8-12-20-20	17/24	2.5-3.5 FT., GRAY WEATHERING ALONG VERTICAL JOINTS
			58	3	DO	18-18-40-40	14/24	6.0-8.0 FT. GRAY WEATHERING ALONG VERTICAL JOINTS
			56	4	DO	10-23-33-40	24/24	
294.7	COMPACT TO DENSE, BROWN, CLAYEY SILT, SOME F TO C SAND, GRAY SUBROUNDED CLASTS	ML	140	5	DO	40-100	11/12	UPPER SILT TILL 9.0-10.0 FT., NO SAMPLE 10.0-10.9 FT., COMPACT SAND, SATURATED 10.9-14.0 FT., GRAY WEATHERING ALONG VERTICAL FRACTURES
			20	7	DO	22-9-11-12	20/24	
			49	8	DO	9-11-38-48	18/24	
			45	9	DO	9-9-36-40	24/24	
			40	10	DO	11-16-24-36	14/24	
			20	11	DO	9-9-11-60	19/24	
			28	12	DO	8-20-8-11	9/24	
			16	13	DO	8-8-8-11	24/24	GLACIOLACUSTRINE CLAY
286.7	VERY SOFT, GRAY, CLAY, LITTLE F TO M SAND	CH	1	15	DO	WH-WH-1-1	26/24	22.9-30.9 FT., THIN BROWN SILT LENSES, DILATANT
			3	16	DO	1-1-2-2	26/24	28.0-28.6 FT., LOOSE GRAY F SAND AND SILT, SATURATED
			0	17	DO	WH-WH-WH-3	23/24	
			14	18	DO	3-7-7-5	22/24	GLACIOLACUSTRINE SILT/SAND
277.4	30.9-32.5 FT., INTERLAYERED SOFT, GRAY CLAY, BROWN, DILATANT, SILT, AND GRAY, F SAND 32.5-40.2 FT., COMPACT TO VERY DENSE, RED BROWN AND GRAY, F SAND, AND SILT, LITTLE M TO C SAND	CH/ML	188	20	DO	100	9/16	32.5-34.0 FT., NO SAMPLE
			20	21	DO	7-10-10-12	10/24	32.5-38.0 FT., F GRAVEL AS DARK GRAY SUBANGULAR STONES PRESENT
			46	22	DO	24-26-20-100	24/24	36.8-38.0 FT., SILT, SLIGHTLY DILATANT
			188	23	DO	100	9/16	38.0-40.2 FT., MULTICOLORED FC SAND, TRACE SILT, LOOSE SATURATED
			158	24	DO	58-100	10/12	38.6-40.0 FT., NO SAMPLE
276.6	VERY DENSE, RED BROWN, F SAND AND SILT, SOME M TO C SAND, AND F GRAVEL, CLAST GRAY SUBANGULAR SHALEY LIMESTONE AND RED BROWN ANGULAR SHALE FRAGMENTS	ML	158	25	DO	58-100	10/12	BASAL RED TILL
276.6			END OF BORING					
41.0	END OF BORING						INSTALLED MW11-2D SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986	

MONITORING WELL INSTALLATION LOG

NYSDEC OHWIS Document No. 201409232-00043

JOB NO. <u>853-3051</u>	PROJECT <u>CWMA / WELLS / MODEL CITY</u>	WELL NO. <u>MW11-2D</u>	SHEET <u>1</u> OF <u>2</u>
GA INSP. <u>DJM</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS - 4 1/4" I.D.</u>	GROUND ELEV. <u>-317.6 FT</u>	WATER DEPTH <u>9.97 FT</u>
WEATHER <u>P. CLOUDY</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS INC</u>	COLLAR ELEV. <u>318.68 FT</u>	DATE/TIME <u>9:22-86</u>
TEMP. <u>16°F</u>	DRILL RIG <u>CME 45</u>	DRILLER <u>J. GENOVESE</u>	STARTED <u>9:00 12 17 85</u>
LOCATION/COORDINATES <u>3.5 FT. SOUTH OF MW11-2S / N 10834.02' E 11130.44'</u>		COMPLETED <u>3:00 12 17 85</u>	

MATERIALS INVENTORY			
WELL CASING <u>2.0</u> in. dia. <u>36.0</u> LI	WELL SCREEN <u>2.0</u> in. dia. <u>2.0</u> LI	BENTONITE SEAL <u>PELLETS 3.0' DEEP</u>	
CASING TYPE <u>PVC</u>	SCREEN TYPE <u>PVC</u>	INSTALLATION METHOD <u>TREMIE TUBE</u>	
JOINT TYPE <u>FLUSH THREADED</u> <u>TEFLON TAPE</u> <u>VITON O-RINGS</u>	SLOT SIZE <u>0.006</u> INCH	FILTER PACK QTY. <u>8.2</u> L.F.	
GROUT QUANTITY <u>292.6</u> F	CENTRALIZERS <u>NA</u>	FILTER PACK TYPE <u>#1-Q SAND</u>	
GROUT TYPE <u>VOLCLAY # 200</u>	DRILLING MUD TYPE <u>NA</u>	INSTALLATION METHOD <u>TREMIE TUBE</u>	

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS SEE BORING LOG MW11-2			
317.6	GROUND SURFACE			
0.0	UPPER CLAY TILL COMPACT, BROWN, SLIGHTLY MOTTLED CLAYEN SILT TO FIRM TO STIFF, GRAY BROWN SILTY CLAY AND F TO C SAND	<p style="font-size: small;">WELL SKETCH details: 8" ALUMINUM CASING WITH LOCK 1.5 FT. STICKUP; 4-#4 SAND; 10" STEEL CASING; BENTONITE GROUT; 2" PVC RISER PIPE; BENTONITE GROUT; 1" PVC SCREEN; CAVED MATERIAL.</p>	<p>AUGERED 7.5 FT WITH 15' CAISON AUGER, GROUTED HOLE. INSTALLED 10" Ø STEEL SURFACE CASING TO 8.0 FT. B.G.S.; AUGERED TO 41.0 FT. B.G.S.; PULLED BACK AUGERS ~2 FT.; HOLE CAVED TO 40.7 FT. B.G.S.; INSTALLED WELL PIPE (1.5' SCREEN, 36' OF RISER) 1.1 FT. STICKUP. AUGERS PULLED BACK IN STEPS OF ABOUT 2 FT.; TREMIED #1-Q SAND TO 32.5 FT. B.G.S. (TOOK SAMPLE); ADDED PELLETS TO 29.5 FT. B.G.S.; ADDED #1-Q SAND TO 29.2 FT. B.G.S.; MIXED GROUT 60 LB. BENTONITE / 40 GAL. H₂O; FILLED TO GROUND SURFACE; PULLED AUGERS, GROUTED VOID TO SURFACE; PUT ON 8" Ø ALUMINUM PROTECTIVE CASING. FILLED INTERIOR OF CASING WITH #4-Q SAND; WEED HOLES.</p>	
309.6	UPPER SILT TILL COMPACT TO DENSE, BROWN, CLAYEN SILT, SOME F TO C SAND			
294.7	GLACIOLACUSTRINE CLAY VERY SOFT, GRAY, CLAY, LITTLE F-M SAND.			
286.7	GLACIOLACUSTRINE SILT/SAND COMPACT TO VERY DENSE RED BROWN AND GRAY, F SAND, AND SILT, LITTLE M TO C SAND.			
277.4	BASAL RED TILL VERY DENSE, RED BROWN, F SAND, AND SILT, SOME M TO C SAND AND F GRAVEL.			
276.6	END OF BORING			
40				

**Golder
Associates**

SUBJECT CWM/WELLS/MODEL CITY MW 11-20		
Job No. 853-3051	Made by DJM	Date 12-17-86
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

WERE PUT IN CASING FOR DRAINAGE. PROTECTIVE PUSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING; A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT; THE BAILER WAS LATER REPLACED BY A WELL WIZARD.

Boring Log

JOB NO. 853-3051 GA. INSP. DJM PROJECT CWM/WELLS/MODEL CITY BORING NO. MW11-25
 DEPTH HOLE 24.0 FT. DEPTH WL. 5.18 FT. DRILLING METHOD HOLLOW STEM AUGERS 4 1/4" ID SHEET 1 OF 1
 TEMP 18° F TIME WL. 9/22/86 DRILLING COMPANY EMPER SOILS INVESTIGATIONS, INC. SURFACE ELEV. -317.8 FT.
 WEATHER SNOW FLURRIES DRILL RIG CNE 45 DRILLER J. GENOVESE DATUM MSL
 COORDINATES N10837.54 E11130.27 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 3:00 / 12-17-85
 LOCATION 3.5 FT. N OF MW11-2D WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 4:00 / 12-17-85

ELEV. DEPTH (FT.)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN. REC./ATT	
295.8	FOR COMPLETE SOILS DESCRIPTION AT THIS LOCATION, ALSO SEE BORING LOG MW11-2D						AUGERED TO 6.0 FT.; INSTALLED 10 INCH STEEL SURFACE CASING TO 6.1 FT. (0.7 FT STICKING UP) AUGERED TO 22.0 FT. NO SAMPLING
22.0	VERY SOFT, GRAY, CLAY, LITTLE F TO M SAND, AS GRAY SUBROUNDED DROPSTONES, OCCASIONAL THIN, BROWN, DILUTANT, SILT LENSE	CH	0	1	DO	NR-NR-NR-WH	26/24 GLACIOLACUSTRINE CLAY
293.8	END OF SAMPLING AUGERED TO 23.0 FT.						END OF SAMPLING
24.0							INSTALLED MW11-25 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986

MONITORING WELL INSTALLATION LOG

NYSDEC OHMS Document No. 201469232-00043

JOB NO. B53-3051 PROJECT CWMA / WELLS / MOON CITY WELL NO. MW11-25 SHEET 1 OF 2
 GA INSP. DJM DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" I.D. GROUND ELEV. 317.8 FT. WATER DEPTH 5.8 FT.
 WEATHER P. CLOUDY DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. COLLAR ELEV. 319.37 FT. DATE/TIME 9-22-86
 TEMP. 16°F DRILL RIG CME 45 DRILLER J. GENOVESE STARTED 10:45 12-18-85 COMPLETED 4:15 12-18-85
 LOCATION/COORDINATES 5.2 FT. NORTH OF MW11-20 / N 0837.54; E 11130.27

MATERIALS INVENTORY

WELL CASING <u>2.0</u> in dia. <u>13.0</u> ft.	WELL SCREEN <u>2.0</u> in dia. <u>10.8</u> ft.	BENTONITE SEAL <u>PELLETS 7.0' DEEP</u>
CASING TYPE <u>PVC</u>	SCREEN TYPE <u>PVC</u>	INSTALLATION METHOD <u>OPEN HOLE</u>
JOINT TYPE <u>FLUSH</u> <u>TEFLON</u> <u>VITON</u> <u>WELDED</u> <u>TAPE</u> <u>O-RINGS</u>	SLOT SIZE <u>0.006</u> INCH	FILTER PACK QTY <u>16 0L-F</u>
GROUT QUANTITY <u>NA</u>	CENTRALIZERS <u>NA</u>	FILTER PACK TYPE <u>#1-0 SAND</u>
GROUT TYPE <u>NA</u>	DRILLING MUD TYPE <u>NA</u>	INSTALLATION METHOD <u>TREMBIE TUBE</u>

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
317.8	GROUND SURFACE		<p>AUGERED 7.5 FT. WITH 12" CAISON AUGER, GROUTED HOLE, INSTALLED 10" Ø STEEL SURFACE CASING 8.0 FT. B.G.S. AUGERED TO 23.0 FT. WITH 4 1/4" I.D. AUGERS. PULLED AUGERS BACK ABOUT 2 FEET; ADDED #1-0 SAND TO 22.0 FT. B.G.S.; INSTALLED WELL PIPE (1-10" SCREEN, 12" OF RISER) 1.8 FT. STICKUP. PULLED AUGERS IN INCREMENTS OF 2 FT. AND TREMBIED SAND TO 7.0 FT. B.G.S. (TOOK SAMPLE). PULLED REMAINING AUGERS; ADDED BENTONITE PELLETS TO GROUND SURFACE; PUT ON 8" Ø ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-0 SAND; WEED HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE</p>	
0.0	<p>UPPER CLAY TILL COMPACT BROWN SLIGHTLY MOTTLED CLAYEN SILT TO FIRM TO STIFF, GRAY BROWN SILTY CLAY AND F TO C SAND</p>		7.0' 7.5' 8.0'	(CONTINUED ON NEXT PAGE)
309.8	<p>UPPER SILT TILL COMPACT TO DENSE, BROWN, CLAYEN SILT, SOME F TO C SAND</p>		11.2'	<p>WELL DEVELOPMENT NOTES</p>
295.9 22.0	<p>GLACIOLACUSTRINE CLAY VERY SOFT, GRAY, CLAY, LITTLE F-M SAND.</p>		22.0' 23.0'	<p>12-19-85: PURGED WITH N₂ GAS 4 TIMES & = 1100 VERY CLOUDY</p>
272.8 24.0	<p>END OF SAMPLING AUGERED TO 23 FT.</p>		24.0'	<p>12-23-85: N₂ GAS PURGE</p> <p>12-24-85: N₂ GAS PURGE</p> <p>1-6-86: N₂ GAS PURGE & = 2000 SILTY</p> <p>1-7-86: N₂ GAS PURGE</p> <p>1-8-86: N₂ GAS PURGE</p>

**Golder
Associates**

SUBJECT CWM/WELLS/MODEL CITY		MW 11-25
Job No. 853-3051	Made by DJM	Date 12-18-85
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING. A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.

Boring Log

NYSDEC OHMS Document No. 201469282-00043

JOB NO. <u>853-3051</u>	QA. INSP. <u>DJM</u>	PROJECT <u>CWM/WELLS MODEL CITY</u>	BORING NO. <u>MW11-30</u>
DEPTH HOLE <u>40.2 FT.</u>	DEPTH WL. <u>0.02 FT.</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS - 4 1/4" ID</u>	SHEET <u>1</u> OF <u>1</u>
TEMP <u>32° F</u>	TIME WL. <u>9/22/86</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS, INC.</u>	SURFACE ELEV. <u>316.5 FT</u>
WEATHER <u>OVERCAST</u>		DRILL RIG <u>CME 45</u>	DRILLER <u>J. GENOVESE</u>
COORDINATES <u>N 10956.65 E 11312.03</u>		WT. SAMPLER HAMMER <u>140 LBS.</u>	DROP <u>30 IN.</u>
LOCATION <u>6.0 FEET EAST OF MW11-35</u>		WT. CASING HAMMER <u>300 LBS.</u>	DROP <u>30 IN.</u>
			DATUM <u>MSL</u>
			STARTED <u>11:00 / 11-11-86</u>
			COMPLETED <u>10:30 / 11-12</u>

ELEV. DEPTH (Ft)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES				REMARKS			
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN.	REC./ATT				
316.5	GROUND SURFACE							GROUND SURFACE			
0.0	LOOSE, GRAY, MTD C SAND, F TO C GRAVEL, AND SILTY CLAY	SW	75	1	DO	6-40-35-6	14/24	FILL			
314.0	FIRM TO STIFF, BROWN, SILTY CLAY, LITTLE F TO C SAND, GRAY AND RED BROWN CLASTS	CL		31	2	DO	6-12-19-20	16/24	UPPER CLAY TILL		
2.5										2.5-4.0 FT., GRAY WEATHERING ALONG VERTICAL FRACTURES	
307.6	COMPACT TURNING TO DENSE, BROWN, CLAYEY SILT, SOME F SAND, LITTLE C SAND	ML		68	4	DO	18-29-39-50	20/24	UPPER SILT TILL		
8.9											8.9-9.4 FT., DENSE BROWN F SAND LITTLE CLAYEY SILT, GRAY WEATHERING ALONG VERTICAL FRACTURES
											9.4-10.0 FT., NO SAMPLING
											14.0-16.0 FT., SOME LENSES OF BROWN CLAYEY SILT
298.5	SOFT TO FIRM, BROWN, SILTY CLAY, SOME F TO C SAND, AS GRAY SUBROUNDED DROPSTONES	CL		7100	5	DO	18-36-100/4	18/18	GLACIOLACUSTRINE CLAY		
18.0										20.0-22.0 FT., SOME SILT AND F SAND POCKETS	
292.5	INTERLAYERED, COMPACT BROWN SILT, VERY SOFT GRAY CLAY, AND DENSE SAND	CL		14	15	DO	8-12-7-5	20/24	GLACIOLACUSTRINE SILT/SAND		
24.0											24.0-24.3 FT., LOOSE CLAYEY SILT, SATURATED, THIN CLAY LENSES
											SILT LAYERS ARE SATURATED AND DILATANT, RANGE FROM 4.0 TO 12.0 IN. THICK
			SM		51	17	DO	12-17-34-4	20/24		
					8	19	DO	3-4-4-4	22/24		
					9	20	DO	3-4-5-4	24/24		
					7	21	DO	WH-3-4-2	24/24		
					14	23	DO	7-7-7-31	8/24		
277.5	TURNING AT 38.0 TO DENSE, BROWN AND GRAY, C SAND, SOME F TO M SAND, LITTLE F GRAVEL, TRACE SILT, SATURATED			7100	24	DO	33-50-100	19/19	WEATHERED BEDROCK		
39.0	VERY DENSE, RED BROWN, WEATHERED SHALE, RED SHALEY FRAGMENTS, CRUMBLY								QUENSTON FORMATION		
26.5									39.2-40.0 FT., NO SAMPLE		
40.2	END OF BORING								END OF BORING		

* NOTE: AT 9.5 FT. REACHED REFUSAL, BORING MOVED 5 FEET TO THE WEST, AUGERED 10 FT. NO SAMPLING, THEN CONTINUED

INSTALLED MW11-30
SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG.
NOTE REVISED FROM MARCH 7, 1984

MONITORING WELL INSTALLATION LOG

JOB NO. B53-3051 PROJECT CWMA / WELLS / MODEL CITY WELL NO. MW11-3D SHEET 1 OF 2
 GA INSP. DJM DRILLING METHOD HOLLOW STEM AUGERS - 4 1/2" I.D. GROUND ELEV. 316.5 FT. WATER DEPTH 10.02 FT.
 WEATHER OVERCAST DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. COLLAR ELEV. 319.82 FT. DATE/TIME 9-22-85
 TEMP. 32.0 F. DRILL RIG CME 45 DRILLER J. GENOVESE STARTED 11:30 11-17-85 COMPLETED 1:00 11-20-85
 LOCATION/COORDINATES 2.0 FT. EAST OF MW11-25 / N 10956.65 / E 11312.03

MATERIALS INVENTORY

WELL CASING 2.0 IN DIA. 38.0 FT. WELL SCREEN 2.0 IN DIA. 5.3 FT. BENTONITE SEAL PELLETS 3.5' DEEP
 CASING TYPE PVC SCREEN TYPE PVC INSTALLATION METHOD THROUGH AUGERS
 JOINT TYPE FLUSH 3-PLOW 1-TON 2-RINGS SLOT SIZE 0.006 INCH FILTER PACK QTY. 70 L.F.
 GROUT QUANTITY 32.5 L.F. CENTRALIZERS NA FILTER PACK TYPE #1-0 SAND
 GROUT TYPE CLAY DRILLING MUD TYPE NA INSTALLATION METHOD TREMBLE TUBE

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
		WELL SKETCH	
316.5	GROUND SURFACE		AUGERED TO 40.2 FT. PUSHED HOLE WITH CLEAN WATER; PULLED AUGERS TO 39.9 FT. B.G.S.; TREMBLED #1-0 SAND TO 40.0 FT. B.G.S. (TOOK SAMPLE); INSTALLED WELL PIPE 2-2' SCREENS, 38' OF RISE; 3.3 FT. STICKUP; ADDED #1-0 SAND TO 35.9 FT. B.G.S.; ADDED PELLETS TO 30.0 FT. B.G.S.; ADDED #1-0 SAND TO 29.9 FT. B.G.S.; SAND AND PELLETS WERE ADDED WHILE THE AUGERS WERE PULLED UP IN INCREMENTS OF ~2 FT.; MIXED GROUT (49 LBS OF BENTONITE / 33 GAL. H ₂ O) (TOOK SAMPLE); TREMBLED GROUT TO GROUND SURFACE. PULLED AUGERS; GROUTED VOID SURFACE; PUT ON 8" ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-Q SAND; WEEP
0.0	FILL LOOSE, GRAY, M TO C SAND # TO GRAVEL, AND SILTY CLAY		
314.0			
2.9	UPPER CLAY TILL FIRM TO STIFF, BROWN, SILTY CLAY, LITTLE # TO C SAND		
307.6			
8.9	UPPER SILT TILL COMPACT TURNING TO DENSE, BROWN, CLAYEY SILT, SOME # SAND, LITTLE C SAND.		
298.5			
18.0	GLACIOLACUSTRINE CLAY SOFT TO FIRM, BROWN, SILTY CLAY, SOME # TO C SAND		
292.5			
24.0	GLACIOLACUSTRINE SILT/SAND INTERLAYERED, COMPACT BROWN SILT, VERY SOFT GRAY CLAY, AND DENSE SAND.		
295			
38.9			
34.7			
277.5	TURNING AT 28.0 FT. TO DENSE, BROWN AND GRAY C SAND, SOME # TO M SAND, LITTLE # GRAVEL, TRACE SILT		
39.0	WEATHERED BEDROCK QUEENSDEN FORMATION VERY DENSE, EBD BROWN WEATHERED SHALE.		
276.5			
40.2	END OF BORING		
			(CONTINUED ON NEXT PAGE)
			WELL DEVELOPMENT NOTES
			11-21-85; BAILED FOR 1 HR PH 8.10, SG 1.25, VERY CLOUDY
			11-23-85; BAILED FOR 3/4 HR
			11-24-85; RUMMED WITH RIG 5 TIMES
			12-19-85; RUMMED WITH N ₂ GAS 5 TIMES 36" 1000, CLOUDY
			12-13-85; N ₂ GAS PURGE
			12-24-85; N ₂ GAS PURGE
			1-4-86; N ₂ GAS PURGE SG = 1.000, CLEAR
			1-7-86; N ₂ GAS PURGE
			1-8-86; N ₂ GAS PURGE

**Golder
Associates**

SUBJECT CWM/WELLS/MODEL CITY		MW11-30
Job No. 853-3031	Made by DJM	Date 11-13-85
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING; A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT. THE BAILER WAS LATER REPLACED BY A WELL WIZARD.

JOB NO. 853-3061 GA. INSP. DJM PROJECT CWM/WELLS/MODEL CITY BORING NO. MW11-35
 DEPTH HOLE 28.0 FT. DEPTH WL. 4.01 FT. DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" ID SHEET 1 OF 1
 TEMP 46° F TIME WL. 9/23/86 DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. 316.0 FT.
 WEATHER OVERCAST DRILL RIG CNE 45 DRILLER J. GENOVESE DATUM M.S.L.
 COORDINATES N 109° 56' 39" E 11306.25 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 1:00 / 11-13-85
 LOCATION 6.0 FEET WEST OF MW11-3D WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 2:00 / 11-13-85

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN. REC./ATT	
292.0	FOR COMPLETE SOILS DESCRIPTION AT THIS LOCATION, SEE BORING LOG MW11-3D						AUGERED TO 240 FT, NO SAMPLING
290.0	COMPACT, GRAY BROWN, SILT, SOME F SAND, SATURATED, DILATANT.	ML	25	1	DO	6-7-18-10	7/24 WT W/HR
288.0	VERY SOFT, GRAY, CLAY, LITTLE F TO M SAND, STICKY, PLASTIC.	CL	4	2	DO	4-2-2-3	22/24 GLACIOLACUSTINE CLAY 26.0-26.2 FT, BROWN DILATANT SILT LAYER.
28.0	END OF SAMPLING AUGERED TO 27.0 FT.						END OF SAMPLING INSTALLED MW11-35 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986

MONITORING WELL INSTALLATION LOG

JOB NO. 853-3031 PROJECT CWM / WELLS / MODEL CITY WELL NO. MW11-35 SHEET 1 OF 2
 SA INSP. DJM DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" I.D. GROUND ELEV. ~ 316.8 FT WATER DEPTH 4.01 FT
 WEATHER OVERCAST DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. COLLAR ELEV. 319.01 FT DATE/TIME 9-26-86
 TEMP. 46°F DRILL RIG GME-45 DRILLER J. GENOVESE STARTED 2:30 11/13/85 COMPLETED 3:45 11/13/85
 LOCATION/COORDINATES 60 FT. WEST OF MW11-3D / N 10956.29, E 11306.75

MATERIALS INVENTORY

WELL CASING 2.0 W. dia. 13.0 I.E. WELL SCREEN 20 W. dia. 16.2 I.I. BENTONITE SEAL PELLETS 7 DEEP
 CASING TYPE PVC SCREEN TYPE PVC INSTALLATION METHOD OPEN HOLE
 JOINT TYPE FLUSH TAPER VITON O-RINGS SLOT SIZE 0.006 INCH FILTER PACK QTY. 19 LB
 GROUT QUANTITY NA CENTRALIZERS NA FILTER PACK TYPE #1-Q SAND
 GROUT TYPE NA DRILLING MUD TYPE NA INSTALLATION METHOD TRAMMIE TUBE

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
316.0	GROUND SURFACE		AUGERED TO 27.0 FT.; PULLED BACK AUGERS ABOUT 2 FT.; TREMIED #1-Q SAND TO 26.0 FT. B.G.S. (TOOK SAMPLE); INSTALLED WELL PIPE (1-10' SCREEN, 1-3' SCREEN); 1-3' RISER, 1-10' RISER, 3.2 FT STICKUP; IN INCREMENTS OF ABOUT 2 FT., PULLED BACK AUGERS AND TREMIED #1-Q SAND TO 8.0 FT. B.G.S.; PULLED REMAINING AUGERS, ADDED PELLETS TO 1.0 FT. B.G.S.; AUGER CUTTINGS ADDED TO GROUND SURFACE; PUT ON 8" ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-Q SAND; WEEP HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE ROSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS PUT AROUND WELL AT A LATER	
0.0	FILL LOOSE SAND, FINE SAND, F.C. SAND, AND SILTY CLAY		1.0'	(CONTINUED ON NEXT PAGE)
313.5 2.5	UPPER CLAY TILL FINE TO MEDIUM SAND, SILTY CLAY, LITTLE F.C. SAND		5.0'	WELL DEVELOPMENT NOTES
307.1 8.9	UPPER SILT TILL LOOSE TO FIRM SAND, BROWN CLAYEY SILT, SOME F. SAND, LITTLE L. SAND		9.0'	11-21-85; BAILED FOR LHR. PH 7.95 7.85, SL 2000, 2050, CLEAR
298.0 18.0	GLACIAL LACUSTRINE CLAY WET TO FIRM, BROWN TO GRAY SILTY CLAY TO CLAY WITH F.C. SAND SILT LENSES/LAYERS OF WHITE SILT OF SAMPLE		26.0'	11-25-85; RUMPED DRY WITH RIG 4 TIMES
288.0 28.0	END OF SAMPLING AUGERS TO 28.0 FT		27.0'	11-26-85; RUMPED DRY WITH RIG 5 TIMES
			12-19-85; N ₂ GAS LIFTING 5 TIMES SL 2000, CLEAR	
			12-23-85; N ₂ GAS PURGE	
			12-24-85; N ₂ GAS PURGE	
			1-6-86; N ₂ GAS PURGE SL = 2000 CLEAR	
			1-7-86; N ₂ GAS PURGE	
			1-8-86; N ₂ GAS PURGE	

**Golder
Associates**

NYS DEC OHMS Document No. 201469232/00043

SUBJECT CWM/WELLS/MODEL CITY

MW 11-3S

Job No. 853-3051
Ref.

Made by DJM
Checked DJM
Reviewed JFC

Date 11-13-85
Sheet 2 of 2

DATE AND NEW WEEP HOLES WERE PUT IN CASING. A DEDICATED
BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.

Boring Log

NYSDEC OHMS Document No. 201469252-00043

JOB NO. <u>853-3051</u>	GA. INSP. <u>DJM</u>	PROJECT <u>CWM/WELLS/MODEL CITY</u>	BORING NO. <u>MW11-4D</u>
DEPTH HOLE <u>44.5 FT.</u>	DEPTH WL. <u>32 FT.</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS-4 1/4" ID</u>	SHEET <u>1</u> OF <u>1</u>
TEMP <u>38° F</u>	TIME WL. <u>9/22/86</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS, INC.</u>	SURFACE ELEV. <u>-316.1 FT.</u>
WEATHER <u>OVERCAST</u>		DRILL RIG <u>CME 45</u>	DRILLER <u>J. GARDISE</u>
COORDINATES <u>N 10956.84 E 11455.82</u>	WT. SAMPLER HAMMER <u>140 LBS.</u>	DROP <u>30 IN.</u>	STARTED <u>10:00/12:00</u>
LOCATION <u>4.0 FT E OF MW11-4S</u>	WT. CASING HAMMER <u>300 LBS.</u>	DROP <u>30 IN.</u>	COMPLETED <u>4:00/12:00</u>

ELEV. DEPTH (FT.)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES				REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN.	REC./ATT		
316.1	GROUND SURFACE							GROUND SURFACE	
314.1	LOOSE TO COMPACT, RED BROWN TO BROWN AND GRAY, F TO M SAND, LITTLE SILT, TRACE CLAY	SW	14	1 2	DO	5-9-5-6	12/24	FILL	
295.6	COMPACT TO VERY DENSE, BROWN, SILT, TO F SAND, SOME SILT, SOME M TO C SAND, GRAY AND BROWN SUBANGULAR TO SUBROUNDED CLASTS, DILATANT	ML	22	3	DO	5-9-13-20	17/24	UPPER SILT TILL TO 4.0 FT., SLIGHTLY MOTTLED, TRACE OF GRAY WEATHERING ALONG JOINTS.	
61			4	DO	33-40-21-28	18/24			
74			6	DO	20-32-42-50	21/24			
90			7	DO	25-40-50-50	21/24			
76			8	DO	22-26-50-56	20/24			
52			9 10	DO	21-24-28-28	15/24			
51			11	DO	18-27-24-21	5/24			
7100			12	DO	27-100/.2	5/B			
44			13	DO	37-30-14-14	12/24			
286.3			VERY SOFT, GRAY, CLAY, LITTLE F TO SAND, STICKY, STICKY, PLASTIC, THIN DILATANT SILT LENSES THROUGHOUT SAMPLE	CH	12	14 15 16	DO		6-6-6-10
3	17	DO			WR-WH-3-3	20/24			
5	18	DO			WH-2-3-3	13/24			
3	19	DO			WR-WH-3-3	24/24			
4	20	DO			WR-WH-4-8	22/24			
275.1	COMPACT TO VERY DENSE, RED BROWN, F SAND, SOME M TO C SAND, DILATANT SILT LENSES OCCUR RANDOMLY THROUGH SAMPLES	SM	7	21 22	DO	3-4-5-7	24/24	GLACIOLACUSTRINE SILT/SAWD 37.5-38.0 FT., NO SAMPLE 38.0-41.0 FT., SOIL IS CRUMBLY 38.5-40.0 FT., NO SAMPLE	
16			23	DO	4-6-10-11	16/24			
43			24	DO	23-20-18	5/24			
140			25	DO	10-40-100	17/18			
218			26	DO	128	5/16			
7100			27	DO	30-16-100/.2	15/15			
218			28	DO	128	5/16			
41.0	VERY DENSE, RED BROWN, F SAND, SOME SILT, SOME M TO C SAND, CLASTS PREDOMINANTLY SUBANGULAR TO ANGULAR GRAY ROCK FRAGMENTS	UL	218	28	DO	128	5/16	BASAL RED TILL 41.2-42.0 FT., AND 42.5-44.0 FT. NO SAMPLE	
272.1	VERY DENSE, RED BROWN, WEATHERED SHALE, SEVERAL SHALE FRAGMENTS		218	28	DO	128	5/16	WEATHERED BEDROCK QUEENSTON FORMATION	
271.6									
44.5									
	END OF SAMPLING AUGERED TO 44.0 FT.							END OF SAMPLING	
								INSTALLED MW11-4D SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986	

MONITORING WELL INSTALLATION LOG

NYCDEC OHMS Document No. 201460232-00043

JOB NO. B53-3051 PROJECT CWM/WELLS/ MODEL CITY WELL NO. MW11-42 SHEET 1 OF 1
 GA INSP. R.D. DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" I.D. GROUND ELEV. ~316.1 FT WATER DEPTH 8.21 FT
 WEATHER OVERCAST DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS INC. COLLAR ELEV. 318.78 FT DATE/TIME 9-22-86
 TEMP. 38°F DRILL RIG CME 42 DRILLER J. GENOVESE STARTED 2-11-85 COMPLETED 12-2-85
 LOCATION/COORDINATES 4.0 FT EAST OF MW11-40 / N 109°56' 24" E 1455.82'

MATERIALS INVENTORY

WELL CASING 2.0 in. dia. 38.0 ft WELL SCREEN 2.0 in. dia. 8.2 ft BENTONITE SEAL PELLETS 3.5' DEEP
 CASING TYPE PVC SCREEN TYPE ZNC INSTALLATION METHOD THROUGH AUGERS
 JOINT TYPE FLUSH THREADED EPDM TAPE ON G-BAND SLOT SIZE 0.006 INCH FILTER PACK QTY. 12.0 LF
 GROUT QUANTITY 28 LF CENTRALIZERS NA FILTER PACK TYPE #1-Q SAND
 GROUT TYPE VOLCLAY #200 DRILLING MUD TYPE NA INSTALLATION METHOD THROUGH AUGERS

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS SEE BORING LOG MW11-4	WELL SKETCH	
316.1	GROUND SURFACE	WELL CASING 2.7 FT. STICKUP	AUGERED TO 44.0 FT. - OLE
0.0	FILL LOOSE TO COMPACT RED BROWN TO BROWN AND GRAY, F TO M SAND, LITTLE SILT/CLAY	8" ALUMINUM CASING WITH LOCK 3.5 FT. STICKUP	CAVED TO 43.5 FT. B.G.S.
314.1	UPPER SILT TILL COMPACT TO VERY DENSE, BROWN, SILT, TO F SAND, SOME SILT, SOME M TO C SAND	2.7 FT. STICKUP	INSTALLED WELL PIPE (1-2' SCREEN, 1-9' SCREEN)
2.0		BENTONITE GROUT	38' OF 2" (SEE 2.7 FT. STICKUP) PULLED AUGERS AND TREATED SAND AND PELLETS, ADDED #1-Q SAND TO 32.0 FT. B.G.S.
295.6		2" PVC RISER PIPE	ADDED PELLETS TO 28.5 FT. B.G.S.; ADDED #1-Q SAND TO 29.0 FT. (TOOK SAMPLE); MIXED GROUT, FILLED TO GROUND SURFACE; PUT ON 8" ALUMINUM PROTECTIVE CHIMNEY
20.9	GLACIOLACUSTRINE CLAY VERY SOFT, GRAY CLAY, LITTLE F TO M SAND	2" PVC RISER PIPE	FILLED INTERIOR OF CASING WITH #4-Q SAND; WEEP HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND THE WELL
286.3		28.0 28.5	A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING; A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT; BAILER WAS LATER REPLACED BY A WELL WIZARD
29.8	GLACIOLACUSTRINE SILT/SAND COMPACT TO VERY DENSE; RED BROWN, F SAND, SOME M TO C SAND	28.0 28.5	WELL DEVELOPMENT NOTES
275.1		32.0	12-19-85 PURGE WITH N ₂ GAS 4 TIMES SC 675, CLOUDY
41.0	BASAL RED TILL VERY DENSE RED BROWN, F SAND, SOME SILT, SOME M TO C SAND	35.3	12-23-85 N ₂ GAS PURGE
272.1		44.0	12-24-85 N ₂ GAS PURGE
44.0	WEATHERED BEDROCK QUEENSTON FORMATION VERY DENSE RED BROWN, WEATHERED SHALE	44.0	1-6-86 N ₂ GAS PURGE SC = 815, CLEAR TO SLIGHTLY CLOUDY
271.6		44.0	1-7-86 N ₂ GAS PURGE
44.5	END OF SAMPLING; AUGERED TO 44.0 FT.	44.0	1-8-86 N ₂ GAS PURGE

Boring Log

JOB NO. 853-3051 GA. INSP. RB PROJECT CWM/WELLS/MODEL CITY BORING NO. MW11-45
 DEPTH HOLE 22.0 FT. DEPTH WL. 282 FT DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" ID SHEET 1 OF 1
 TEMP - TIME WL. 9/22/86 DRILLING COMPANY EMERSON SOILS INVESTIGATIONS, INC. SURFACE ELEV. 316.4 FT
 WEATHER SNOW FLURRIES DRILL RIG CME 45 DRILLER J. GEORGE DATUM M.S.L.
 COORDINATES N 10956.54 E 11452.00 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED - 11:15 AM
 LOCATION 40 FEET WEST OF MW11-4D WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED - 12:12 PM

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS.	BLOWS/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN. REC./ATT		
	FUR COMPLETE SOILS DESCRIPTION AT THIS LOCATION ALSO SEE BORING LOG MW11-4D						AUGERED TO 200 FT, NO SAMPLING	
246.4								
246.0	Loose, brown, <u>F</u> sand, and silt. Little M to C sand.	MU	7	1	DO	2-4-3-7	16/24	UPPER SILT TILL GLACIOLACUSTRINE CLAY 21.0-21.5 FT, BROWN SILT SOME SAND DILATANT
20.4	VERY SOFT, GRAY, <u>CLAY</u> , LITTLE F TO M SAND.	CU						
22.0	END OF BORING							END OF BORING
								INSTALLED MW11-45 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986.

MONITORING WELL INSTALLATION LOG

NYSDEC OHMS Document No. 201469232-00043

JOB NO. B53-3051 PROJECT CWM / WELLS / MODEL CITY WELL NO. MW11-45 SHEET 1 OF 1
 SA INSP RB DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" I.D. GROUND ELEV. -316.4 FT. WATER DEPTH 3.89 FT.
 WEATHER SNOW DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS INC. COLLAR ELEV. 320.40 FT. DATE/TIME 9-22-86
 TEMP. 4.32° F DRILL RIG CME 45 DRILLER J. GENOVESE STARTED 12-12-85 COMPLETED 12-12-85
 LOCATION/COORDINATES 40 FT. WEST OF MW11-42 / N 10956.54 E 11457.00

MATERIALS INVENTORY

WELL CASING <u>2.0</u> in dia. <u>13.0</u> in	WELL SCREEN <u>2.0</u> in dia. <u>10.8</u> in	BENTONITE SEAL <u>PELLETS 10.0' DEEP</u>
CASING TYPE <u>PVC</u>	SCREEN TYPE <u>PVC</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>
JOINT TYPE <u>FLUSH TAPER</u> <u>TEFLON TAPE</u> <u>WITON O-RINGS</u>	SLOT SIZE <u>0.006 INCH</u>	FILTER PACK QTY <u>12 L.F.</u>
GROUT QUANTITY <u>NA</u>	CENTRALIZERS <u>NA</u>	FILTER PACK TYPE <u>#1-Q SAND</u>
GROUT TYPE <u>NA</u>	DRILLING MUD TYPE <u>NA</u>	INSTALLATION METHOD <u>TREMBLE TUBE</u>

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS SEE BORING LOG MW11-4	<p style="font-size: x-small;">WELL CASING 4.0 FT. STICKUP 8" Ø ALUMINUM CASING WITH LEGS 4.4 FT. STICKUP 4" Ø SAND BENTONITE PELLET SEAL 2" Ø PVC RISER PIPE 21-Q SAND 2" Ø PVC SCREEN COVER MATERIAL</p>	<u>AUGGED TO 22.0 FT.</u>	
<u>316.4</u>	GROUND SURFACE			<u>WELL CAVED - OPEN TO 21.8 FT.</u>
<u>0.0</u>	FILL WAS TO CORRECT, ALSO GROUND TO GROUND AND LAY, E-21 SAND W/RE SILT, TENSILE CLAY			<u>B.M.S. - INSTALLED WELL PIPE (1-10' SCREEN, 1-9' RISER, 1-10' RISER) 4.0 FT. STICKUP, PULLED AUGERS IN INCREMENTS OF -3 FT AND TREATED #1-Q SAND TO 10.0 FT. B.G.S. (TOX SAMPLE); PULLED REST OF AUGERS AND BACKFILLED WITH PELLETS TO GROUND SURFACE; PUT ON 8" Ø ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-Q SAND; WEED HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEED HOLES WERE PUT IN CASING; A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.</u>
<u>314.4</u> <u>2.0</u>	UPPER SILT TILL COMPACT TO VERY DENSE, BROWN, SILT TO F SAND SOME SILT, SOME M-4 SAND			
<u>296.0</u> <u>20.4</u>	GLACIOFLUSTRINE CLAY VERY SOFT GRAY CLAY LITTLE F TO M SAND			
<u>294.4</u> <u>22.0</u>	END OF BORING			
			WELL DEVELOPMENT NOTES	
			<u>12-19-85: PURGE WITH N₂ GAS 4 TIMES SC 950 CLOUDY</u>	
			<u>12-23-85: PURGE WITH N₂ GAS</u>	
			<u>12-24-85: PURGE WITH N₂ GAS</u>	
			<u>1-6-86: PURGE WITH N₂ GAS SC = 1300 CLEAR</u>	
			<u>1-7-86: PURGE WITH N₂ GAS</u>	
			<u>1-8-86: PURGE WITH N₂ GAS</u>	

JOB NO. B53-3051
 SCALE 1 INCH = 5 FEET

Golder Associates

CHECKED DJM
 DATE DRAWN 12-11-86

JOB NO. B53-3051 QA. INSP. DJM PROJECT CWM/WELLS/NOEL CITY BORING NO. MW11-5D
 DEPTH HOLE 48.5 FT. DEPTH WL. 7.87 FT DRILLING METHOD HOLLOW STEM AUGERS 3 3/4 ID SHEET 1 OF 1
 TEMP 19° F TIME WL. 9/22/86 DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. 317.8 FT.
 WEATHER SNOW SHOWERS DRILL RIG CME 45 DRILLER J. GENOVESE DATUM M.S.L.
 COORDINATES N 109° 40' 40" E 11123.85 WT. SAMPLER HAMMER 140 LBS DROP 30 IN. STARTED 10:00 / 12-2
 LOCATION 3.8 FEET EAST OF MW11-55 WT. CASING HAMMER 300 LBS DROP 30 IN. COMPLETED 11:10 / 12-3

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 8 IN. REC / ATT		
313.8	FOR COMPLETE SOILS DESCRIPTION AT THIS LOCATION ALSO SEE BORING LOG MW11-55						AUGERED TO 4.0 FT, NO SAMPLING INSTALLED 8.0 INCU DIA. PVC SURFACE CASING TO 5.0 FT. CASING WAS REMOVED BEFORE WELL INSTALLATION.	
4.0	VERY STIFF TO FIRM, GRAY BROWN, SILTY CLAY, SOME F TO M SAND, GRAY SUBROUNDED CLASTS.	CL	54	1	DO	16-22-32-42	24/24	LIPPER CLAY TILL 4.0 - 7.0 FT, SOIL MOTTLED WITH GRAY WEATHERING ALONG FRACTURES. 7.0 - 8.0 FT, NO SAMPLE
142			2	DO	42-100	12/12		
41			3	DO	12-17-24-30	26/24		
62			4	DO	28-30-32-45	8/24		
36			5	DO	12-18-18-28	21/24		
343.3	COMPACT, GRAY BROWN, CLAYEY SILT, SOME F TO C SAND, LITTLE F TO C GRAVEL AS GRAY CLASTS.	ML	24	6	DO	10-12-12-13	26/24	LIPPER SILT TILL
14.5			10	8	DO	5-6-4-5	26/24	GLACIOLACUSTRINE CLAY
302.3	VERY SOFT, GRAY, CLAY, LITTLE F TO M SAND, STICKY, PLASTIC	CH	5	9	DO	2-3-2-3	26/24	18.0 - 30.0 FT, OCCASIONAL THIN BROWN SILT LENSES, DILATANT.
13.9			8	10	DO	3-4-4-5	26/24	
			17	11	DO	8-10-7-7	10/24	22.0 - 28.0 FT, COMPACT GRAY BROWN SFT TRACE F SAND (DILATANT) INTERLAYERED WITH OCCASIONAL CLAY CLASTS.
			4	12	DO	1-2-2-3	16/24	
			6	13	DO	4-3-3-4	20/24	
			9	14	DO	3-4-5-7	19/24	
			8	15	DO	3-4-4-4	21/24	
264.7	COMPACT TO DENSE, BROWN TO RED BROWN, F SAND, SOME TO AWD SILT, SOME TO TRACE M-L SAND	SM	11	16	DO	4-4-7-26	18/24	GLACIOLACUSTRINE SILT/SAND 33.1 - 36.0 FT, LITTLE F TO C GRAVEL, CLASTS AS GRAY SUBROUNDED DROP STONES, DILATANT
55.1			25	18	DO	7-11-14-18	13/24	
			51	19	DO	8-14-37-46	8/24	40.5 - 42.0 FT, DENSE TO VERY DENSE BROWN SILT AND F SAND.
			127	20	DO	27-100	18/12	
			67	21	DO	34-27-40	20/18	
			105	22	DO	45-60-130	20/18	
	78	23	DO	18-30-48-50	22/24			
	58	24	DO	26-28-30-34	22/24			
270.9	DENSE, RED BROWN, F SAND, SOME M TO C SAND, LITTLE F GRAVEL, SHALE FRAGMENTS	ML	33	27	DO	5-7-26-30	24/24	BASAL RED TILL
41.5			260	28	DO	150	7/6	WEATHERED BEDROCK QUENSTON FORMATION
264.5	VERY DENSE, RED BROWN, WEATHERED SHALE, RED BROWN SHALE FRAGMENTS						END OF SAMPLING	
264.3								
48.5	END OF SAND, NO AUGERED TO 48.0 FT.							

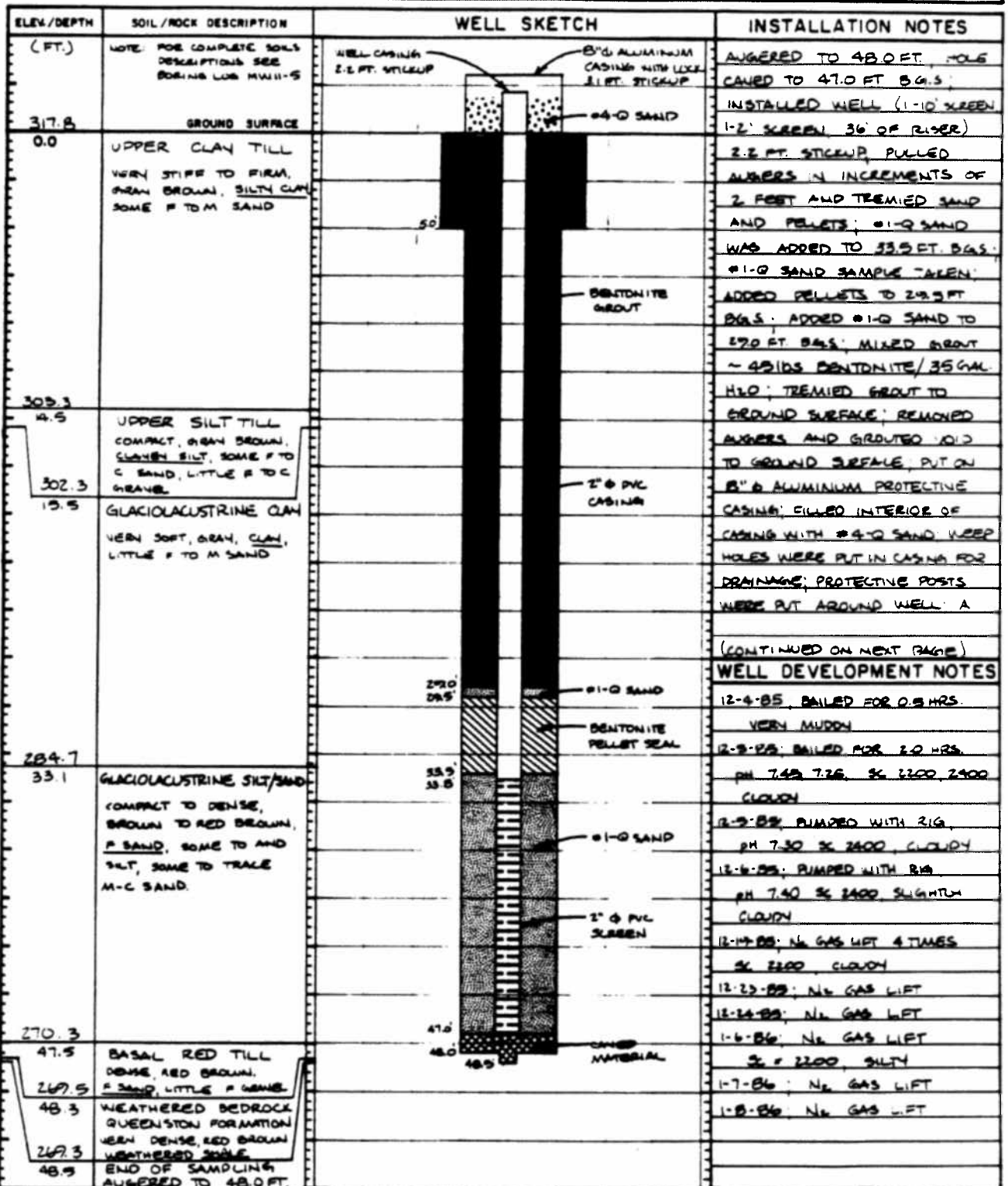
INSTALLED MW11-5D
 SEE ACCOMPANYING
 MONITORING WELL
 INSTALLATION LOG.
 NOTE REVISED FROM
 MARCH 7, 1986.

MONITORING WELL INSTALLATION LOG

JOB NO. 853-3051 PROJECT CUM / WELLS / MODEL CITY WELL NO. MW11-50 SHEET 1 OF 2
 GA WSP DJM DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" I.D. GROUND ELEV. -317.8 WATER DEPTH 7.87 FT
 WEATHER CLOUDY DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS INC. COLLAR ELEV. 319.99 DATE/TIME 9-22-86
 TEMP 23°F DRILL RIG GME 45 DRILLER GENOVESE STARTED 2:00 12-3-85 COMPLETED 10:30 12-4-85
 LOCATION/COORDINATES 3.8 FT. EAST OF MW11-55 / N 109° 66' 60" E 11673.83 TIME / DATE TIME / DATE

MATERIALS INVENTORY

WELL CASING 2.0 IN. DIA. 360 LF WELL SCREEN 2.0 IN. DIA. 132 LF BENTONITE SEAL PELLETS 40' DEEP
 CASING TYPE PVC SCREEN TYPE PVC INSTALLATION METHOD TREMIE TUBE
 JOINT TYPE FLUSH THERMO TAPES WITH O-RINGS SLOT SIZE 0.005 INCH FILTER PACK QTY 13.5 L.F.
 GROUT QUANTITY 29 FT. CENTRALIZERS NA FILTER PACK TYPE #1-0 SAND
 GROUT TYPE 10CLAY 100 DRILLING MUD TYPE NA INSTALLATION METHOD TREMIE TUBE



**Golder
Associates**

SUBJECT CWM/WELLS/MODEL CITY		MW 11-SD
Job No. 853-3051	Made by DJM	Date 12-4-85
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW
WEEP HOLES WERE PUT IN CASING; A DEDICATED BAILER WAS
INSTALLED SUBSEQUENT TO DEVELOPMENT; BAILER WAS LATER REPAIRED
BY A WELL WIZARD.

NOTE: HOLE WAS AUGERED 9.0 FT. WITH 6 1/4" (I.D.) AUGERS AND AN
8" ϕ PVC CASING WAS INSTALLED BUT WAS LATER REMOVED
PRIOR TO WELL COMPLETION.

Blank lined area for additional notes or drawings.

Boring Log

JOB NO. <u>853-3051</u>	GA. INSP. <u>DJM</u>	PROJECT <u>CWM/WELLS/MOOD CITY</u>	BORING NO. <u>MW11-55</u>
DEPTH HOLE <u>18.0 FT.</u>	DEPTH WL. <u>9.20 FT</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS-3 3/4" ID</u>	SHEET <u>1</u> OF <u>1</u>
TEMP <u>59° F</u>	TIME WL. <u>9/22/86</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS, INC.</u>	SURFACE ELEV. <u>317.3 FT.</u>
WEATHER <u>CLOUDY</u>		DRILL RIG <u>CME 45</u>	DRILLER <u>J. GONOVSE</u> DATUM <u>USL</u>
COORDINATES <u>N 10956.82 E 11670.05</u>		WT. SAMPLER HAMMER <u>140 LBS.</u> DROP <u>30 IN.</u>	STARTED <u>1:50</u> / <u>11-19-85</u>
LOCATION <u>3.8 FT WEST OF MW11-50</u>		WT. CASING HAMMER <u>300 LBS.</u> DROP <u>30 IN.</u>	COMPLETED <u>12:15</u> / <u>12-4-85</u>

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 8 IN. REC./ATT		
317.3	GROUND SURFACE						INSTALLED 80 INCH DIA. PVC SURFACE CASING TO 50 FT. CASING WAS REMOVED BEFORE WELL INSTALLATION	
0.0	FIRM, DARK BROWN, CLAYEY SILT, AND DENSE GRAY AND BROWN, F TO C SAND.	ML SW	74	2	DO	13-32-42	12/18	FILL
316.8								UPPER CLAY TILL 1.5 - 20 FT. NO SAMPLE.
1.5	COMPACT TO DENSE, BROWN MOTTLED, CLAYEY SILT, SOME F TO C SAND, CLASTS AS GRAY AND RED BROWN SUBROUNDED AND SUBANGULAR DROP STONES	CL	30	3	DO	8-14-16-20	16/24	2.0 - 4.0 FT, GRAY WEATHERING ALONG VERTICAL FRACTURES AUGERED. 4.0 - 16.0 FT, NO SAMPLING, SEE BORING LOG MW11-50 FOR COMPLETE SOILS DESCRIPTION AT THIS LOCATION.
301.3								
16.0	VERY SOFT, GRAY, CLAY, LITTLE F TO C SAND, AS GRAY SUBROUNDED DROPSTONES, PLASTIC STICKY	CH	2	4	DO	WR-WR-2-3	26/24	GLACIOLACUSTRINE CLAY 16.0 - 16.3 FT, SILTY CLAY LITTLE F TO M SAND
299.3								
18.0	END OF SAMPLING AUGERED TO 17.3 FT.							END OF SAMPLING
								INSTALLED MW11-55 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986.

JOB NO. <u>853-3051</u>	Golder Associates	CHECKED <u>DJM</u>
SCALE <u>1 INCH = 5 FEET</u>		DATE DRAWN <u>12/15/86</u>

MONITORING WELL INSTALLATION LOG

JOB NO. BS3-3051 PROJECT CWAIA/WELLS/MODEL CITY WELL NO. MW 1-55 SHEET 1 OF 1
 SA INSP. DJM DRILLING METHOD HOLLOW STEM AUGERS - 3/4" I.D. GROUND ELEV. -316.9 FT WATER DEPTH 5.20 FT
 WEATHER OVERCAST DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS INC. COLLAR ELEV. 319.12 FT DATE/TIME 9-22-86
 TEMP. 30°F DRILL RIG CMG 45 DRILLER J. GONDRESE STARTED 12:45 2-4-85 COMPLETED 12:20 2-4-85
 LOCATION/COORDINATES 3.8 FT. WEST OF MW 11-50 / N 10996.88; E 11670.03

MATERIALS INVENTORY

WELL CASING <u>2.0</u> IN. DIA. <u>10.0</u> FT	WELL SCREEN <u>2.0</u> IN. DIA. <u>8.2</u> FT	BENTONITE SEAL <u>PELLETS 7' DEEP</u>
CASING TYPE <u>PVC</u>	SCREEN TYPE <u>PVC</u>	INSTALLATION METHOD <u>OPEN HOLE</u>
JOINT TYPE <u>FLUSH THERMOPLASTIC VITON O-RINGS</u>	SLOT SIZE <u>2.006 INCH</u>	FILTER PACK QTY <u>10.3 LF</u>
GROUT QUANTITY <u>NA</u>	CENTRALIZERS <u>NA</u>	FILTER PACK TYPE <u>#1-Q SAND</u>
GROUT TYPE <u>NA</u>	DRILLING MUD TYPE <u>NA</u>	INSTALLATION METHOD <u>OPEN HOLE</u>

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS SEE BORING LOG MW 11-50	<p>The well sketch shows a vertical well casing with a 2.2 ft. stickup at the top. The casing is 8" diameter aluminum with a lock and 3.8 ft. stickup. Inside the casing, there is a 2" diameter PVC riser pipe with a 2.2 ft. stickup. A bentonite pellet seal is located between the riser pipe and the casing. Below the seal is a 7.0 ft. section of #1-Q sand, followed by a 7.0 ft. section of #4-Q sand. At the bottom of the casing is a 2" diameter PVC screen. The ground surface is at elevation 317.3. The casing extends to elevation 302.8. The screen is at elevation 17.3. The total depth of the well is 18.0 ft.</p>	<p>AUGERED TO 17.3 FT.</p> <p>PULLED AUGERS, ADDED SAND TO 16.0 FT. (TOOK SAMPLE);</p> <p>INSTALLED WELL PIPE (1-2' SCREEN - 1-5' SCREEN - 1-0' RISER) 2.2 FT. STICKUP</p> <p>ADDED #1-Q SAND TO 7.0 FT B.G.S.; ADDED PELLETS TO GROUND SURFACE; PUT ON 8" ALUMINUM PROTECTIVE CASING;</p> <p>FILLED INTERIOR OF CASING WITH #4-Q SAND; WEEP HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING; A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.</p> <p>NOTE: HOLE WAS AUGERED 50 FT WITH 6/4" (1.0) AUGERS AND AN 8" PVC CASING WAS INSTALLED BUT WAS LATER REMOVED PRIOR TO WELL COMPLETION.</p> <p>WELL DEVELOPMENT NOTES</p> <p>2-6-85: BAILED FOR 3.5 HRS SLIGHTLY CLOUDY</p> <p>2-23-85: N₂ GAS LIFTED</p> <p>2-24-85: N₂ GAS LIFTED</p> <p>1-6-86: N₂ GAS LIFTED CLEAR</p> <p>1-7-86: N₂ GAS LIFTED</p> <p>1-8-86: N₂ GAS LIFTED</p>	
317.3	GROUND SURFACE			
0.0	UPPER CLAY TILL VERY STIFF TO FIRM, GRAY BROWN SILTY CLAY SOME F-M SAND			
302.8	UPPER SILT TILL COMPACT, GRAY BROWN CLAYEY SILT, SOME F-M SAND, LITTLE F-C GRAVEL			
301.8	GLACIOLACUSTRINE CLAY VERY SOFT GRAY CLAY			
19.0	LITTLE F-M SAND END OF SAMPLING AUGERED TO 17.3			

Boring Log

JOB NO. B53-3051 GA. INSP. DJM PROJECT CWM/WELLS/NOEL CITY BORING NO. MW11-6D
 DEPTH HOLE 46.1 FT. DEPTH WL. 6.42 FT. DRILLING METHOD HOLLOW STEM AUGERS - 4 1/8" ID SHEET 1 OF 1
 TEMP 50°F TIME WL. 9/27/86 DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. -316.6 FT
 WEATHER SUNNY/RAINY DRILL RIG CME 45 DRILLER J. GROVESE DATUM MSL
 COORDINATES N10.96866 E11.81563 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 1:30 / 11-1-85
 LOCATION 2.5 FT. WEST OF MW11-65 WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 3:30 / 11-6-85

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS.	BLOWS/FOOT	SAMPLES				REMARKS
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN.	REC./ATT	
316.6	GROUND SURFACE							GROUND SURFACE
0.0	COMPACT TO DENSE, GRAY BROWN, F-C SAND, SOME GRAVEL, TRACE CLAY, SATURATED FROM 0.7-1.0 FT.	ML	32	1	DO	16-20-12-6	16/24	FILL
315.6								UPPER CLAY TILL
1.0	FIRM TO STIFF, BROWN, SLIGHTLY MOTTLED, CLAYEY SILT TO SILTY CLAY, SOME F-C SAND, GRAY WEATHERING ALONG VERTICAL FRACTURES AND JOINTS	CL	60	2	DO	10-10-50-35	8/24	
			39	3	DO	15-15-24-32	23/24	
			99	4	DO	39-49-50-48	26/24	6.0-10.0 FT. GRAY SUBROUNDED CLASTS
306.6			70	5	DO	10-24-45-35	26/24	
10.0	COMPACT GRAY BROWN, CLAYEY SILT, SOME F-C SAND, LITTLE F GRAVEL, GRAY SUBANGULAR CLASTS.	ML	20	6	DO	8-10-10-5	26/24	UPPER SILT TILL
			18	7	DO	5-8-10-13	14/24	14.0-16.0 FT. SOFT GRAY BROWN SILTY CLAY
			8	8	DO	2-3-5-6	20/24	16.0-20.0 FT. SOIL IS INTERLAYERED WITH SILT OR F SAND LENSES, DILATANT
			66	9	DO	22-28-38-40	22/24	20.0-20.5 FT. COMPACT BROWN GRAY F SAND AND CLAYEY SILT, DILATANT
			22	11	DO	17-12-9-8	14/24	
			15	12	DO	5-6-9-11	24/24	22.0-23.0 FT. COMPACT BROWN GRAY SILT INTER-LAYERED WITH SOFT CLAY
293.6			18	14	DO	4-6-12-13	24/24	GLACIOLACUSTRINE CLAY
23.0	VERY SOFT, GRAY CLAY, LITTLE F TO M SAND, AS GRAY SUBANGULAR DROP STONES, PLASTIC, STICKY	CH	4	15	DO	2-2-3	24/24	
			10	16	DO	4-4-6-6	24/24	28.0-30.0 FEET, OCCASIONAL BROWN SILT AND/OR F SAND LENSE
			0.5	17	DO	WH-WH-03-5	24/24	
			9	18	DO	4-4-5-6	24/24	
283.1			14	19	DO	6-7-7-8	24/24	
33.5	INTERLAYERED LOOSE GRAY SAND, AND VERY SOFT GRAY CLAY, SOME SILT	ML/CH	3	21	DO	2-1-2-2	24/24	GLACIOLACUSTRINE SILT/SAND (LAMINATED CLAYS)
280.1			23	22	DO			
36.5	COMPACT BROWN, F SAND, SOME SILT, LITTLE M TO C SAND, LITTLE F GRAVEL, AS GRAY SUBROUNDED CLASTS, SLIGHTLY DILATANT	ML	16	23	DO	3-4-12-13	24/24	GLACIOLACUSTRINE SILT/SANDS
276.6			40	25	DO	16-16-24-40	24/24	
40.0	VERY DENSE, RED BROWN, CLAYEY SILT, SOME F SAND, LITTLE TO TRACE F GRAVEL, RED BROWN SHALEY FRAGMENTS	ML	174	27	DO	178	182.6	BASAL RGD TILL AUGERED 40.5 TO 42.0 FT, NO SAMPLING
272.6			188	28	DO	180	187.6	AUGERED 42.5 TO 46.0 FT, NO SAMPLING
44.0	VERY DENSE, RED BROWN, WEATHERED SHALE, DRY CRUMBLY	ML	218	29	DO	100/1	87.6	WEATHERED BEDROCK OUNSTON FORMATION AUGERED 44.5 TO 46.0 FT, NO SAMPLING
270.5								
46.1	END OF SAMPLING AUGERED TO 46.0 FT.		100	30	DO	100/1	1/1	END OF SAMPLING

INSTALLED MW11-6D
 SEE ACCOMPANYING
 MONITORING WELL
 INSTALLATION LOG.
 NOTE REVISED FROM
 MARCH 7, 1986.

MONITORING WELL INSTALLATION LOG

JOB NO. 853-3051 PROJECT CWM/WELLS/MOSEL CITY WELL NO. MW11-60 SHEET 1 OF 2
 SA HSP. DJM DRILLING METHOD HOLLOW STEEL AUGERS - 4 1/4" (I.D.) GROUND ELEV. ~316.6 FT WATER DEPTH 6.42 FT
 WEATHER COOL DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. COLLAR ELEV. 318.41 FT DATE/TIME 9.22.86
 TEMP. 23°F DRILL RIG CME 45 DRILLER J. GENOVESE STARTED 9:30 11.7.85 COMPLETED 9:30 11.8.85
 LOCATION/COORDINATES 2.3 FT. WEST OF MW11-05 / N 10968.66 E 11819.63 TIME / DATE TIME / DATE

MATERIALS INVENTORY

WELL CASING <u>2.0</u> IN. DIA. <u>36.0</u> FT.	WELL SCREEN <u>2.0</u> IN. DIA. <u>5.8</u> FT.	BENTONITE SEAL <u>PELLETS 2.9' DEEP</u>
CASING TYPE <u>PVC</u>	SCREEN TYPE <u>PVC</u>	INSTALLATION METHOD <u>TREMIE TUBE</u>
JOINT TYPE <u>FLUSH</u> <u>BELOW</u> <u>W/TON</u> <u>DRILLED</u> <u>TAPE</u> <u>R-RINGS</u>	SLOT SIZE <u>0.006 INCH</u>	FILTER PACK QTY <u>1 B.L.F.</u>
GROUT QUANTITY <u>30 L.F.</u>	CENTRALIZERS <u>NA</u>	FILTER PACK TYPE <u>#1-Q SAND</u>
GROUT TYPE <u>VOLCAN BENTONITE #200</u>	DRILLING MUD TYPE <u>NA</u>	INSTALLATION METHOD <u>TREMIE TUBE</u>

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
316.6	GROUND SURFACE		AUGERED TO 46.0 FT. PULLED AUGERS BACK TO 40 FT B.G.S. TREMIED PELLETS TO 41.0 FT B.G.S. TREMIED #1-Q SAND TO 40 FT B.G.S. INSTALLED WELL PIPE (1-5" SCREEN, 3/8" OF RISER PIPE) 1.8 FT STICKUP. IN STEPS PULLED BACK AUGERS AND TREMIED #1-Q SAND AND PELLETS.	
0.0	FILL COMPACT TO DENSE, GRAY BROWN F-C SAND, SOME GRAVEL, TRASS CLAY			ADDER #1-Q SAND TO 32.9 FT B.G.S. (TOOK SAMPLE), ADDER PELLETS TO 30.0 FT. B.G.S. TREMIED GROUT TO GROUND SURFACE (GROUT MIX ABOUT 1.0 LB. BENTONITE/1 GAL WATER). PULLED AUGERS AND GROUTED TO GROUND SURFACE.
315.6	UPPER CLAY TILL FIRM TO STIFF, BROWN, SLIGHTLY MOTTLED, SLANTED SILT TO SILTY CLAY, SOME F-C SAND.			PUT ON 8" Ø ALUMINUM PROTECTIVE CASING FILLED INTERIOR OF CASING WITH #4-Q SAND. WEEP HOLES WERE PUT IN CASING FOR DRAINAGE. PROTECTIVE
1.0	UPPER SILT TILL COMPACT GRAY BROWN, CLAYEN SILT, SOME F-C SAND, LITTLE # GRAVEL			(CONTINUED ON NEXT PAGE)
306.6	GLACIOCLASTIC CLAY VERY SOFT, GRAY CLAY, LITTLE F TO M SAND			WELL DEVELOPMENT NOTES 11-20-85; BAILED 1.5 HRS. PH 8.30 S = 1400 VERY TURBID 11-21-85; BAILED 1.5 HRS. PH 8.2 S = 1300 RED BROWN VERY TURBID 11-25-85; PUMPED WITH RIG TO BELOW SUCTION LIFT 4 TIMES PH 7.9, 7.8 T.B. S. 1300, 1300, 1150 CLOUDY 11-26-85; PUMPED WITH RIG 4 TIMES CLOUDY 11-27-85; BAILED 2 HRS. PH 7.8, 7.8 T.B. T.B. S. 1450, 1320, 900, 1350 CLOUDY 12-2-85; BAILED 1.5 HRS. PH 7.45 S = 1400 VERY TURBID 12-19-85; N ₂ GAS LIFTING 4 TIMES S = 1600 SLIGHTLY CLOUDY 12-23-85 N ₂ GAS LIFT: 12-24- N ₂ GAS LIFT: 01-06-86 N ₂ GAS LIFT: 01-07-86 N ₂ GAS LIFT: 01-08-86 N ₂ GAS LIFT: S = 1500, CLEAR TO SLIGHTLY CLOUDY
293.6	GLACIOCLASTIC SILT/SAND (LAMINATED CLAYS) UNCONSOLIDATED, LOOSE, GRAY F SAND, AND VERY SOFT GRAY CLAY, SOME SILT.			
23.0	GLACIOCLASTIC SILT/SAND COMPACT, BROWN, F SAND, SOME SILT, LITTLE M TO C SAND, LITTLE # GRAVEL			
283.1	BASAL RED TILL VERY DENSE, RED BROWN, CLAYEN SILT, SOME F SAND, LITTLE TO TRASS # GRAVEL			
55.5	WEATHERED BEDROCK QUEEN STON FORMATION VERY DENSE, RED BROWN, WEATHERED SHALE.			
280.1	END OF SAMPLING AUGERED TO 46.1 FT.			

**Golder
Associates**

SUBJECT CWM/WELLS/MODEL CITY		MW 11-6D
Job No. 853-3051	Made by DJM	Date 11-8-85
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

POSTS WERE PUT AROUND WELL. A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING. A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT; THE BAILER WAS LATER REPLACED BY A WELL NIZARD.

JOB NO. B53-3051 GA. INSP. DJM PROJECT CWM/WELLS/MODEL CITY BORING NO. MW11-65
 DEPTH HOLE 26.0 FT. DEPTH WL. 6.27 FT. DRILLING METHOD HOLLOW STEM AUGERS 4 1/4" ID SHEET 1 OF 1
 TEMP 41° F TIME WL. 9/22/86 DRILLING COMPANY EMPRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. -37.6 FT.
 WEATHER SUNNY/COOL DRILL RIG CME 45 DRILLER J. GENOVESE DATUM MSL
 COORDINATES N10949.18 E 11818.98 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 10:00 / 11:30
 LOCATION 2.5 FT EAST OF MW11-60 WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 11:30 / 11:30

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS
				NUMBER	TYPE	HAMMER BLOWS PER 8 IN. REC./ATT	
297.6	FOR COMPLETE SOILS DESCRIPTION AT THIS LOCATION ALSO SEE BORING LOG MWH-60						AUGERED TO 19.5 FT, NO SAMPLING
200 295.6	FIRM GRAY BROWN CLAYEY SILT, SOME TO C SAND, MOIST GRAY SUBROUNDED AND SUBANGULAR CLASTS	ML	14	2	DO	7-7-7-7 12/24	UPPER SILT TILL 20.0-20.2 FEET COMPACT BROWN F-SAND W/CLAY
22.0	SOFT GRAY BROWN SILTY CLAY AND F-C SAND, TO VERY SOFT GRAY CLAY AND TO LITTLE F-C SAND, CLASTS AS GRAY SUBANGULAR DRIP STONES, STICKY, PLASTIC.	CL CH	20	3 4	DO	7-11-9-9 24/24	GLACIOLACUSTRINE CLAY
291.6			8	5	DO	7-4-4-5 6/24	OCCASIONAL SILT LENSE PRESENT BETWEEN 24.0 AND 26.0 FT.
26.0	END OF SAMPLING AUGERED TO 24.0 FT.						END OF SAMPLING INSTALLED MW11-65 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986

MONITORING WELL INSTALLATION LOG

NY SDEC OHMS Document No. 201469232-00043

JOB NO. <u>853-3091</u>	PROJECT <u>CWM/WELLS/MODEL CITY</u>	WELL NO. <u>MW11-65</u>	SHEET <u>1</u> OF <u>1</u>
GA INSP. <u>DJM</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS - 4 1/4" ID</u>	GROUND ELEV. <u>317.3 FT</u>	WATER DEPTH <u>6.27 FT</u>
WEATHER <u>SUNNY</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS INC</u>	COLLAR ELEV. <u>320.03 FT</u>	DATE/TIME <u>9-22-86</u>
TEMP. <u>41°F</u>	DRILL RIG <u>CME 45</u>	DRILLER <u>J. GENOVESE</u>	STARTED <u>12:30 11/8/85</u>
LOCATION/COORDINATES <u>2.5 FT EAST OF MW11-60 / N 10969 B</u>	<u>E 11818 B</u>	COMPLETED <u>1:30 11/8/85</u>	DATE/TIME

MATERIALS INVENTORY			
WELL CASING <u>2.0</u> M. DIA. <u>10.0</u> I.D.	WELL SCREEN <u>2.0</u> M. DIA. <u>16.2</u> I.D.	BENTONITE SEAL <u>PELLETS 3.5'</u> 2WDX220	
CASING TYPE <u>PVC</u>	SCREEN TYPE <u>PVC</u>	INSTALLATION METHOD <u>OPEN HOLE</u>	
JOINT TYPE <u>FLUSH THREADED, TAPER, O-RINGS</u>	SLOT SIZE <u>0.006 INCH</u>	FILTER PACK QTY <u>18.5 - F</u>	
GROUT QUANTITY <u>NA</u>	CENTRALIZERS <u>NA</u>	FILTER PACK TYPE <u>1-0 SAND</u>	
GROUT TYPE <u>NA</u>	DRILLING MUD TYPE <u>NA</u>	INSTALLATION METHOD <u>OPEN HOLE</u>	

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
317.6	GROUND SURFACE	<p style="font-size: x-small;">WELL SKETCH: A vertical cross-section of the well. From top to bottom: 5" aluminum casing with 2.7 ft stickup; 4" sand; bentonite pellet seal; powdered bentonite seal; another bentonite pellet seal; 2" PVC riser pipe; 8" sand; 2" PVC screen; and finally 24.0 ft of casing at the bottom. Elevations are marked on the left: 317.6 (ground surface), 0.0 (fill), 2.0, 4.0, 5.5, 7.5, 23.5, 24.0, and 24.0 (bottom of casing).</p>	AUGERED TO 24.0 FT.; PULLED AUGERS; ADDED #1-0 SAND TO 23.5 FT. B.G.S.; INSTALLED WELL PIPE (1.5' SCREEN, 1-10' SCREEN, 1-10' RISER) 2.7 FT STICKUP; ADDED #1-0 SAND TO 5.5 FT. B.G.S. (TOOK SAMPLE); ADDED PELLETS TO 4.0 FT. B.G.S.; ADDED BENTONITE POWDER TO 2.0 FT. B.G.S.; ADDED PELLETS TO GROUND SURFACE; PUT ON 8" φ ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING; WEEP HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PUT AROUND WELL ON THE SITE AND NEW WEEP HOLES WERE PUT IN CASING. A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.
0.0	FILL		
	UPPER CLAY TILL FIRM TO STIFF, BROWN CLAYEY SILT TO SILTY CLAY, SOME F-I L SAND.		
	UPPER SILT TILL COMPACT GRAY BROWN CLAYEY SILT, SOME F-I SAND, LITTLE # GRAVEL.		
295.6	GLAUCOUS/STRAWN CLAY VERY SOFT CLAY CLAY, LITTLE F-I SAND.		
24.0	END OF SAMPLING AUGERED TO 24.0 FT.		

WELL DEVELOPMENT NOTES	
11-20-85: BAILED FOR 15 MINS.	PH 7.80, 7.95, SC 2000, 2050, CL 2001
11-21-85: BAILED FOR 37 MINS.	PH 7.65, SC 2200, CLEAR
11-25-85: BAILED FOR 2.0 MINS.	PH 7.70, 7.75, SC 2100, 2200 CLEAR
11-26-85: PUMPED WITH 816 (PUMPED 024) 4 TIMES, SLIGHTLY CLOUDY	
11-27-85: BAILED 30 MINS.	PH 7.40, 7.40, 7.40, SC 2350, 2200, 2350, 2350, CLEAR
12-23-85: N ₂ GAS LIFT	
12-24-85: N ₂ GAS LIFT	
1-6-86: N ₂ GAS LIFT	
1-7-86: N ₂ GAS LIFT	
1-8-86: N ₂ GAS LIFT	SC = 1300, CLEAR

JOB NO. 853-3051 GA. INSP. FWS PROJECT CWM/WELLS/MOORE CITY BORING NO. MW11-75
 DEPTH HOLE 18.5 FT. DEPTH WL. 3.27 FT. DRILLING METHOD HOLLOW STEM AUGERS 4 1/4 ID SHEET 1 OF 1
 TEMP 75°F TIME WL. 9/22/86 DRILLING COMPANY EMPRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. 317.3 FT
 WEATHER SUNNY DRILL RIG ACKER AD-2 DRILLER J. GENOVESE DATUM MSL
 COORDINATES N10 29.05 E 12,028.70 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 1:30 15-6-86
 LOCATION 8.5 FEET EAST OF MW11-70 WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 4:00 15-6-86

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN.		
317.3	GROUND SURFACE						GROUND SURFACE	
0.0	COARSE GRAVEL, ROADFILL	CW	-	-	AS	-	FILL 0.0-2.0 FT, NO SAMPLE TAKEN	
315.3							UPPER CLAY TILL	
2.0	STIFF TO VERY STIFF, RED BROWN AND GRAY BROWN MOTTLED, CLAYEY SILT, SOME F TO C SAND, SOME GRAVEL AT 100 FT BECOMING FIRM, GRAY BROWN, SILTY CLAY, SOME F TO M SAND	CL	32	2	DO	10-13-19	11/18	4.0-6.0 FT. GRAY WEATHERING ALONG VERTICAL FRACTURES
			51	3	DO	17-24-27-30	17/24	
			116	4	DO	60-62-54-50	23/24	
			26	5	DO	11-12-14-15	18/24	
			23	6	DO	12-12-11-11	4/24	
303.3			46	7	DO	11-11-35-64	14/24	
14.0	COMPACT, GRAY BROWN, SILT, AND F SAND, SOME M TO C SAND, TRACE F GRAVEL	ML	15	8	DO	4-9-6-6	18/24	UPPER SILT TILL
301.3								GLACIOLAUSTRING CLAY
16.0	SOFT, GRAY BROWN, SILTY CLAY, SOME F TO M SAND, TRACE F GRAVEL	CL	7	9	DO	3-4-3-4		
299.3								
18.0	END OF SAMPLING AUGERED TO 18.5 FT.							END OF SAMPLING INSTALLED MW11-75 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG.

MONITORING WELL INSTALLATION LOG

NYSDEC OHMS Document No. 201469232-00043

JOB NO. <u>853-3031</u>	PROJECT <u>CWM / WELLS / MODEL CITY</u>	WELL NO. <u>MW11-75</u>	SHEET <u>1</u> OF <u>2</u>
SA INSP. <u>FWS</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS-4 1/4" ID</u>	GROUND ELEV. <u>317.3 FT</u>	WATER DEPTH <u>32.7 FT</u>
WEATHER <u>CLOUDY</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS</u>	COLLAR ELEV. <u>319.83 FT</u>	DATE/TIME <u>9-22-86</u>
TEMP <u>75°F</u>	DRILL RIG <u>ACKER AD-2</u>	DRILLER <u>J. GENOVESE</u>	STARTED <u>4:10</u> / <u>5:4</u> / <u>8:40</u> / <u>5:7</u> / <u>86</u>
LOCATION/COORDINATES <u>85 FT. EAST OF MW 11-7D / N 109° 09' 05" E 12028.70</u>		TIME / DATE	

MATERIALS INVENTORY			
WELL CASING <u>2.0</u> IN. DIA. <u>80</u> LF	WELL SCREEN <u>2.0</u> IN. DIA. <u>12.9</u> LF	BENTONITE SEAL <u>PELLETS 30' DEEP</u>	
CASING TYPE <u>304 STAINLESS STEEL</u>	SCREEN TYPE <u>304 STAINLESS STEEL</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>	
JOINT TYPE <u>FLUSH TYPON VITCH O-RINGS</u>	SLOT SIZE <u>0.006 INCH</u>	FILTER PACK QTY. <u>15.5 L.F.</u>	
GROUT QUANTITY <u>NA</u>	CENTRALIZERS <u>NONE</u>	FILTER PACK TYPE <u>#1-Q SAND</u>	
GROUT TYPE <u>NA</u>	DRILLING MUD TYPE <u>NONE</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>	

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
317.3	GROUND SURFACE		AUGERED TO 18.5 FT. ADDED #1-Q SAND TO 18.4 FT. BELOW GROUND SURFACE. INSTALLED WELL PIPE (1-2' SCREEN 1-0' SCREEN 1-3' RISER 1-5' RISER) 2.5 FT. STICKUP; ADDED #1-Q SAND TO 9.5 FT. STARTED TO LIGHTLY RAIN; DRILLER OUT OF #1-Q SAND; RAINING; THEREFORE USED #4-Q SAND. ADDED #4-Q SAND TO 5.0 FT. ADDED PELLETS TO 2.0 FT. REMOVED AUGERS; MIXED CEMENT GROUT; FILLED TO GROUND SURFACE; PUT ON 8"Ø ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-Q SAND; WEED HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER RAISED AROUND WELL BY THE SITE AND NEW WEED	
0.0	FILL COARSE GRAVEL ROADFILL			(CONTINUED ON NEXT PAGE)
315.3				WELL DEVELOPMENT NOTES
2.0	UPPER CLAY TILL STIFF TO VERY STIFF RED BROWN TO GRAY BROWN MOTTLED GLASSY SILT, BECOMING FIRM GRAY BROWN, SILTY GRAY SOME FT. TO M. SAND. GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 4.0-6.0 FT.			DATE DEVELOPED: 9-7-86 TO 6-10-86
303.3				DEVELOPMENT METHOD: A 2 LIFT
14.0	UPPER SILT FILL COMPLETELY GRAY BROWN, SILTY AND F. SAND, SOME M-CROWN TRACE GRAVEL			VOLUME PURGED: 15.4 GAL
301.3				FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT TABLE.
16.0	CLAY COAGULATING CLAY VERY GRAY BROWN, SILTY AND SOME F-M SAND, TRACE GRAVEL			
299.3				
18.0	END OF SAMPLING AUGERED TO 18.5 FT.			NOTE: A 0.5 FT. END CAP WAS PLACED AT THE BOTTOM OF THE SCREEN SECTION 2, 5 AND 10 FT. SCREEN SECTIONS ARE ACTUALLY 2.35, 5.325, 10.325 FT. IN LENGTH, RESPECTIVELY.

**Golder
Associates**

SUBJECT CWM/WELLS/MODEL CITY		MW11-73
Job No. 853-3051	Made by FWS	Date 5.7.86
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

HOLES WERE PUT IN CASING; A DEDICATED STAINLESS STEEL BAILER
WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.

JOB NO. 853-3051 GA. INSP. FWS PROJECT CWMA WELLS/MODEL CITY BORING NO. MW11-7D
 DEPTH HOLE 44.5 FT. DEPTH WL. 6.27 FT. DRILLING METHOD HOLLOW STEM AUGERS 4 1/4 ID SHEET 1 OF 1
 TEMP 75° F TIME WL. 9/22/86 DRILLING COMPANY EMPRE SOLS INVESTIGATIONS, INC. SURFACE ELEV. 317.2 FT
 WEATHER SUNNY/WARM DRILL RIG ACKER AD-2 DRILLER J. GENOVESE DATUM MSL
 COORDINATES N10970.80 E17020.11 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 10:40 / 5-7-86
 LOCATION 85 FEET WEST OF MW11-7S WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 2:02 / 5-8-86

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN. REC./ATT		
299.2	FOR COMPLETE SOILS DESCRIPTION AT THIS LOCATION ALSO SEE BORING LOG MW11-7S						AUGERED TO 180 FT. NO SAMPLING. AUGERED AND SAMPLED TO 200 FT. INSTALLED 10 INCH PVC SURFACE CASING TO 19.7 FT. CONTINUED AUGERING AND SAMPLING	
180	VERY SOFT GRAY, CLAY, LITTLE TO TRACE F SAND	CH	4	1	DO	1-2-2-2	24/24	GLACIOLACUSTRINE CLAY 22.0-24.0 FT. CLAY MIXED WITH SAND AND GRAVEL WITH GRAY SILT AND F SAND LENSES, DILATANT
			4	2	DO	2-1-3-3	7/24	
			14	3	DO	2-7-7-8	15/24	
			3	4	DO	WH-1-2-2	29/24	
			5	5	DO	2-2-3-3	24/24	
			2	6	DO	WR-WH-2-1	21/24	
			2	7	DO	WR-WH-2-2	24/24	
			6	8	DO	2-3-3-2	24/24	
			2	9	DO	WR-1-1-1	20/24	
			5	10	DO	1-1-4-5	16/24	
279.3	COMPACT TO VERY DENSE RED BROWN, F SAND, SOME TO AND SILT, SOME TO TRACE M-C SAND, SOME TO TRACE GRAVEL, CLASTS AS GREEN GRAY LIMESTONE AND RED BROWN SHALE	SM	13	11	DO	2-5-8-11	11/24	GLACIOLACUSTRINE SILT/SAND
37.9			24	12	DO	5-12-12-17	12/24	42.0-43.0 FT. DILATANT
274.2	HARD RED BROWN, CLAYEY SILT, SOME F TO C SAND, AND GRAVEL, CLASTS AS GREEN GRAY LIMESTONE, RED BROWN SHALE	ML	135	13	DO	50-50-85-150	15/23	BASAL RED TILL
43.0			500	14	DO	100-3-3	6/6	
272.7	END OF SAMPLING						END OF SAMPLING	
44.5	END OF SAMPLING AUGERED TO 43.6 FT.						*NOTE 300 LB. HAMMER USED INSTALLED MW11-7D SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG.	

MONITORING WELL INSTALLATION LOG

JOB NO. B53-3051 PROJECT CNM/WELLS/MODEL CITY WELL NO. MW11-7D SHEET 1 OF 2
 SA MSP FWS DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" I.D. GROUND ELEV 317.2 FT. WATER DEPTH 6.27 FT.
 WEATHER P.CLOUDY DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. COLLAR ELEV 318.71 FT. DATE/TIME 9-22-86
 TEMP 68°F DRILL RIG ACKER AD-2 DRILLER J. GENOVESE STARTED 2:30 9-13-86 COMPLETED 8:15 9-15-86
 LOCATION/COORDINATES 80 FT WEST OF MW11-7S / N 10970.80 E 13070.11 TIME / DATE TIME / DATE

MATERIALS INVENTORY

WELL CASING 2.0 in dia. 4.0 LI WELL SCREEN 2.0 in dia. 4.9 LI BENTONITE SEAL PELLETS 4.4' DEEP
 CASING TYPE 304 STAINLESS STEEL SCREEN TYPE 304 STAINLESS STEEL INSTALLATION METHOD TREMIE TUBE & WASH
 JOINT TYPE FLUSH TEFLO VITON O-RINGS SLOT SIZE 0.006 INCH FILTER PACK QTY 7.64 F.; 175 LBS.
 GROUT QUANTITY 70 GAL. CENTRALIZERS NONE FILTER PACK TYPE #1-Q SAND
 GROUT TYPE BENTONITE DRILLING MUD TYPE NONE INSTALLATION METHOD TREMIE TUBE & WASH

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS, SEE BORING LOG PART-10	WELL SKETCH	
317.2	GROUND SURFACE		AUGERED TO 19.0 FT. WITH 12 INCH (O.D.) AUGERS; GROUTED 10" Ø PVC CASING TO 19.0 FT. B.G.S. (TOOK GROUT SAMPLE); PUSHED 10" CASING TO 19.7 FT.
0.0	FILL COARSE GRAVE ROADFILL	1.0'	
315.2		2.0'	
2.0	UPPER CLAY TILL STIFF TO VERY STIFF, RED BROWN, TO GRAY BROWN MOTTLED, CLAYEY SILT, BECOMING FIRM GRAY BROWN, SILTY CLAY SOME F TO M SAND, GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 4.0-6.0 FT.	12" Ø AUGER BORING	AUGERED TO 43.6 FT. WITH 4 1/4 INCH (I.D.) AUGERS; PULLED AUGERS; INSTALLED 6" Ø TEMPORARY STEEL CASING; WASHED OUT-OPEN TO 43.6 FT. B.G.S.; TREMIED (WITH WATER) #4-Q SAND TO 43.3 FT. B.G.S. (TOOK DRY SAMPLE); INSTALLED WELL PIPE (2-2' SCREENS 4-10' RISERS) 1.6 FT. STICKUP;
303.2	UPPER SILT TILL COMPACT GRAY BROWN SILT AND F SAND SOME M-C SAND, TRACE GRAVEL	14.0'	ADDED #1-Q SAND TO 36.0 FT. B.G.S. (TOOK SAMPLE);
301.2		16.0'	ADDED PELLETS TO 31.6 FT B.G.S.; ADDED #4-Q SAND TO 31.2 FT. B.G.S.; MIXED GROUT; 12' BATCH 55 LBS. BENTONITE / 35 GAL H ₂ O.
16.0	GLAUCOUSISH CLAY SOFT, GRAY BROWN, SILTY CLAY, SOME F-M SAND, TRACE FG GRAVEL, 22.0-24.0 FT. CLAY MIXED WITH SAND, GRAVEL, AND SILT.	19.0'	
14.0		19.7'	
		DRIVEN 6" Ø TEMPORARY CASING HERE	
		2" Ø TUBE 308 S.S. RISER PIPE	
		#4-Q SAND	
		3/8" Ø BENTONITE PELLET SEAL	
		#1-Q SAND	
		2" Ø TUBE 308 S.S. SCREEN	
		#4-Q SAND	
219.3		31.2'	
37.9	GLAUCOUSISH SILT/SAND, COMPACT TO VERY DENSE, RED BROWN, F SAND, SOME TO AND SILT SOME TO TRACE M-C SAND, SOME TO TRACE GRAVEL	38.4'	
274.7		43.3'	
43.0	BASAL RED TILL HARD RED BROWN CLAYEY SILT, SOME F-C SAND, SOME GRAVEL	43.6'	
272.7		44.5'	
44.5	END OF SAMPLING AUGERED TO 43.6 FT.	44.5'	

(CONTINUED ON NEXT PAGE)
WELL DEVELOPMENT NOTES

DATE DEVELOPED: 9-15-86
 TO 6-10-86
 DEVELOPMENT METHOD: AIR LIFT
 VOLUME PURGED: 94.7 GAL.

FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT TABLE.

NOTE: A 0.3 FT. END CAP WAS PLACED AT THE BOTTOM OF THE SCREEN SECTION 3, 9, AND 10 FT. SCREEN SECTIONS ARE ACTUALLY 2.35, 9.325, 10.325 FT. IN LENGTH, RESPECTIVELY.

**Golder
Associates**

SUBJECT CWM/WELLS/MODEL CITY MW11-7D		
Job No. 853-3051	Made by FWS	Date 5-15-86
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

2ND BATCH 45 LBS. BENTONITE / 35 GAL. H₂O; REMOVED 6" ϕ STEEL CASING; GROUT 2.0 FT. B.G.S.; ADDED PELLETS TO 1.0 FT. B.G.S.; MIXED CEMENT GROUT; FILLED TO TOP OF 10" PVC CASING; PUT ON 8" ϕ ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF PROTECTIVE CASING WITH # 4-Q SAND; WEEP HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING; A WELL WIZARD WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.

MONITORING WELL INSTALLATION LOG

JOB NO. 853-3081 PROJECT CWM / WELLS / MODEL CITY WELL NO. MW11-80 SHEET 1 OF 2
 GA INSP. FWS DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" I.D. GROUND ELEV. 317.2 FT. WATER DEPTH 6.46 FT.
 WEATHER CLOUDY DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. COLLAR ELEV. 318.98 FT. DATE/TIME 3-22-86
 TEMP. 72°F DRILL RIG MARKER AD-2 DRILLER J. GENOVESE STARTED 1:30 3-19-86 COMPLETED 2:45 3-19-86
 LOCATION/COORDINATES 3.5 FT. WEST OF MW11-85 / N 10975.20 ; E 12164.61

MATERIALS INVENTORY

WELL CASING 2.0 M. DIA. 40.0 I.I. WELL SCREEN 2.0 M. DIA. 4.9 I.I. BENTONITE SEAL PELLETS 9.5' DEEP
 CASING TYPE 304 STAINLESS STEEL SCREEN TYPE 304 STAINLESS STEEL INSTALLATION METHOD THROUGH 6" CASING
 JOINT TYPE FLUSH TAPER P-RINGS SLOT SIZE 0.006 INCH FILTER PACK QTY 6.6 L.F. ; 169 LBS.
 GROUT QUANTITY 65 GAL. CENTRALIZERS NONE FILTER PACK TYPE #1-0 SAND
 GROUT TYPE BENTONITE DRILLING MUD TYPE NONE INSTALLATION METHOD TREMIE TUBE WASH

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
317.2	GROUND SURFACE		<p>AUGERED TO 19.0 FT. WITH 12 INCH (O.D.) AUGERS;</p> <p>GROUTED 10" Ø PVC CASING TO 19.0 FT. B.G.S. (TOOK GROUT SAMPLE); PUSHED CASING TO 19.7 FT. B.G.S.; AUGERED TO 43.3 FT. B.G.S. WITH 4 1/4" (I.D.) AUGERS; PULLED AUGERS; INSTALLED 6" Ø TEMPORARY STEEL CASING; WASHED OUT - OPEN TO 43.3 FT. B.G.S.; TREMIED (WITH WATER)</p> <p>#4-0 SAND TO 43.1 FT. B.G.S. (TOOK DRY SAMPLE); INSTALLED WELL PIPE (2-2' SCREENS, 4-10' RISERS) 1.8 FT. STICKUP</p> <p>ADDED #1-0 SAND TO 36 B.G.S. (TOOK SAMPLE); ADDED PELLETS TO 31.2 FT. B.G.S.; ADDED #4-0 SAND TO 30.9 FT. B.G.S.; MIXED GROUT; 1ST BATCH 60 LBS BENTONITE / 40 GAL. H₂O, 2ND BATCH 37 LBS BENTONITE/</p> <p>(CONTINUED ON NEXT PAGE)</p>	
0.0	UPPER CLAY TILL VERY STIFF, TO STIFF, GRAY BROWN TO BROWN, CLAYEY SILT, SOME TO AND F-C SAND, LITTLE GRAVEL			<p>WELL DEVELOPMENT NOTES</p> <p>DNE DEVELOPED: 5-16-86 TO 6-10-86</p> <p>DEVELOPMENT METHOD: AIR LIFT</p> <p>VOLUME PURGED: 51.0 GAL</p> <p>FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT TABLE.</p>
309.2	UPPER SILT TILL COMPACT, GRAY BROWN, CLAYEY SILT, SOME F-M SAND, TURNING AT 12.0 FT. TO COMPACT, GRAY BROWN, F SAND, AND SILT, LITTLE TO SOME M-C SAND, LITTLE GRAVEL			
295.0	GLACIOLACUSTRINE CLAY VERY SOFT, GRAY, CLAY, SOME F TO C SAND, LITTLE F ANGULAR GRAVEL			
279.4	GLACIOLACUSTRINE Silt/SAND LOOSE BROWN, F SAND, SOME CLAY, SOME SILT, TURNING TO VERY DENSE, RED BROWN, F SAND, SOME CLAYEY SILT, TO SILT AND SAND			
274.4	BASAL RED TILL VERY STIFF, RED BROWN, CLAYEY SILT, SOME F SAND, LITTLE F-C GRAVEL			
273.9	END OF SAMPLING AUGERED TO 43.3 FT.			
43.5				

**Golder
Associates**

SUBJECT CWM/WELLS/MODEL CITY MW 11-8D		
Job No. 853-3051	Made by FWS	Date 5-16-86
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

25 GAL. H₂O; REMOVED 6" ϕ STEEL CASING; GROUT 0.2 FT. B.G.S.; MIXED CEMENT GROUT; FILLED TO TOP OF 10" PVC CASING; PUT ON 8" ϕ ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF PROTECTIVE CASING WITH # 4-Q SAND; WEEP HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PLACED AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING; A WELL WIZARD WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.

Boring Log

JOB NO. 853-3051 GA. INSP. CFC PROJECT CWM/WEELS/MODEL CITY BORING NO. MW11-95
 DEPTH HOLE 180 FT DEPTH WL. 5.14 FT DRILLING METHOD HOLLOW STEM AUGERS 4 1/4 ID SHEET 1 OF 1
 TEMP 60° F TIME WL. 2/22/86 DRILLING COMPANY EMPRE SOIL INVESTIGATIONS, INC. SURFACE ELEV. 316.9 FT
 WEATHER OVERCAST DRILL RIG CME 45 DRILLER K SWINAKO DATUM M.S.L.
 COORDINATES N10978.99 E12309.01 WT. SAMPLER HAMMER 140 LBS DROP 30 IN. STARTED 9:00 / 4-22-86
 LOCATION 50 FT. E OF MW11-90 WT. CASING HAMMER 300 LBS DROP 30 IN. COMPLETED 10:30 A / 2-28-86

ELEV. DEPTH (FT.)	DESCRIPTION	UNIFIED CLASS	BLOW/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN. REC./ATT		
316.9 0.0	GROUND SURFACE						GROUND SURFACE	
	STIFF TO VERY STIFF, BROWN TO DARK BROWN MOTTLED, CLAYEY SILT, SOME F-C SAND, TRACE TO LITTLE GRAVEL	CL	7	1	DO	7-3-4-5	16/24	UPPER CLAY TILL
			19	2	DO	5-7-12-16	16/24	GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 2.7 TO 10.0 FT.
			34	3	DO	10-14-20-26	24/24	
			78	4	DO	28-38-40-40	24/24	
			25	5	DO	6-11-14-16	14/24	
			24	6	DO	10-12-12-13	26/24	FROM 10.0 FT. FIRM TO STIFF GRAY BROWN SILTY CLAY
304.9 12.0	SOFT TO FIRM, GRAY BROWN, SILTY CLAY AND F-C SAND, CLASTS AS SUBANGULAR DEBRIS	CL	40	10	DO	19-20-20-17	19/24	GLACIOLACUSTRINE CLAY
302.9 14.0	FIRM OR COMPACT, GRAY CLAYEY SILT, SOME F-C SAND, LITTLE GRAVEL, VERY WET	ML	7	11	DO	WH-2-5-8	12/24	UPPER SILT TILL
300.9 16.0	SOFT, GRAY, CLAY, TRACE F-M SAND, TRACE F GRAVEL	CH	14	12	DO	6-7-7-8	24/24	GLACIOLACUSTRINE CLAY
298.8 18.0	END OF BORING							END OF BORING
								INSTALLED MW11-95 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG.

MONITORING WELL INSTALLATION LOG

JOB NO. B53-3051 PROJECT CWM / WELLS / MODEL CITY WELL NO. MW11-9S SHEET 1 OF 1
 GA INSP. CPC DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" ID GROUND ELEV. 316.9 FT. WATER DEPTH 3.14 FT.
 WEATHER OVERCAST DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS INC. COLLAR ELEV. 319.47 FT. DATE/TIME 9-22-86
 TEMP. 60°F DRILL RIG GME 45 DRILLER K. SWINNICH STARTED 11:00 4-29-86 COMPLETED 1:45 4-29-86
 LOCATION/COORDINATES 2.0 FT. EAST OF MW11-9D / N 10978.99 S 12309.01

MATERIALS INVENTORY

WELL CASING <u>2.0</u> IN. DIA. <u>10.0</u> LF	WELL SCREEN <u>2.0</u> IN. DIA. <u>10.0</u> LF	BENTONITE SEAL <u>PELLETS 5.0</u> DEEP
CASING TYPE <u>304 STAINLESS STEEL</u>	SCREEN TYPE <u>304 STAINLESS STEEL</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>
JOINT TYPE <u>FLUSH TEFLON VITON O-RINGS</u>	SLOT SIZE <u>0.006 INCH</u>	FILTER PACK QTY. <u>12 L.F.</u>
GROUT QUANTITY <u>NA</u>	CENTRALIZERS <u>NONE</u>	FILTER PACK TYPE <u>#1-0 SAND</u>
GROUT TYPE <u>NA</u>	DRILLING MUD TYPE <u>NONE</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS, SEE BORING LOG MW11-9S		AUGERED TO 18.0 FT.; ADDED #1-0 SAND TO 17.9 FT.; INSTALLED WELL PIPE (1-10" SCREEN, 2-5" RISERS) 2.7 FT. STICKUP.	
316.9 0.0	GROUND SURFACE			ADDED #1-0 SAND TO 6.0 FT.
	UPPER CLAY TILL STIFF TO VERY STIFF, BROWN TO DARK BROWN MOTTLED, CLAYEY SILT, SOME F-C SAND, TRACE TO LITTLE GRAVEL. GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 2.7-10.0 FT.			ADDED PELLETS TO 1.0 FT.; REMOVED AUGERS; MRED CEMENT GROUT; FILLED TO GROUND SURFACE; PUT ON 8" Ø ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-0 SAND; WEED HOLES WERE CUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PLACED AROUND WELL ON THE SITE AND NEW WEED HOLES WERE IN CASING.
308.9 12.0	GLACIOLACUSTRINE CLAY SOFT TO FIRM, GRAY BROWN, SILTY CLAY AND F-C SAND			A DEDICATED STAINLESS STEEL BAULER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.
307.9 14.0	UPPER SILT TILL FIRM TO COMPACT, GRAY CLAY SILTY SAND F-C SAND, LITTLE GRAVEL			
300.9 16.0	GLACIOLACUSTRINE CLAY SOFT, GRAY, SILTY, TRACE F-C SAND, TRACE F GRAVEL			
298.9 18.0	END OF BORING			
				WELL DEVELOPMENT NOTES
				DATE DEVELOPED: 4-30-86 TO 6-10-86
				DEVELOPMENT METHOD: A 2-FT VOLUME PURGED: 26.3 GAL.
			FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT TABLE.	
			NOTE: A 0.5 FT. END CAP WAS PLACED AT THE BOTTOM OF THE SCREEN SECTION. 2, 5, AND 10 FT. SCREEN SECTIONS ARE ACTUALLY 2.35, 5.325, 10.325 FT. IN LENGTH, RESPECTIVELY.	

Boring Log

JOB NO. 853-3051 GA. INSP. FWS PROJECT CANAL WELLS/NOBEL CITY BORING NO. MW11-9D
 DEPTH HOLE 44.0 FT. DEPTH WL. 6.29 FT. DRILLING METHOD HOLLOW STEM AUGERS, 4 1/4 ID SHEET 1 OF 1
 TEMP 65° F TIME WL. 9/22/86 DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. 317.2 FT
 WEATHER CLOUDY/RAIN DRILL RIG ACKER AD-2 DRILLER J. GENOVESE DATUM MSL
 COORDINATES N10979.39 E12304.16 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 3:00 / 5-1
 LOCATION 5.0 FT. WEST OF MW11-95 WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 11:00 / 5-20-86

ELEV. DEPTH (FT.)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN. REC./ATT		
297.2 200	FOR A COMPLETE SOILS DESCRIPTION AT THIS LOCATION ALSO SEE BORING LOG MW11-95						INSTALLED 10 IN. DIAM. PVC PIPE 20.0 FT. AUGERED TO 20.0 FT NO SAMPLING	
278.7 38.5	VERY SOFT, GRAY, CLAY, LITTLE TO SOME F-M SAND, OCCASIONAL THIN SILT AND CLAY LENSE	CH	18	1	DO	9-11-7-6	5/24	GLACIOLACUSTRINE CLAY
			18	2	DO	8-11-7-7	4/24	
			4	3	DO	1-2-2-3	7/24	
			5	4	DO	1-2-3-5	13/24	
			1	5	DO	WR-WH-1-1	17/24	
			2	6	DO	1-1-1-1	18/24	
			3	7	DO	1-1-2-3	23/24	
			0	8	DO	WR-WR-WH-WH	21/24	
			9	9	DO	3-4-5-5	22/24	
			6	10	DO	WR-1-5-7	14/24	
274.2 43.0	LAMINATED SOFT, GRAY, CLAY, AND F SAND TURNING TO LOOSE TO VERY DENSE, F SAND, LITTLE TO SOME SILT, TRACE TO SOME CLAY, SATURATED, DILATANT	MH ML	1	11	DO	WR-WR-1-13	14/24	GLACIOLACUSTRINE SILT AUGERED 43.2 TO 43.5 FT. NO SAMPLING
273.3 43.0	HARD, RED BROWN, CLAYEY SILT, SOME F-M SAND, SMALL GRAY SPECS (LIMESTONE) AND RED CLASTS (SHALE)	ML	7150	12	DO	30-50-100/2	15/15	BASAL RED TILL
273.3 43.9	END OF SAMPLING AUGERED TO 44.0 FT.							END OF SAMPLING
								INSTALLED MW11-9D SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG.

MONITORING WELL INSTALLATION LOG

JOB NO. 853-3051 PROJECT CWM/WELLS/MODEL CITY WELL NO. MW11-9D SHEET 1 OF 2
 GA INSP. FWS DRILLING METHOD HOLLOW STEM AUGERS-4 1/4" I.D. GROUND ELEV. 317.2 FT. WATER DEPTH 6.29 FT.
 WEATHER RAIN DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. COLLAR ELEV. 318.96 FT. DATE/TIME 9-22-86
 TEMP. 50°-55° F DRILL RIG ACKER AD-2 DRILLER J. KENYESE STARTED 11:03 5-20-86 COMPLETED 4:40 5-21-86
 LOCATION/COORDINATES 4.0 FT. WEST OF MW11-9S / N 10979 39; E 12304 16 TIME / DATE TIME / DATE

MATERIALS INVENTORY

WELL CASING <u>2.0</u> M. DIA. <u>4.0</u> I.D.	WELL SCREEN <u>2.0</u> M. DIA. <u>2.6</u> I.D.	BENTONITE SEAL <u>PELLETS 4.2' DEEP</u>
CASING TYPE <u>304 STAINLESS STEEL</u>	SCREEN TYPE <u>304 STAINLESS STEEL</u>	INSTALLATION METHOD <u>THROUGH 6" CASING</u>
JOINT TYPE <u>FLUSH TEFLON VITON O-RINGS</u>	SLOT SIZE <u>0.006 INCH</u>	FILTER PACK QTY <u>7 B.L.F. 235 10s</u>
GROUT QUANTITY <u>105 GAL.</u>	CENTRALIZERS <u>NONE</u>	FILTER PACK TYPE <u>#1-Q SAND</u>
GROUT TYPE <u>BENTONITE</u>	DRILLING MUD TYPE <u>NONE</u>	INSTALLATION METHOD <u>TREMIE TYPE WASH</u>

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS, SEE BOREHOLE LOG MW11-9D			
317.2	GROUND SURFACE			
0.0	UPPER CLAY TILL STIFF TO VERY STIFF, BROWN, TO DARK BROWN, MOTTLED, CLAYEY SILT, SOME F-C SAND, TRACE TO LITTLE GRAVEL. GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 2.7-10.0 FT.		AUGERED TO 19.0 FT. WITH 12 INCH (O.D.) AUGERS. GROUTED 10" Ø PVC CASING 19.0 FT. B.G.S.; PUSHED CASING TO 20.0 FT. B.G.S. TOOK GROUT SAMPLE AUGERED TO 44.0 FT. WITH 4 1/4" (I.D.) AUGERS; PULLED AUGERS; INSTALLED 6" Ø TEMPORARY STEEL CASING; WASHED OUT - OPEN TO 44.0 FT. B.G.S.; INSTALLED WELL PIPE; HAD SOME COLLAPSE; WASHED OUT BORING; RAN OUT OF WATER; 5-21-86 WASHED OUT BORING; REMOVED WELL PIPE; TREMIED #4-Q SAND (WITH WATER) TO 43.8 FT.; INSTALLED NEW, CLEAN WELL PIPE (1-5' SCREEN, 4-10' RISERS); 1.8 FT. STICKUP; ADDED #1-Q SAND TO 36.2 FT. B.G.S.; ADDED PELLETS TO	
305.2	12.0		GLACIOLACUSTRINE CLAY SOFT TO FIRM, GRAY BROWN SILTY CLAY AND F-C SAND	WASHED OUT BORING; RAN OUT OF WATER; 5-21-86
305.2	14.0		UPPER SILT TILL FIRM TO COMPACT, GRAY CLAYEY SILT, SOME F-C SAND, LITTLE GRAVEL	WASHED OUT BORING
301.2	16.0		GLACIOLACUSTRINE CLAY SOFT, GRAY, CLAY, TRACE F-M SAND, TRACE F GRAVEL	REMOVED WELL PIPE
				TREMIED #4-Q SAND (WITH WATER) TO 43.8 FT.; INSTALLED NEW, CLEAN WELL PIPE (1-5' SCREEN, 4-10' RISERS); 1.8 FT. STICKUP; ADDED #1-Q SAND TO 36.2 FT. B.G.S.; ADDED PELLETS TO
				(CONTINUED ON NEXT PAGE)
				WELL DEVELOPMENT NOTES
				DATE DEVELOPED: 5-22-86 TO 6-10-86
				DEVELOPMENT METHOD: AIR LIFT
				VOLUME PURGED: 43.5 GAL.
			FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT TABLE.	
278.7				
38.3	GLACIOLACUSTRINE SILT/SAND SOFT, GRAY, CLAY AND F SAND TURNING TO LOOSE TO VERY DENSE F SAND, LITTLE TO SOME SILT, TRACE TO SOME CLAY			
274.2	43.0	BASAL RED TILL HARD, RED BROWN, CLAYEY SILT, SOME F-M SAND		
273.3	43.9	END OF SAMPLING AUGERED TO 44.0 FT.	NOTE: A 8.8 FT. END CAP WAS PLACED AT THE BOTTOM OF THE SCREEN SECTION. 2, 5, AND 10 FT. SCREEN SECTIONS ARE ACTUALLY 2.35, 9.325, 10.325 FT. IN LENGTH, RESPECTIVELY.	

Golder Associates

SUBJECT CWM/WELLS/MODEL CITY		MW 11-9D
Job No. 853-3051	Made by FWS	Date 5-21-86
Ref.	Checked DJM	Sheet 2 of 2
	Reviewed JFC	

32.0 FT. B.G.S.; MIXED GROUT, 1ST BATCH 45 LBS. BENTONITE / 30 GAL. H₂O, 2ND BATCH 40 LBS. BENTONITE / 30 GAL. H₂O; REMOVED 6" STEEL CASING; 3RD BATCH 45 LBS BENTONITE / 30 GAL. H₂O, 4TH BATCH 25 LBS. BENTONITE / 15 GAL. H₂O; GROUT 2.1 FT. B.G.S.; MIXED CEMENT GROUT; FILLED TO GROUND SURFACE; PUT ON 8" Ø ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-Q SAND; WEEP HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PLACED AROUND WELL BY THE SITE AND NEW WEEP HOLES WERE PUT IN CASING; A WELL WIZARD WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.

NOTE: DURING THE BORING AND INSTALLATION OF THIS WELL, THERE WAS ROAD OIL PRESENT AROUND THE OUTSIDE OF THE 10 INCH PVC CASING. THE AMOUNT OF ROAD OIL WAS MINIMAL AND DID NOT APPEAR TO CONTAMINATE THE WELL.

Boring Log

JOB NO. 853-3001 GA. INSP. DJM PROJECT CWM/WELLS/MODEL CITY BORING NO. P11-15
 DEPTH HOLE 16.0 FT. DEPTH WL. 9.3 FT. DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" ID SHEET 1 OF 1
 TEMP 50° F TIME WL. 11/18/85 DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. -316.0 FT.
 WEATHER SUNNY/COOL DRILL RIG CME 45 DRILLER J. GENOVESE DATUM MSL
 COORDINATES N10846 47 E12263.45 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 12:30 / 10-31-85
 LOCATION _____ WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 3:30 / 10-31-85

ELEV. DEPTH (FT.)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES				REMARKS
				NUMBER	TYPE	HAMMER BLOWS PER 8 IN.	REC./ATT	
316.0	GROUND SURFACE							GROUND SURFACE
0.0	FIRM TO VERY STIFF, BROWN SLIGHTLY MOTTLED, CLAYEY SILT, TRACE TO LITTLE F-C GRAVEL AS GRAY SUBROUNDED CLASTS	CL	5	1	DO	2-2-3-4	15/24	UPPER CLAY TILL
			31	2	DO	5-12-19-24	20/24	LOOSE, DARK BROWN CLAYEY SILT TOPSOIL WITH TWIGS, LEAVES AND ROOTS TO 0.4 FT.
			54	3	DO	14-28-26-40	23/24	OCCASIONAL GRAY SILT AND F SAND LENSE BETWEEN 0.4 AND 4.0 FT.
			125	4	DO	45-65-60-42	19/24	GRAY WEATHERING ALONG VERTICAL FEATURES FROM 4.0 TO 12.0 FT.
			34	5	DO	10-16-18-21	24/24	
			39	6	DO	28-18-21-30	24/24	
			26	7	DO	8-12-14-12	10/24	
302.0 14.0 300.0 16.0	VERY SOFT, GRAY, CLAY, TRACE F-M SAND, TRACE SILT	CH	2	8	DO	1-1-1-2	24/24	GLACIOCLASTIC CLAY
	END OF SAMPLING AUGERED TO 14.0 FT.							END OF SAMPLING
								INSTALLED P11-15 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986.

MONITORING WELL INSTALLATION LOG

JOB NO. 853-321 PROJECT CWM/WELLS/MOORE CITY WELL NO. P11-15 SHEET 1 OF 1
 GA INSP. DJM DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" (I.D.) GROUND ELEV. ~316.0 FT WATER DEPTH 9.30 FT
 WEATHER SUNNY DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS INC COLLAR ELEV. 318.32 FT. DATE/TIME 11-18-85
 TEMP. 14°F DRILL RIG CME 45 DRILLER J. SPONOVESE STARTED 9:15 11:19:25 COMPLETED 3:30 11:19:25
 LOCATION/COORDINATES N 10546.47 E 12263.45 TIME / DATE TIME / DATE

MATERIALS INVENTORY

WELL CASING 2.0 IN. DIA. 3.0 I.F. WELL SCREEN 2.0 IN. DIA. 10.8 I.F. BENTONITE SEAL PELLETS 2.5' DEEP
 CASING TYPE PVC SCREEN TYPE PVC INSTALLATION METHOD THROUGH AUGERS
 JOINT TYPE FLUSH THREADED TEFLON TAPE WITON O-RINGS SLOT SIZE 0.006 INCH FILTER PACK QTY 11.0 L.F.
 GROUT QUANTITY NA CENTRALIZERS NA FILTER PACK TYPE #2-0 SAND
 GROUT TYPE NA DRILLING MUD TYPE NA INSTALLATION METHOD THROUGH AUGERS

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
316.0	GROUND SURFACE		<p>AUGERED TO 4.0 FT. PULLED AUGERS. OPEN TO 13.5 FT. B.G.S. INSTALLED WELL PIPE (1-10" SCREEN, 1-5" RISER) 2.3 FT. STICKUP. ADDED #2-0 SAND TO 2.5 FT. B.G.S. ADDED PELLETS TO GROUND SURFACE. 8" Ø ALUMINUM PROTECTIVE CASING WAS INSTALLED. WEED HOLES WERE PUT IN CASING FOR DRAINAGE. PROTECTIVE POSTS WERE PUT AROUND WELL. A CONCRETE PAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEED HOLES WERE PUT IN CASING. THE INTERIOR OF PROTECTIVE CASING FILLED WITH #4-0 SAND. A DEDICATED BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.</p>	
0.0	TOP SOIL			
315.5	BLACK BROWN, SILTY CLAY			
0.5	UPPER CLAY TILL			
14.0	FIRM, BROWN TO GRAY BROWN, CLAY, TRACE TO LITTLE P SAND OR SILT, TRACE GRAVEL, WEATHERED TO 60 FT.			
307.0	GLACIOLACUSTRINE CLAY			
14.0	SOFT TO VERY SOFT, GRAY, CLAY.			
300.0				
16.0	END OF SAMPLING AUGERED TO 14.0 FT.			
			<p>WELL DEVELOPMENT NOTES</p> <p>11-20-85, BAILED DRY 15 MIN. 12-4-85, BAILED DRY 30 MIN. PH 7.43, 7.40, 7.43 SC 5740, 5800, 5900 SLIGHTLY SILTY.</p>	

Boring Log

JOB NO. B53-3051 GA. INSP. DJM PROJECT CWIN/WELLS/MODEL CITY BORING NO. P11-25
 DEPTH HOLE 14.0 FT. DEPTH WL. 151 FT. DRILLING METHOD HOLLOW STEM AUGERS - 4 1/4" ID SHEET 1 OF 1
 TEMP 50°F TIME WL. 9/27/86 DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. 318.6 FT.
 WEATHER SUNNY/COOL DRILL RIG CME 45 DRILLER J. GENOVESE DATUM MSL
 COORDINATES N19.159.59 E 11764.56 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 8:30 / 11-1-85
 LOCATION — WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 10:30 / 11-1-85

ELEV. DEPTH (FT.)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN. REC./ATT		
318.6	GROUND SURFACE						GROUND SURFACE	
0.0	FIRM TO VERY STIFF, BROWN, MOTTLED, SILTY CLAY, LITTLE TO SOME F-C SAND, TRACE TO LITTLE F-C GRAVEL AS GRAY, SUBROUNDED CLASTS.	CL	9	1	DO	3-4-5-6	15/24	UPPER CLAY TILL VERY LOOSE, BROWN AND GRAY F-C SAND AND GRAVEL FILL, LITTLE SILT, TRACE CLAY TO .2 FEET OCCASIONAL GRAY SILT AND F SAND LENSE BETWEEN .2 AND 4.0 FEET GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 2.0 TO 8.0 FEET GLACIOLACUSTRINE CLAY
30			2	DO	6-12-18-30	21/24		
38			3	DO	12-16-22-24	24/24		
120			4	DO	58-60-60-30	4/24		
310.6	SOFT TO FIRM, BROWN TO GRAY BROWN, SILTY CLAY, LITTLE TO SOME F-C SAND, CLASTS AS GRAY SUBROUNDED DROP STONES, TURNING AT 12.0 FT. TO VERY SOFT GRAY, CLAY, TRACE SILT, TRACE F-M SAND, STICKY, PLASTIC	CL	10	5	DO	3-4-6-7	22/24	
8.0			10	6	DO	4-4-6-6	24/24	
304.6		CH	13	7	DO	8-7-6-3	4/24	
14.0	END OF BORING						END OF BORING INSTALLED P11-25 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG. NOTE REVISED FROM MARCH 7, 1986	

MONITORING WELL INSTALLATION LOG

JOB NO. B53-3051 PROJECT CWM / WELLS / MODEL CITY WELL NO. P11-25 SHEET 1 OF 1
 GA WSP D.J.M. DRILLING METHOD HOLLOW STEEL AUGERS - 4 1/4" (I.D.) GROUND ELEV 318.6 FT. WATER DEPTH 1.51 FT.
 WEATHER CLOUDY DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS INC COLLAR ELEV 320.94 FT. DATE/TIME 9-22-86
 TEMP 28°F DRILL RIG CME 45 DRILLER J. GENOVESE STARTED 11:45 12-13-85 COMPLETED 1:30 12-13-85
 LOCATION/COORDINATES N 1059.97; E 11764.56

MATERIALS INVENTORY

WELL CASING 2.0 IN. DIA. 8.0 FT. WELL SCREEN 2.0 IN. DIA. 8.2 FT. BENTONITE SEAL PELLETS 48" DEEP
 CASING TYPE PVC SCREEN TYPE PVC INSTALLATION METHOD THROUGH AUGERS
 JOINT TYPE FLUSH TAPER NYLON R-RINGS SLOT SIZE 0.006 INCH FILTER PACK QTY 8.7 L.F.
 GROUT QUANTITY NA CENTRALIZERS NA FILTER PACK TYPE #1-0 SAND
 GROUT TYPE NA DRILLING MUD TYPE NA INSTALLATION METHOD THROUGH AUGERS

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
318.6	GROUND SURFACE		<p>AUGERED TO 4.0 FT.; PULLED AUGERS; OPEN TO 13.5 FT. B.G.S.; INSTALLED WELL PIPE (1-2' SCREEN, 1-9' SCREEN, 1-B' RISER PIPE) 3.3 FT. STICKUP; ADDED #1-0 SAND TO 4.8 FT. B.G.S. (TOOK SAMPLE); ADDED PELLETS TO GROUND SURFACE; PUT ON 8" Ø ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-0 SAND; WEEP HOLES WERE PUT IN PROTECTIVE CASING FOR DRAINAGE; PROTECTIVE POSTS WERE PUT AROUND WELL; A CONCRETE PA WAS LATER PUT AROUND WELL ON THE SITE AND NEW WEEP HOLES WERE PUT IN CASING; A DEDICATED BALLER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.</p>	
0.0	UPPER CLAY TILL FIRM TO VERY STIFF, BROWN MOTTLED SILTY CLAY, LITTLE TO SOME F-C SAND, TRALE TO LITTLE F-C GRAVEL.		<p>WELL DEVELOPMENT NOTES 12-19-85 PURGED WITH N₂ GAS 4 TIMES SG -1200 CLOUDY</p>	
310.6	GLAUCOLASTINE CLAY SOFT TO FIRM BROWN TO GRAY BROWN SILTY CLAY, AT 120% VERY SOFT GRAY CLAY, TRALE F-A SAND			
304.6	END OF BORING			

Boring Log

JOB NO. 853-3051 GA. INSP. CFC PROJECT CWM/WELLS/MODEL CITY BORING NO. P11-35
 DEPTH HOLE 22.0 FT. DEPTH WL. 2.22 FT. DRILLING METHOD HOLLOW STEM AUGERS 4 1/4 ID SHEET 1 OF 1
 TEMP 30° E TIME WL. 9/22/86 DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS, INC. SURFACE ELEV. 318.4 FT.
 WEATHER PARTLY CLOUDY DRILL RIG CME 45 DRILLER K. SWANICK DATUM MSL
 COORDINATES N 10.169.46 E 12151.62 WT. SAMPLER HAMMER 140 LBS. DROP 30 IN. STARTED 9:30 / 5-2-86
 LOCATION — WT. CASING HAMMER 300 LBS. DROP 30 IN. COMPLETED 1:15 / 5-2-86

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS	BLOWS/FOOT	SAMPLES			REMARKS	
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN. REC./ATT		
318.4	GROUND SURFACE						GROUND SURFACE	
0.0	FIRM TO HARD, BROWN, <u>CLAYEY SILT</u> , SOME TO AND F-C SAND, TRACE TO LITTLE GRAVEL	CL	12	1	DO	4-5-7-9	17/29	UPPER CLAY TILL MOTTLED TO 6.0 FT.
			29	2	DO	10-12-17-22	22/24	GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 2.0 TO 6.0 FT.
			35	3	DO	11-15-20-25	24/24	
			84	4	DO	25-40-44-27	7/24	INTERLAYERED TAN F-M SAND AND SILT LENSES FROM 6.0 FT.
			15	5	DO	3-5-10-15	24/24	
			6	6	DO			
308.4	LOOSE TO VERY DENSE, BROWN TO GRAY BROWN, F-C SAND, AND SILT, TRACE TO LITTLE GRAVEL, TRACE TO LITTLE CLAY, SATURATED	SM/ML	25	7	DO	10-13-12-15	20/24	UPPER SILT TILL
10.0			22	8	DO	14-11-11-14	24/24	
			9	9	DO	3-4-5-31	16/24	
			68	11	DO	22-43-25-32	24/24	VERY DENSE F-C GRAVEL AND F-C SAND LENSE AT 18.0 FT.
			55	12	DO	8-23-32-9	2/24	
298.4	VERY SOFT, GRAY, <u>CLAY</u> , TRACE F SAND, TRACE F GRAVEL	CH	3	13	DO	WH-1-2-2	19/24	GLACIOLACUSTRINE CLAY
20.0	END OF BORING							END OF BORING
296.4								INSTALLED P11-35 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG.
22.0								

MONITORING WELL INSTALLATION LOG

JOB NO. 853-3051 PROJECT CWM / WELLS / MODEL CITY WELL NO. P11-35 SHEET 1 OF 1
 GA WSP CFC DRILLING METHOD HOLLOW STEM AUGERS-4 1/2" ID GROUND ELEV 318.4 FT. WATER DEPTH 2.22 FT.
 WEATHER CLEAR DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS COLLAR ELEV 320.9 FT. DATE/TIME 9-22-86
 TEMP 40° F DRILL RIG CME 45 DRILLER K. SHIVANISH STARTED 1:00 5-2-86 COMPLETED 3:15 5-2-86
 LOCATION/COORDINATES N 1016.246; E 12151.62 TIME / DATE TIME / DATE

MATERIALS INVENTORY

WELL CASING 2.0 IN. DIA. 8.0 FT. WELL SCREEN 2.0 IN. DIA. 3.9 FT. BENTONITE SEAL PELLETS 4.5' DEEP
 CASING TYPE 304 STAINLESS STEEL SCREEN TYPE 304 STAINLESS STEEL INSTALLATION METHOD THROUGH AUGERS
 JOINT TYPE FLUSH TYPON VITON SLOT SIZE 0.006 INCH FILTER PACK QTY 16.7 L.F.
 GROUT QUANTITY NA CENTRALIZERS NONE FILTER PACK TYPE #1-Q SAND
 GROUT TYPE NA DRILLING MUD TYPE NONE INSTALLATION METHOD THROUGH AUGERS

ELEV./DEPTH (Ft.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS, SEE BORING LOG P11-33		
318.4	GROUND SURFACE		AUGERED TO 22.0 FT.; ADDED #4-Q SAND TO 21.0 FT. BELOW GROUND SURFACE; INSTALLED WELL PIPE (1-5' SCREEN 1-10' SCREEN, 1-3' RISER, 1-2' RISER) BOTTOM OF WELL PIPE SANK TO 21.7 FT. BELOW GROUND SURFACE; 2-LFT. STICKUP; ADDED #1-Q SAND TO 5.3 FT. BELOW GROUND SURFACE (TOOK SAMPLE); ADDED PELLETS TO 1.0 FT.; REMOVED AUGERS; MIXED CEMENT GROUT, FILLED TO GROUND SURFACE; PUT ON 8" DIA ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-Q SAND; WEED HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE ROSTS WERE PUT AROUND WELL; A CONCRETE PAD WAS LATER PUT AROUND THE WELL BY THE SITE AND NEW WEED HOLES WERE PUT IN CASING; A DEDICATED STAINLESS STEEL BAILER WAS INSTALLED SUBSEQUENT TO DEVELOPMENT.
0.0	UPPER CLAY TILL FIRM TO HARD, BROWN CLAYEY SILT, SOME TO SAND F-C SAND, TRACE TO LITTLE GRAVEL; GRAY WEATHERING ALONG VERTICAL FRACTURES FROM 2.0-6.0 FT. INTERLAYERED SILT AND SAND LENSES FROM 6.0-10.0		WELL DEVELOPMENT NOTES
308.4	UPPER SILT TILL LOOSE TO VERY DENSE, BROWN TO GRAY BROWN F-C SAND, AND SILT, TRACE TO LITTLE GRAVEL		DATE DEVELOPED: 9-2-86 TO 6-10-86
10.0	GLACIOLACUSTRINE CLAY VERY SOFT GRAY, CLAY, TRACE F SAND, TRACE F GRAVEL		DEVELOPMENT METHOD: AIR LIFT
20.0	END OF BORING		VOLUME PURGED: 41.9 GAL.
296.4			FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT TABLE.
22.0			NOTE: A 0.3 FT. END CAP WAS PLACED AT THE BOTTOM OF THE SCREEN SECTION. 2, 5, AND 10 FT. SCREEN SECTIONS ARE ACTUALLY 2.35, 9.325, 10.325 FT. IN LENGTH, RESPECTIVELY.

Boring Log

JOB NO. 853-3051 GA. INSP. CFC PROJECT CWM / WELLS / MODEL CITY BORING NO. P11-45
 DEPTH HOLE 26.0 FT DEPTH WL. 211 FT DRILLING METHOD HOLLOW STEM AUGERS - 4 1/2" ID SHEET 1 OF 1
 TEMP 65° F TIME WL. 9/22/86 DRILLING COMPANY EMPIRE SOILS INVESTIGATIONS INC SURFACE ELEV. 318.8 FT
 WEATHER PARTLY CLOUDY DRILL RIG CME 46 DRILLER K SWINNICH DATUM MSL
 COORDINATES N 10.171.32 E 12.352.03 WT. SAMPLER HAMMER 140 LBS DROP 30 IN STARTED 9:35 / 5-5-86
 LOCATION _____ WT. CASING HAMMER 300 LBS DROP 30 IN COMPLETED 11:35 / 5-5-86

ELEV. DEPTH (FT)	DESCRIPTION	UNIFIED CLASS.	BLOWS/FOOT	SAMPLES				REMARKS
				NUMBER	TYPE	HAMMER BLOWS PER 6 IN.	REC./ATT	
318.8	GROUND SURFACE							GROUND SURFACE
0.0	DENSE, DARK BROWN, SILT AND F-C SAND, SOME GRAVEL, SINGLE LARGE GRAY, PUMICE-LIKE STONE IN SPLIT SPHON	ML	32	1	DO	10-8-26-16	20/24	FILL
316.8	STIFF, BROWN MOTTLED CLAYEY SILT, SOME F-C SAND, GRAY WEATHERING ALONG VERTICAL FRACTURES.	CL	18	2	DO	6-8-10-18	24/24	UPPER CLAY FILL
314.8	COMPACT TO VERY LOOSE, BROWN TO GRAY BROWN, SILT AND F SAND, TRACE TO SOME F-C GRAVEL, TRACE CLAY, SATURATED, DILATANT.	ML	13	3	DO	7-7-8-10	23/24	UPPER SILT FILL
29			4	DO	11-12-16-24	21/24		
26			5	DO	8-12-14-14	16/24		
23			6	DO	6-20-8-10	12/24		
11			7	DO	5-5-6-5	14/24		
2			8	DO	WH-WH-2-2	9/24		
17			9	DO	7-7-10-10	19/24		
11			10	DO	5-6-5-6	8/24		
9			11	DO	8-4-5-6	15/24		
14			12	DO	7-7-7-5	20/24		
295.0	VERY SOFT, GRAY, CLAY, TRACE F-M SAND, OCCASIONAL BROWN SILT LENS	CH	0	13	DO	WH-WH-WH-3	24/24	GLACIOLACUSTRINE CLAY
293.2								
26.0	END OF SAMPLING AGEED TO 29.6 FT.							END OF SAMPLING
								INSTALLED P11-45 SEE ACCOMPANYING MONITORING WELL INSTALLATION LOG.

MONITORING WELL INSTALLATION LOG

JOB NO. <u>853-3051</u>	PROJECT <u>CNAM / WELLS / MODEL CITY</u>	WELL NO. <u>P11-45</u>	SHEET <u>1</u> OF <u>2</u>
GA INSP. <u>CFC</u>	DRILLING METHOD <u>HOLLOW STEM AUGERS-4 1/4" ID</u>	GROUND ELEV. <u>38.8</u>	WATER DEPTH <u>2.11 FT</u>
WEATHER <u>CLOUDY</u>	DRILLING COMPANY <u>EMPIRE SOILS INVESTIGATIONS, INC.</u>	COLLAR ELEV. <u>320.95</u>	DATE/TIME <u>9-22-86</u>
TEMP. <u>70°F</u>	DRILL RIG <u>CME 45</u>	DRILLER <u>K. SWINNICH</u>	STARTED <u>1:00 5-5-86</u>
LOCATION/COORDINATES <u>N 10171.52 E 12352.03</u>		COMPLETED <u>2:50 5-5-86</u>	

MATERIALS INVENTORY

WELL CASING <u>2.0</u> IN. DIA. <u>10.0</u> FT.	WELL SCREEN <u>2.0</u> IN. DIA. <u>15.9</u> FT.	BENTONITE SEAL <u>PELLETS 5.4' DEEP</u>
CASING TYPE <u>304 STAINLESS STEEL</u>	SCREEN TYPE <u>304 STAINLESS STEEL</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>
JOINT TYPE <u>FLUSH TEPALON VITON O-RINGS</u>	SLOT SIZE <u>0.006 INCH</u>	FILTER PACK QTY. <u>190LF</u>
GROUT QUANTITY <u>NA</u>	CENTRALIZERS <u>NONE</u>	FILTER PACK TYPE <u>#1-Q SAND</u>
GROUT TYPE <u>NA</u>	DRILLING MUD TYPE <u>NONE</u>	INSTALLATION METHOD <u>THROUGH AUGERS</u>

ELEV./DEPTH (FT.)	SOIL/ROCK DESCRIPTION	WELL SKETCH	INSTALLATION NOTES	
	NOTE: FOR COMPLETE SOIL DESCRIPTIONS, SEE BORING LOG P11-45	<p style="font-size: small;">WELL CASING 2.2 FT. STICKUP 8" Ø ALUMINUM CASING WITH LOCK 2.9 FT. STICKUP #4-Q SAND CEMENT GROUT 18" Ø BENTONITE PELLET SEAL 2" Ø TYPE 304 SS. RISER PIPE #1-Q SAND 2" Ø TYPE 304 SS. SCREEN NOM. 8" Ø BOREHOLE</p>	AUGERED TO 25.6 FT.; ADDED #1-Q SAND TO 23.7 FT. BELOW GROUND SURFACE (TOOL SAMPLE); INSTALLED WELL PIPE (1-5' SCREEN 1-10' SCREEN 1-10' RISER) 2.2 FT. STICKUP; ADDED #1-Q SAND TO 6.6 FT. BELOW GROUND SURFACE; NOTE: AT 13.0-14.0 FT. BELOW GROUND SURFACE HAD SOME CAVE IN; ADDED PELLETS TO 1.2 FT. BELOW GROUND SURFACE; REMOVED AUGERS; MIXED CEMENT GROUT FILLED TO GROUND SURFACE; PUT ON 8" Ø ALUMINUM PROTECTIVE CASING; FILLED INTERIOR OF CASING WITH #4-Q SAND; WEED HOLES WERE PUT IN CASING FOR DRAINAGE; PROTECTIVE ROSTS WERE PUT AROUND WELL; A CONCRETE BAD WAS LATER PUT AROUND WELL BY THE SITE AND NEW WEED	
318.8	GROUND SURFACE			(CONTINUED ON NEXT PAGE)
0.0	FILL			WELL DEVELOPMENT NOTES
34.3	DENSE, DARK BROWN SILT AND F-C SAND, SOME GRAVEL			DATE DEVELOPED: 5-7-86 TO 6-10-86
4.5	UPPER CLAY TILL			DEVELOPMENT METHOD: AIR LIFT
295.0	STIFF, BROWN MOTTLED CLAYEY SILT, SOME F-C SAND, GRAY WEATHERING ALONG VERTICAL FRACTURES			VOLUME PURGED: 56.3 GAL
23.8	UPPER SILT TILL			FOR FURTHER DETAILS SEE ACCOMPANYING WELL DEVELOPMENT TABLE.
	COMPACT TO VERY LOOSE, BROWN TO GRAY BROWN, SILT AND F SAND, TRACE TO SOME F-C GRAVEL			
295.0	GLACIOFLUVIAL CLAY			
23.8	VERY SOFT, GRAY, CLAY, TRACE F-M SAND, OCCASIONAL SILT LENS			
293.2	END OF SAMPLING			
26.0	AUGERED TO 25.6			

