

ATMOS ENERGY CORPORATION, CO - KS DIVISION
DEEP WELL GROUND BED DATA

STATE: KANSAS CITY: ULYSSES (OCL) DATE: May 15, 2014

PROJECT NUMBER: 060.30472 NW ULYSSES RECTIFIER AND GROUND BED

LOCATION: WS N RD G @ CO RD 9 ROW EASEMENT. 3 MILES W OF ULYSSES AND 2.98 MILES N OF US HWY 160 C/L. GRANT CO, KS.

CONTRACTOR: MCLEAN'S CP INSTALLATION INSPECTOR: STEVE MITCHELL, ATMOS ENERGY, #10836

GROUND BED: DEPTH - 450 FEET DIA - 10 INCHES

ANODES: NUMBER - 15 TYPE - ENVIRANODES MFG. - SAE

CASING: SIZE - 10 INCHES TYPE - PVC DEPTH - 20 FEET

COKE BREEZE: AMOUNT - 7205 LBS. TYPE - CONDUCRETE MFG. - SAE

CASING CENTRALIZER SPACING: 20 FT. 0 FT. 0 FT. 0 FT. 0 FT.

DEPTH (FEET)	DRILLER'S LOG	WELL COLUMN NOTES	DEPTH TO ANODE	BEFORE COKE	AFTER COKE
5	SANDY BROWN CLAY	WELL TOP 32" DEEP BENTONITE HOLE PLUG 5 FT TO 10 FT	25 - 50# BAGS OF BENTONITE HOLE PLUG USED TO SET CASING	14.65 VDC	SAE
10	SANDY BROWN CLAY			APPLIED	BACKFILL
15	SANDY BROWN CLAY				CANNOT
20	SANDY BROWN CLAY				BE
25	BROWN SAND				ENERGIZED
30	BROWN SAND				FOR 30
35	BROWN SAND				DAYS TO
40	BROWN SAND				ALLOW
45	BROWN SAND				FOR
50	BROWN SAND				CURING
55	BROWN SAND		TURN ON		
60	BROWN SAND		DATE IS		
65	BROWN SAND		JUNE 16.		
70	BROWN SAND				
75	BROWN SAND				
80	BROWN SAND				
85	BROWN SAND				
90	BROWN SAND				
95	BROWN SAND				
100	BROWN CLAY W/GRAVEL				
105	BROWN CLAY				
110	BROWN CLAY	NEAT CEMENT FROM 10 FT TO 222 FT			
115	BROWN CLAY				
120	BROWN CLAY				
125	TAN SANDY CLAY				
130	TAN SANDY CLAY				
135	TAN CLAY				
140	TAN SANDY CLAY				
145	TAN SANDY CLAY				
150	TAN SANDY CLAY				
155	TAN SANDY CLAY				
160	TAN CLAY				
165	TAN SANDY CLAY				
170	TAN SANDY CLAY				
175	TAN SANDY CLAY				
180	TAN SANDY CLAY				
185	TAN SANDY CLAY W/GRAVEL				
190	TAN SANDY CLAY W/GRAVEL				
195	TAN SANDY CLAY W/GRAVEL		AMPS		
200	TAN SANDY CLAY W/GRAVEL		1		
205	TAN SANDY CLAY W/GRAVEL				
210	TAN SANDY CLAY W/GRAVEL		1		
215	TAN SANDY CLAY W/GRAVEL				
220	TAN SANDY CLAY W/GRAVEL		1		
225	TAN BROWN SAND				
230	TAN BROWN SAND		1.6		
235	TAN BROWN SAND	CONDUCRETE FROM 222 FT TO 450 FT	235 FT		
240	TAN BROWN SAND			1	
245	TAN BROWN SAND				
250	TAN BROWN SAND				
250	TAN BROWN SAND			249 FT	0.7

DEPTH (FEET)	DRILLER'S LOG	WELL COLUMN BACKFILLING	DEPTH TO ANODE	BEFORE COKE AMPS	AFTER COKE
255	WHITE/TAN SAND	CONDUCRETE FROM 222 FT TO 450 FT			SAE
260	WHITE/TAN SAND		263 FT	1.3	BACKFILL
265	TAN SAND/SANDSTONE				CANNOT
270	TAN SAND/SANDSTONE			1.5	BE
275	TAN SAND		278 FT		ENERGIZED
280	TAN SAND			1.9	FOR 30
285	TAN SAND				DAYS TO
290	TAN SAND		292 FT	1.8	ALLOW
295	TAN SANDY CLAY				FOR
300	TAN SANDY CLAY			2	CURING
305	TAN SANDY CLAY		306 FT		TURN ON
310	BROWN CLAY W/GRAVEL			1.6	DATE IS
315	BROWN/WHITE CLAY W/GRAVEL				JUNE 16.
320	BROWN/WHITE CLAY W/GRAVEL		320 FT	1.4	
325	WHITE CLAY W/GRAVEL				
330	WHITE CLAY W/GRAVEL			0.9	
335	WHITE CLAY W/GRAVEL		335 FT		
340	WHITE CLAY W/GRAVEL			1.7	
345	WHITE CLAY W/GRAVEL		349 FT		
350	WHITE CLAY W/GRAVEL			1.3	
355	WHITE CLAY W/GRAVEL				
360	WHITE CLAY W/GRAVEL		363 FT	1.5	
365	WHITE CLAY W/GRAVEL				
370	WHITE CLAY W/GRAVEL			1.5	
375	WHITE CLAY W/GRAVEL		377 FT		
380	WHITE CLAY W/GRAVEL			1.7	
385	BLACK SHALE				
390	BLACK SHALE		391 FT	1.8	
395	BLACK SHALE				
400	BLACK SHALE			1.8	
405	BLACK SHALE	406 FT			
410	BLACK SHALE		1.7		
415	BLACK SHALE				
420	BLACK SHALE	420 FT	1.9		
425	BLACK SHALE				
430	BLACK SHALE		1.8		
435	BLACK SHALE	434 FT			
440	BLACK SHALE		1.5		
445	BLACK SHALE				
450	BLACK SHALE				
455	BLACK SHALE				
500	BLACK SHALE				

COMMENTS: ALL ANODE DEPTHS ARE TOP OF THE ANODE. MEASURED 120 mg/L OF CHLORIDE (CITY OF ULYSSES WATER) BEFORE DRILLING BEGAN AND 140 mg/L OF CHLORIDE FROM PIT ON MAY 15, 2014 BEFORE PIT CONTENTS DISTURBED. 15 SAE ENVIRANODES PLUS 7205# SAE CONDUCRETE SETTLED AT 222 FT. PUMPED NEAT CEMENT (102 - 90# BAGS CEMENT W/503 GALLONS OF WATER) FROM 222 FT TO 10 FT. Poured in 7 - 50# BAGS OF BENTONITE HOLE PLUG ON TOP OF NEAT CEMENT. INSTALLED PITLESS ADAPTER TEE (10"X2"X10") ON CASING. CONNECTED 2' PVC PIPE TO ADAPTER AND RAN TO ANODE JUNCTION BOX. ANODE WIRES FROM WELL TO RECTIFIER POLE ARE BURIED 30"-32" DEEP. YELLOW "CATHODIC PROTECTION" TAPE LAYS 15" ABOVE ANODE WIRES/PVC PIPE. CAPPED 10" PVC CASING WITH 10" PVC CAP - CAP IS 30" - 32" BELOW GRADE. WELL IS "PRE-PLUGGED".

DRILLING PIT LEFT OPEN TO ALLOW FOR EVAPORATION TO DE-WATER PIT CONTENTS. ESTIMATED PIT HOLDS 200 BARRELS OF DRILLING MUD CREATED FROM POTABLE WATER AND DOWNHOLE MATERIALS. PIT IS LINED WITH PLASTIC. ATMOS ENERGY CREWS WILL MONITOR PITS FOR DEWATERING. ONCE DONE, THEY WILL CUT OFF LINER 6" BELOW GRADE AND BACKFILL. LAND WILL THEN BE RESTORED TO CRP STATUS BY CERTIFIED CONTRACTOR.

RECTIFIER IS UNIVERSAL 240 VAC INPUT WITH 50 V / 50 A OUTPUT.