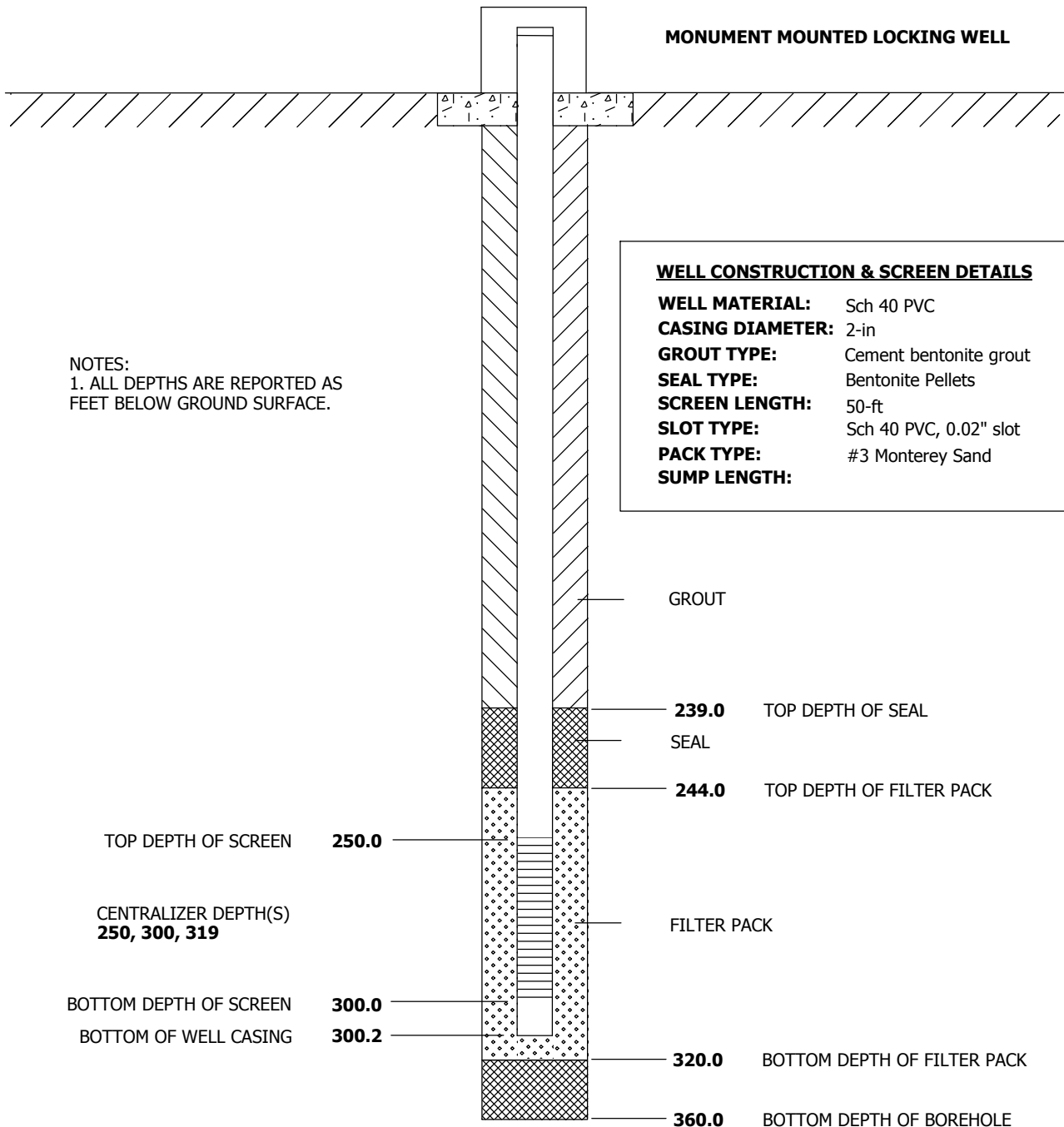


WELL COMPLETION DIAGRAM

PROJECT NO: 326128.01.07.AR	PROJECT: IM-3 Hydrogeologic Investigation, PG&E Topock	WELL NO: CW-1D
LOCATION: East Mesa Area, BLM Land		
DRILLING CONTRACTOR: WDC Exploration & Wells, Montclair, CA	DRILLING START DATE: 01/04/2005	
DRILLING METHOD: Rotosonic	DRILLING END DATE: 01/13/2005	
LOGGER: T. McDonald	WELL COMPLETION DATE: 01/13/2005	
TOP OF WELL CASING (NGVD 29): 566.46	NORTHING COORDINATE (CCS DAND 27, ZONE 5): 2102692.93	
GROUND SURFACE ELEVATION (NGVD 29): 563.77	EASTING COORDINATE (CCS NAD 27 ZONE 5): 7613263.17	



WELL DIAGRAM IS NOT TO SCALE

SOIL BORING LOG

PROJECT NAME: IM-3 Hydrogeologic Investigation, PG&E Topock		HOLE DEPTH (ft): 360.0	DRILLING CONTRACTOR: WDC Exploration & Wells, Montclair, CA	
SURFACE ELEVATION: 563.8 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,102,692.93	EASTING (CCS NAD 27 Z 5): 7,613,263.17	DATE STARTED: 01/04/2005	DATE COMPLETED: 01/13/2005
DRILLING METHOD: Rotosonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: Speedstar 15K	
LOCATION: East Mesa Area, BLM Land			LOGGED BY: T. McDonald	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
	INTERVAL	TYPE/ NUMBER	RECOVERY (ft)			
0						Conductor casing set to 10 ft bgs, wash casing to 100 ft bgs without collection of core. Per work-plan, drilled interval in unsaturated zone was not logged.
100				SP	POORLY GRADED SAND WITH GRAVEL (SP) -brn (7.5YR5/4), 40% gravel m-c, 30% c sand, 20% m sand, 5% f sand, <5% silt, ang-subang, wet sand and gravel, igneous / metamorphic, massive.	groundwater grab sample collected from 100-118 ft bgs possible slough and all core may not have been retrieved from 100-106 ft bgs
105				SP-SC	POORLY GRADED SAND WITH SILTY CLAY (SP-SC) -reddish brn 5YR4/4, 40% m-sand, 20% c-sand, 15% f-gravel, 15% clay-silt, 10% f-sand, ang-subang, igneous / metamorphic, mottles of dk reddish-brn 5YR3/4 and grnish-gry GLEY1 5/5GY, massive.	



SOIL BORING LOG

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SURFACE ELEVATION: 563.8 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,102,692.93	EASTING (CCS NAD 27 Z 5): 7,613,263.17	DATE STARTED: 01/04/2005	DATE COMPLETED: 01/13/2005
DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: Speedstar 15K	
LOCATION: East Mesa Area, BLM Land			LOGGED BY: T. McDonald	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
110		S1	16	SP	POORLY GRADED SAND WITH GRAVEL (SP) -reddish brn 5YR4/4 to 5/4, 50% m sand, 20% c-sand, 15% f-c gravel, 10% f-sand, 5% clay/silt, ang-subang, igneous/meta., faint gravel-fabric and v-faint bedding, soft-firm in intervals.	
115						
120					SILTY SAND (SM) -lt yellowish-gry 2.5Y 6/2, 40% m-sand, 30% f-sand, 15% silt, 10% m-sand, 5% c-sand, soft, dry, massive. - brn7.5YA 4/3-5/3, 25% c-sand, 25% m-sand, 20% clay/silt, 15% f-gravel, 15% f-sand, ang-subang, igneous and metamorphic, massive, .5 cm-3cm, wet	
125				SM		
130		S2	20		- brn 10YR 4/3-5/3, 30% m-sand, 25% c-sand, 25% clay/silt, 10% f-gravel, 10% f-sand, ang-subang, igneous/metamorphic, .5-1cm, massive	
135						
140				SP	POORLY GRADED SAND WITH SILT AND GRAVEL (SP) -dk reddish-gray (5YR4/3) to dk-gray (7.5YR4/1), 50% m-sand, 20% c-sand, 10% f-sand, 10% clay/silt, 10% f-c gravel, hard w/caliche development, moist to drier.	100-120ft bgs open hole, bailed and collect water sample, sample ID: CW1-120 @14:15

SOIL BORING LOG

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SURFACE ELEVATION: 563.8 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,102,692.93	EASTING (CCS NAD 27 Z 5): 7,613,263.17	DATE STARTED: 01/04/2005	DATE COMPLETED: 01/13/2005
DRILLING METHOD: Rotosonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: Speedstar 15K	
LOCATION: East Mesa Area, BLM Land			LOGGED BY: T. McDonald	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
145				SP	POORLY GRADED SAND WITH SILT AND GRAVEL (SP) - brn (7.5YR 5/3) with mottles of reddish-brn (5YR4/3), 65% m-sand, 20% c-sand, 10% f-gravel, <5% clay/silt, ang-subang, igneous/meta., massive, wet.	stop drilling at 140 ft on 1/5/05, but core not removed, continue drilling on 1/6/05
150		S3	20			
155				SM	SILTY SAND WITH GRAVEL (SM) -brn (7.5YR4/3), 30% f-sand, 20% silt/clay, 20% m-sand, 15% f-c-gravel, ang-subang, igneous/meta, 1-2cm., 10% mottling dk reddish gry(5YR4/3).	
160					WELL GRADED SAND (SW) -gray-brn (10YR5/2) 30% c-gravel, 30% m-sand, 25% f-sand, 15% gravel, <5% clay/silt, ang-subang, igneous/meta, color homogenized to high permeability, ave-1-3cm. -10% more clay/silt	160-180ft open hole, bailed one hour (130 gallons) groundwater grab sample collected from 160-176 ft bgs
165						very hard drilling 165-170 ft
170		S4	16	SW	-75% m-sand, 10% f-sand, 5% c-sand, 5% gravel, 5% clay/silt	
175						

SOIL BORING LOG

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SURFACE ELEVATION: 563.8 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,102,692.93	EASTING (CCS NAD 27 Z 5): 7,613,263.17	DATE STARTED: 01/04/2005	DATE COMPLETED: 01/13/2005
DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: Speedstar 15K	
LOCATION: East Mesa Area, BLM Land			LOGGED BY: T. McDonald	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
180					WELL GRADED SAND (SW) -gray-brn (10YR5/2) 30% c-gravel, 30% m-sand, 25% f-sand, 15% gravel, <5% clay/silt, ang-subang, igneous/meta, color homogenized to high permeability, ave-1-3cm. -75% c-gravel	lost core from 175-180 ft
185				SM	SILTY SAND WITH GRAVEL (SM) -reddish brn 5YR5/3, 30% m-sand, 30% f-sand, 20% clay/silt, 10% f-gravel, 10% c-sand, ang-subang, igneous./meta., massive, moist-wet.	
190		S3	20	SC	CLAYEY SAND (SC) dk grayish-brn 10YR4/2, 50% m-sand, 20% silt/clay, 10% f-sand, 5% f-gravel, 5% c-sand, ang-subang, igneous/meta, silty sticky/plastic, wet.	
195				SW-SM	WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM) -reddish brn 5YR5/3, 30% m-sand, 30% f-sand, 20% c-sand, 10% f-gravel, 10% clay/silt, 5% mottles of reddish-brn 2.5YR4/4, ang-subang, igneous/meta, moist-wet. -weak caliche 196-199 ft -sand layer, brn 7.5YR4/4, 80% m-f sand	
200				MH	SILT (MH) -dk grayish brn 10YR4/2, 75% silt, 15% f-sand, 10% clay, sticky/plastic, moist-wet. POORLY GRADED SAND (SP) -brn 10YR5/3, 50% m-sand, 45% f-sand, 5% clay/silt, v-soft, massive, wet.	
205				SP	-yellowish-brn 10YR5/4, 60% m-sand, 20% c-sand, 10% f-sand, ,5% gravel, 5% clay/silt, ang-subang, igneous/meta, soft-firm, wet	
210						200-204 ft sand not typical, sand end possibly reworked slough

SOIL BORING LOG

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DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: Speedstar 15K	
LOCATION: East Mesa Area, BLM Land			LOGGED BY: T. McDonald	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
215		S4	20	SW-SM	WELL GRADED SAND WITH SILT (SW-SM) -brn 10YR5/3, 10% mottles of brn 7.5YR4/4 weak caliche, 40% m-sand, 25% f-sand, 20% c-sand, 10% f-gravel, 10% clay/silt, ang-subang, massive, wet, igneous/metamorphic, abrupt lower boundary, firm.	open hole 220 to 240 ft bgs, bail one hour (~110 gals) groundwater grab sample collected from 220-240 ft bgs
220				SP-SM	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM) -brn 7.5YR5/3-4/3, 35% f-sand, 20% m-sand, 15% c-sand, 15% f-gravel, 10% clay/silt, 30% mottling reddish-brn 5YR4/4, ang-subang, igneous/metamorphic, hard-v. hard.	
225					WELL GRADED SAND (SW) -brn 7.5YR5/3, 60% m-sand, 20% f-sand, 15% c-sand, 5% clay/silt, ang-subang, igneous/metamorphic, massive, wet.	
230		S5	20		-10% clay/silt	
235					-shift in color, reddish brn, 7.5YR4/4 to 5YR 4/4	
240					-brn 7.5YR4/4 to 5YR4/4	
245					-6" caliche zone 10-20% clay/silt	

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DRILLING METHOD: Rotosonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: Speedstar 15K	
LOCATION: East Mesa Area, BLM Land			LOGGED BY: T. McDonald	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
250		S6	0	SW	WELL GRADED SAND (SW) -brn 7.5YR5/3, 60% m-sand, 20% f-sand, 15% c-sand, 5% clay/silt, ang-subang, igneous/metamorphic, massive, wet.	
255						
260						
265						
270		S7	16		-40-50% gravel -20% silt/clay	
275						
280						260-280 ft bgs core may have been fully recovered, but some bags filled with >2 ft of core



SOIL BORING LOG

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LOCATION: East Mesa Area, BLM Land			LOGGED BY: T. McDonald	

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	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
285				SW	WELL GRADED SAND (SW) -brn 7.5YR5/3, 10-15% yellowish-red 5YR4/6 mottling, 60% m-sand, 20% f-sand, 15% c-sand, 5% clay/silt, ang-subang, igneous/metamorphic with weak caliche development, massive, firm-hard, wet.	groundwater grab sample collected from 280-300 ft bgs
290		S9	20	SW-SC		
295				SW-SC		
300				SW	WELL GRADED SAND (SW) -brn 7.5YR4/4, 40% m-sand, 30% c-sand, 15% f-gravel, 15% f-sand, 5% clay/silt, ang-subang, igneous/metamorphic, massive, wet.	300-309 ft appears core is washed cut and not representative 300-320 ft only received 16ft of core
305				SW	-reddish brn, 7.5 YR4/4	
310		S10	15	SC-SM	SILTY CLAYEY SAND (SC-SM) - 40% dk greenish-gray (Gley1 4/104), 40% brown (7.5YR4/4), 20% yellowish red (5YR4/5), 10% f-c gravel, 5-10% c sand, 20% m sand, 30% f sand, 30-35% clay/silt, subang to ang, m plastic to plastic, m sticky, massive, ig and mm gravels up to 1 cm (one 9 cm), weak to mod. caliche at 306'	
310				SW	WELL GRADED SAND (SW) -brn 7.5YR4/4, 40% m-sand, 30% c-sand, 15% f-gravel, 15% f-sand, 5% clay/silt, ang-subang, igneous/metamorphic, massive, wet.	
315				SW-SM	WELL GRADED SAND WITH SILT (SW-SM) - brn 7.5YR4/3-5/3, 30-35% f sand, 30% m sand, 10-15% c sand, 10% f gravel, 10-15% silt/clay, subang to ang, massive, wet, igneous and metamorphic, max silt at 311', 313', 316',	



SOIL BORING LOG

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LOCATION: East Mesa Area, BLM Land			LOGGED BY: T. McDonald	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
320					WELL GRADED SAND WITH SILT (SW-SM) - brn 7.5YR4/3-5/3, 30-35% f sand, 30% m sand, 10-15% c sand, 10% f gravel, 10-15% silt/clay, subang to ang, massive, wet, igneous and metamorphic, max silt at 311', 313', 316',	
325		S11	10	SC	CLAYEY SAND WITH GRAVEL (SC) - gray (10YR5/1), 30% gravel up to 6 cm (freshly broken), 25% f sand, 20% clay, 15% m sand, 5% c sand, 5% silt, massive, soft, wet, decreasing sand with depth. 80% gravel at 321'.	very hard drilling conditions from 320-330 ft, only 10 foot run possible, observed discharged, changed to reddish brn/red
330				SM	SILTY SAND (SM) - brn 7.5YR5/2-4/2 with reddish brown 5YR5/4 at 324', 35% f sand, 25% m sand, 15% c sand, 20% silt, 5% f very weathered in-place gravel, subang to ang, firm to hard, weak bedding, massive, igneous and metamorphic, moist. At 325', in-ground igneous / metamorphic rock, v pale brn (10YR3/2), broken to clay / silt size dust, whitish, few gravels	
335				SW-SM	WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM) yellowish red to red (7.5YR5/6 to 5YR5/6), 40% m sand, 20% f sand, 10-15% f gravel, 10-15% c sand, 5-10% clay / silt, weak caliche throughout, subang to ang, m hard to hard, massive, igneous / metamorphic, moist.	
340						lost bottom 3 ft of core from 340-345 ft groundwater grab sample collected from 340-347 ft bgs very hard drilling from 340-350 ft
345				SC	CLAYEY SAND (SC) - greenish gray (Gley1 5/10GY), 30% m sand, 30% f sand, 15% f-c gravel, 10-15% clay, 10% c sand, subang to ang, massive, igneous / metamorphic, wet.	
350					CONGLOMERATE (BR) - reddish brn (5YR5/4), 40% m sand, 20% f sand, 15% f-c gravel, 15% c sand, 5-10% clay / silt, hard, massive	

SOIL BORING LOG

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SURFACE ELEVATION: 563.8 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,102,692.93	EASTING (CCS NAD 27 Z 5): 7,613,263.17	DATE STARTED: 01/04/2005	DATE COMPLETED: 01/13/2005
DRILLING METHOD: Rotosonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: Speedstar 15K	
LOCATION: East Mesa Area, BLM Land			LOGGED BY: T. McDonald	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, PERCENT COMPOSITION, GRADING, GRAIN SHAPE, MINERALOGY, DENSITY/CONSISTENCY, STRUCTURE, MOISTURE.	COMMENTS DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
355			12	BR	<p>CONGLOMERATE (BR) - reddish brn (5YR5/4), 40% m sand, 20% f sand, 15% f-c gravel, 15% c sand, 5-10% clay / silt, hard, massive</p>	12 ft core recovered from 350-360 ft, 2 ft from core lost with previous run
360					- 8 cm igneous gravel cored through	
<p>Boring Terminated at 360 ft</p> <p>ABBREVIATIONS cc = continuous core run brn = brown lt = light dk = dark vf = very fine-grained f = fine-grained m = medium-grained c = coarse-grained vc = very coarse-grained ang = angular subang = subangular subrnd = subrounded rnd = rounded br = bedrock formation ss = sandstone conglom = conglomerate mm = metamorphic comptd = compacted qtz = quartz</p>						