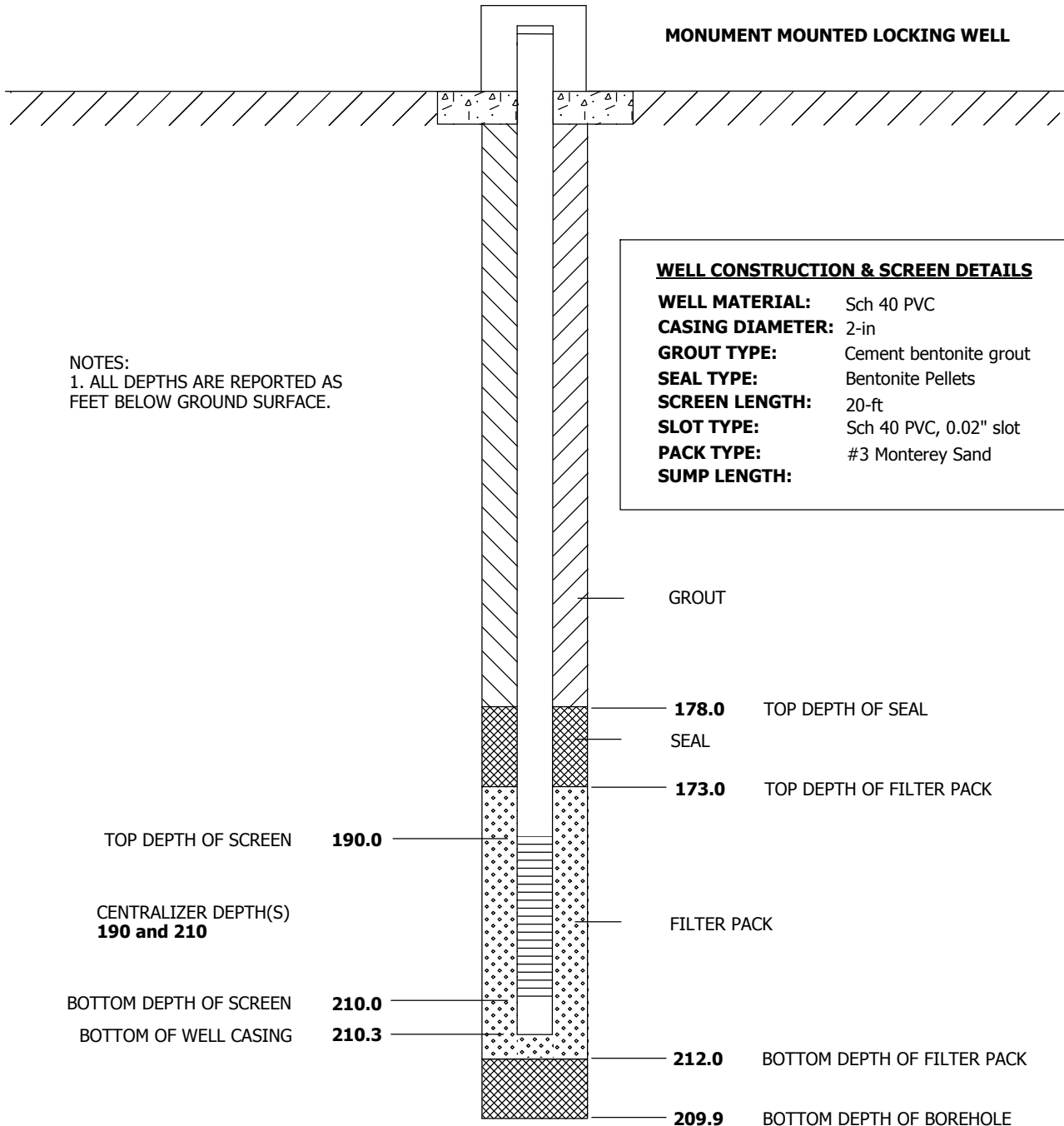


WELL COMPLETION DIAGRAM

PROJECT NO: 326128.01.07.AR	PROJECT: IM-3 Hydrogeologic Investigation, PG&E Topock	WELL NO: OW-2M
LOCATION: East Mesa, Parcel No. 650-151-06		
DRILLING CONTRACTOR: WDC Exploration & Wells, Montclair, CA	DRILLING START DATE: 12/01/2004	
DRILLING METHOD: Rotosonic	DRILLING END DATE: 12/01/2004	
LOGGER: K. Brown	WELL COMPLETION DATE: 12/05/2004	
TOP OF WELL CASING (NGVD 29): 548.52	NORTHING COORDINATE (CCS DAND 27, ZONE 5): 2103160.57	
GROUND SURFACE ELEVATION (NGVD 29): 545.87	EASTING COORDINATE (CCS NAD 27 ZONE 5): 7613382.67	

MONUMENT MOUNTED LOCKING WELL



WELL CONSTRUCTION & SCREEN DETAILS

WELL MATERIAL:	Sch 40 PVC
CASING DIAMETER:	2-in
GROUT TYPE:	Cement bentonite grout
SEAL TYPE:	Bentonite Pellets
SCREEN LENGTH:	20-ft
SLOT TYPE:	Sch 40 PVC, 0.02" slot
PACK TYPE:	#3 Monterey Sand
SUMP LENGTH:	

NOTES:
1. ALL DEPTHS ARE REPORTED AS FEET BELOW GROUND SURFACE.

WELL DIAGRAM IS NOT TO SCALE

SOIL BORING LOG

PROJECT NAME: IM-3 Hydrogeologic Investigation, PG&E Topock		HOLE DEPTH (ft): 347.0	DRILLING CONTRACTOR: WDC Exploration & Wells, Montclair, CA	
SURFACE ELEVATION: 546.7 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,103,142.09	EASTING (CCS NAD 27 Z 5): 7,613,374.28	DATE STARTED: 11/22/2004	DATE COMPLETED: 12/05/2004
DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06			LOGGED BY: M. Godwin	

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)			
5				GW	GRAVELLY SAND (GW) - dark olive gray 5YR3/2, 80% gravel, 20% sand, ang gneiss, qtz and k-spar fragments from cuttings, loose, wet.	cutting return from setting 20 ft conductor casing for core sampling, water used as drilling fluid
10						
15						
20						
25		CC01	10	GM	SILTY GRAVEL (GM) - dk grayish brn 2.5YR4/2, 50% ang gravel, 50% silt supported, caliche layer, gneiss and qtz, cobbles to 2", cemented with CaCO3, loose to hard, dry.	
30				GW	SANDY GRAVEL (GW) - lt brn 7.5YR6/4, to dk greenish gray 5.6YR4/1(rock), 50% ang c sand, 40% gravel, 10% fines, ang to subrnd clasts to 3", caliche cemented clasts, gneiss, qtz and chalcedony, loose to cemented, dry.	
				SG	GRAVELLY SAND (SG) - brn 7.5YR5/4, 70% sand, 25% gravel, 5% fines, cemented subang qtz, lithic c sand, firm, dry.	
35				GW	SANDY GRAVEL (GW) - grayish brn 2.5YR5/2, 80% gravel, 20% m c sand, gneiss, granodiorite, qtz and volcanics, loose to cemented, dry.	



SOIL BORING LOG

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DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06			LOGGED BY: M. Godwin	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
40		CC02	10	SW	GRAVELLY SAND (SW) - lt yellowish brn 10YR6/4, 80% sand, 15% gravel, 5% fines, clasts up to 1", gneiss, qtz and lithics, firm, dry, thick with silty sand. SANDY GRAVEL (GW) - brn 7.5YR5/4, 60% gravel, 35% f c ang sand, 5% fines, subang to subrnd clasts to 3", matrix supported, loose to firm, dry, upward fining.	
				GW		
45		CC03	10	GP	GRAVEL (GP) - gray, 95% gravel, 5% sand, subang, gneiss, granodiorite, qtz, clasts 1/2"-1", loose, wet. CLAYEY GRAVEL (GC) - grayish brn 2.5YR5/2, 40% m sand, 30% gravel, 30% fines, subang clasts to 2", gneiss, granodiorite, qtz, low plasticity, soft, moist.	
				GC		
50				SM	SILTY SAND (SM) - lt brn 7.5YR6/4, (sand is pale yellow 2.5YR7/3), 45% sand, 45% fines, 10% gravel, imbricated clasts, medium grained qtz and lithic sand, loose, dry, rhythmic bed to 1/4" thick. SANDY GRAVEL (GW) - grayish brn 2.5YR5/2, 60% f gravel, 30% m c sand, 10% fines, subang clasts up to 2", soft, moist, upward coarsening.	not cored, large cobble at 50 ft, advance casing without sampling
55				GW		
60		CC04	0			on 12/6/04 at 7:00: At 50' with casing cuttings show sand with silt from 50-60 ft, 40% c sand? 10-15% fines?
65		CC05	10	GW	GRAVEL (GW) - grayish brn 2.5YR5/2, 60% gravel, 30% sand, 10% fines, subang clasts to 4" at base, silty matrix at base, gneiss and granodiorite, loose, wet, upward fining.	groundwater grab sample collected from 60-80 ft bgs
				GW	SANDY GRAVEL (GW) - brn 7.5YR5/4, 50% f subang to subrnd gravel, 40% c sand, 10% fines, gneiss, granodiorite and qtz, loose, moist to dry.	
				SW	SAND (SW) - grayish brn 2.5YR5/2, 90%, 10% gradational with below, upward fining to v f sand, subrnd, qtz, lithic and biotite, soft, wet.	
				GC	CLAYEY GRAVEL (GC) - lt olive brn 2.5YR5/3, 70% gravel, 20% sand, 10% fines, >clay content at base, clasts to 3" at base, gneiss, granodiorite, qtz, upward fining, low plasticity, firm, moist.	
70						

SOIL BORING LOG

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SURFACE ELEVATION: 546.7 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,103,142.09	EASTING (CCS NAD 27 Z 5): 7,613,374.28	DATE STARTED: 11/22/2004	DATE COMPLETED: 12/05/2004
DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06			LOGGED BY: M. Godwin	

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)			
75		CC06	10	GW	SANDY GRAVEL (GW) - brn 7.5YR5/4, 60% gravel, 40% vf to c sand, ang to subang, qtz, lithic, biotite, gneiss, granodiorite and volcanics loose, dry. - cemented at 75-76.5 ft, upward coarsening	
80				CL	SANDY CLAY WITH GRAVEL (CL) - grayish brn 10YR5/2, ang to subang gravel up to 1" (mm clasts), medium plasticity, soft, moist, massive.	bail and sample borehole OW-2D-80, collected OW-2D-80 @ 14:15 for analysis wet at 82-82.5 ft
85		CC07	8	SM	SILTY SAND WITH GRAVEL (SM) - dk grayish brn 10YR4/2, 20% fines, 10% subang to ang gravel up to 1.5" (mm clasts), majority f sand, increasing clay with depth, moist to wet, silty cemented.	
				SW	SAND WITH GRAVEL AND SILT (SW) - grayish brn 10YR5/2, 60% sand, 30% subang to subrnd gravel (mm clasts) up to 3/4" but most <1/2", dry, moderately cemented.	
90				GC	CLAYEY GRAVEL WITH SAND (GC) - brn 7.5YR4/2, 40% fines, 20% f to c sand, ang to subrnd gravel up to 2.5" but most <1" (mm clasts), medium dense, moist. - clay matrix mottled with 5% red 10YR4/3 after 90 ft	at 8:22 pull core, driller notes tough drilling at 8:55 rig down at 9:00, tightening parts and at 9:11 rig running again
95		CC08	12	GM	SILTY GRAVEL WITH SAND (GM) - brn 7.5YR3/3, 50% f sand, 25% c subang sand, gravel ang to subrnd up to 1" (mm clasts), <10% caliche mottling, clasts > weathered with depth, loose, dry to moist.	collect bag sample from 93-94'
				CL	SANDY CLAY WITH GRAVEL (CL) - brn 7.5YR4/2, 25% c sand, ang to subang gravel up to 1.5" (mm clasts), dense, soft, moist, less clay with depth.	difficult to break core with putty knife
100				SM	SILTY SAND WITH GRAVEL AND CLAY (SM) - grayish brn 10YR5/2, 15% fines, subang gravel <3/4" (mm clasts), highly weathered, medium dense.	
				CL	SANDY CLAY WITH GRAVEL (CL) - brn 10YR5/3, 20% f to c sand, ang to subang gravel up to 1/4" (mm clasts), soft, wet, massive. - brn 10YR4/3, 15% f to c sand, trace caliche, trace red mottling, firm, moist to wet	pull rods at 9:38, core up at 9:47, push casing at 10:00
105				CL		



SOIL BORING LOG

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DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06			LOGGED BY: M. Godwin	

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		CC09	20	CL	SANDY CLAY WITH GRAVEL (CL) - brn 10YR5/3, 20% f to c sand, ang to subang gravel up to 1/4" (mm clasts), soft, wet, massive.	bag sample up to 3" from 110-112 ft
				SM	CLAY (CL) - white 10YR8/1, <5% mm gravel, clay, and white powdery clasts up to 3", loose to moderately cemented, dry. SILTY SAND WITH GRAVEL (SM) - very pale brn 10YR8/2, 40% m to f sand, 20% subang gravel up to 3" (most<1"), 15% c sand, loose, dry.	
				SC	CLAYEY SAND WITH GRAVEL (SC) - dk grayish brn 10YR4/2, 15% c sand, subang to subrnd gravel up to 1", dense, moist.	
115				SM	SILTY SAND WITH GRAVEL (SM) - very pale brn 10YR8/2, 40% m to f sand, 20% subang gravel up to 3" (most<1"), 15% c sand, loose, dry.	
				SC	CLAYEY SAND WITH GRAVEL (SC) - grayish brn 10YR5/2, ang gravel up to 1.5" (mm clasts), sand mostly fine grained, decreased clay with depth, dense, dry to moist.	
120				SW	GRAVELLY SAND WITH CLAY (SW) - grayish brn 10YR5/2, 40% c sand, 30% ang gravel up to 1" , 20% fines, increasing clay with depth, dense, moist, moderately cemented.	collect grain size sample from 116-117 ft
125				CL	SANDY CLAY WITH GRAVEL (CL) - brn 10YR5/3, 20% c sand, 5% subang gravel up to 1" , less c sand with depth, plastic, firm (increasing firmness with depth), moist.	groundwater grab sample collected from 120-140 ft bgs
130				CL	- 6" layer of clayey gravel, ang to subang gravel up to 1/2" (mm clasts), loose, dry - moist, firm	drier at 123
135				ML	- same as above but more gravel, color dk grayish brn 10YR4/2 SILT WITH GRAVEL (ML) - lt gray 5YR7/1, 10% ang to subang gravel up to 2" , loose, dry.	no core recovery from 132-140 ft bgs, collect sample OW2D-132', driller notes productive zone
				CL	SANDY CLAY (CL) - dk grayish brn 10YR4/2, 30% c sand, 10% f to m sand, moderately plastic, wet. - no gravel observed	
140						

SOIL BORING LOG

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SURFACE ELEVATION: 546.7 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,103,142.09	EASTING (CCS NAD 27 Z 5): 7,613,374.28	DATE STARTED: 11/22/2004	DATE COMPLETED: 12/05/2004
DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06			LOGGED BY: M. Godwin	

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		CC11	19.5	CL	GRAVELLY CLAY (CL) - brn 10YR5/3, 30% ang to subang gravel up to 3/4" (mm clasts), >20% fines, 10% c subrnd sand, medium dense, moist.	grain size sample from 154-155 ft
				SP	SAND (SP) - pale brn 10YR7/2, 10% c sand, <10% fines, trace ang to subang gravel up to 3/4", dry, silty indurated.	
				CL	GRAVELLY CLAY (CL) - dk grayish brn 10YR4/2, 20% f to c subang to subrnd sand, >20% fines, ang to subang gravel (mm clasts) up to 1.5" but most <1/2", dense, moist.	
150				GW	SANDY GRAVEL (GW) - lt brnsh gray 10YR6/2, 20% c subang to subrnd sand, 10-20% fines, ang to subang gravel up to 3", dry, silty cemented.	
				SC	CLAYEY SAND WITH GRAVEL (SC) - brn 10YR4/3, 10-20% fines, m to f subang sand, subang gravel up to 1.5" but most <1/2", medium dense, moist.	
155				CL	SANDY CLAY (CL) - lt brnsh gray 10YR6/2, 40% f sand, <10% ang to subang gravel up to 1/4", dry to damp, silty to moderately cemented, increased cementation with depth.	
				SW	GRAVELLY SAND WITH CLAY (SW) - grayish brn 10YR5/2, 10-20% fines, 10% c subang sand, subang gravel up to 2.5" (mm clasts), medium to dense, dry to damp.	
160		CL	SANDY CLAY (CL) - lt gray to brn 10YR7/1, 50% fines, 30% f sand, <10% c sand, <10% subang gravel up to 3/4", firm, moderately cemented.			
165		CC12	20	SC	CLAYEY SAND (SC) - dk grayish brn 10YR4/2, ~20% fines, ~15% ang to subang gravel up to 1/4" (gets up to 2" with depth), c ang to subang sand, dense, damp, some dk green mottling. - more f gravel	
170				SC	- lt gray 10YR7/2 to very pale brn 10YR7/3, f to c ang to subang sand, 5% ang to subang gravel up to 1", dry to moist, silty to moderately cemented	
				SC	- very pale brn 10YR8/2, 10-20% fines, 10% ang gravel up to 1.5" (mm clasts), dry, silty cemented	
175				SC	- dk gray 10YR4/1, 15% fines, <10% ang to subang gravel up to 1", damp, moderately cemented - very dense	

SOIL BORING LOG

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DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06			LOGGED BY: M. Godwin	

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				SW	GRAVELLY SAND (SW) - dk grayish brn 10YR4/2, 50% c sand, <10% fines, more fines with depth, ang to subang gravel and sand grains, very dense, damp, moderately cemented, weathered clasts.	difficult drilling
185				SW	SAND WITH SILT AND GRAVEL (SW) - brn 7.5YR5/3, 10-15% fines, 10% ang to subang gravel up to 1.5" (mm clasts), c subang to subrnd sand, medium dense, moist to wet.	more cemented at 183 ft
				SC	CLAYEY SAND (SC) - brn 7.5YR5/3 with a layer of 5YR5/2, 30% f to m sand, 20% c sand, 20% fines, subang to ang mm gravel to 3", loose, moist to dry.	
				CL	SANDY CLAY (CL) - brn 10YR4/4, 25% c ang to subang sand, >20% fines, <10% ang to subang gravel up to 2" but most <1", firm, damp.	grain size sample from 188-190 ft
190		CC13	19	SP	SAND (SP) - lt gray 10YR7/2, <10% c sand, trace subang gravel up to 1/2", dry, silty cemented. - brn 10YR4/3, 15% gravel up to 1" (mafic and MM clasts), c subang sand, clast supported, loose to medium dense, wet	grain size sample from 190-192 ft
195				SC	CLAYEY SAND WITH GRAVEL (SC) - brn 7.5YR5/3, 50% c to f sand, 15% f gravel to c sand, ang to subang gravel up to 3", mm clasts, dense, damp, moderately cemented, moderately weathered.	
200				SW	SAND (SW) - grayish brn 10YR5/2, 50% c ang to subang sand, <10% fines, 5% ang gravel up to 3/4" , loose, wet.	no recovery from 199-200
				SW	GRAVELLY SAND (SW) - grayish brn 10YR5/2, 40% ang to subang gravel up to 1/2" , <10% fines, mafic MM clasts, loose to moderately cemented, wet. - more clay, 10-20% fines	groundwater grab sample collected from 200-220 ft bgs
205				GW	SANDY GRAVEL (GW) - dk gray 10YR4/1, 50% ang to subang gravel up to 1.5" (mm clasts), 35% c sand, <10% fines, clasts supported, medium dense, loose, wet. - gravel up to 2" at 209 ft	
210						



SOIL BORING LOG

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DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06			LOGGED BY: M. Godwin	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
215		CC14	15	SC	<p>CLAYEY SAND WITH GRAVEL (SC) - brn 10YR5/3, 10-20% fines, ang gravel up to 1" (mm clasts), clay matrix, firm, damp to moist.</p> <ul style="list-style-type: none"> - 2" clay around gravel layer, ang to subang mm clasts (weathered) up to 1.5" - mottled, 40% lt yellowish brn 10YR6/4 and 15% dk gray 10YR4/1, intermittent gravel zones from 213-214.5 ft(weathered), ang, up to 1" -clay supported 1/2" to 1" thick 	hard drilling, no recovery due to hard shaking to remove core, lost most
220					- 2 ft recovery - not sure where from between 220 to 230 ft	
225						
230		CC15	2	SW/SM	<p>GRAVELLY SAND WITH SILT (SW/SM) - brn 10YR5/3, 40% ang to subang gravel, 30% c ang to subrnd sand, 20% f to m sand, 10-20% fines, felsic and mafic mm clasts up to 1" , weathered clasts, medium dense, moist to wet.</p>	
235						
240						
245				SW/SC	<p>SAND WITH GRAVEL AND CLAY (SW/SC) - brn 10YR5/3, 40% c subang to subrnd sand to f gravel, 10-20% fines, 5% c gravel up to 1.5" (most <1"), ang to subang, mm clasts (felsic and mafic), weathered, loose to medium dense, wet.</p> <ul style="list-style-type: none"> - clayey sand with gravel (SC), same as above except >20% fines, less sand and gravel - same as 240', but 30% c sand to f gravel, more m sand 	



SOIL BORING LOG

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DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---		DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06				LOGGED BY: M. Godwin	

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		CC16	20	SC	<p>SAND WITH GRAVEL AND CLAY (SW/SC) - brn 10YR5/3, 40% c subang to subrnd sand to f gravel, 10-20% fines, 5% c gravel up to 1.5" (most <1"), ang to subang, mm clasts (felsic and mafic), weathered, loose to medium dense, wet.</p> <p>CLAYEY SAND WITH GRAVEL (SC) - brn 10YR5/3, >20% fines, 15% c subang to subrnd sand (rest f to m), 10% ang to subang gravel mm clast up to 3" (mostly mafic), matrix supported, medium dense, moist.</p> <p>- pale yellow 2.5YR7/3, 10% c ang to subrnd sand, <10% ang to subang gravel (mm, mostly mafic) up to 1/2" , dry to damp, silty cemented,</p>	difficult drilling - cobble
255				SW/SM	SAND WITH SILT AND GRAVEL (SW/SM) - dk yellowish brn (10YR 4/4) mottled with gray 10YR5/1 with trace of reddish brn, 30% m to f sand, 25% c sand, ~15% f gravel, ~10% fines, 5% c ang gravel up to 3" (felsic MM), medium dense, silty cemented, moist.	
260				SW/SC	GRAVELLY SAND WITH CLAY (SW/SC) - brn 10YR5/3, 15-25% gravel up to 3" (ang mm), ~15% c ang to subrnd sand, 10-20% fines, dense, moist.	
265				SC	CLAYEY SAND WITH GRAVEL (SC) - brn 10YR5/3, 35% f to m ang to subrnd sand, >20% fines, 15% c sand, ang gravel up to 1" (mafic), dense, moist.	
265				SW	GRAVELLY SAND (SW) - yellowish brn 10YR5/4, ~65% sand, 40% c ang to subrnd sand, 30% f ang to subang gravel up to 1" (mm clast - felsic and mafic), <10% fines, loose to medium dense, moist to wet. - 30-35% c sand	lots of rig chatter
270				GW/GC	SANDY GRAVEL WITH CLAY (GW/GC) - brn 10YR5/3, ~40% f gravel, 30% c ang to subrnd sand, 10-20% fines, ~10% c ang to subang gravel up to 2" (mm clasts - mostly mafic), medium dense, moist.	
270				SW/SC	SAND WITH CLAY AND GRAVEL (SW/SC) - dk grayish brn, 10-20% fines, 10-15% f gravel up to 1", 10% c sand (mainly f to m sand), medium dense, moist.	
270		CC17	20	CL	CLAYEY SAND WITH GRAVEL (SC) - pale brn 10YR6/3 and gray 10YR5/1 mottled 50/50, 35% f to m sand, >20% fines, 20% c ang to subrnd sand, 15% f ang to subang gravel, 5% ang gravel up to 1" (mm clasts), medium dense, damp.	
275				SC	SANDY CLAY WITH GRAVEL (CL) - yellowish brn 10YR5/4, >50% fines, 40% f to c sand (10-15% c ang to subrnd sand), 15% c to f ang to subang gravel up to 1.5" (mm clasts), medium stiff, moist. CLAYEY SAND WITH GRAVEL (SC) - yellowish brn 10YR5/4, >20% fines, 15% f to c ang to subrnd sand, 15% f to c ang to subang gravel up to 2" (mm clast), medium dense, moist.	
280				SW/SC	SAND WITH CLAY, SILT AND GRAVEL (SW/SC) - brn 10YR4/3, 20% f ang to subang gravel up to 1" (mm clast), 10-20% fines, 10% c subang to subrnd sand, medium dense, damp to moist.	



SOIL BORING LOG

PROJECT NAME: IM-3 Hydrogeologic Investigation, PG&E Topock		HOLE DEPTH (ft): 347.0	DRILLING CONTRACTOR: WDC Exploration & Wells, Montclair, CA	
SURFACE ELEVATION: 546.7 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,103,142.09	EASTING (CCS NAD 27 Z 5): 7,613,374.28	DATE STARTED: 11/22/2004	DATE COMPLETED: 12/05/2004
DRILLING METHOD: Rotosonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06			LOGGED BY: M. Godwin	

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)			
285		CC18	20	SW/SM	SAND WITH SILT AND GRAVEL (SW/SM) - brn 10YR5/3, >50% ang to subrnd sand (35% c sand and rest f to m), 15% ang to subang gravel up to 1" (mm clast), 10-20% fines, loose to medium dense, moist to wet, weathered. - brn 10YR5/3, gravel and c sand increasing with depth	boring continues in hole 20 ft south ((280-340'), move 20' south of OW-2M(was OW-2D until but refusal at 260' with casing cored to 280')
				SC	CLAYEY SAND WITH GRAVEL (SC) - dk grayish brn 10YR4/2, ~20% fines, 10% c sand, 10% m to f sand, 15% f to c ang to subang gravel up to 3" (mm clast-felsic and mafic), medium dense, moist. - 10YR4/2 to 4/3, silty cemented, less gravel with depth	
290				SW	GRAVELLY SAND WITH SILT (SW) - brn 7.5YR5/3, 40% c ang to subrnd sand, ~40% ang to subang gravel up to 1.5" (mm clast), up to 20% fines with depth, ~10% fines, ~10% m to f sand, medium dense, moist to wet.	
295				SC	CLAYEY SAND WITH GRAVEL (SC) - brn 10YR4/3, 10-30% ang to subang gravel up to 3/4" (mm clasts) increased gravel with depth, ~20% fines, 20% c ang to subrnd sand (rest f to m sand), silty cemented, medium dense, moist to wet.	
				SW	SAND WITH GRAVEL (SW) - reddish brn 5YR4/4, 30-40% c ang to subrnd sand, 30% m sand (rest f sand), 25% ang to subrnd gravel up to 3/4" (mostly mafic mm clast), ~10% fines, loose to medium dense, wet.	
300				SW/SC	SAND WITH CLAY AND GRAVEL (SW/SC) - brn 10YR5/3, 30% c ang to subrnd sand, 20% ang to subang gravel up to 2" (mm clast), 20% m sand, 10% f sand, 10-20% fines, medium dense, wet.	
305		CC19	18	SW	SANDY GRAVEL WITH SILT (SW) - brn 10YR5/3, >50% ang to subang gravel up to 3" mostly mafic (mm clast), 40% ang to subrnd sand (25% c sand), ~10% fines, intermittent zones with up to 20% fines, trace cobble, grain supported, loose, wet.	
				SW/SC	GRAVELLY SAND WITH CLAY (SW/SC) - brn 10YR4/3, 40% c sand, 30% ang to subang gravel up to 1.5" (mm mostly mafic), 20% m to f sand, 10-20% fines (increased fines with depth), loose, wet.	
310				SW/SM	SAND WITH SILT AND GRAVEL (SW/SM) - brn to dk yellowish brn 10YR5/3 to 4/4, 10-20% fines, 15% ang to subang gravel up to 3/4" (mm clast), f to c sand, medium dense, moist to wet.	
				SW/SC	GRAVELLY SAND WITH CLAY (SW/SC) - brn 7.5YR4/3, 30% ang to subang gravel up to 2" (mm clast), 10-20% fines (increased clay), f to c sand, medium dense, moist to wet.	
315				SC	CLAYEY SAND WITH GRAVEL (SC) - brn 7.5YR4/3, ~ 30% ang to subang gravel up to 1.5" (mm weathered clasts), f to m sand (~10% c sand), matrix supported, medium dense, moist (trace wet).	

SOIL BORING LOG

PROJECT NAME: IM-3 Hydrogeologic Investigation, PG&E Topock		HOLE DEPTH (ft): 347.0		DRILLING CONTRACTOR: WDC Exploration & Wells, Montclair, CA	
SURFACE ELEVATION: 546.7 ft. MSL		NORTHING (CCS NAD 27 Z 5): 2,103,142.09		EASTING (CCS NAD 27 Z 5): 7,613,374.28	
DRILLING METHOD: Rotasonic		WATER LEVEL (ft): ---		DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06				LOGGED BY: M. Godwin	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE/NUMBER	RECOVERY (ft)			
320				SW/SC	GRAVELLY SAND WITH CLAY (SW/SC) - brn 7.5YR5/3 with 5-10% reddish brn 5YR4/4 (from weathered clast), 40% ang to subang gravel up to 1" (mm clast), 25% c ang to subrnd sand (rest f to m), 30% f ang to subang gravel up to 3/4" , 10-20% fines, loose to medium dense, moist to wet. - less gravel and more c sand with depth	DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES. Boring Terminated at 347 ft ABBREVIATIONS cc = continuous core run
				SC	CLAYEY SAND WITH GRAVEL (SC) - brn 7.5YR4/3, 40% f to m sand, >20% fines, 10% c ang to subrnd sand, 10% ang to subang gravel up to 1/2" (mm clast), matrix supported, silty cemented, medium dense, moist.	
325				GW	GRAVEL WITH SAND AND SILT (GW) - grayish brn 10YR5/2, 50-60% ang to subang gravel up to 3/4" , 30-50% sand (up to 40% c sand), ~10% fines, clast supported, loose, wet. - up to 3" past 325', gravel size increases with depth, mafic and felsic mm clast, coarsens with depth (sand and gravel but amount of fines increases - cobble layer (subang, mafic mm, >4") at 327.4 ft	
				GC	CLAYEY SILTY GRAVEL (GC) - lt brnsh gray 10YR6/2, ~50% ang to subang gravel up to 2" (most <1"), 25% f to c sand, >20% fines, loose (soft), wet.	
330			18	CL	SANDY CLAY WITH GRAVEL (CL) - mottled brn to dk yellowish brn 10YR5/3 to 4/4 with 10% greenish gray 5/10GY, >50% fines, 30% sand (10% c ang to subang sand), 15% ang to subang gravel up to 2" most 1" or less (felsic, mafic and mm), increased sand with depth, stiff, moist.	
				SW/SC	SAND WITH CLAY AND GRAVEL (SW/SC) - brn 10YR5/3, 40% c sand, 15% f ang to subang gravel up to 3/4" (weathered mm mostly mafic), 10-20% fines, medium dense, moist.	
335						
340				SC	CLAYEY SAND WITH GRAVEL (SC) - mottled brn 10YR5/3 to 4/3 with up to 20% reddish brn 5YR4/4 and up to 20% greenish gray 5/10GY, >20% fines, 25% ang to subang gravel up to 1" (most <1/2"), 10-15% f to c sand, weathered clast, matrix supported, medium to tightly cemented, dense, dry to damp, gravel size increases with depth up to 2", red and green colors increase with depth.	
				345		
CL	SANDY CLAY (CL) - mottled greenish gray 6/10GY and 15% reddish brn 5YR4/4, >50% fines, 20% f to m sand, 15% c sand, 15% ang to subang gravel up to 1" (mm, mafic), soft to med stiff, moist.					

SOIL BORING LOG

PROJECT NAME: IM-3 Hydrogeologic Investigation, PG&E Topock		HOLE DEPTH (ft): 347.0	DRILLING CONTRACTOR: WDC Exploration & Wells, Montclair, CA	
SURFACE ELEVATION: 546.7 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,103,142.09	EASTING (CCS NAD 27 Z 5): 7,613,374.28	DATE STARTED: 11/22/2004	DATE COMPLETED: 12/05/2004
DRILLING METHOD: Rotosonic		WATER LEVEL (ft): ---	DRILLING EQUIPMENT: 6" casing w/ 4" cont. core	
LOCATION: East Mesa, Parcel No. 650-151-06			LOGGED BY: M. Godwin	

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)			
					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 comptd = compacted qtz = quartz	