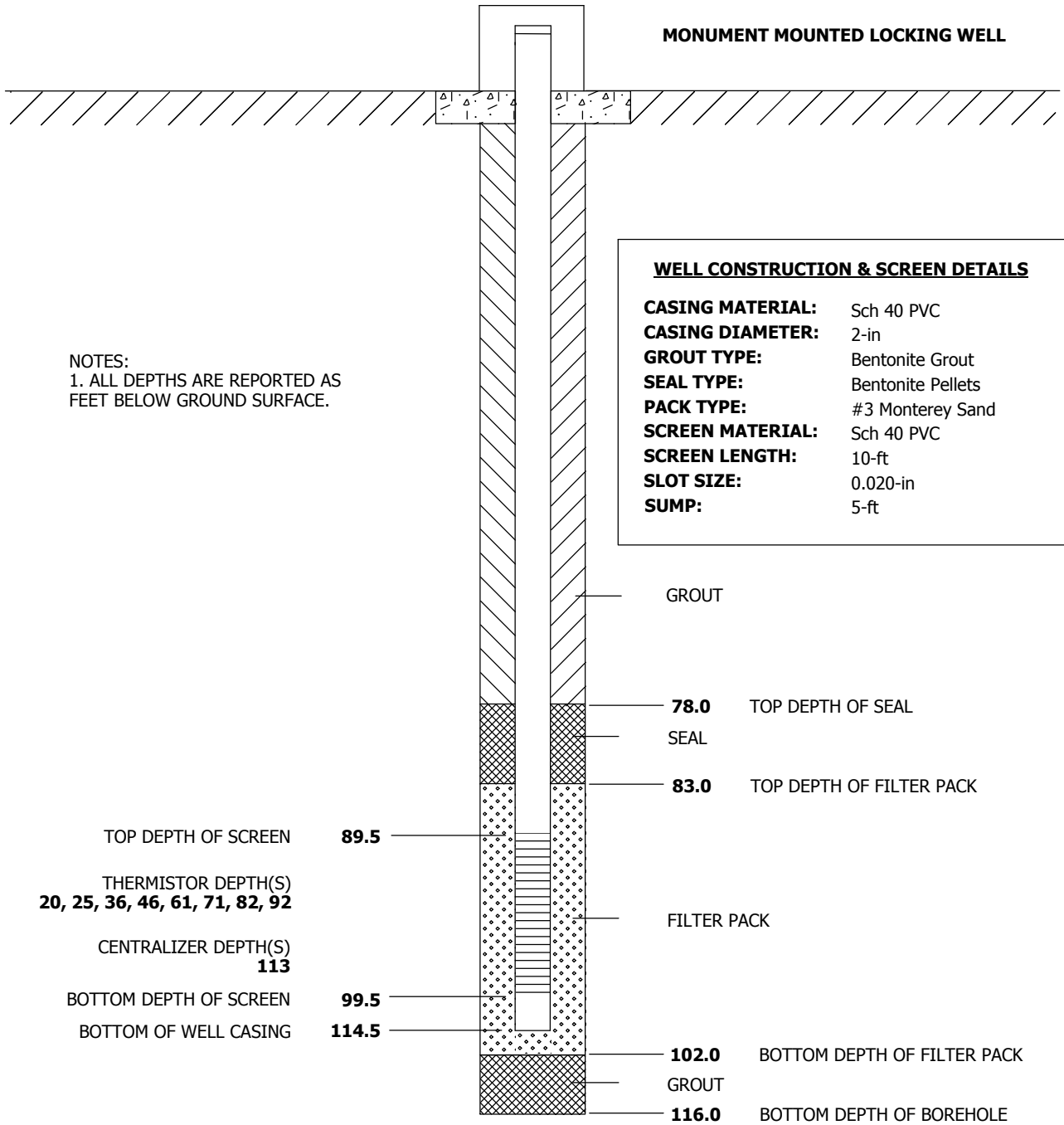
WELL COMPLETION DIAGRAM

PROJECT NO: 326228.IM	**PROJECT:** PG&E Topock, Interim Measures, Phase 2 (2005)	**WELL NO:** **MW-34-100**

LOCATION: Adjacent to MW-34-55 on Colorado River floodplain.

DRILLING CONTRACTOR: Prosonic Corp. Phoenix, AZ	**DRILLING START DATE:** 01/27/2005
DRILLING METHOD: Rotosonic	**DRILLING END DATE:** 01/29/2005
LOGGER: B. Moayyad, T. McDonald	**WELL COMPLETION DATE:** 01/30/2005
TOP OF WELL CASING (NGVD 29): 460.97	**NORTHING COORDINATE (CCS DAND 27, ZONE 5):** 2102530.55
GROUND SURFACE ELEVATION (NGVD 29): 458.93	**EASTING COORDINATE (CCS NAD 27 ZONE 5):** 7616452.40



WELL CONSTRUCTION & SCREEN DETAILS

CASING MATERIAL:	Sch 40 PVC
CASING DIAMETER:	2-in
GROUT TYPE:	Bentonite Grout
SEAL TYPE:	Bentonite Pellets
PACK TYPE:	#3 Monterey Sand
SCREEN MATERIAL:	Sch 40 PVC
SCREEN LENGTH:	10-ft
SLOT SIZE:	0.020-in
SUMP:	5-ft

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

WELL DIAGRAM IS NOT TO SCALE

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
326228.IM	MW-34

SOIL BORING LOG

PROJECT NAME: PG&E Topock, Interim Measures, Phase 2 (2005)		**HOLE DEPTH (ft):** 116.0	**DRILLING CONTRACTOR:** Prosonic Corp. Phoenix, AZ	
SURFACE ELEVATION: 458.9 ft. MSL	**NORTHING (CCS NAD 27 Z 5):** 2,102,530.55	**EASTING (CCS NAD 27 Z 5):** 7,616,452.40	**DATE STARTED:** 01/27/2005	**DATE COMPLETED:** 01/29/2005
DRILLING METHOD: Rotosonic		**WATER LEVEL (ft):**	**DRILLING EQUIPMENT:** Track Mounted Sonic	
LOCATION: Adjacent to MW-34-55 on Colorado River floodplain.			**LOGGED BY:** B. Moayyad, T. McDonald	

DEPTH BGS (feet)	SAMPLE INTERVAL	SAMPLE TYPE/ NUMBER	SAMPLE RECOVERY (ft)	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.
5		Box 1	7	SP	**POORLY GRADED SAND (SP)** - dk grayish brn 10YR4/2, 98% sand, 2% fines with some organic matter and roots, loose, moist - pale brn 10YR6/3, 95% m sand, massive	collect bag samples for archive description and potential grain-size testing. collect bag sample: MW34-GS-4
10		Box 2 Box 3 Box 4	10		- yellowish brn 10YR5/4, moist to wet, bottom 8" transition with mottling with dark gray 10YR4/1 - dk grayish brn 10YR4/2, wet, massive - transition zone and mottling coincides with water tube at approx 8.5 to 9 ft bgs - 99% f sand, 1% fines	collect bag sample: MW34-GS-8
15					- color shift to yellowish brn 10YR5/4	
20		Box 4 Box 5 Box 6	10	SP	**POORLY GRADED SAND (SP)** - dk grayish brn 10YR4/2, 99% f-m sand, 1% fines with some organic matter and roots, loose, moist - brn 10YR5/3 - 99% vf sand, 1% fines	collect bag sample: MW34-GS-16
25						
30		Box 6 Box 7 Box 8	10			collect bag sample: MW34-GS-30
35						

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					POORLY GRADED SAND (SP) - dk grayish brn 10YR4/2, 99% f-m sand, 1% fines with some organic matter and roots, loose, moist	
					- 70-80% qtz, 20-30% mafic grains	
40					- 96% sand, 3% gravel, 1% fines	
		Box 8 Box 9 Box 10	10	SP	**POORLY GRADED SAND WITH GRAVEL (SP)** - brn 10YR5/3, 87% sand, 15% rnd to well rnd gravel <1cm to 6cm, 4% silt, igneous, metamorphic, vesicular basalt, quartzite, soft, wet, massive, carbonate	collect bag sample: MW34-GS-42.2
					- dk gray 2.5YR2/1, 60% silt, 40% vf sand, soft, wet, massive	
45				SP	**POORLY GRADED SAND (SP)** - brn 10YR5/3, 95% rnd to well rnd sand, 5% fines, 3% rnd to well rnd gravel, igneous and metamorphic, soft, wet, gravel with vesicular basalt, carbonate, massive	collect bag sample: MW34-GS-43
				ML	**SILTY CLAY (ML)** - brn 10YR5/3 - 7.5YR5/3, 98% fines, 2% sand, very abrupt boundary, sticky, plastic, fine grain layer	
			0		**POORLY GRADED SAND (SP)** - brn 10YR4/3, 92% rnd sand, 5% subrnd gravel up to 1", 3% fines, qtz, some mafic, wet	
50						took sample at 13:05: MW34-GS-50
		Box 11	5		- 10YR5/3, 90% rnd sand, 10% subrnd f gravel up to 1 cm, qtzite, mafic, darker/coarser than above	
55				SP	- 896% sand, 4% f gravel up to 1/2" subrnd to subang, less mafic	
					- 10YR5/3, subang to subrnd gravel	
60					- 90% subrnd to rnd sand, coarsening, 10% rnd gravel up to 2 1/2", carbonate/granitic	
					- 96% subrnd to rnd sand, 4% gravel up to 1", 5"mm cobble	
		Box 12 Box 13	10.45		- no gravel	
65					- occasional silty clay lenses 2-4" thick	
				SW	**WELL GRADED SAND WITH GRAVEL (SW)** - 80% rnd f sand, 15% fines, 5% subang to subrnd gravel up to 1"	took sample at 13:40: MW34-GS-65
					POORLY GRADED SAND (SP) - brn 7.5YR5/4, 90% f sand, 8% c sand, 2% fines, rnd, loose, wet	
70					- becomes more gray in color near wood	

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SOIL BORING LOG

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		Box 14 Box 15	9	SP	**POORLY GRADED SAND (SP)** - brn 7.5YR5/4, 90% f sand, 8% c sand, 2% fines, rnd, loose, wet - large wood fragments >6", no sediment, charcoal appearance - 98% sand, <2% fines, coarse, subrnd, f qtz sand	sample collected at 14:35: MW34-GS-73
75				GW	**WELL GRADED GRAVEL WITH SAND AND SILT (GW)** - brn 7.5YR5/3, 70% gravel up to 5", 20% sand, 10% fines, rnd to subrnd, medium, wet	
				SP	**POORLY GRADED SAND (SP)** - brn 7.5YR5/2, 95% f rnd qtz sand, 5% silt, some mafics, loose, wet	
80						
		Box 16 Box 17	9.5	GW	**WELL GRADED GRAVEL WITH SAND AND COBBLES (GW)** - brn 7.5YR5/3, 60% rnd gravel up to 5", 35% subrnd qtz sand, 5% fines, igneous and metamorphic, wet - 60% gravel with 15% cobbles	sample collected at 15:00: MW-34P-GS-80
85						
		Box 18 Box 19	9	GW	**SILTY SANDY GRAVEL (GW)** - 55% sand, 43% gravel up to 6", 2% fines	drilling becomes much harder below 87 ft
90				SW	**WELL GRADED SAND WITH GRAVEL (SW)** - very dk gray 7.5YR3/4, 70% sand, 15% rnd f-m gravel, 15% clay and silt, wet - dark gray/brn silty sand, becomes hard with 10-15% clay and silt fines - becomes reddish brn 5YR4/4 by 95 ft - 87% sand, 10% gravel, 3% fines	cobbles fall from core at 89, difficulty removing core barrel due to hard material
95						
		Box 20 Box 21	8.1	SW	**WELL GRADED SAND WITH SILT AND GRAVEL (SW)** - weak red 10YR4/4, 70% sand, 15% silt, 15% gravel, medium density	possible reworked Miocene Conglomerate
100					**CONGLOMERATE (BR)** - weak red 10YR4/4, conglomerate consists or 60% subang gravel up to 2.7", 25% subang sand, 15% silty fines, hard, dry.	Top Miocene Conglomerate 98 ft
						sample collected at 16:40: MW-34D-GS-102
105						

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				BR	**CONGLOMERATE (BR)** - weak red 10YR4/4, conglomerate consists or 60% subang gravel up to 2.7", 25% subang sand, 15% silty fines, hard, dry.	- core is shattered by vibration and is moist due to injected water, otherwise dry
					- carbonate cement evident, weak to moderate induration	
110		Box 22	9			no bag sample taken
115						
					Boring Terminated at 116 ft	

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
comptd = compacted
qtz = quartz