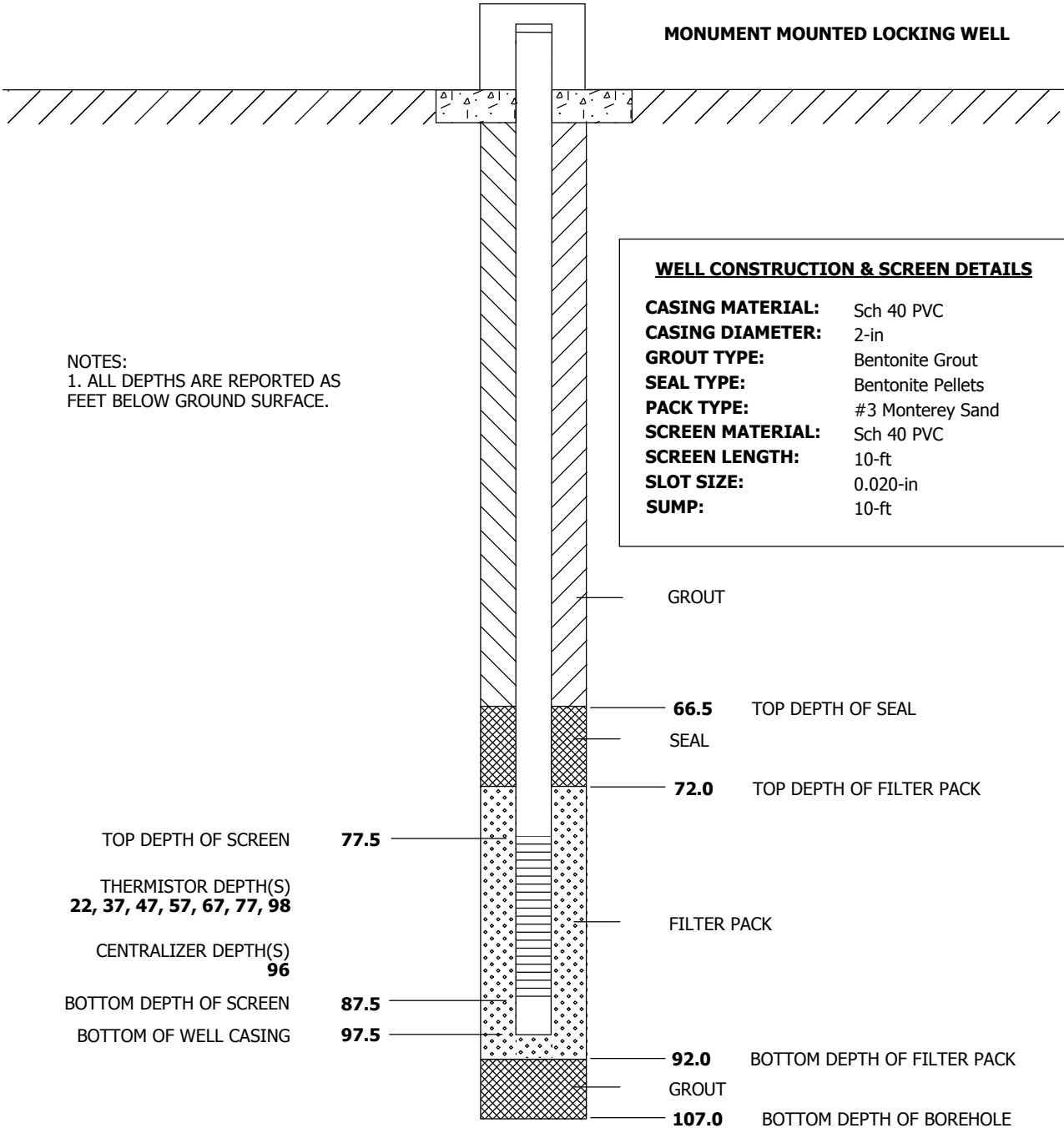


# WELL COMPLETION DIAGRAM

<b>PROJECT NO:</b> 326228.IM	<b>PROJECT:</b> PG&E Topock, Interim Measures, Phase 2 (2005)	<b>WELL NO:</b> MW-27-085
<b>LOCATION:</b> Approx 600' southeast of TW-2D, near MW-27, Colorado River floodplain.		
<b>DRILLING CONTRACTOR:</b> Prosonic Corp. Phoenix, AZ		<b>DRILLING START DATE:</b> 02/09/2005
<b>DRILLING METHOD:</b> Rotosonic		<b>DRILLING END DATE:</b> 02/10/2005
<b>LOGGER:</b> B. Moayyad, B. Trebble		<b>WELL COMPLETION DATE:</b> 02/11/2005
<b>TOP OF WELL CASING (NGVD 29):</b> 460.99		<b>NORTHING COORDINATE (CCS DAND 27, ZONE 5):</b> 2102290.53
<b>GROUND SURFACE ELEVATION (NGVD 29):</b> 458.44		<b>EASTING COORDINATE (CCS NAD 27 ZONE 5):</b> 7616540.35

**MONUMENT MOUNTED LOCKING WELL**



**WELL CONSTRUCTION & SCREEN DETAILS**

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

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

WELL DIAGRAM IS NOT TO SCALE



ALISTO ENGINEERING GROUP  
WALNUT CREEK, CALIFORNIA

# LOG OF WELL MW-27

Page 1 of 1

SEE SITE PLAN

ALISTO PROJECT NO: 10-320-09      DATE DRILLED: 04/13/99  
 CLIENT: Pacific Gas and Electric Co.  
 LOCATION: Topock Compressor Station  
 DRILLING METHOD: Hollow-stem auger; split spoon  
 DRILLING COMPANY: Gregg Drilling      CASING ELEVATION:  
 LOGGED BY: Dan Hidalgo      APPROVED BY: Dan Hidalgo

WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
<p>2' 0.020" Slotted PVC Screen</p> <p>2' Sch. 40 PVC Casing</p> <p>#3 Lonestar Sand</p> <p>Enviroplug Bentonite Chips</p>	<p>5</p> <p>10</p> <p>15</p> <p>20</p> <p>25</p> <p>30</p>	<p>■</p> <p>■</p>		<p>SP</p>	<p>SAND: moderate yellowish-brown; very fine- to fine-grained; moist.</p> <p>At approximately 4 feet, wet.</p> <p>At 12 feet color change to dark brownish-gray.</p> <p>Total depth of borehole is 17 feet.</p>

**SOIL BORING LOG**

<b>PROJECT NAME:</b> PG&E Topock, Interim Measures, Phase 2 (2005)		<b>HOLE DEPTH (ft):</b> 107.0	<b>DRILLING CONTRACTOR:</b> Prosonic Corp. Phoenix, AZ	
<b>SURFACE ELEVATION:</b> 458.4 ft. MSL	<b>NORTHING (CCS NAD 27 Z 5):</b> 2,102,290.53	<b>EASTING (CCS NAD 27 Z 5):</b> 7,616,540.35	<b>DATE STARTED:</b> 02/09/2005	<b>DATE COMPLETED:</b> 02/10/2005
<b>DRILLING METHOD:</b> Rotosonic		<b>WATER LEVEL (ft):</b>	<b>DRILLING EQUIPMENT:</b> Track Mounted Sonic	
<b>LOCATION:</b> Approx 600' southeast of TW-2D, near MW-27, Colorado River floodplain.			<b>LOGGED BY:</b> B. Moayyad, B. Trebble	

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		Box 1	5.6	SP	<b>POORLY GRADED SAND (SP)</b> - lt yellowish brn 10YR6/4, 98% f sand, 2% fines, subrnd fine qtz-rich sand, loose, dry.	collect bag samples for archive description and potential grain-size testing.
10		Box 2 Box 3	10	SP	<b>POORLY GRADED SAND WITH SILT (SP)</b> - very dk gray 7.5YR3/1, 95% sand, 5% fines (silt), wet, organic zone 10-15ft, some roots noted.	soil becomes compacted and pushed aside. 7ft run becomes 4ft
15				SP	<b>POORLY GRADED SAND (SP)</b> - becomes brn 7.5YR5/3 at 15ft and below, 98% sand, 2% fines.	collect bag sample MW27D-GS-10@12:45 saturated at ~11ft
20				SP	<b>POORLY GRADED SAND WITH SILT (SP)</b> - very dk gray 7.5YR3/1, 95% sand, 5% fines, no rocks observed, dk organic zone 17-19.5 ft.	
25		Box 4 Box 5	9.5	SP	<b>POORLY GRADED SAND (SP)</b> - brn 7.5YR4/3, 98% sand, 2% fines, no gravel, few lithics, subrnd qtz-rich sand, loose, wet	20ft samples at 13:00
30				SP	- brn 7.5YR5/3, few mafic minerals, qtz-rich fine sand	water sample at 14:10
35		Box 6 Box 7	9		- grades to m sand by 33 ft, 98% sand, 2% fines	sands fine upwards from 30 to 38ft, 30ft samples collected at 14:25 water sample collected at 32-37ft MW27D-24.5

**SOIL BORING LOG**

<b>PROJECT NAME:</b> PG&E Topock, Interim Measures, Phase 2 (2005)		<b>HOLE DEPTH (ft):</b> 107.0		<b>DRILLING CONTRACTOR:</b> Prosonic Corp. Phoenix, AZ	
<b>SURFACE ELEVATION:</b> 458.4 ft. MSL	<b>NORTHING (CCS NAD 27 Z 5):</b> 2,102,290.53	<b>EASTING (CCS NAD 27 Z 5):</b> 7,616,540.35	<b>DATE STARTED:</b> 02/09/2005	<b>DATE COMPLETED:</b> 02/10/2005	
<b>DRILLING METHOD:</b> Rotasonic		<b>WATER LEVEL (ft):</b>		<b>DRILLING EQUIPMENT:</b> Track Mounted Sonic	
<b>LOCATION:</b> Approx 600' southeast of TW-2D, near MW-27, Colorado River floodplain.				<b>LOGGED BY:</b> B. Moayyad, B. Trebble	

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)			
40		Box 8 Box 9	9	SP	<p><b>POORLY GRADED SAND (SP)</b> - brn 7.5YR4/3, 98% sand, 2% fines, no gravel, few lithics, subrnd qtz-rich sand, loose, wet</p> <p>- grades to c sand by 35ft, 98% sand, 2% fines, ~85% qtz, 5% feldspars, ~10% mafics, no gravel</p> <p>- 1st isolated rounded fluvial pebble</p> <p>- 95% sand, 3% subrnd to rnd gravel up to 1", 2% fines, gravel composed of chert metamorphics and one weathered limestone</p>	<p>bag sample MW27D-GS-35 collected at 14:20</p> <p>40ft samples collected at 14:40</p> <p>collect groundwater sample from 42-47ft MW27D-44.5</p>
45					<p>- 89% sand, 10% gravel, 1% fines</p>	
50		Box 10 Box 11	8.5		<p>- 94% sand, 5% gravel, 2% fines, subrnd medium qtz-rich sand as above, no gravel</p>	<p>bag sample MW27D-GS-50 collected at 15:50</p>
55				SW	<p><b>WELL GRADED SAND WITH GRAVEL (SW)</b> - brn, 58% rnd f to c qtz-rich sand, 40% gravel, 2% fines, gravel is igneous and metamorphic, rnd up to 2.5", medium density, wet</p>	<p>bag sample collected MW27D-GS-56 at 16:00</p>
60		Box 12 Box 13	8.5		<p><b>POORLY GRADED SAND (SP)</b> - brn 7.5YR5/3, 93% qtz-rich sand, 5% gravel, 2% fines, subrnd, fine, loose, wet</p> <p>- poorly graded fine sand as above, 91% f sand, 7% rnd quartzite gravel, 2% gravel</p>	<p>60ft samples collected at 16:10</p> <p>collect groundwater sample at 62-67ft MW27D-64.5</p> <p>soft drilling</p>
65				SP	<p>- becomes gravelly at 67ft with gravels up to 1.7 inch long</p> <p>- 88% sand, 10% gravel, 2% fines</p>	
70						

**SOIL BORING LOG**

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<b>SURFACE ELEVATION:</b> 458.4 ft. MSL	<b>NORTHING (CCS NAD 27 Z 5):</b> 2,102,290.53	<b>EASTING (CCS NAD 27 Z 5):</b> 7,616,540.35	<b>DATE STARTED:</b> 02/09/2005	<b>DATE COMPLETED:</b> 02/10/2005
<b>DRILLING METHOD:</b> Rotosonic		<b>WATER LEVEL (ft):</b>	<b>DRILLING EQUIPMENT:</b> Track Mounted Sonic	
<b>LOCATION:</b> Approx 600' southeast of TW-2D, near MW-27, Colorado River floodplain.			<b>LOGGED BY:</b> B. Moayyad, B. Trebble	

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		Box 14 Box 15	10	SP	<b>POORLY GRADED SAND (SP)</b> - brn 7.5YR5/3, 88% qtz-rich sand, 10% gravel, 2% fines, subrnd, fine, loose, wet  - 93% subrnd qtz-rich sand, 5% rnd to subrnd gravel up to 2 inch long, 1% fines	
80				SW	<b>WELL GRADED SAND WITH GRAVEL (SW)</b> - brn 7.5YR5/2, 57% subrnd sand, 40% rnd to subrnd gravel, 3% fines, 3.5" long cobbles (weathered metamorphic and igneous), medium density, wet  - vesicular basalt cobble	harder, slower drilling below 75ft  bag sample taken in gravel zone at 77ft MW27D-GS-77
85		Box 16 Box 17	9.5	SC	<b>CLAYEY SAND (SC)</b> - gray 7.5YR5/1, 80% sand, 20% silt and clay, silty plastic, soft, wet	
				GW	<b>WELL GRADED GRAVEL WITH SAND AND COBBLES (GW)</b> - brn 7.5YR5/2, 80% gravel, 18% sand, 2% fines, subrnd metamorphic gravel and cobbles, medium dense, wet - 1st granitic boulder - 75% gravel, 23% sand, 2% fines, igneous rnd gravel	
				SM	<b>SILTY SAND WITH GRAVEL (SM)</b> - reddish brn 2.5YR4/4, 60% sand, 30% silty fines, 10% f gravel, subrnd, medium to hard, moist to wet	reworked Tmc with fluvial sand and gravel
90					<b>CONGLOMERATE (BR)</b> - reddish brn 2.5YR4/4, 60% sand, 30% silty fines, 10% f gravel, subrnd, medium to hard density, moist  - core is shattered and dry, reddish brn indurated conglomerated with subang cobbles and gravels, fines are primarily composed of red silt. When crushed : 42% sand, 40% cobbles and gravels, 18% silty fines, color: pale reddish brn 10YR5/4 (on rock color)	Top Miocene Conglomerate at 87 ft
95		Box 18 Box 19	8.5			moisture introduced below 92ft during drilling
100				BR		
					- some intact core at 99, 100 and 103 ft	
105		Box 20 Box 21	8.5			

**SOIL BORING LOG**

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<b>DRILLING METHOD:</b> Rotosonic		<b>WATER LEVEL (ft):</b>	<b>DRILLING EQUIPMENT:</b> Track Mounted Sonic	
<b>LOCATION:</b> Approx 600' southeast of TW-2D, near MW-27, Colorado River floodplain.			<b>LOGGED BY:</b> B. Moayyad, B. Trebble	

DEPTH BGS (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	TYPE/ NUMBER	RECOVERY (ft)			
					<p><b>CONGLOMERATE (BR)</b> - reddish brn 2.5YR4/4, 60% sand, 30% silty fines, 10% f gravel, subrnd, medium to hard density, moist</p> <hr/> <p>- same conglomerate to 107 ft, Boring Terminated at 107 ft</p> <p><b>ABBREVIATIONS</b>                      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</p>	<p><b>DRILLING OBSERVATIONS AND OPERATIONS, DAILY START AND END TIMES, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.</b></p>