

As-built Construction TW-3D Extraction Well

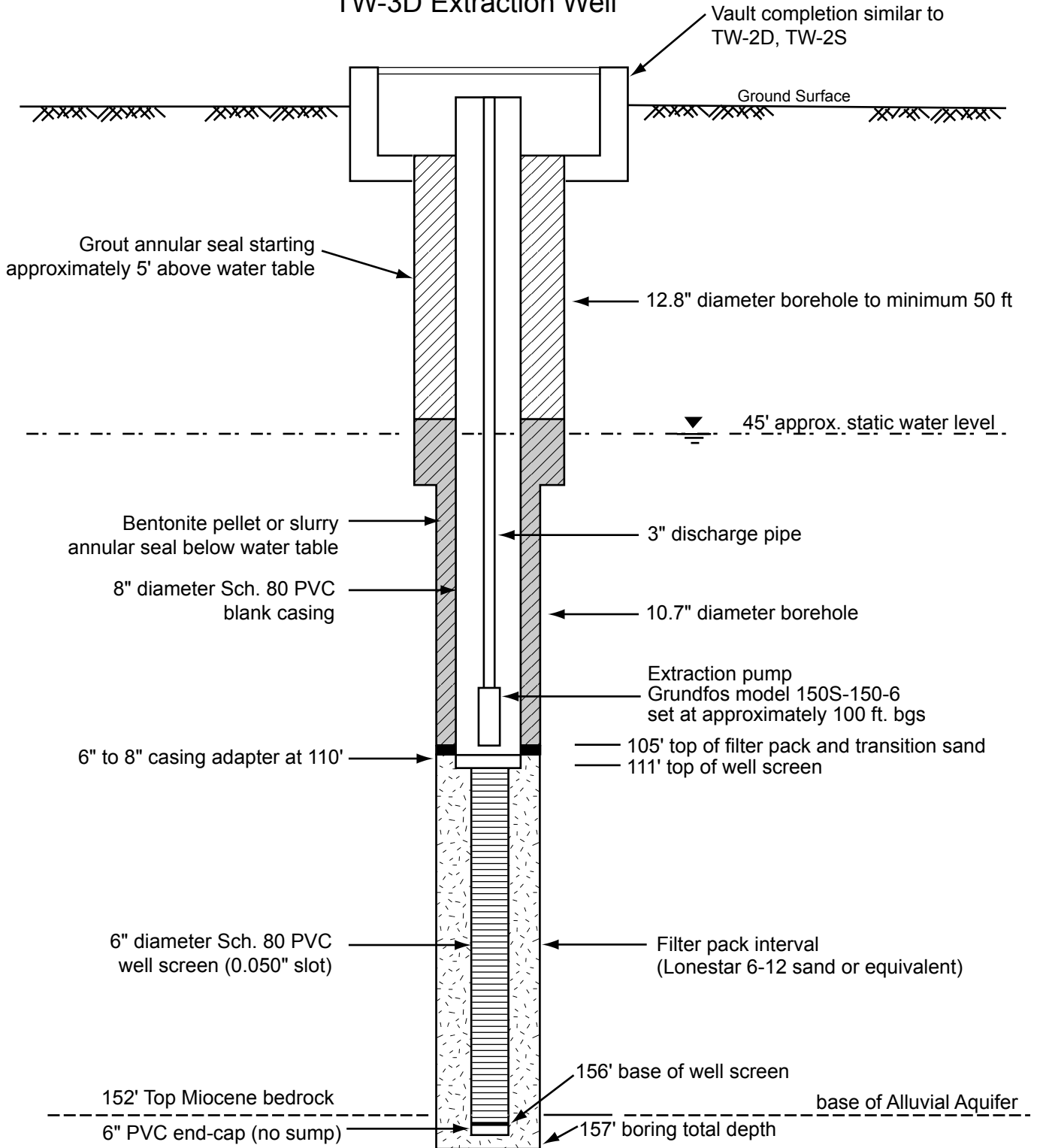


DIAGRAM NOT TO SCALE

Well screen selection reviewed with DTSC 10/21/05

Well TW-3D installed 10/26-27/05

FIGURE 3
WELL CONSTRUCTION DIAGRAM
TW-3D EXTRACTION WELL
 IM NO. 3 GROUNDWATER EXTRACTION SYSTEM
 PG&E TOPOCK COMPRESSOR STATION

SOIL BORING LOG

PROJECT NAME: PG&E Topock Interim Measures Extraction Well		HOLE DEPTH (ft): 157.0	DRILLING CONTRACTOR: Prosonic Corp., Phoenix, AZ	
SURFACE ELEVATION: 497.0 ft. MSL	NORTHING (CCS NAD 83): Approx. 2,102,627.34	EASTING (CCS NAD 83): Approx. 7,615,874.57	DATE STARTED: 10/20/2005 09:00	DATE COMPLETED: 10/24/2005 14:15
DRILLING METHOD: Rotosonic		DRILLING EQUIPMENT: Standard Rotosonic Rig		
LOCATION: MW-20 bench, approx. 13 ft. west and 6 ft. south of TW-2D		LOGGED BY: J. Piper		

DEPTH BGS (feet)	SAMPLE				USCS CODE	SOIL DESCRIPTION
	INTERVAL	RECOVERY (ft)	PID (PPM)	SOIL SAMPLE		SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY
5					SW	- start coring at 9:00 AM 10/20/05 Note: TW-3D pilot boring (7" diameter) continuously cored using sonic core barrel system. No analytical sampling conducted during drilling. GRAVELLY SAND WITH SILT (SW) - dk yellowish brn (10YR4/2 to 5/4), 65% poorly sorted f-m sand, 30% rnd quartz, limestone, and vesicular basaltic gravel up to 15 cm (minor portion reworked? subang mm clasts), 5% silt, moist. - dry
10					SP	POORLY GRADED SAND (SP) - dk yellowish orange (10YR7/4 to 6/6), 95% well sorted f sand, 5% gravel up to 1 cm, loose, moist
15					SW	GRAVELLY SAND (SW) - dk yellowish brn (10YR4/2), 55% sand, 40% rnd qtz, limestone, and jasper gravel up to 4-5 cm, 5% fines - 60% sand, no fines (coarsening downwards), rounded chert and limestone clasts up to 12 cm
20					GW	WELL GRADED SANDY GRAVEL (GW) - 10YR4/2, 60% rnd (fluvial) gravel up to 15 cm (diverse rock types), 40% sand
25					GW	WELL GRADED SANDY GRAVEL (GW) - 10YR4/2, 60% rnd (fluvial) gravel up to 15 cm (diverse rock types), 40% sand
30					SW/GW	GRAVELLY SILTY SAND (SW/GW) - med brn (5YR4/4), 50% sand, 40% subang mm gravel with weathered rinds, 10% fines, weakly cemented
35					SW/GW	GRAVELLY SILTY SAND (SW/GW) - med brn (5YR4/4), 50% sand, 40% subang mm gravel with weathered rinds, 10% fines, weakly cemented

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40					SW/GW	GRAVELLY SILTY SAND (SW/GW) - med brn (5YR4/4), 50% sand, 40% subang mm gravel with weathered rinds, 10% fines, weakly cemented
					SW/SM	GRAVELLY SILTY SAND (SW/SM) - med brn (5YR4/4), 45% sand, 40% gravel up to 5 cm, 15% fines, slightly cohesive - weakly cemented, dry to moist
					SM/GM	SILTY GRAVEL WITH SAND (SM/GM) - 45% gravel up to 9 cm, 40% sand, 20% fines
45						- saturated conditions encountered at 47 ft. GRAVELLY SILTY SAND (SM) - med brn (5YR4/4), 55% sand, 30% fines, 15% gravel up to 3 cm, slightly plastic
50					SM	- 55% sand, 25% gravel up to 5 cm, 20% fines, coarsening downwards
55						
60					SW	GRAVELLY SAND (SW) - 5YR4/4-3/4, 55% poorly sorted sand, 40% subang weathered mm gravel up to 15 cm, 5% fines - increasing sand and less fines, gravel up to 4 cm
65					SM	GRAVELLY SILTY SAND (SM) - 45% sand, 30% gravel up to 7 cm, 25% clayey fines
					SW	SAND WITH GRAVEL AND SILT (SW) - 60% poorly sorted f-c sand, 25% mm gravel, 15% fines
					GW	SANDY GRAVEL (GW) - 5YR5/2 - 10YR6/2, 70% fluvial (and some reworked? mm) gravel up to 8 cm, 27% sand, 3% fines
70						

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75					GW	<p>SANDY GRAVEL (GW) - 5YR5/2 - 10YR6/2, 70% fluvial (and some reworked? mm) gravel up to 8 cm, 27% sand, 3% fines</p> <p>- 65% ang to subang mm gravel up to 3 cm, 35% sand</p> <p>- 5YR4/4, 65% gravel up to 3 cm, 25% sand, 10% fines</p>
80					SW	<p>- end of drilling on 10/20/05</p> <p>SAND (SW) - 60% sand, 30% gravel up to 9 cm, 10% fines, gradational contact (grades finer)</p> <p>- start of drilling at 8:45 10/21/05</p>
85					SM	<p>GRAVELLY SAND WITH SILT AND CLAY (SM) - 55% sand, 25% gravel up to 5 cm, 20% fines</p>
90					SW	<p>SAND (SW) - 55% m-c sand, 25% gravel up to 13 cm, 20% fines (clay increasing with depth), becoming slightly plastic</p> <p>- 50% sand, 35% gravel, 15% fines</p>
95					GW	<p>SANDY GRAVEL (GW) - 65% gravel up to 3 cm, 35% sand, 5% fines</p>
					GM/SM	<p>SILTY SAND AND GRAVEL (GM/SM) - 5YR4/4, 40% sand, 40% mm gravel up to 13 cm, 20% fines</p>
					SW	<p>GRAVELLY SAND (SW) - 52% well sorted m-c sand, 45% f gravel up to 2 cm, 3% fines</p> <p>- 62% gravel up to 15 cm, 35% sand, 3% fines</p>
100					GW	<p>GRAVEL WITH SAND (GW) - 50% sand, 45% gravel up to 4 cm (90% of gravel is subang mm clasts, 10% is reworked? subrnd mm clasts), 5% fines</p>
105						

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110					GW	GRAVEL WITH SAND (GW) - 50% sand, 45% gravel up to 4 cm (90% of gravel is subang mm clasts, 10% is reworked? subrnd mm clasts), 5% fines - 57% gravel up to 4 cm, 40% sand, 3% fines - 50% sand, 40% gravel, 10% fines
115					SW/SM	GRAVELLY SILTY SAND (SW/SM) - 5YR3/4, 55% sand, 25% gravel up to 3 cm, 20% fines
120					SM	SILTY SAND (SM) - 65% sand, 25% fines (clayey), 10% gravel, slightly plastic - clayey - clayey
125					SW	GRAVELLY SAND (SW) - 60% gravel up to 4 cm, 25% well sorted m-c sand, 15% fines
130					GW	GRAVEL WITH SAND AND SILT (GW) - 50% sand, 40% gravel up to 15 cm, 10% fines
135					SM	SILTY SAND (SM) - 55% sand, 25% gravel (mm cobble), 20% fines
					SW	SAND WITH GRAVEL AND SILT (SW) - 5YR4/4, 60% sand, 25% gravel up to 4 cm, 15% silty fines - maximum clast size decreasing
140					SM	GRAVELLY SILTY SAND (SM) - 50% sand, 40% gravel up to 3 cm, 10% fines
					SW	GRAVELLY SAND (SW) - 45% sand, 40% gravel up to 3 cm, 15% fines

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					GW	SANDY GRAVEL (GW) - 50% gravel up to 12 cm, 45% sand, 5% fines, grading finer downwards
145					SM	GRAVEL WITH SAND AND SILT (SM) - 60% gravel up to 15 cm, 35% sand, 5% fines - becoming stiff - transition to weathered bedrock - stronger white CO3 cemented zones, mm clasts very weathered - 45% sand, 45% gravel up to 12 cm, 10% fines, weathered bedrock with (mm clasts), stiff, competent, moist - drilling becomes harder below 150 ft.
150					BR	BEDROCK (BR) - consolidated Miocene conglomerate, 45% gravel up to 15 cm, 40% sand, 15% fines, competent, dry, dark reddish brown - shattered, moist - shattered, dry bedrock
155						- End of boring 16:30 10/21/05 - Enlarged borehole to 10.7" for installing extraction well TW-3D. See TW-3D installation report.
						<i>Total Depth = 157 ft bgs</i>
						ABBREVIATIONS <i>brn = brown</i> <i>lt = light</i> <i>dk = dark</i> <i>vf = very fine-grained</i> <i>f = fine-grained</i> <i>m = medium-grained</i> <i>c = coarse-grained</i> <i>ang = angular</i> <i>subang = subangular</i> <i>subrnd = subrounded</i> <i>rnd = rounded</i> <i>mm = metamorphic</i>