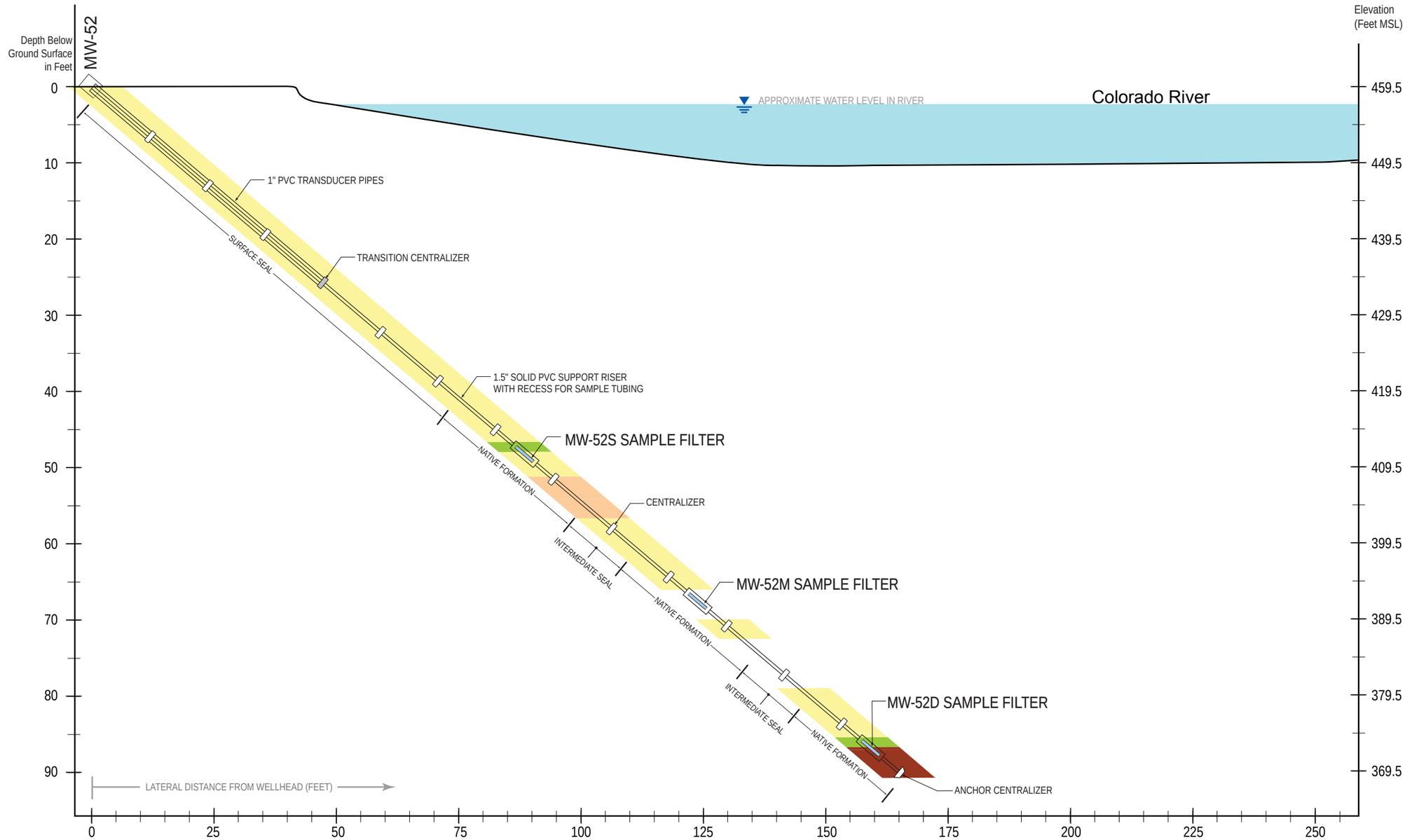
% Gravel	% Sand	% Sand	% Sand	% Fine	USCS
--	Cse	Med	Fne	--	
5			95	20	SP
			100		
			100		
		100			
		50	50		SP
			100		SP
		2	98		
15			85		
5			95		
5			93	2	
5		5	88	2	
63		18	17	2	GW
5		10	85		SP
40	20	20	20		SW
2			96	2	SP
			98	2	
					NR
2		49	49		SP
					NR
20	80	2	96	2	SP
65	10	10	10	5	GW
					BR

Contacts are generalized. Refer to boring log for precise depths and descriptions.



LEGEND

- SM
- SP
- SW
- SP/GW
- SP/SW
- GW
- GM
- BR
- NR - No Recovery

Well Construction Information

Drilling Contractor: Prosonic/Boart-Longyear (Driller-Denzil Roberts)
Drilling Method: Rotosonic
Drilling Start: February 23, 2007
Drilling End: February 27, 2007
Well Installation Complete: March 10, 2007
Logged By: Rob Tweidt, P.G.

Borehole Diameter: 6 inches
Borehole Angle: 40 Degrees from Horizontal
Borehole Azimuth: 087 Degrees
Drilled Borehole Depth: 158 feet
Annular Materials:
- **Native Formation** – Native sands and gravels as logged.
- **Intermediate Seal** – Native sands and gravels with bentonite slurry grout (approx. 5 gallons) placed every 10 feet.
- **Surface Seal** – Bentonite slurry grout.

Completion Type: 10" steel monument casing placed at an angle within 3'x3'x4" concrete pad.

Notes:
1. Drawing scale is approximate.
2. Lithology is conceptual. Color bands should not be interpreted as laterally extensive stratigraphic units.
3. River bed depth estimated from "Transect B" of July 2005 Riverbed Survey.

MULTI-LEVEL MONITORING WELL CONSTRUCTION DIAGRAM MW-52 LOCATION

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

ES042007002BAO slant_wells_MW-52_v2.ai 06-27-07 llui

SHEET 1 of 5

PROJECT NUMBER: 354948.FP.05

BORING NUMBER: *MW-52*

SOIL BORING LOG

PROJECT NAME: PG&E Topock		**HOLE DEPTH (ft):** 158.0	**DRILLING CONTRACTOR:** Prosonic/Boart Longyear - Phoenix, AZ	
SURFACE ELEVATION: 461.9 ft. MSL	**NORTHING (CCS NAD 27 Z 5):** 2,101,738.98	**EASTING (CCS NAD 27 Z 5):** 7,616,776.33	**DATE STARTED:** 2/23/2007	**DATE COMPLETED:** 2/27/2007
DRILLING METHOD: Rotosonic-continuous 4-inch core		**DRILLING EQUIPMENT:** Track Mounted Rig - up to 7-inch drive casing		SB County Permit No. 2007020134
LOCATION: South of I-40 on the west bank of the river		**LOGGED BY:** R. Tweidt/C Kreller	**DRILLER NAME:** Denzel Roberts	

DRILL DEPTH (feet)	SAMPLE: INTERVAL	SAMPLE: RECOVERY (ft)	SAMPLE: Isoflow Sample	SAMPLE: SOIL SAMPLE	USCS CODE	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, GRAIN SIZE DISTRIBUTION, MINERALOGY, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE	COMMENTS: DRILLING OBSERVATIONS AND OPERATIONS, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
						ORGANIC SURFACE MATERIAL	
						POORLY GRADED SAND (SP) - yellowish brn (10YR 5/6), 95% fn sand, 5% subrnd gravel (up to 3/4 inch), moist, loose, trace organic	Boring drilled at azimuth 087 and dip of 40 degrees from horizontal (beneath the Colorado River). Grab groundwater samples (GGW) and discrete soil samples (CS) were collected at the depths indicated. All depths expressed as length drilled (ft) and must be corrected for angle to derive elevation.
						100% fn sand	
5						SP AS ABOVE: dk olive brn (2.5YR 3/3)	
						SP AS ABOVE: yellowish brn (10YR 5/6)	
						SP AS ABOVE: dk olive brn (2.5YR 3/3), saturated	
10							Collect MW52-CS-9-10'
						SP AS ABOVE: 100% fn sand, saturated	No recovery from 10' to 12'
			MW-52-GGW-23			SP AS ABOVE: yellowish brn (10YR 5/6) and dk olive brn (2.5Y 3/3) mottled appearance, 100% fn sand, saturated	
15							
					SP	SP AS ABOVE: dk olive brn (2.5Y 3/3), mottling absent, 100% fn sand, organics present	
20							Collect MW52-CS-20-21'
						SP AS ABOVE: dk gray (2.5YR 4/3), 100% med sand, loose, moist	
25						SP AS ABOVE: dk grayish brn (10YR 5/4), 100% fn-med sand, trace organics	Driller indicates slough in hole after 15-foot core run
						SP AS ABOVE: yellowish brn (10YR 5/4)	
30						SP AS ABOVE: 100% fn-med sand	
						SP AS ABOVE: dk grayish brn (10YR 4/2)	
35							

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PROJECT NUMBER: 354948.FP.05

BORING NUMBER: *MW-52*

SOIL BORING LOG

PROJECT NAME: PG&E Topock		**HOLE DEPTH (ft):** 158.0	**DRILLING CONTRACTOR:** Prosonic/Boart Longyear - Phoenix, AZ	
SURFACE ELEVATION: 461.9 ft. MSL	**NORTHING (CCS NAD 27 Z 5):** 2,101,738.98	**EASTING (CCS NAD 27 Z 5):** 7,616,776.33	**DATE STARTED:** 2/23/2007	**DATE COMPLETED:** 2/27/2007
DRILLING METHOD: Rotosonic-continuous 4-inch core		**DRILLING EQUIPMENT:** Track Mounted Rig - up to 7-inch drive casing		SB County Permit No. 2007020134
LOCATION: South of I-40 on the west bank of the river		**LOGGED BY:** R. Tweidt/C Kreller	**DRILLER NAME:** Denzel Roberts	

DRILL DEPTH (feet)	SAMPLE: INTERVAL	SAMPLE: RECOVERY (ft)	SAMPLE: Isoflow Sample	SAMPLE: SOIL SAMPLE	USCS CODE	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, GRAIN SIZE DISTRIBUTION, MINERALOGY, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE	COMMENTS: DRILLING OBSERVATIONS AND OPERATIONS, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
			MW-52-GGW-43			**POORLY GRADED SAND (SP)** - yellowish brn (10YR 5/6), 95% fn sand, 5% subrnd gravel (up to 3/4 inch), moist, loose, trace organic	
						SP AS ABOVE: 100% fn sand	
40						SP AS ABOVE: dk grayish brn (10YR 4/2), 100% fn sand, moist, loose, trace organics	
							No recovery from 43' to 45'
45							Collect MW52-CS-45-46'
						SP AS ABOVE: 100% fn sand, trace med sand component	
50						SP AS ABOVE: 100% fn sand, trace med sand component	Collect MW52-CS-51-52'
					SP		
55						SP AS ABOVE: brn (10YR 5/3), organic material present (plant material)	
			MW-52-GGW-63			**POORLY GRADED SAND WITH GRAVEL (SP)** - brn (10YR 5/3), 85% fn sand, 15% subrnd to rnd gravel (up to 3.5 inches), brn (10YR 5/3)	
60						SP AS ABOVE: 5% gravel, large pieces of organic (plant) material	Collect carbon samples
							Collect MW52-CS-60-61'
						SP AS ABOVE: trace fines	
							No recovery from 63' to 67'
65						**POORLY GRADED SAND (SP)** - dk yellowish brn (10YR 4/4), trace fines, 95% fn sand, 5% subrounded to round gravel (up to 1 inch), saturated, loose, trace organics	
						SP AS ABOVE: trace med sand component	
70							

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PROJECT NUMBER: 354948.FP.05

BORING NUMBER: *MW-52*

SOIL BORING LOG

PROJECT NAME: PG&E Topock		**HOLE DEPTH (ft):** 158.0	**DRILLING CONTRACTOR:** Prosonic/Boart Longyear - Phoenix, AZ	
SURFACE ELEVATION: 461.9 ft. MSL	**NORTHING (CCS NAD 27 Z 5):** 2,101,738.98	**EASTING (CCS NAD 27 Z 5):** 7,616,776.33	**DATE STARTED:** 2/23/2007	**DATE COMPLETED:** 2/27/2007
DRILLING METHOD: Rotosonic-continuous 4-inch core		**DRILLING EQUIPMENT:** Track Mounted Rig - up to 7-inch drive casing		SB County Permit No. 2007020134
LOCATION: South of I-40 on the west bank of the river		**LOGGED BY:** R. Tweidt/C Kreller	**DRILLER NAME:** Denzel Roberts	

DRILL DEPTH (feet)	SAMPLE: INTERVAL	SAMPLE: RECOVERY (ft)	SAMPLE: Isoflow Sample	SAMPLE: SOIL SAMPLE	USCS CODE	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, GRAIN SIZE DISTRIBUTION, MINERALOGY, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE	COMMENTS: DRILLING OBSERVATIONS AND OPERATIONS, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
					SP	**POORLY GRADED SAND (SP)** - yellowish brn (10YR 5/6), 95% fn sand, 5% subrnd gravel (up to 3/4 inch), moist, loose, trace organic	Collect MW52-CS-71-72'
75					GW	**WELL GRADED GRAVEL WITH SAND (GW)** - brn (10YR 5/5), 65% subrnd to rnd gravel (up to 2.5 inches), 35% fn to med sand, trace fines, saturated, loose	
			MW-52-GGW-83		SP	**POORLY GRADED SAND (SP)** - brn (10YR 5/3), 85% fn sand, 10% med subrnd sand, 5% subrnd to rnd gravel (up to 1/2 inch), wet, loose	Collect MW52-CS-77-78'
80							
					SW	**WELL GRADED SAND WITH GRAVEL (SW)** - 60% fn-cse sand, 40% subrnd to rnd gravel (up to 3 inches)	Collect MW52-CS-84-85'
85							
90					SP	**POORLY GRADED SAND (SP)** - dk grayish brn (2.5YR 4/2), 100% fn sand, trace subrnd to rnd gravel, trace fines, wet, loose	
						SP AS ABOVE: 100% fn sand, trace fines, gravel component absent	
95							Driller indicates borehole collapses with casing withdrawal
			MW-52-GGW-103				
100						SP AS ABOVE: 100% fn sand	Collect MW52-CS-101-102'
105							No recovery from 103' to 107'

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PROJECT NUMBER: 354948.FP.05

BORING NUMBER: *MW-52*

SOIL BORING LOG

PROJECT NAME: PG&E Topock		**HOLE DEPTH (ft):** 158.0	**DRILLING CONTRACTOR:** Prosonic/Boart Longyear - Phoenix, AZ	
SURFACE ELEVATION: 461.9 ft. MSL	**NORTHING (CCS NAD 27 Z 5):** 2,101,738.98	**EASTING (CCS NAD 27 Z 5):** 7,616,776.33	**DATE STARTED:** 2/23/2007	**DATE COMPLETED:** 2/27/2007
DRILLING METHOD: Rotosonic-continuous 4-inch core		**DRILLING EQUIPMENT:** Track Mounted Rig - up to 7-inch drive casing		SB County Permit No. 2007020134
LOCATION: South of I-40 on the west bank of the river		**LOGGED BY:** R. Tweidt/C Kreller	**DRILLER NAME:** Denzel Roberts	

DRILL DEPTH (feet)	SAMPLE: INTERVAL	SAMPLE: RECOVERY (ft)	SAMPLE:	SAMPLE: Isoflow Sample	SAMPLE: SOIL SAMPLE	USCS CODE	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, GRAIN SIZE DISTRIBUTION, MINERALOGY, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE	COMMENTS: DRILLING OBSERVATIONS AND OPERATIONS, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
110						SP	**POORLY GRADED SAND (SP)** - dk grayish brn (2.5YR 4/2), 100% fn sand, trace subrnd to rnd gravel, trace fines, wet, loose	Slough material from 107' to 109'
115						SP	**POORLY GRADED SAND (SP)** - dk brn (2.5YR 4/1), 100% fn-med sand (25% med sand), trace subrnd to rnd gravel (up to 2.5 inches), moist, loose	No recovery from 113' to 119'
120				MW-52-GGW-123			SP AS ABOVE: lt olive brn (2.5Y 4/1), decrease in med grained component, increased fn grained component	Poor core recovery from 119' to 123' Material heaving into hole with bit removal Collect MW52-CS-122-123'
125							SP AS ABOVE: 100% fn sand, trace med sand, trace fines, gravel absent	
130						SP	**POORLY GRADED SAND WITH GRAVEL(SP)** - yellowish brn (10YR 5/4), 80% cse sand, 20% subrnd to rnd gravel (up to 2 inches), moist, loose	Increase rig chatter and difficult drilling at 127'
135						GW	**WELL GRADED GRAVEL WITH SAND (GW)** - 65% subrnd to well rnd gravel (up to 6 inches), 30% fn-cse subrnd sand, 5% fn sand	Drill bit has cobbles in it Very slow drilling
140				MW-52-GGW-143		BR	**MIOCENE CONGLOMERATE (BR)** - dk red (2.5YR 3/6), 65% sand, 25% fns, 10% gravel, dry, moderate to strongly cemented	

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SHEET 5 of 5	PROJECT NUMBER: 354948.FP.05	BORING NUMBER: *MW-52*

SOIL BORING LOG

PROJECT NAME:		HOLE DEPTH (ft):	DRILLING CONTRACTOR:	
PG&E Topock		158.0	Prosonic/Boart Longyear - Phoenix, AZ	
SURFACE ELEVATION:	**NORTHING (CCS NAD 27 Z 5):**	**EASTING (CCS NAD 27 Z 5):**	**DATE STARTED:**	**DATE COMPLETED:**
461.9 ft. MSL	2,101,738.98	7,616,776.33	2/23/2007	2/27/2007
DRILLING METHOD:		**DRILLING EQUIPMENT:**		SB County Permit No. 2007020134
Rotosonic-continuous 4-inch core		Track Mounted Rig - up to 7-inch drive casing		
LOCATION:		**LOGGED BY:**	**DRILLER NAME:**	
South of I-40 on the west bank of the river		R. Tweidt/C Kreller	Denzel Roberts	

DRILL DEPTH (feet)	SAMPLE: INTERVAL	SAMPLE: RECOVERY (ft)	SAMPLE:	SAMPLE: Isoflow Sample	SAMPLE: SOIL SAMPLE	USCS CODE	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, GRAIN SIZE DISTRIBUTION, MINERALOGY, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE	COMMENTS: DRILLING OBSERVATIONS AND OPERATIONS, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
145						BR	**MIOCENE CONGLOMERATE (BR)** - dk red (2.5YR 3/6), 65% sand, 25% fns, 10% gravel, dry, moderate to strongly cemented	
150								
155								
							Total Drilled Depth = 158 ft bgs as defined at the top of the borehole.	

ABBREVIATIONS

brn = brown
lt = light
dk = dark
vf = very fine-grained
fn = fine-grained
med = medium-grained
cse = coarse-grained
ang = angular
subang = subangular
subrnd = subrounded
rnd = rounded

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