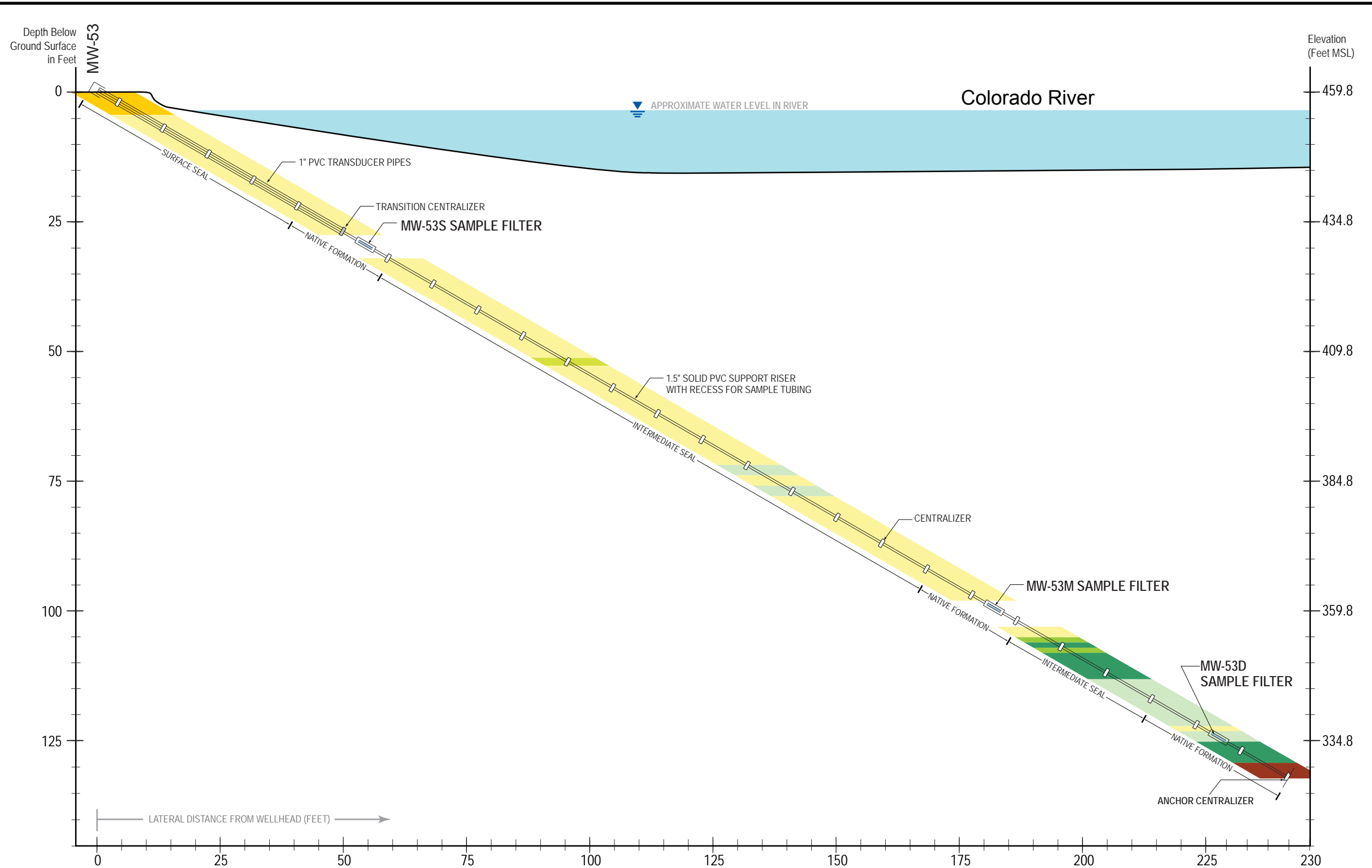


% Gravel	% Sand	% Sand	% Sand	% Fine	USCS
--	Cse	Med	Fne	--	
0	2	0	78	20	SM
5	0	0	90	5	SP
0	0	68	30	2	
0	0	2	93	5	
					NR
5	5	15	70	5	
5	1	24	67	3	
5	4	38	51	2	
20	4	49	25	2	SP/GW
0	0	1	98	2	SP
5	0	25	68	2	
0	3	40	55	2	
15	2	61	20	2	
40	2	24	34	0	SP/SW
5	0	47	48	0	SP
20	10	60	10	0	SP/SW
					SP
5	9	78	8	0	
0	0	70	30	0	
5	3	68	24	0	
5	4	68	23	0	
					NR
0	0	20	80	0	
40	6	18	36	0	GW
30	6	6	8	50	GM
40	9	9	12	30	
40	6	18	36	0	SW
30	21	28	21	0	
50	9	9	12	20	GM
					BR

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



LEGEND

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

Well Construction Information

Drilling Contractor: Prosonic/Boart-Longyear (Driller-Denzil Roberts)
 Drilling Method: Rotosonic
 Drilling Start: March 12, 2007
 Drilling End: March 25, 2007
 Well Installation Complete: March 29, 2007
 Logged By: Rob Tweidt, P.G.

Borehole Diameter: 6 inches
 Borehole Angle: 30 Degrees from Horizontal
 Borehole Azimuth: 090 Degrees
 Drilled Borehole Depth: 265 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-53 LOCATION**
 PG&E TOPOCK COMPRESSOR STATION
 NEEDLES, CALIFORNIA

SOIL BORING LOG

PROJECT NAME: PG&E Topock		HOLE DEPTH (ft): 265.0	DRILLING CONTRACTOR: Prosonic/Boart Longyear - Phoenix, AZ	
SURFACE ELEVATION: 461.0 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,101,761.47	EASTING (CCS NAD 27 Z 5): 7,616,788.39	DATE STARTED: 3/12/2007	DATE COMPLETED: 3/25/2007
DRILLING METHOD: Rotosonic-continuous 4-inch core		DRILLING EQUIPMENT: Track Mounted Rig - up to 7-inch drive casing		SB County Permit No. 2007020135

LOCATION: South of I-40 on the west bank of the river	LOGGED BY: R. Tweidt	DRILLER NAME: Denzel Roberts
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DRILL DEPTH (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	Soilflow Sample			
5				SM	SILTY SAND (SM) - It yellowish brn (2.5YR 6/4), 80% fn grained (up to 1.5 cm), sand (trace cse), 20% fines, well sorted, slightly moist, no odor, plant roots, SM AS ABOVE: It olive brn (2.5YR 5/3), saturated	Boring drilled at azimuth 090 and dip of 30 degrees from horizontal. Grab groundwater samples (GGW) and depth discrete soil samples (CS) were collected at depths indicated. All depths expressed as length drilled (ft) and must be corrected for angle to derive elevation.
10		15				
15						
20		10		SP	SAND (SP) - It olive brn (2.5YR 5/4), 5% gravel [minor subrnd to rnd gravel and cobble (up to 5.5 cm)], 90% fn sand, 5% fines, well sorted, wet, no odor, cobble is locally derived diorite that is subrnd. SP AS ABOVE: gravel is absent, micaceous, tree roots SP AS ABOVE: trace gravel (up to 0.1 cm) SP AS ABOVE: dk grayish brn (2.5YR 4/2)	
25					SP AS ABOVE: trace gravel (up to 0.2 cm)	
30		7			SP AS ABOVE: very dk gray brn (10YR 3/2) SP AS ABOVE: abundant tree roots SP AS ABOVE: dk organic material present SP AS ABOVE: 98% med sand, trace fines, trace gravel (up to 0.1 cm)	No Recovery from 25 - 28' Collect wood sample MW-53-30' Collect sample MW-53-CS-31.5-32'
35						

SOIL BORING LOG

PROJECT NAME: PG&E Topock		HOLE DEPTH (ft): 265.0	DRILLING CONTRACTOR: Prosonic/Boart Longyear - Phoenix, AZ	
SURFACE ELEVATION: 461.0 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,101,761.47	EASTING (CCS NAD 27 Z 5): 7,616,788.39	DATE STARTED: 3/12/2007	DATE COMPLETED: 3/25/2007
DRILLING METHOD: Rotosonic-continuous 4-inch core		DRILLING EQUIPMENT: Track Mounted Rig - up to 7-inch drive casing		SB County Permit No. 2007020135
LOCATION: South of I-40 on the west bank of the river		LOGGED BY: R. Tweidt	DRILLER NAME: Denzel Roberts	

DRILL DEPTH (feet)	SAMPLE				USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	Isoflow Sample	SOIL SAMPLE			
40						SAND (SP) - lt olive brn (2.5YR 5/4), 5% gravel [minor subrnd to rnd gravel and cobble (up to 5.5 cm)], 90% fn sand, 5% fines, well sorted, wet, no odor, cobble is locally derived diorite that is subrnd.	
45		20				POORLY GRADED SAND (SP) - dk yellowish brn (10YR 4/4), 90% fn sand, 5% med sand, 5% fines	
50						SP AS ABOVE	
55					SP	SP AS ABOVE	Collect sample MW53-CS-52.5-53'
60		0					
65							
70		11				SP AS ABOVE: 85% fn sand, 10% med sand, 5% fines	

SOIL BORING LOG

PROJECT NAME: PG&E Topock		HOLE DEPTH (ft): 265.0	DRILLING CONTRACTOR: Prosonic/Boart Longyear - Phoenix, AZ	
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DRILLING METHOD: Rotosonic-continuous 4-inch core		DRILLING EQUIPMENT: Track Mounted Rig - up to 7-inch drive casing		SB County Permit No. 2007020135

LOCATION: South of I-40 on the west bank of the river	LOGGED BY: R. Tweidt	DRILLER NAME: Denzel Roberts
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DRILL DEPTH (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	Soilflow Sample			
75			MW53-GGW-75'		<p>SAND (SP) - lt olive brn (2.5YR 5/4), 5% gravel [minor subrnd to rnd gravel and cobble (up to 5.5 cm)], 90% fn sand, 5% fines, well sorted, wet, no odor, cobble is locally derived diorite that is subrnd.</p> <p>becoming more cse-grained</p>	
80					<p>POORLY GRADED SAND (SP) - dk gray (10YR 4/1), 5% gravel (up to 1.75 cm), well rnd, (70% fn sand, 15% med sand, 5% cse sand), 5% fines, chert and sandstone</p>	
85		20			<p>SP AS ABOVE: dk organic-rich layer with abundant, 2% gravel, 95% sand (2% cse sand, 25% med sand, 73% fn sand), 3% fines, wood pieces and plant roots, moderate organic/sulfur odor</p> <p>minor cse gravel, dioritic, angular to subangular</p>	Collect wood sample MW-83ft
90			MW53-GGW-95'	SP	<p>SP AS ABOVE: 98% sand (2% cse sand, 10% med sand, 88% fn sand), 2% fines, abundant plant roots, slightly more fn grained sand</p> <p>SP AS ABOVE: brn (10YR 5/3), 2% gravel (up to 2 cm), rnd to subrnd, 95% sand (2% cse sand, 95% med sand, 3% fn sand), 3% fines, chert</p>	
95					<p>SP AS ABOVE: 5% gravel (up to 2.5 cm), rnd to subrnd, 93% sand, (5% cse sand, 40% med sand, 55% fn sand), 2% fines</p>	
95		0			SP AS ABOVE	No Recovery from 95 - 97'
100						
105				SP	<p>POORLY GRADED SAND WITH GRAVEL (SP) - dk grayish brn (10YR 4/2), 20% gravel [fn to cse gravel (up to 6.5 cm)], 78% sand (5% cse sand, 60% med sand, 35% fn sand), 2% fines, mod to well sorted, wet, no odor, subrnd to rnd, volcanogenic origin (rhyolitic to andesitic) and limestone.</p>	



SOIL BORING LOG

PROJECT NAME: PG&E Topock		HOLE DEPTH (ft): 265.0	DRILLING CONTRACTOR: Prosonic/Boart Longyear - Phoenix, AZ	
SURFACE ELEVATION: 461.0 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,101,761.47	EASTING (CCS NAD 27 Z 5): 7,616,788.39	DATE STARTED: 3/12/2007	DATE COMPLETED: 3/25/2007
DRILLING METHOD: Rotosonic-continuous 4-inch core		DRILLING EQUIPMENT: Track Mounted Rig - up to 7-inch drive casing		SB County Permit No. 2007020135
LOCATION: South of I-40 on the west bank of the river		LOGGED BY: R. Tweidt		DRILLER NAME: Denzel Roberts

DRILL DEPTH (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	Soilflow Sample			
110		18	MW53-GGW-115'	SP	SAND (SP) - dk yellowish brn (10YR 4/4), 98% fn sand, 2% fines, well sorted, wet, no odor, SP AS ABOVE: 5% gravel (up to 4 cm), subrnd to rnd, 93% sand (20% med sand, 80% fn sand), 2% fines	No Recovery from 115 - 120'
115					SP AS ABOVE: 30% med sand, 70% fn sand	
120		0			SP AS ABOVE: 10% med sand, 90% fn sand	
125				SP	SP AS ABOVE: 5% gravel(up to 4 cm), rnd to subrnd, 93% sand, 2% fines SP AS ABOVE: 98% sand (10% med sand, 90% fn sand), 2% fines	
130		15	MW53-GGW-135'		SP AS ABOVE: appearance of cse gravel (up to 12 cm), rnd to subrnd SP AS ABOVE: 98% sand, (5% cse sand, 20% med sand, 75% fn sand), 2% fines coarsening of sand	
135					SP AS ABOVE: 5% cse sand, 40% med sand, 55% fn sand	
140					wood pieces present SP AS ABOVE: 15% gravel (up to 8 cm), subang to rnd, 83% sand (5% cse sand, 70% med sand, 25% fn sand), 2% fines, composed of metasediments, granite, limestone	

SOIL BORING LOG

PROJECT NAME: PG&E Topock		HOLE DEPTH (ft): 265.0	DRILLING CONTRACTOR: Prosonic/Boart Longyear - Phoenix, AZ	
SURFACE ELEVATION: 461.0 ft. MSL	NORTHING (CCS NAD 27 Z 5): 2,101,761.47	EASTING (CCS NAD 27 Z 5): 7,616,788.39	DATE STARTED: 3/12/2007	DATE COMPLETED: 3/25/2007
DRILLING METHOD: Rotosonic-continuous 4-inch core		DRILLING EQUIPMENT: Track Mounted Rig - up to 7-inch drive casing		SB County Permit No. 2007020135

LOCATION: South of I-40 on the west bank of the river	LOGGED BY: R. Tweidt	DRILLER NAME: Denzel Roberts
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DRILL DEPTH (feet)	SAMPLE				USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	Isotflow Sample	SOIL SAMPLE			
145		20			SP	SAND (SP) - dk yellowish brn (10YR 4/4), 98% fn sand, 2% fines, well sorted, wet, no odor, wood chips	Collect wood sample MW-53-142.5' Collect sample MW-53-CS-143.5-144' Collect wood sample MW-53-144'
150				SW	WELL GRADED SAND WITH GRAVEL (SW) dk grayish brn (10YR 4/2) SP AS ABOVE: 40% gravel (up to 6 cm), subrnd to rnd, 60% sand (5% cse sand, 45% med sand, 50% fn sand), composed of chert, limestone, volcanic and granitic rocks SP AS ABOVE: 40% gravel (up to 6 cm), 60% sand (20% cse sand, 60% med sand, 20% fn sand)		
155				SP	SP AS ABOVE: 5% gravel (up to 6 cm), subrnd to rnd, 95% sand (50% med sand, 50% fn sand), limestone & granite composition		
160				SW	WELL GRADED SAND WITH GRAVEL SAND (SW) - dk grayish brn (10YR 4/2), 30% gravel [fn to cse gravel (up to 5 cm)], subang to well rnd, 70% sand (20% cse sand, 50% med sand, 30% fn sand), mod sorted, wet, no odor, sandstone, chert, limestone, granite SP AS ABOVE: 30% gravel (up to 4 cm), 70% sand (10% cse sand, 30% med sand, 60% fn sand) clay lens with silt, yellowish brn (10YR 5/4), med stiff, slow dilatency, high to moderate plasticity, mod to high dry strength		
165		20		SP	SAND (SP) - dk yellowish brn (10YR 4/4), 20% gravel (up to 8 cm), subrnd to rnd, 80% sand, (15% cse sand, 70% med sand, 15% fn sand), well sorted, wet, no odor, limestone, chert, diorite SP AS ABOVE: 20% gravel (up to 5 cm), 80% sand (15% cse sand, 70% med sand, 15% fn sand) SP AS ABOVE: 5% gravel (up to 3 cm), 95% sand (12% cse sand, 78% med sand, 10% fn sand)		
170						SP AS ABOVE: 10% cse sand, 80% med sand, 10% fn sand	
175						SP AS ABOVE: gravel (up to 5 cm) subang to rnd, composed of chert, quartz, granitics, 5% cse sand, 35% med sand, 60% fn sand SP AS ABOVE: 5% gravel (up to 3 cm), 95% sand (5% cse sand, 35% med sand, 60% fn sand) gravel is absent SP AS ABOVE: 70% med sand, 30% fn sand	

SOIL BORING LOG

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LOCATION: South of I-40 on the west bank of the river	LOGGED BY: R. Tweidt	DRILLER NAME: Denzel Roberts
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DRILL DEPTH (feet)	SAMPLE				USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	Isoflow Sample	SOIL SAMPLE			
180						<p>SAND (SP) - dk yellowish brn (10YR 4/4), 20% gravel (up to 8 cm), subrnd to rnd, 80% sand, (15% cse sand, 70% med sand, 15% fn sand), well sorted, wet, no odor, limestone, chert, diorite</p> <p>SP AS ABOVE: 5% gravel (up to 3 cm), subrnd to rnd, 95% sand (3% cse sand, 68% med sand, 24% fn sand), granite, diorite, quartz, chert</p> <p>SP AS ABOVE: 5% cse sand, 70% med sand, 25% fn sand</p>	
185		20		MW53-GGW-195'		<p>SP AS ABOVE: 5% gravel (up to 2.5 cm), subang to subrnd, 95% sand (30% med sand, 70% fn sand)</p> <p>SP AS ABOVE: 5% gravel (up to 3 cm), subrnd to well rnd , 95% sand (5% cse sand, 70% med sand, 25% fn sand), gravel composed of chert, silicified silt & sandstone</p>	
190					SP	<p>SP AS ABOVE: lt-gray mottling patches within the sand. Slight musty organic odor</p>	Collect sample MW-53-CS-192-193'
195							No Recovery from 195 - 205'
200		0					
205						<p>SP AS ABOVE: 20% med sand, 80% fn sand</p>	
210							



SOIL BORING LOG

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LOCATION: South of I-40 on the west bank of the river	LOGGED BY: R. Tweidt	DRILLER NAME: Denzel Roberts
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DRILL DEPTH (feet)	SAMPLE			USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	Soilflow Sample			
250		18	MW53-GGW-255'	SW	GRAVELLY SAND (SW) - very dk grayish brn (10YR3/2), 30% gravel (up to 7 cm), subrnd to well rnd, 70% sand (20% cse sand, 40% med sand, 30% fn sand), moderately sorted, wet, sedimentary & metamorphic rock assemblage, no odor	DRILLING OBSERVATIONS AND OPERATIONS, DRILL RATE, REFUSALS, SAMPLING AND TESTING NOTES.
255		GM		SILTY GRAVEL WITH SAND (GM) - dk grayish brn (10YR4/2), 50% gravel (up to 12 cm), ang to well rnd, 30% sand (30% cse sand, 30% med sand, 40% fn sand), 20% fines, poorly sorted, wet, sedimentary, volcanic, metamorphic rock assemblage, no odor decomposed metamorphics		
260		10		GC	CLAYEY GRAVEL WITH SAND (SP) - dk brn (7.5YR 3/3), 40% gravel (up to 9 cm), ang to rnd, 20% sand (30% cse sand, 30% med sand, 40% fn sand), 40% fines, poorly sorted, slightly moist, combination of fluvial and reworked miocene conglomerate, no odor MIOCENE CONGLOMERATE	
265			BR			
<p>Total Drilled Depth = 265 ft bgs as defined at the top of the borehole.</p> <p>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</p>						