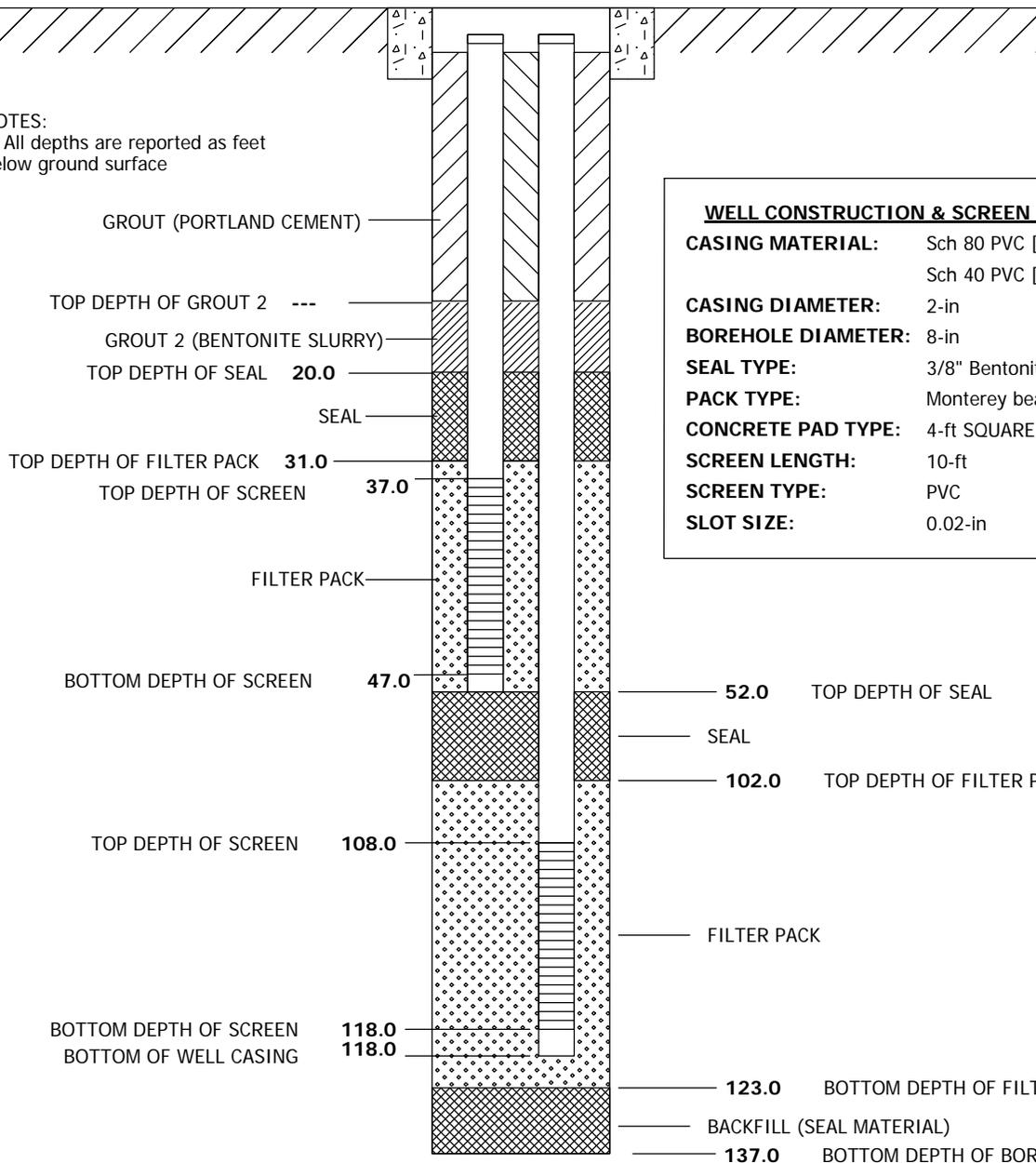


WELL COMPLETION DIAGRAM

PROJECT NO: 354948.FP.07.FW	PROJECT: Topock AZ Drilling	WELL NO: <i>MW-55-120</i> <i>MW-55-45</i>
LOCATION: Site 2 - Alternate		
DRILLING CONTRACTOR: Boart Longyear	DRILLING START: 3/29/2008	
DRILLING METHOD: Rotasonic	DRILLING END: 3/31/2008	
LOGGER: R.Tweidt	WELL COMPLETION DATE: 4/2/2008	
GROUND SURFACE ELEVATION (NAVD 88): 463.6	GENERAL REMARKS: Both wells constructed in one borehole.	
NORTHING (CCS NAD 83 Z 5): 2102606.18	EASTING (CCS NAD 83 Z 5): 7618326.13	

12-in DIAMETER WELL VAULT (FLUSH WITH GRADE)

NOTES:
1. All depths are reported as feet below ground surface



<u>WELL CONSTRUCTION & SCREEN DETAILS</u>	
CASING MATERIAL:	Sch 80 PVC [MW-55-120] Sch 40 PVC [MW-55-45]
CASING DIAMETER:	2-in
BOREHOLE DIAMETER:	8-in
SEAL TYPE:	3/8" Bentonite Pellets
PACK TYPE:	Monterey beach sand # 3
CONCRETE PAD TYPE:	4-ft SQUARE (inset in asphalt)
SCREEN LENGTH:	10-ft
SCREEN TYPE:	PVC
SLOT SIZE:	0.02-in

WELL DIAGRAM IS NOT TO SCALE

SOIL BORING LOG

PROJECT NAME: Topock AZ Drilling		HOLE DEPTH (ft): 137.0	DRILLING CONTRACTOR: Boart-Longyear (Dale Osteberg)	
SURFACE ELEVATION (NAVD88): 463.6 ft. MSL	NORTHING (CCS NAD 83 Z 5): 2,102,606.18	EASTING (CCS NAD 83 Z 5): 7,618,326.13	DATE STARTED: 3/29/2008	DATE COMPLETED: 3/31/2008
DRILLING METHOD: Rotosonic - continuous core			DRILLING EQUIPMENT: 6" core barrel, 8" casing	
LOCATION: Site 2 - Alternate			LOGGED BY: R. Tweidt	

DEPTH BGS (feet)	SAMPLE				USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	ISOFLOW SAMPLE	SOIL SAMPLE			
5					SM	SILTY SAND with GRAVEL (SM) - Brn (10YR 4/3), 15% gravel (up to 4 cm), 45% subang-ang fn sand, 40% fines, well graded, gravel is predominantly metamorphic, slightly moist.	Soil descriptions based on observation of continuous Rotosonic core. See list of abbreviations at end of log. Nested wells MW-55-45 and MW-55-120 installed in this borehole. Collect soil sample MW55-CS-6-7
10		12			GP	POORLY GRADED GRAVEL (GP) - Reddish black (2.5YR 2.5/1), 90% ang-subang gravel (up to 3 cm), 10% fn sand, no fines, poorly graded, semi-consolidated pieces of metamorphic material present, wet. - clayey silt layer present (ML), very dk greyish brn (10YR 3/2), slow dilatency, med plasticity	
15						SILTY SAND (SM) - Dk yellowish brn (10YR 3/4), 10% gravel (up to 2 cm), 60% fn sand, 30% fines, poorly graded, wet. - SM AS ABOVE: (at 12' bgs) dk brn (7.5YR 3/4), 5% rnd-subrnd gravel (up to 2 cm), 75% fn sand, 20% fines. Fluvial sediments. - SM AS ABOVE: 5% rnd-subrnd gravel, 60% fn sand, 35% fines - SM AS ABOVE: increased gravel size, alluvial and fluvial sediments present, gravel is subang. Max clast size = 5 cm. - SM AS ABOVE: gravel is subang, metamorphic and granitic. Max clast size = 11 cm. - SM AS ABOVE: pieces of consolidated sandstone present. 15% subang gravel, 75% fn-med sand, 10% fines	Collect soil sample MW55-CS-16-17 Drill rate 17' to 27' = 1.7 ft/min
20							
25							Collect soil sample MW55-CS-26-27 Drill rate 27' to 37' = 1.7 ft/min
30					SM	- SM AS ABOVE: Increased gravel size and content. 20% gravel, 45% fn-med sand, 35% fines. Max clast size = 12 cm. - SM AS ABOVE: 10% gravel, 70% sand, 20% fines - SM AS ABOVE: 10% gravel (up to 4 cm), 60% fn sand, 30% fines, gravel is predominantly sandstone and granitic.	
35		10	MW55-GGW-01				Isowflow #1: 27-37' bgs Water used to drill: 200 gallons Sample ID: MW55-GGW-01

SOIL BORING LOG

PROJECT NAME: Topock AZ Drilling		HOLE DEPTH (ft): 137.0	DRILLING CONTRACTOR: Boart-Longyear (Dale Osteberg)	
SURFACE ELEVATION (NAVD88): 463.6 ft. MSL	NORTHING (CCS NAD 83 Z 5): 2,102,606.18	EASTING (CCS NAD 83 Z 5): 7,618,326.13	DATE STARTED: 3/29/2008	DATE COMPLETED: 3/31/2008
DRILLING METHOD: Rotasonic - continuous core			DRILLING EQUIPMENT: 6" core barrel, 8" casing	
LOCATION: Site 2 - Alternate			LOGGED BY: R. Tweidt	

DEPTH BGS (feet)	SAMPLE				USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	ISOFLOW SAMPLE	SOIL SAMPLE			
40		10	MW55-GGW-02			<p>SILTY SAND (SM) - Dk yellowish brn (10YR 3/4), 10% gravel (up to 2 cm), 60% fn sand, 30% fines, poorly graded, wet.</p> <p>- (at 35' bgs) SM AS ABOVE: 15% subrnd-subang gravel (up to 5 cm), 65% fn-med sand, 20% fines, gravel is predominantly metamorphic and granitic.</p> <p>- SM AS ABOVE: 10% subrnd-ang gravel (up to 3 cm), 50% fn-med sand, 40% fines.</p>	<p>Collect soil sample MW55-CS-36-37 Drill rate 37' to 47' = 1.7 ft/min</p> <p>Isoflow #2: 37-47' bgs Water used to drill: 200 gallons Sample ID: MW55-GGW-02</p>
45							<p>Collect soil sample MW55-CS-46-47 Drill rate 47' to 57' = 1.5 ft/min</p>
50		10				<p>SANDY SILT with GRAVEL (ML) - Dk reddish brn (2.5YR 3/4), 5% subang-ang gravel (up to 8 cm), 20% fn sand, 75% fines, well graded, low to med strength, low plasticity, slow to rapid dilatency in pulverized sample, gravel composition is metamorphics and granitics, slightly moist.</p>	
55						<p>- ML AS ABOVE: section more cse, 5% gravel (up to 3 cm), 40% fn sand, 55% fines.</p> <p>- ML AS ABOVE: 5% gravel, 20% fn sand, 75% fines. 8 cm piece of Miocene conglomerate in cuttings.</p> <p>- ML AS ABOVE: section more cse, 5% gravel (up to 2.5 cm), 40% fn sand, 55% fines.</p>	<p>Collect soil sample MW55-CS-56-57</p>
60		10	MW55-GGW-03				<p>Isoflow #3: 57-67' bgs Water used to drill: 500 gallons Sample ID: MW55-GGW-03</p>
65							<p>Collect soil sample MW55-CS-66-67</p>
70						<p>- ML AS ABOVE: coarsening of soil. Increased gravel content and max clast size. 25% subang-ang gravel (up to 14 cm), 30% fn sand, 45% fines. Gravel is composed of metamorphics and granitic rocks. Abundant pieces of miocene conglomerate present.</p>	

SOIL BORING LOG

PROJECT NAME: Topock AZ Drilling		HOLE DEPTH (ft): 137.0	DRILLING CONTRACTOR: Boart-Longyear (Dale Osteberg)	
SURFACE ELEVATION (NAVD88): 463.6 ft. MSL	NORTHING (CCS NAD 83 Z 5): 2,102,606.18	EASTING (CCS NAD 83 Z 5): 7,618,326.13	DATE STARTED: 3/29/2008	DATE COMPLETED: 3/31/2008
DRILLING METHOD: Rotosonic - continuous core			DRILLING EQUIPMENT: 6" core barrel, 8" casing	
LOCATION: Site 2 - Alternate			LOGGED BY: R. Tweidt	

DEPTH BGS (feet)	SAMPLE				USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	ISOFLOW SAMPLE	SOIL SAMPLE			
75		10			ML	<p>SANDY SILT with GRAVEL (ML) - Dk reddish brn (2.5YR 3/4), 5% subang-ang gravel (up to 8 cm), 20% fn sand, 75% fines, well graded, low to med strength, low plasticity, slow to rapid dilatency in pulverized sample, gravel composition is metamorphics and granitics, slightly moist.</p>	<p>Collect soil sample MW55-CS-76-77 Drill rate 77' to 87' = 1.3 ft/min</p>
80		10	MW55-GGW-04				
85					ML	<p>- ML AS ABOVE: Increased fines. 5% subang-ang gravel (up to 3 cm), 25% fn sand, 70% fines. Gravel comprised of metamorphics and minor granitics.</p>	<p>Collect soil sample MW55-CS-86-87 Drill rate 87' to 97' = 0.8 ft/min</p>
90		10					
95					NR	<p>NO RECOVERY (NR) - Sluff material is the same as core logged above and below this interval</p>	<p>Isoflow #5: 97-107' bgs Water used to drill: 250 gallons Sample ID: MW55-GGW-05</p>
100		0	MW55-GGW-05				
105							

SOIL BORING LOG

PROJECT NAME: Topock AZ Drilling		HOLE DEPTH (ft): 137.0	DRILLING CONTRACTOR: Boart-Longyear (Dale Osteberg)	
SURFACE ELEVATION (NAVD88): 463.6 ft. MSL	NORTHING (CCS NAD 83 Z 5): 2,102,606.18	EASTING (CCS NAD 83 Z 5): 7,618,326.13	DATE STARTED: 3/29/2008	DATE COMPLETED: 3/31/2008
DRILLING METHOD: Rotosonic - continuous core			DRILLING EQUIPMENT: 6" core barrel, 8" casing	
LOCATION: Site 2 - Alternate			LOGGED BY: R. Tweidt	

DEPTH BGS (feet)	SAMPLE				USCS CODE	SOIL DESCRIPTION	COMMENTS
	INTERVAL	RECOVERY (ft)	ISOFLOW SAMPLE	SOIL SAMPLE			
				CS		NO RECOVERY (NR) - Sluff material is the same as core logged above and below this interval	
110		10			ML	SANDY SILT with GRAVEL (ML) - Dk reddish brn (2.5YR 3/4), 5% subang-ang gravel (up to 3 cm), 25% fn sand, 70% fines, well graded, low to med strength, low plasticity, slow to rapid dilatency in pulverized sample, gravel composition is metamorphics and granitics, slightly moist.	Collect soil sample MW55-CS-106-107 Drill rate 107' to 117' = 1.1 ft/min
115				CS		SILTY SAND WITH GRAVEL (SM) - Reddish brn (2.5YR 4/3), 10% gravel (up to 3 cm), 50% fn-med subrnd-ang sand, 40% fines, well graded, metamorphic and sedimentary rocks, wet. - SM AS ABOVE: decomposed gravel to clay present - SM AS ABOVE: Becomes more cse, 15% gravel (up to 8 cm), 60% med sand, 25% fines. Cemented sandstone clasts present.	
120		10	MW55-GGW-06		ML	SANDY SILT with GRAVEL (ML) - Reddish brn (2.5YR 4/4), 10% subang-ang gravel (up to 12 cm), 25 % fn sand, 65% fines, well graded, predominantly metamorphics, no apparent structure, moist. - 120.5' to 120.75' - clay layer, white (10R 8/1), no apparent structure.	Collect soil sample MW55-CS-116-117 Drill rate 117' to 127' = 1.1 ft/min Isoflow #6: 117-127' bgs Water used to drill: 200 gallons Sample ID: MW55-GGW-06
125				CS			Collect soil sample MW55-CS-126-127
130		8					Heavy rig chatter.
135				CS	BR	MIOCENE CONGLOMERATE (BR) - Reddish brn (2.5YR 4/4), subang-ang, clast composition predominantly metamorphic. Max clast size = 7 cm, dry.	Collect soil sample MW55-CS-134-135
		2					
Boring Terminated at 137 ft							
ABBREVIATIONS cc = continuous core run							

SOIL BORING LOG

PROJECT NAME: Topock AZ Drilling		HOLE DEPTH (ft): 137.0	DRILLING CONTRACTOR: Boart-Longyear (Dale Osteberg)	
SURFACE ELEVATION (NAVD88): 463.6 ft. MSL	NORTHING (CCS NAD 83 Z 5): 2,102,606.18	EASTING (CCS NAD 83 Z 5): 7,618,326.13	DATE STARTED: 3/29/2008	DATE COMPLETED: 3/31/2008
DRILLING METHOD: Rotasonic - continuous core			DRILLING EQUIPMENT: 6" core barrel, 8" casing	
LOCATION: Site 2 - Alternate			LOGGED BY: R. Tweidt	

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	RECOVERY (ft)	ISOFLOW SAMPLE	SOIL SAMPLE			
						brn = brown lt = light dk = dark vf = very fine-grained fn = fine-grained med = medium-grained cse = 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	