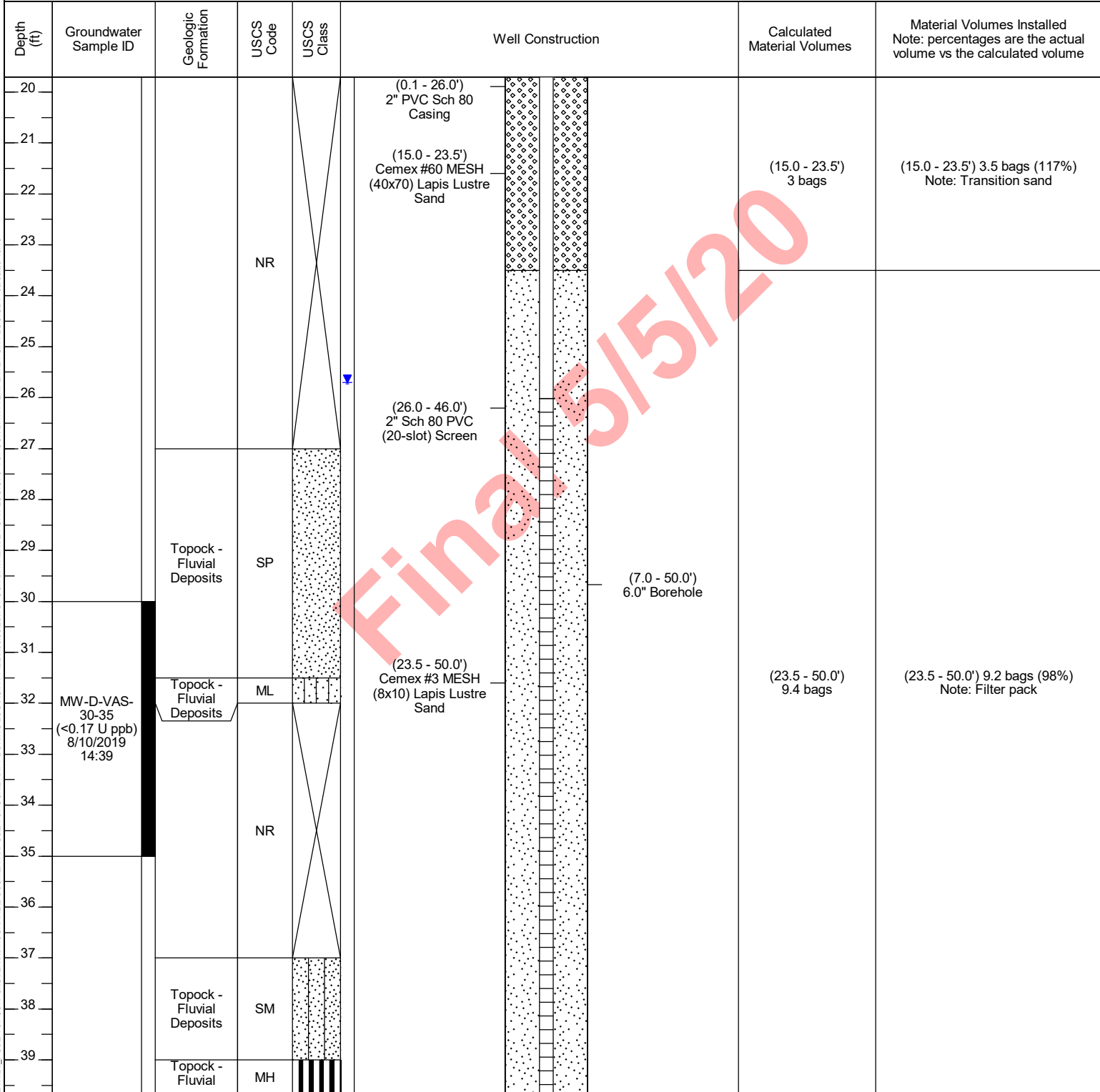


Date Started: 10/17/2019	Surface Elevation: 478.95 ft amsl	<b>Well ID: MW-77-046</b>
Date Completed: 01/11/2020	Shallow Well Elevation: 478.81 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: NA ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102938.75	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615959.25	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 6-8 inches	
Logger: Grant Willford	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 10/31/2019	
Total Depth: 50 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
0					(+0.3 - 2.2') Surface completion		(+0.3 - 2.2') 16 bags Note: 30" diameter concrete pad with 18" diameter lockable vault, King Kon-Crete 4000 PSI
1					(0.1 - 26.0') 2" PVC Sch 80 Casing		
2							
3							
4							
5							
6							
7					(1.2 - 15.0') Portland Cement 6% Bentonite Type I, II and V with Benseal (7.5 - 8.5') Centralizer	(1.2 - 15.0') 24.6 gallons	(1.2 - 15.0') 45 gallons (183%) Note: Grout Seal. Used >20% of the calculated volume due to potential voids forming during drilling and grout migration.
8			NR				
9							
10							
11							
12							
13							
14							
15							
16							
17					(15.0 - 23.5') Cemex #60 MESH (40x70) Lapis Lustre Sand	(15.0 - 23.5') 3 bags	(15.0 - 23.5') 3.5 bags (117%) Note: Transition sand
18			NR				
19							

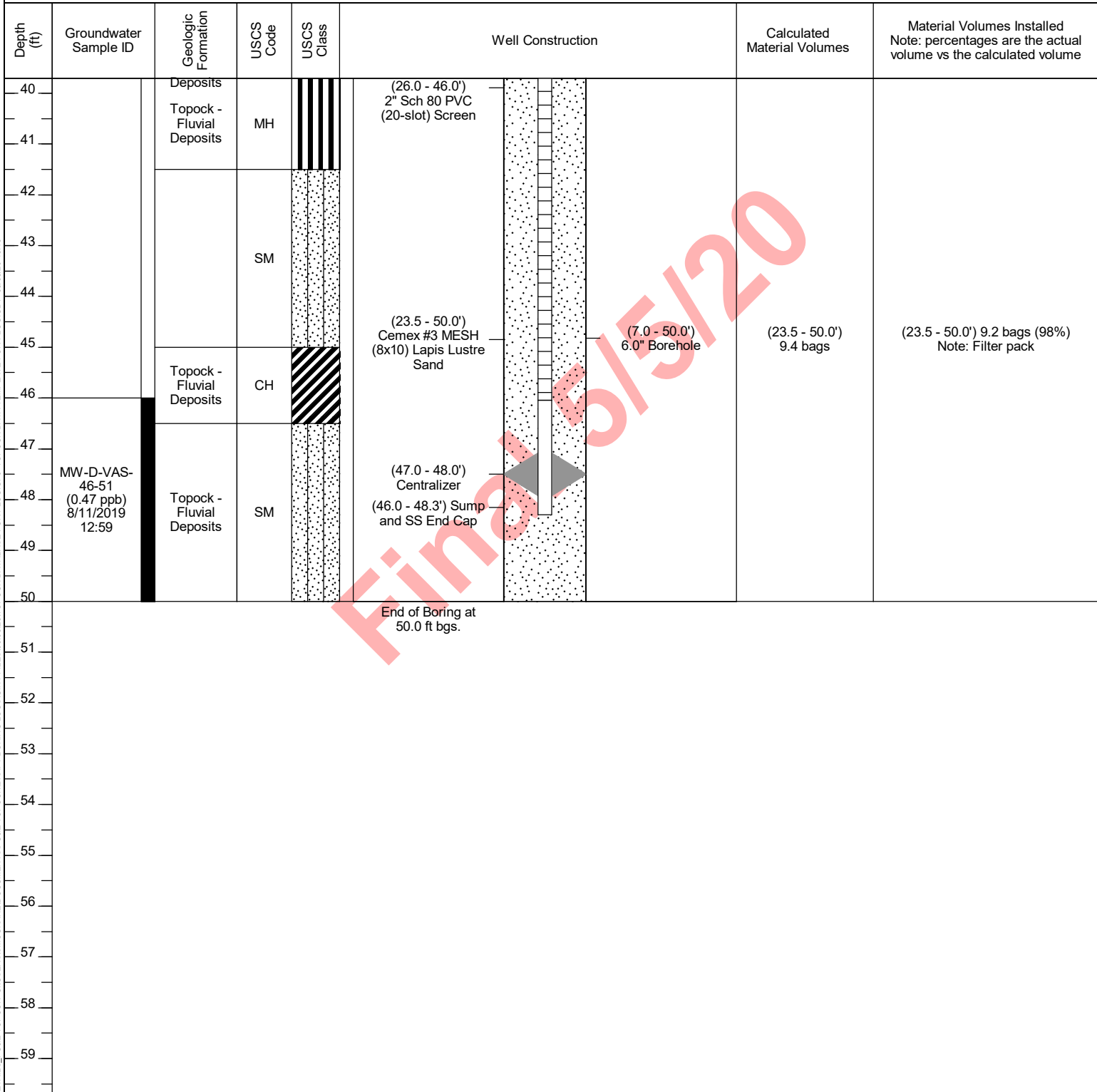
Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: groundwater samples collected during the drilling of MW-77d; solid blue water table marks represent depth to water (ft. bgs.) measured post development; installed in MW-77sr

Date Started: 10/17/2019	Surface Elevation: 478.95 ft amsl	<b>Well ID: MW-77-046</b>
Date Completed: 01/11/2020	Shallow Well Elevation: 478.81 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: NA ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102938.75	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615959.25	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 6-8 inches	
Logger: Grant Willford	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 10/31/2019	
Total Depth: 50 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	



Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: groundwater samples collected during the drilling of MW-77d; solid blue water table marks represent depth to water (ft. bgs.) measured post development; installed in MW-77sr

Date Started: 10/17/2019	Surface Elevation: 478.95 ft amsl	<b>Well ID: MW-77-046</b>
Date Completed: 01/11/2020	Shallow Well Elevation: 478.81 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: NA ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102938.75	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615959.25	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 6-8 inches	
Logger: Grant Willford	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 10/31/2019	
Total Depth: 50 ft bgs	Well Completion: <input checked="" type="checkbox"/> Flush <input type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	



Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: groundwater samples collected during the drilling of MW-77d; solid blue water table marks represent depth to water (ft. bgs.) measured post development; installed in MW-77sr

WELL CONSTRUCTION DETAILS\_PG&E\_TOPOCK\_TOPOCKDRAFT BORING LOGS\GINT FILES\05.05.20\TOPOCK DATABASE FOR PLOG.GPJ\_TOPOCK DATA TEMPLATE FOR PLOG.GDT\_05/05/20 18:43

Date Started: 10/16/2019	Surface Elevation: 478.95 ft amsl	<b>Boring No.: MW-77sr</b>
Date Completed: 10/16/2019	Northing (NAD83): 2102938.75	
Drilling Co.: Cascade	Easting (NAD83): 7615959.25	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 50 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type: Boart Longyear Track	Borehole Diameter: 6-8 inches	Location: PG&E Topock, Needles, California
Driller Name: Eddie Ramos	Depth to First Water: 28.0 ft bgs	
Drilling Asst: F. Sandoval/J. Candelaria	Sampling Method: 4 inch x 10 ft. Core Barrel	Project Number: RC000753.0051
Logger: Grant Willford	Sampling Interval: 17-50 ft bgs.	
Editor: Sean McGrane	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
1							(0.0 - 17.0') No recovery (NR); Core not collected or logged, see MW-77d log for lithology	(0.0 - 17.0') Soft drilling	(0.0 - 50.0') No water used
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18	0				NR				
19									
20									

Final 5/5/20

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: depth to water and groundwater samples collected during the drilling of MW-77d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-77-046 installed in borehole

SOIL BORING LOG: PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\05.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 05/05/20 18:37

Date Started:	10/16/2019	Surface Elevation:	478.95 ft amsl	<b>Boring No.: MW-77sr</b>	
Date Completed:	10/16/2019	Northing (NAD83):	2102938.75		
Drilling Co.:	Cascade	Easting (NAD83):	7615959.25	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	50 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-8 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	28.0 ft bgs		
Drilling Asst:	F. Sandoval/J. Candelaria	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	RC000753.0051
Logger:	Grant Willford	Sampling Interval:	17-50 ft bgs.		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid		
21	0				NR						
22											
23											
24											
25	60				SP	SP	(27.0 - 31.5') Topock - Fluvial Deposits; Poorly graded sand (SP); very pale brown / grayish orange (10YR 7/4); very fine grained to fine grained, subangular to round; trace silt; moist	(27.0 - 37.0') Very soft drilling. Poor recovery, very loose sands pushed out into the formation by the core barrel.			
26											
27											
28					Topock - Fluvial Deposits						
29											
30											
31											
32				MW-D-VAS-30-35 (<0.17 U ppb) 8/10/2019 14:39	Topock - Fluvial Deposits	ML	ML		(31.5 - 32.0') Topock - Fluvial Deposits; Sandy silt (ML); dark gray (10YR 4/1); medium plasticity; some very fine to fine grained sand, subangular to round; trace; moist; soft		
33									(32.0 - 37.0') No recovery (NR); See drilling notes		
34						NR					
35											
36	156				SM	SM	(37.0 - 39.0') Topock - Fluvial Deposits; Silty sand (SM); very pale brown / grayish orange (10YR 7/4) some gray (10YR 5/1); very fine grained to medium grained, subangular to round; some silt; trace clay; trace coarser clast composed of quartz; moist; some small high plasticity silt/clay lenses throughout unit, 2-3 inches long 0.5-1 inch wide	(37.0 - 50.0') Soft drilling			
37											
38					Topock - Fluvial Deposits						
39					Topock - Fluvial Deposits	MH	MH		(39.0 - 41.5') Topock - Fluvial Deposits; Sandy elastic silt (MH); dark grayish brown / dark yellowish brown (10YR 4/2); high plasticity; some very fine to fine grained sand, subangular to		
40											

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: depth to water and groundwater samples collected during the drilling of MW-77d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-77-046 installed in borehole

SOIL BORING LOG: PG&E TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\05\_20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 05/05/20 18:37

Date Started:	10/16/2019	Surface Elevation:	478.95 ft amsl	<b>Boring No.: MW-77sr</b>	
Date Completed:	10/16/2019	Northing (NAD83):	2102938.75		
Drilling Co.:	Cascade	Easting (NAD83):	7615959.25	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	50 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-8 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	28.0 ft bgs		
Drilling Asst:	F. Sandoval/J. Candelaria	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	RC000753.0051
Logger:	Grant Willford	Sampling Interval:	17-50 ft bgs.		
Editor:	Sean McGrane	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Depth (ft)	Recovery (in)	Sieve Sample ID	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Soil Description	Drilling Notes	Drilling Fluid
41	156			Topock - Fluvial Deposits	MH		round; trace; moist to wet; soft to very soft		
42					SM		(41.5 - 45.0') Silty sand with gravel (SM); brown (10YR 5/3); very fine grained to very coarse grained, subangular to round; some granules to very large pebbles, subangular to round; little silt; trace small cobbles, subround; trace clay; wet		
43									
44									
45				Topock - Fluvial Deposits	CH		(45.0 - 46.5') Topock - Fluvial Deposits; Fat clay (CH); dark yellowish brown (10YR 4/6); high plasticity; trace small pebbles, round; trace very fine grained sand, subround; trace silt; moist to wet; stiff to soft		
46									
47				Topock - Fluvial Deposits	SM		(46.5 - 50.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); brown (10YR 5/3); very fine grained to very coarse grained, subangular to round; some granules to very large pebbles, angular to round; little silt; trace small cobbles, subround to round; trace clay; moist		
48			MW-D-VAS-46-51 (0.47 ppb) 8/11/2019 12:59						
49									
50									
End of Boring at 50.0 ft bgs.									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: depth to water and groundwater samples collected during the drilling of MW-77d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-77-046 installed in borehole

SOIL BORING LOG: PG&E-TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E-TOPOCK\DRIFT BORING LOGS\GINT FILES\05\_20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 05/05/20 18:37