

Date Started: 09/10/2019	Surface Elevation: 460.4 ft amsl	Well ID: MW-92-37, MW-92-72
Date Completed: 09/24/2019	Shallow Well Elevation: 462.0 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 462.0 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102811.6	Project: Final GW Remedy Phase 1
Driller Name: Steve Vasquez	Easting (NAD83): 7617576.7	Location: PG&E Topock, Needles, California
Drilling Asst: L. Amaya / O. Flores	Borehole Diameter: 10-12 inches	Project Number: RC000753.0051
Logger: David Cornell	Water Level Start: 5.22 ft bgs	
Editor: Sean McGrane	Development End Date: 10/22/2019	
Total Depth: 77 ft bgs	Well Completion: <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
0					(+2.2 - 3.0') Monument painted desert sand		Note: 12x12-inch Lockable Steel Monument
0.6					(+0.6 - 3.0') Concrete Pad		(+0.6 - 3.0') 17 bags Note: 24-inch Diameter Concrete Pad, King Kon-Crete 4000 PSI, Mixed with Buff dye
1.5					(+1.5 - 17.0') 2" PVC Sch 40 Casing		
1.5					(1.5 - 13.0') Portland Cement 6% Bentonite	(1.5 - 13.0') 63.3 gallons	(1.5 - 13.0') 85 gallons (34%) Note: Type I, II and V and Benseal, used >20% of the calculated volume due to potential migration into the formation
0.0					(0.0 - 17.0') 12.0" Borehole		
9.5					(9.5 - 10.5') Centralizer		
13.0					(13.0 - 15.0') Bentonite seal chips	(13.0 - 15.0') 2.1 bags	(13.0 - 15.0') 2.5 bags (19%) Note: Puregold Medium Chips
15.0					(15.0 - 41.0') Cemex #3 MESH (8x10)	(15.0 - 41.0') 26.5 bags	(15.0 - 41.0') 30 bags (13%) Note: Lapis Lustre Sand
17.0					(17.0 - 77.0') 10.0" Borehole		
	MW-Y'-VAS-12-17 (<0.033 U ppb) 8/20/2019 13:58	Topock - Fluvial Deposits	SP	NR			

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, groundwater data was collected from MW-91d

WELL CONSTRUCTION DETAILS_PG&E_TOPOCK_DRAFT BORING LOGS\GINT FILES\123119\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/31/19 16:33

Date Started: 09/10/2019	Surface Elevation: 460.4 ft amsl	Well ID: MW-92-37, MW-92-72
Date Completed: 09/24/2019	Shallow Well Elevation: 462.0 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 462.0 ft amsl	Client: PG&E
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Driller Name: Steve Vasquez	Easting (NAD83): 7617576.7	Location: PG&E Topock, Needles, California
Drilling Asst: L. Amaya / O. Flores	Borehole Diameter: 10-12 inches	
Logger: David Cornell	Water Level Start: 5.22 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 10/22/2019	
Total Depth: 77 ft bgs	Well Completion: <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
18					(17.0 - 37.0') 2" Sch 40 PVC (20-slot) Screen		
19							
20							
21		Topock - Fluvial Deposits	SP				
22							
23							
24							
25							
26		Topock - Fluvial Deposits	SP				
27							
28					(17.0 - 77.0') 10.0" Borehole	(15.0 - 41.0') 26.5 bags	(15.0 - 41.0') 30 bags (13%) Note: Lapis Lustre Sand
29							
30							
31							
32							
33			NR				
34							
35							
36							
37			NR				

WELL CONSTRUCTION DETAILS_PG&E_TOPOCK_TOPOCK DRAFT BORING LOGS\GINT FILES\1231.19\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/31/19 16:33

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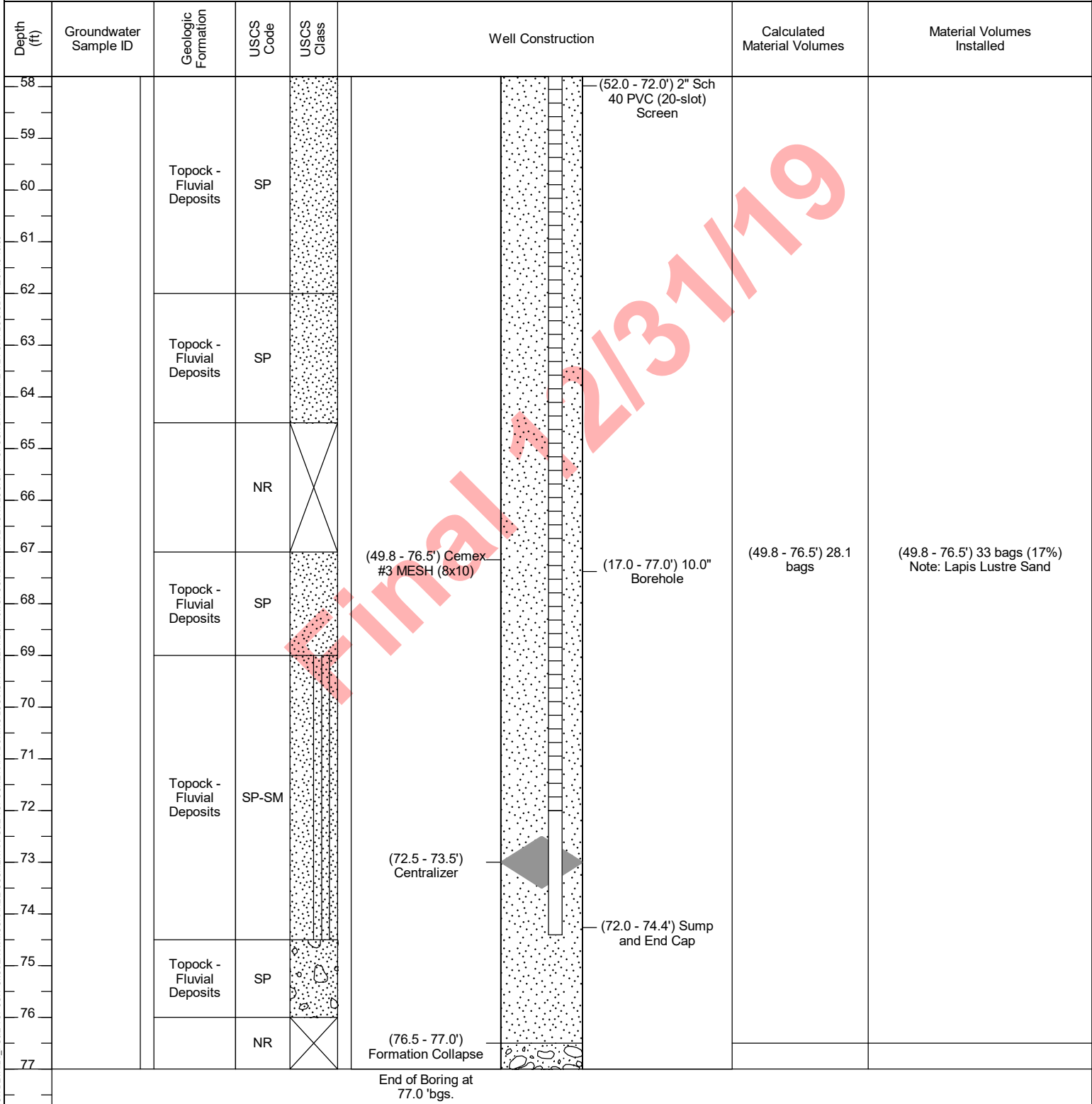
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Date Completed: 09/24/2019	Shallow Well Elevation: 462.0 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 462.0 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102811.6	Project: Final GW Remedy Phase 1
Driller Name: Steve Vasquez	Easting (NAD83): 7617576.7	Location: PG&E Topock, Needles, California
Drilling Asst: L. Amaya / O. Flores	Borehole Diameter: 10-12 inches	
Logger: David Cornell	Water Level Start: 5.22 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 10/22/2019	
Total Depth: 77 ft bgs	Well Completion: <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Stick-up	

Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed
38					(37.5 - 38.5') Centralizer		
39					(37.0 - 39.4') Sump and End Cap	(15.0 - 41.0') 26.5 bags	(15.0 - 41.0') 30 bags (13%) Note: Lapis Lustre Sand
40							
41							
42			NR				
43							
44							
45					(41.0 - 49.8') Bentonite seal chips	(41.0 - 49.8') 6.4 bags	(41.0 - 49.8') 7 bags (9%) Note: Puregold Medium Chips
46							
47							
48		Topock - Fluvial Deposits	SP		(17.0 - 77.0') 10.0" Borehole		
49		Topock - Fluvial Deposits	SP-SM				
50							
51							
52					(52.0 - 72.0') 2" Sch 40 PVC (20-slot) Screen		
53		Topock - Fluvial Deposits	SP				
54	MW-Y'-VAS-52-57 (<0.033 U ppb) 8/21/2019 11:41				(49.8 - 76.5') Cemex #3 MESH (8x10)	(49.8 - 76.5') 28.1 bags	(49.8 - 76.5') 33 bags (17%) Note: Lapis Lustre Sand
55							
56			NR				
57		Topock - Fluvial Deposits	SP				

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WELL CONSTRUCTION DETAILS_PG&E TOPOCK C:\USERS\SMC\GRANDOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\123119\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/31/19 16:33

Date Started: 09/10/2019	Surface Elevation: 460.4 ft amsl	Well ID: MW-92-37, MW-92-72
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Drilling Method: Sonic Drilling	Northing (NAD83): 2102811.6	Project: Final GW Remedy Phase 1
Driller Name: Steve Vasquez	Easting (NAD83): 7617576.7	Location: PG&E Topock, Needles, California
Drilling Asst: L. Amaya / O. Flores	Borehole Diameter: 10-12 inches	
Logger: David Cornell	Water Level Start: 5.22 ft bgs	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 10/22/2019	
Total Depth: 77 ft bgs	Well Completion: <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Stick-up	



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WELL CONSTRUCTION DETAILS_PG&E_TOPOCK_DRAFT BORING LOGS\GINT FILES\123119\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/31/19 16:33

Date Started: 09/09/2019	Surface Elevation: 460.4 ft amsl	Boring No.: MW-92s
Date Completed: 09/10/2019	Northing (NAD83): 2102811.6	
Drilling Co.: Cascade	Easting (NAD83): 7617576.7	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 77 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type: Prosonic Truck Mounted	Borehole Diameter: 10-12 inches	Location: PG&E Topock, Needles, California
Driller Name: Steve Vasquez	Depth to First Water: 4.6 ft bgs	
Drilling Asst: L. Amaya / O. Flores	Sampling Method: 4 inch x 10 ft. Core Barrel	Project Number: RC000753.0051
Logger: David Cornell	Sampling Interval: Screen Intervals	
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
0 - 17.0							(0.0 - 17.0') No recovery (NR); Core not collected or logged, see MW-92d boring log for lithologic descriptions	(0.0 - 17.0') Heaving sands	(0.0 - 17.0') 300 gallons of water used; 275 gallons of water recovered; 25 gallons of water lost
17.0 - 25.0			MW-Y'-VAS-12-17 (<0.033 U ppb) 8/20/2019 13:58	Topock - Fluvial Deposits	SP		(17.0 - 25.0') Topock - Fluvial Deposits; Poorly graded sand (SP); dark grayish brown / dark yellowish brown (10YR 4/2); very fine grained to medium grained, subangular to subround; trace silt; trace clay; wet	(17.0 - 37.0') Heaving sands. Full recovery not obtained likely due to soft material and sloughing out of core barrel.	(17.0 - 47.0') No water used

Final 12/31/19

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SOIL BORING LOG_PG&E_TOPOCK_C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/31/19 16:03

Date Started:	09/09/2019	Surface Elevation:	460.4 ft amsl	Boring No.: MW-92s	
Date Completed:	09/10/2019	Northing (NAD83):	2102811.6		
Drilling Co.:	Cascade	Easting (NAD83):	7617576.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	77 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mounted	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	4.6 ft bgs		
Drilling Asst:	L. Amaya / O. Flores	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	RC000753.0051
Logger:	David Cornell	Sampling Interval:	Screen Intervals		
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				Topock - Fluvial Deposits	SP	[Dotted pattern]	(23') dark gray (10YR 4/1)		
22									
23				Topock - Fluvial Deposits	SP	[Dotted pattern]	(25.0 - 29.0') Topock - Fluvial Deposits; Poorly graded sand (SP); dark grayish brown / dark yellowish brown (10YR 4/2); very fine grained to medium grained, subangular to subround; trace silt; trace clay; wet		
24									
25				Topock - Fluvial Deposits	SP	[Dotted pattern]	(29.0 - 37.0') No recovery (NR)	(29.0') No recovery due to loss of fine grained sands out of core barrel or pushed out into the formation.	
26	144								
27		No Sieve Samples Collected		NR	NR	[Crossed out]	(37.0 - 47.0') No recovery (NR); Core not collected or logged, see MW-92d boring log for lithologic descriptions	(37.0 - 47.0') Heaving sands.	
28									
29				NR	NR	[Crossed out]			
30									
31				NR	NR	[Crossed out]			
32									
33				NR	NR	[Crossed out]			
34									
35				NR	NR	[Crossed out]			
36									
37				NR	NR	[Crossed out]			
38									
39				NR	NR	[Crossed out]			
40									

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SOIL BORING LOG: PG&E TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\12.31.19\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/31/19 16:03

Date Started:	09/09/2019	Surface Elevation:	460.4 ft amsl	Boring No.: MW-92s	
Date Completed:	09/10/2019	Northing (NAD83):	2102811.6		
Drilling Co.:	Cascade	Easting (NAD83):	7617576.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	77 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mounted	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	4.6 ft bgs		
Drilling Asst:	L. Amaya / O. Flores	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	RC000753.0051
Logger:	David Cornell	Sampling Interval:	Screen Intervals		
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									
42									
43									
44					NR				
45									
46									
47									
48				Topock - Fluvial Deposits	SP		(47.0 - 49.0') Topock - Fluvial Deposits; (SP); grayish brown (10YR 5/2); very fine grained to medium grained, subangular to subround; trace coarse grained sand; trace silt; trace clay; wet	(47.0 - 57.0') Heaving sands. Full recovery not obtained likely due to compaction.	(47.0 - 77.0') 430 gallons of water used; 400 gallons of water recovered; 30 gallons of water lost
49			Topock - Fluvial Deposits	SP-SM		(49.0 - 51.0') Topock - Fluvial Deposits; (SP-SM); grayish brown (10YR 5/2); very fine grained to medium grained, subangular to subround; little silt; trace clay; wet			
50		No Sieve Samples Collected							
51									
52	108			Topock - Fluvial Deposits	SP		(51.0 - 56.0') Topock - Fluvial Deposits; (SP); grayish brown (10YR 5/2); very fine grained to medium grained, subangular to subround; trace coarse grained sand; trace silt; trace clay; wet		
53			MW-Y'-VAS-52-57 (<0.033 U ppb) 8/21/2019 11:41						
54									
55									
56									
57					NR		(56.0 - 57.0') No recovery (NR)		
58	90			Topock - Fluvial Deposits	SP		(57.0 - 62.0') Topock - Fluvial Deposits; (SP); grayish brown (10YR 5/2); very fine grained to medium grained, subangular to subround; trace coarse grained sand; trace silt; trace clay; wet	(57.0 - 67.0') Heaving sands. Full recovery not obtained likely due to compaction and possibly falling out of barrel.	
59									
60									

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Date Started:	09/09/2019	Surface Elevation:	460.4 ft amsl	Boring No.: MW-92s	
Date Completed:	09/10/2019	Northing (NAD83):	2102811.6		
Drilling Co.:	Cascade	Easting (NAD83):	7617576.7	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	77 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Prosonic Truck Mounted	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Steve Vasquez	Depth to First Water:	4.6 ft bgs		
Drilling Asst:	L. Amaya / O. Flores	Sampling Method:	4 inch x 10 ft. Core Barrel	Project Number:	RC000753.0051
Logger:	David Cornell	Sampling Interval:	Screen Intervals		
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
61	90			Topock - Fluvial Deposits	SP				
62				Topock - Fluvial Deposits	SP		(62.0 - 64.5') Topock - Fluvial Deposits; (SP); brown (10YR 5/3); very fine grained to medium grained, subangular to subround; trace coarse grained sand; trace silt; trace clay; wet		
63									
64									
65							(64.5 - 67.0') No recovery (NR)		
66					NR				
67									
68	108	No Sieve Samples Collected		Topock - Fluvial Deposits	SP		(67.0 - 69.0') Topock - Fluvial Deposits; (SP); brown (10YR 4/3); very fine grained to medium grained, subangular to subround; trace coarse grained sand; trace silt; trace clay; wet	(67.0 - 77.0') Heaving sands. Full recovery not obtained likely due to compaction.	
69				Topock - Fluvial Deposits	SP-SM		(69.0 - 74.5') Topock - Fluvial Deposits; (SP-SM); brown (10YR 4/3); very fine grained to medium grained, subangular to subround; trace granules to small pebbles, angular to subangular; trace coarse grained sand; trace silt; trace clay; wet		
70									
71									
72									
73									
74									
75				Topock - Fluvial Deposits	SP		(74.5 - 76.0') Topock - Fluvial Deposits; Poorly graded sand with gravel (SP); brown (10YR 5/3); very fine grained to very coarse grained, subangular to subround; some small to large pebbles, subround to round; trace silt; trace clay		
76									
77					NR		(76.0 - 77.0') No recovery (NR)		
End of Boring at 77.0' bgs.									
78									
79									
80									

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