

Date Started: 08/26/2019	Surface Elevation: 483.88 ft amsl	Well ID: MW-82-46, MW-82-112
Date Completed: 10/15/2019	Shallow Well Elevation: 484.46 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 484.36 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2103053.57	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615991.39	Location: PG&E Topock, Needles, California
Drilling Asst: J. Colon \ F. Sandar	Borehole Diameter: 10-12 inches	
Logger: Auguste Parrinello	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Grant Willford	Development End Date: 9/20/2019	
Total Depth: 117 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					(+1.0 - 2.0') Surface completion		(+1.0 - 2.0') 20 bags Note: 30" Diameter Concrete Pad with 18" Diameter Lockable Vault, Quickcrete Concrete Mix with Buff dye
1					(+0.6 - 26.0') 2" PVC Sch 40 Casing		
2					(1.8 - 22.0') Portland Cement 6% Bentonite Type I, II and V with Hydrogel		(1.8 - 22.0') 90 gallons (106%) Note: Grout seal
3					(0.0 - 8.0') 12.0" Borehole		
4							
5							
6							
7							
8							
9			NR				
10					(9.5 - 10.5') Centralizer		
11						(1.8 - 22.0') 85.1 gallons	
12							
13							
14							
15							
16							
17							
18		Topock - Fill	SP		(8.0 - 117.0') 10.0" Borehole		

WELL CONSTRUCTION DETAILS_PG&E TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\120820\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/14/20 11:20

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: solid blue and hollow blue water table marks represent depth to water (ft. bgs.) measured post development for the shallow well and deep well respectively; installed in MW-82s

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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
20		Topock - Fill	SP	SP	(+0.6 - 26.0') 2" PVC Sch 40 Casing	(1.8 - 22.0') 85.1 gallons	
21							
22							
23					(22.0 - 24.0') Bentonite seal chips Puregold Medium Chips	(22.0 - 24.0') 1.4 bags	(22.0 - 24.0') 1.5 bags (107%) Note: Seal between filter pack and grout.
24							
25			NR	NR			
26							
27					(26.0 - 46.0') 2" Sch 40 PVC (20-slot) Screen		
28		Topock - Fill	SP	SP		(8.0 - 117.0') 10.0" Borehole	
29							
30							
31							
32					(24.0 - 50.0') Cemex #3 MESH (8x20) Lapis Lustre Sand Lapis	(24.0 - 50.0') 25.5 bags	(24.0 - 50.0') 31 bags (122%) Note: Filter pack, used >20% of the calculated volume due to potential voids forming during drilling.
33							
34	MW-H-VAS-32-37 (< 0.17 U ppb) 8/7/2019 11:30		NR	NR			
35							
36							
37							
38		Topock - Fluvial Deposits	SM	SM			

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WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\120820\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/14/20 11:20

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Driller Name: Eddie Ramos	Easting (NAD83): 7615991.39	Location: PG&E Topock, Needles, California
Drilling Asst: J. Colon \ F. Sandar	Borehole Diameter: 10-12 inches	
Logger: Auguste Parrinello	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Grant Willford	Development End Date: 9/20/2019	
Total Depth: 117 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
40 - 42		Topock - Fluvial Deposits	SM		(26.0 - 46.0') 2" Sch 40 PVC (20-slot) Screen		
42 - 45	--no sample-- (Interval did not produce.) 8/6/2019 10:00	Topock - Fluvial Deposits	SM		(24.0 - 50.0') Cemex #3 MESH (8x20) Lapis Lustris Sand Lapis	(24.0 - 50.0') 25.5 bags	(24.0 - 50.0') 31 bags (122%) Note: Filter pack, used >20% of the calculated volume due to potential voids forming during drilling.
45 - 46		Topock - Fluvial Deposits	ML				
46 - 47					(46.5 - 47.5') Centralizer		
47 - 49	MW-H-VAS-47-52 (< 0.17 U ppb) 8/7/2019 13:30				(46.0 - 48.3') Sump and PVC End Cap		
49 - 50					(8.0 - 117.0') 10.0" Borehole		
50 - 55					(50.0 - 90.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(50.0 - 90.0') 29.1 buckets	(50.0 - 90.0') 40 buckets (137%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids forming during drilling.
55 - 58			NR				

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Drilling Method: Sonic Drilling	Northing (NAD83): 2103053.57	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615991.39	Location: PG&E Topock, Needles, California
Drilling Asst: J. Colon \ F. Sandar	Borehole Diameter: 10-12 inches	
Logger: Auguste Parrinello	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Grant Willford	Development End Date: 9/20/2019	
Total Depth: 117 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
60					(+0.5 - 92.0') 2" PVC Sch 40 Casing		
61							
62							
63							
64							
65							
66							
67							
68							
69			NR		(50.0 - 90.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(50.0 - 90.0') 29.1 buckets	(50.0 - 90.0') 40 buckets (137%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids forming during drilling.
70							
71							
72							
73							
74							
75					(74.5 - 75.5') Centralizer		
76							
77							
78							

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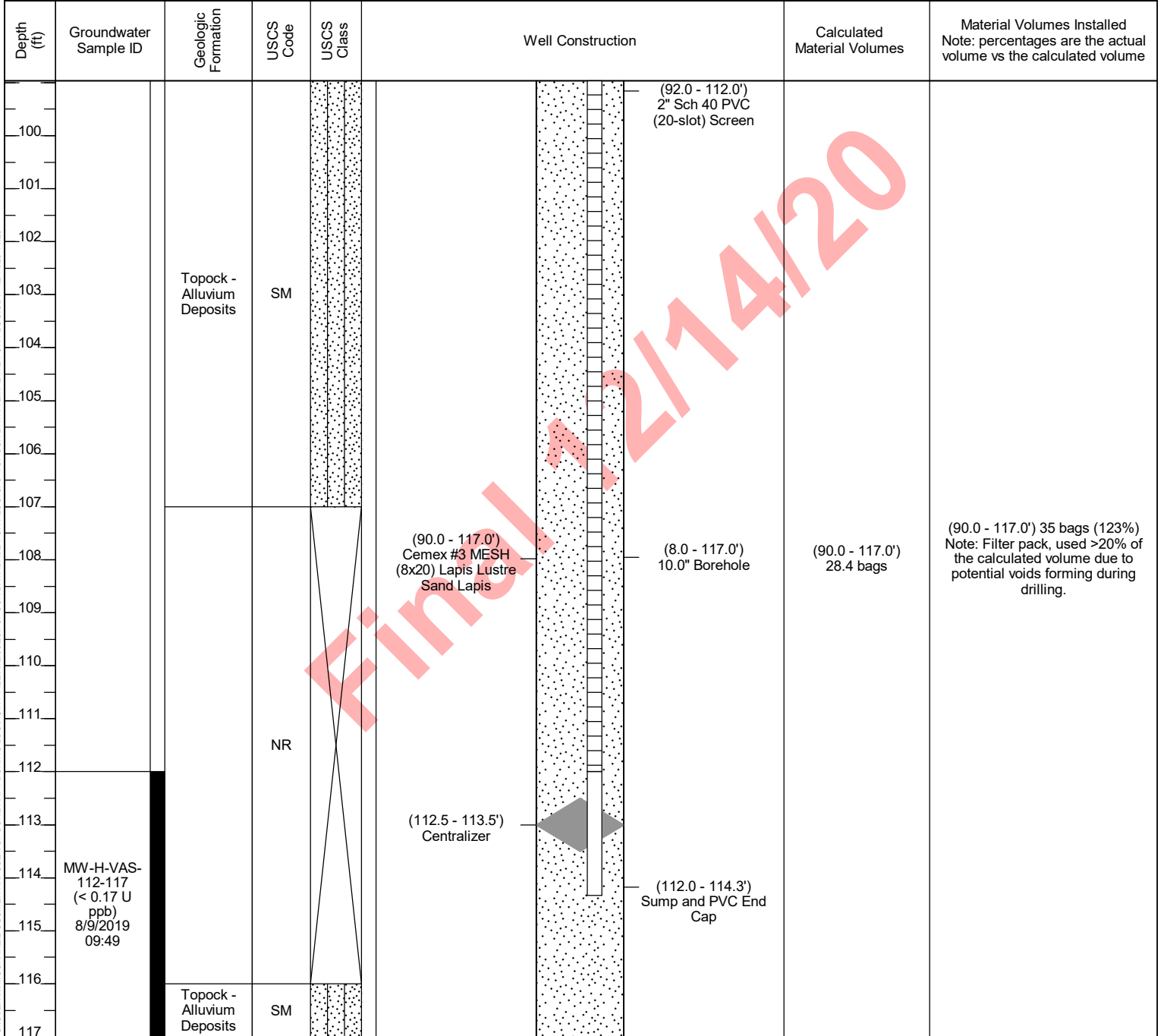
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Drilling Method: Sonic Drilling	Northing (NAD83): 2103053.57	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615991.39	Location: PG&E Topock, Needles, California
Drilling Asst: J. Colon \ F. Sandar	Borehole Diameter: 10-12 inches	
Logger: Auguste Parrinello	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Grant Willford	Development End Date: 9/20/2019	
Total Depth: 117 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
80					(+0.5 - 92.0') 2" PVC Sch 40 Casing		
81							
82							
83			NR				
84	MW-H-VAS-82-87 (< 0.0333 U ppb) 8/9/2019 08:12				(50.0 - 90.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(50.0 - 90.0') 29.1 buckets	(50.0 - 90.0') 40 buckets (137%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids forming during drilling.
85							
86							
87							
88							
89					(8.0 - 117.0') 10.0" Borehole		
90		Topock - Alluvium Deposits	SM				
91							
92					(92.0 - 112.0') 2" Sch 40 PVC (20-slot) Screen		
93							
94					(90.0 - 117.0') Cemex #3 MESH (8x20) Lapis Lustre Sand Lapis	(90.0 - 117.0') 28.4 bags	(90.0 - 117.0') 35 bags (123%) Note: Filter pack, used >20% of the calculated volume due to potential voids forming during drilling.
95							
96							
97							
98		Topock - Alluvium Deposits	SM				

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Driller Name: Eddie Ramos	Easting (NAD83): 7615991.39	Location: PG&E Topock, Needles, California
Drilling Asst: J. Colon \ F. Sandar	Borehole Diameter: 10-12 inches	
Logger: Auguste Parrinello	Static Water Level: See Log for Depths	Project Number: RC000753.0051
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End of Boring at 117.0 ft bgs.

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Date Started:	08/24/2019	Surface Elevation:	483.88 ft amsl	Boring No.: MW-82s	
Date Completed:	08/26/2019	Northing (NAD83):	2103053.57		
Drilling Co.:	Cascade	Easting (NAD83):	7615991.39	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	117 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track Mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	28.5 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	J. Colon \ F. Sandar	Sampling Method:	8 inch x 10 ft. Core Barrel		
Logger:	Auguste Parrinello	Sampling Interval:	17-47 and 87-117		
Editor:	Grant Willford	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-82d.	(0.0 - 7.0') Soft drilling	
2									
3									
4	0								
5									
6									
7									
8								(7.0 - 17.0') Soft drilling	
9					NR				
10		No sieve samples collected							
11									
12	0								
13									
14									
15									
16									
17									
18				Topock - Fill	SP		(17.0 - 24.0') Topock - Fill; Poorly graded sand (SP); very pale brown (10YR 7/3); very fine grained to fine grained, angular to subround; trace silt; moist; no odor; homogeneous; no staining	(17.0 - 27.0') Soft drilling. No recovery from approximately 24 to 27 ft bgs due to compaction of soft material.	
19	84								
20									

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Date Started: 08/24/2019	Surface Elevation: 483.88 ft amsl	Boring No.: MW-82s
Date Completed: 08/26/2019	Northing (NAD83): 2103053.57	
Drilling Co.: Cascade	Easting (NAD83): 7615991.39	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 117 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type: Boart Longyear Track Mount	Borehole Diameter: 10-12 inches	Location: PG&E Topock, Needles, California
Driller Name: Eddie Ramos	Depth to First Water: 28.5 ft bgs	Project Number: RC000753.0051
Drilling Asst: J. Colon \ F. Sandar	Sampling Method: 8 inch x 10 ft. Core Barrel	
Logger: Auguste Parrinello	Sampling Interval: 17-47 and 87-117	
Editor: Grant Willford	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	84			Topock - Fill	SP				
22									
23									
24									
25	48	No sieve samples collected			NR		(24.0 - 27.0') No recovery (NR)		
26									
27									
28									
29									
30									
31									
32	120			Topock - Fluvial Deposits	SM		(37.0 - 44.5') Topock - Fluvial Deposits; Silty sand (SM); dark yellowish brown (10YR 3/4); very fine grained to fine grained, angular to subround; little silt; trace clay; moist; no odor; homogeneous; no staining	(37.0 - 47.0') Soft drilling	
33									
34									
35									
36									
37									
38									
39									
40									

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Date Completed:	08/26/2019	Northing (NAD83):	2103053.57		
Drilling Co.:	Cascade	Easting (NAD83):	7615991.39	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	117 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track Mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	28.5 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	J. Colon \ F. Sandar	Sampling Method:	8 inch x 10 ft. Core Barrel		
Logger:	Auguste Parrinello	Sampling Interval:	17-47 and 87-117		
Editor:	Grant Willford	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	120		--no sample-- (Interval did not produce.) 8/6/2019 10:00	Topock - Fluvial Deposits	SM		(44.5 - 45.0') Topock - Fluvial Deposits; Silty sand (SM); dark yellowish brown (10YR 3/4); very fine grained to fine grained, angular to subround; some silt; little clay; moist; no odor; stratified; no staining; increase in silt and clay			
42				Topock - Fluvial Deposits	SM					
43				Topock - Fluvial Deposits	ML		(45.0 - 47.0') Topock - Fluvial Deposits; Silt with sand (ML); dark yellowish brown (10YR 3/4); medium plasticity; some very fine to fine grained sand, angular to subround; little clay; trace small to medium pebbles, angular to subangular; moist; soft to medium stiff; no odor; lensed; no staining			
44							(47.0 - 87.0') No recovery (NR); Core not collected or logged see MW-82d.			
45	0	No sieve samples collected	MW-H-VAS-47-52 (< 0.17 U ppb) 8/7/2019 13:30					(47.0 - 57.0') Soft drilling		
46										
47										
48										
49										
50										
51										
52										
53										
54							NR			
55										
56										
57										
58										
59										
60										

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Driller Name:	Eddie Ramos	Depth to First Water:	28.5 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	J. Colon \ F. Sandar	Sampling Method:	8 inch x 10 ft. Core Barrel		
Logger:	Auguste Parrinello	Sampling Interval:	17-47 and 87-117		
Editor:	Grant Willford	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									
62									
63	0								
64									
65									
66									
67								(67.0 - 77.0) Soft drilling	
68									
69									
70		No sieve samples collected			NR				
71									
72	0								
73									
74									
75									
76									
77								(77.0 - 87.0) Soft drilling	
78									
79	0								
80									

Final 12/19/20

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Logger: Auguste Parrinello	Sampling Interval: 17-47 and 87-117	
Editor: Grant Willford	Converted to Well: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

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81	0		MW-H-VAS-82-87 (< 0.0333 U ppb) 8/9/2019 08:12		NR				
82									
83									
84									
85	No sieve samples collected			Topock - Alluvium Deposits	SM		(87.0 - 97.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very coarse grained, angular; some granules to large pebbles, angular; some silt; trace clay; moist to wet; no odor; homogeneous; no staining	(87.0 - 97.0') Soft drilling	
86									
87									
88									
89									
90									
91									
92									
93									
94									
95	120			Topock - Alluvium Deposits	SM		(97.0 - 107.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very coarse grained, angular; some granules to large pebbles, angular; some silt; trace clay; moist to wet; no odor; homogeneous; no staining	(97.0 - 107.0') Rough drilling	
96									
97									
98									
99									
100									

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 data was collected from MW-82d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-H-46, MW-H-112 installed in borehole

SOIL BORING LOG: PG&E TOPOCK C:\USERS\SMC\GRAND\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\12.08.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/09/20 21:52

Date Started: 08/24/2019	Surface Elevation: 483.88 ft amsl	Boring No.: MW-82s
Date Completed: 08/26/2019	Northing (NAD83): 2103053.57	
Drilling Co.: Cascade	Easting (NAD83): 7615991.39	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 117 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type: Boart Longyear Track Mount	Borehole Diameter: 10-12 inches	Location: PG&E Topock, Needles, California
Driller Name: Eddie Ramos	Depth to First Water: 28.5 ft bgs	Project Number: RC000753.0051
Drilling Asst: J. Colon \ F. Sandar	Sampling Method: 8 inch x 10 ft. Core Barrel	
Logger: Auguste Parrinello	Sampling Interval: 17-47 and 87-117	
Editor: Grant Willford	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
101	120			Topock - Alluvium Deposits	SM				
102									
103									
104									
105									
106									
107									
108	12	No sieve samples collected		Topock - Alluvium Deposits	NR		(107.0 - 116.0') No recovery (NR)	(107.0 - 117.0') Soft drilling. No Recovery from approximately 107 to 116 ft bgs due too extremely loose and wet sands falling out of core barrel.	
109									
110									
111									
112									
113									
114									
115									
116									
117									
118				Topock - Alluvium Deposits	SM		(116.0 - 117.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very coarse grained, angular; some granules to large pebbles, angular; little silt; trace large cobbles, angular; trace clay; wet; no odor; homogeneous; no staining		
119							End of Boring at 117.0 ft bgs.		
120									

Final 1219120

MW-H-VAS-112-117 (< 0.17 U ppb) 8/9/2019 09:49

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 data was collected from MW-82d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-H-46, MW-H-112 installed in borehole

SOIL BORING LOG: PG&E TOPOCK C:\USERS\MCGRANED\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\12.08.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/09/20 21:52