

Date Started: 06/14/2019	Surface Elevation: 465.81 ft amsl	Well ID: MW-86-30, MW-86-66
Date Completed: 08/01/2019	Shallow Well Elevation: 468.02 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 467.91 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2103339.99	Project: Final GW Remedy Phase 1
Driller Name: Dan O'Mara	Easting (NAD83): 7616129.88	Location: PG&E Topock, Needles, California
Drilling Asst: Jario Pacheco	Borehole Diameter: 10-12 inches	
Logger: Michael Andrews	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 7/17/2019	
Total Depth: 70 ft bgs	Well Completion: <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	

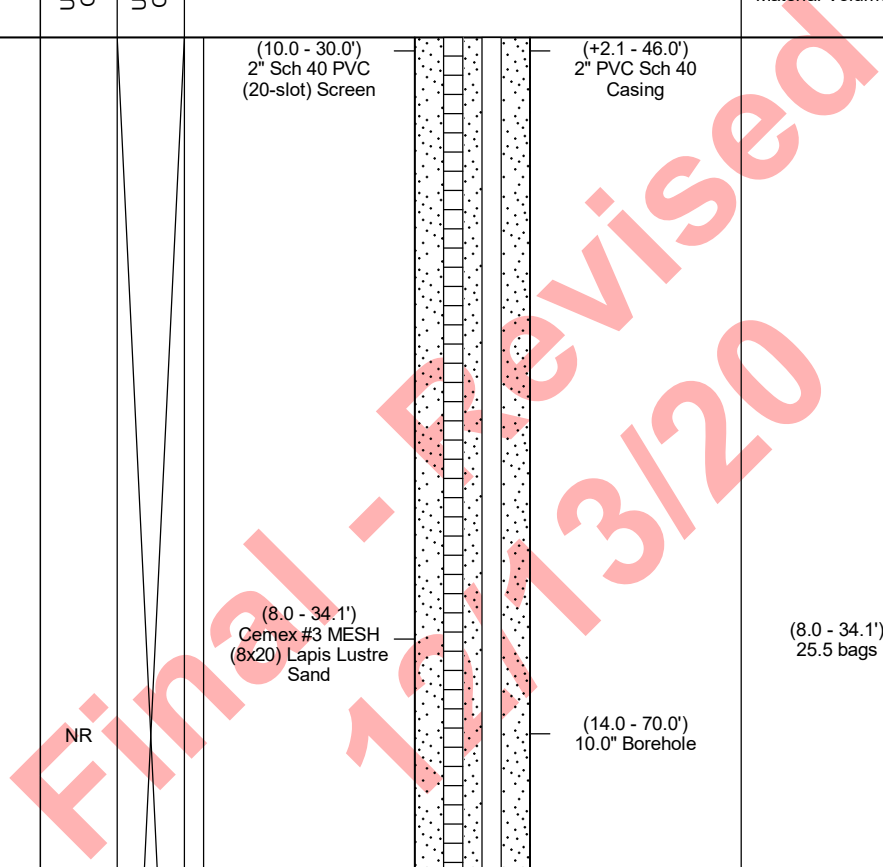
Depth (ft)	Groundwater Sample ID	Geologic Formation	USCS Code	USCS Class	Well Construction	Calculated Material Volumes	Material Volumes Installed Note: percentages are the actual volume vs the calculated volume
0					(+2.2 - 10.0') 2" PVC Sch 40 Casing		Note: 12x12-inch Lockable Steel Monument
1					(+2.1 - 46.0') 2" PVC Sch 40 Casing		
2					(+3.1 - 5.0') Surface completion		Note: 24-inch Diameter Concrete Well Pad, King Kon-Crete 4000 PSI. Removed 4 feet of grout seal in preparation for the installation of the monument surface completion.
3							
4							
5			NR		(5.0 - 6.0') Portland Cement 5% Bentonite Type I, II and V with Hydrogel	(5.0 - 6.0') 33.3 gallons	(5.0 - 6.0') 35 gallons (105%) Note: Grout seal
6					(6.0 - 8.0') Bentonite seal chips Puregold Medium Chips	(6.0 - 8.0') 2.1 bags	(6.0 - 8.0') 2.5 bags (119%) Note: Seal above filter pack
7							
8							
9							
10					(10.0 - 30.0') 2" Sch 40 PVC (20-slot) Screen		
11							
12					(8.0 - 34.1') Cemex #3 MESH (8x20) Lapis Lustre Sand	(8.0 - 34.1') 25.5 bags	(8.0 - 34.1') 36 bags (141%) Note: Filter pack, used >20% of the calculated volume due to potential voids forming during drilling.
13	MW-O-VAS-12.5-17 (0.163 J ppb) 5/8/2019 14:20	Topock - Fluvial Deposits	SP				
14							
15							
16			NR		(14.0 - 70.0') 10.0" Borehole		

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, J = estimated value, 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-86s

WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\SMC\GRANDOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\120820\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/13/20 22:21

Date Started: 06/14/2019	Surface Elevation: 465.81 ft amsl	Well ID: MW-86-30, MW-86-66
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Drilling Co.: Cascade	Deep Well Elevation: 467.91 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2103339.99	Project: Final GW Remedy Phase 1
Driller Name: Dan O'Mara	Easting (NAD83): 7616129.88	Location: PG&E Topock, Needles, California
Drilling Asst: Jario Pacheco	Borehole Diameter: 10-12 inches	
Logger: Michael Andrews	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 7/17/2019	
Total Depth: 70 ft bgs	Well Completion: <input type="checkbox"/> Flush <input checked="" 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
18 - 30.0					(10.0 - 30.0') 2" Sch 40 PVC (20-slot) Screen		
18 - 46.0					(+2.1 - 46.0') 2" PVC Sch 40 Casing		
8.0 - 34.1					(8.0 - 34.1') Cemex #3 MESH (8x20) Lapis Lustre Sand	(8.0 - 34.1') 25.5 bags	(8.0 - 34.1') 36 bags (141%) Note: Filter pack, used >20% of the calculated volume due to potential voids forming during drilling.
27.0 - 70.0				NR	(14.0 - 70.0') 10.0" Borehole		
30.0 - 32.3					(30.0 - 32.3') Sump and PVC End Cap		
34.1 - 43.5					(34.1 - 43.5') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(34.1 - 43.5') 9 buckets	(34.1 - 43.5') 14 buckets (156%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids forming during drilling.



WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\SMC\GRANE\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\120820\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/13/20 22:21

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, J = estimated value, 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-86s

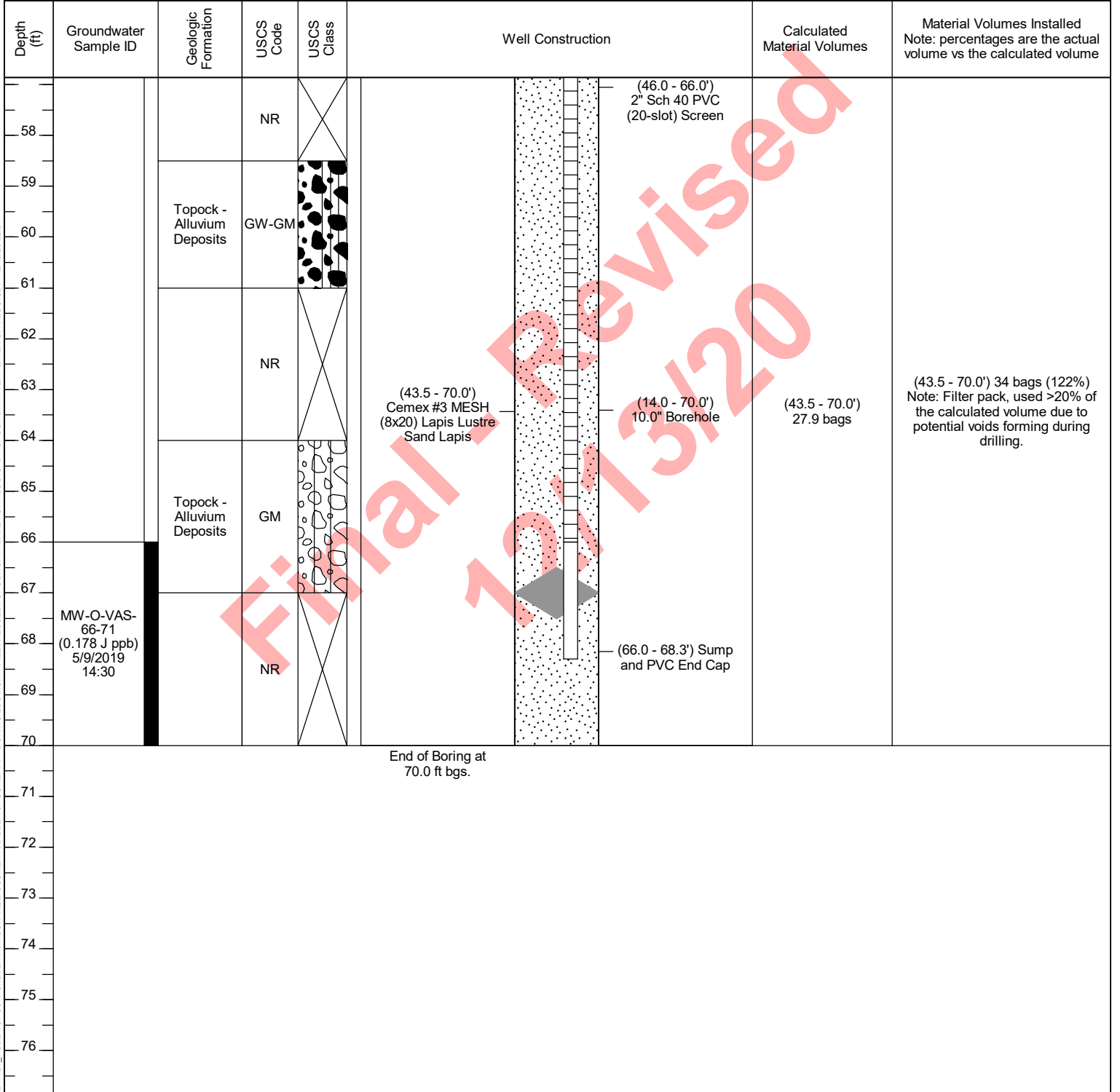
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Drilling Co.: Cascade	Deep Well Elevation: 467.91 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2103339.99	Project: Final GW Remedy Phase 1
Driller Name: Dan O'Mara	Easting (NAD83): 7616129.88	Location: PG&E Topock, Needles, California
Drilling Asst: Jario Pacheco	Borehole Diameter: 10-12 inches	
Logger: Michael Andrews	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 7/17/2019	
Total Depth: 70 ft bgs	Well Completion: <input type="checkbox"/> Flush <input checked="" 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
38					(+2.1 - 46.0') 2" PVC Sch 40 Casing		
39							
40					(34.1 - 43.5') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(34.1 - 43.5') 9 buckets	(34.1 - 43.5') 14 buckets (156%) Note: Intermediate seal, used >20% of the calculated volume due to potential voids forming during drilling.
41							
42							
43							
44							
45							
46					(46.0 - 66.0') 2" Sch 40 PVC (20-slot) Screen		
47				NR	(14.0 - 70.0') 10.0" Borehole		
48							
49							
50					(43.5 - 70.0') Cemex #3 MESH (8x20) Lapis Lustre Sand Lapis	(43.5 - 70.0') 27.9 bags	(43.5 - 70.0') 34 bags (122%) Note: Filter pack, used >20% of the calculated volume due to potential voids forming during drilling.
51	MW-O-VAS-51-56 (<0.033 U ppb) 5/9/2019 09:18						
52							
53							
54							
55							
56							

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Date Completed: 08/01/2019	Shallow Well Elevation: 468.02 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 467.91 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2103339.99	Project: Final GW Remedy Phase 1
Driller Name: Dan O'Mara	Easting (NAD83): 7616129.88	Location: PG&E Topock, Needles, California
Drilling Asst: Jario Pacheco	Borehole Diameter: 10-12 inches	
Logger: Michael Andrews	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 7/17/2019	
Total Depth: 70 ft bgs	Well Completion: <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Stick-up <input type="checkbox"/> To Be Completed in Well Vault	



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Date Started:	06/12/2019	Surface Elevation:	465.81 ft amsl	Boring No.: MW-86s	
Date Completed:	06/13/2019	Northing (NAD83):	2103339.99		
Drilling Co.:	Cascade	Easting (NAD83):	7616129.88	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	70 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	10.0 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	Jario Pacheco	Sampling Method:	8 inch x 10 ft Core Barrel		
Logger:	Michael Andrews	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
1							(0.0 - 10.0') No recovery (NR); core not collected or logged, see lithology log for MW-86d	(0.0 - 14.0') 12 inch conductor casing fell downhole.	
2									
3									
4									
5	0				NR				
6									
7									
8									
9									
10									
11							(10.0 - 16.0') Topock - Fluvial Deposits; Poorly graded sand (SP); dark yellowish brown (10YR 4/4); fine grained to medium grained; trace silt; wet		(10.0 - 16.0') 80 gallons of water used; 50 gallons of water recovered; 30 gallons of water lost
12									
13	72		MW-O-VAS-12.5-17 (0.163 J ppb) 5/8/2019 14:20	Topock - Fluvial Deposits	SP				
14									
15									
16									
17							(16.0 - 58.5') No recovery (NR); Loose sands, which fell out of core barrel several times, see lithology log for MW-86d		
18	0				NR				
19									
20									

Final - Revised 2/13/20

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, J = estimated value, NR = no recovery; Notes: depth to water and groundwater samples collected during drilling of the MW-86d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-86-30, MW-86-66 installed in borehole

SOIL BORING LOG: PG&E TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\12.08.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 12/13/20 22:09

Date Started:	06/12/2019	Surface Elevation:	465.81 ft amsl	Boring No.: MW-86s	
Date Completed:	06/13/2019	Northing (NAD83):	2103339.99		
Drilling Co.:	Cascade	Easting (NAD83):	7616129.88	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	70 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	10.0 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	Jario Pacheco	Sampling Method:	8 inch x 10 ft Core Barrel		
Logger:	Michael Andrews	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									
22									
23	0								
24									
25									
26									
27									
28									
29									
30					NR				
31	0								
32									
33									
34									
35									
36								(35.0 - 56.0') Rough drilling	
37									
38	0								
39									
40									

Final - Revised 12/13/20

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, J = estimated value, NR = no recovery; Notes: depth to water and groundwater samples collected during drilling of the MW-86d; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-86-30, MW-86-66 installed in borehole

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Date Completed: 06/13/2019	Northing (NAD83): 2103339.99	
Drilling Co.: Cascade	Easting (NAD83): 7616129.88	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 70 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type: Terrasonic track mount	Borehole Diameter: 10-12 inches	Location: PG&E Topock, Needles, California
Driller Name: Dan O'Mara	Depth to First Water: 10.0 ft bgs	Project Number: RC000753.0051
Drilling Asst: Jario Pacheco	Sampling Method: 8 inch x 10 ft Core Barrel	
Logger: Michael Andrews	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	0								
44									
45									
46									
47									
48									
49									
50					NR				
51	0								
52									
53			MW-O-VAS-51-56 (<0.033 U ppb) 5/9/2019 09:18						
54									
55									
56									
57									
58									
59	30			Topock - Alluvium Deposits	GW-GM		(58.5 - 61.0') Topock - Alluvium Deposits; Well graded gravel with silt and sand (GW-GM); dark yellowish brown (10YR 4/4); granules to large pebbles, angular to subangular; little very fine to very coarse grained sand, angular to subangular; little silt; wet; 70,20,10,0	(58.5 - 67.0') Core lost downhole, core recovered some intervals	
60									

Final - Revised 12/13/20

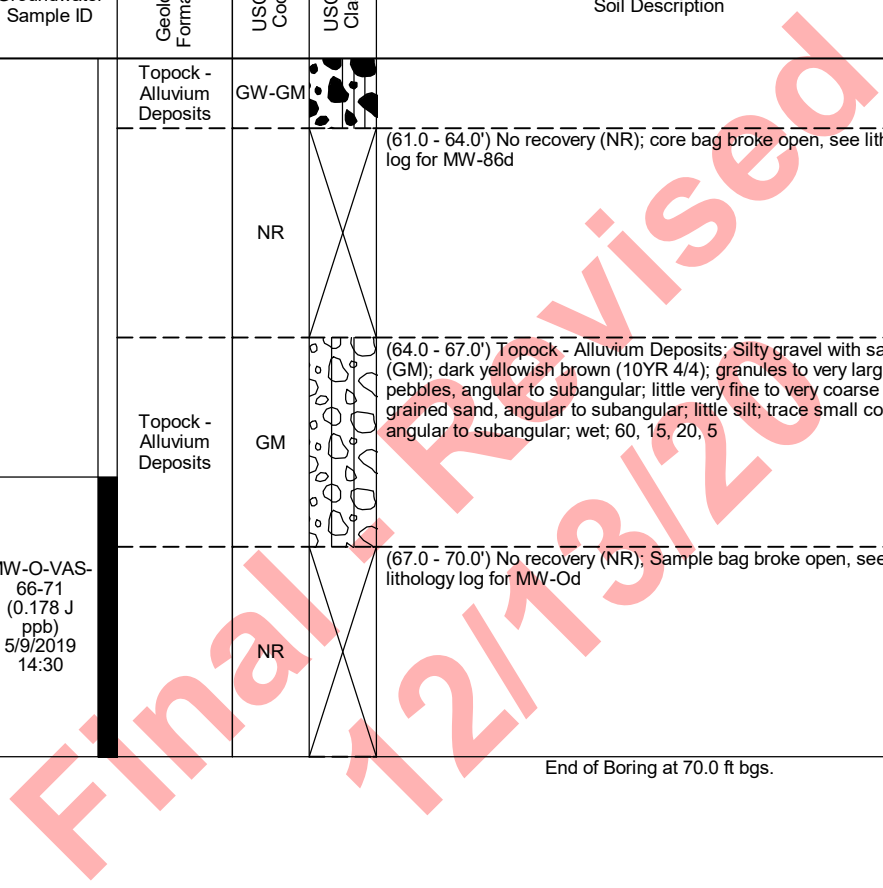
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Drilling Co.:	Cascade	Easting (NAD83):	7616129.88	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	70 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Terrasonic track mount	Borehole Diameter:	10-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Dan O'Mara	Depth to First Water:	10.0 ft bgs	Project Number:	RC000753.0051
Drilling Asst:	Jario Pacheco	Sampling Method:	8 inch x 10 ft Core Barrel		
Logger:	Michael Andrews	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	30			Topock - Alluvium Deposits	GW-GM			lost when core bags broke.	
62					NR		(61.0 - 64.0') No recovery (NR); core bag broke open, see lithology log for MW-86d		
65	36			Topock - Alluvium Deposits	GM		(64.0 - 67.0') Topock - Alluvium Deposits; Silty gravel with sand (GM); dark yellowish brown (10YR 4/4); granules to very large pebbles, angular to subangular; little very fine to very coarse grained sand, angular to subangular; little silt; trace small cobbles, angular to subangular; wet; 60, 15, 20, 5	(65.0 - 70.0') Drill rods chattering	(65.0 - 70.0') 200 gallons of water used; 20 gallons of water recovered; 180 gallons of water lost
67			MW-O-VAS-66-71 (0.178 J ppb) 5/9/2019 14:30		NR		(67.0 - 70.0') No recovery (NR); Sample bag broke open, see lithology log for MW-Od		
70							End of Boring at 70.0 ft bgs.		
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									

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