

Date Started: 12/04/2019	Surface Elevation: 478.39 ft amsl	Well ID: MW-81-43, MW-81-98
Date Completed: 01/09/2020	Shallow Well Elevation: 478.02 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 477.91 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102850.62	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615928.21	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 10-12 inches	
Logger: KK / SM / GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 1/8/2020	
Total Depth: 180 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					(+0.2 - 2.3') Surface completion		(+0.2 - 2.3') 14 bags Note: 30" diameter concrete pad with 18" diameter lockable vault, King Kon-Crete 4000 PSI
1					(0.4 - 22.8') 2" PVC Sch 80 Casing		
2					(0.5 - 78.0') 2" PVC Sch 80 Casing		
3		Topock - Fill	SP-SC				
4							
5							
6							
7							
8		Topock - Fluvial Deposits	SC		(2.0 - 15.0') Portland Cement 6% Bentonite Type I, II and V and Hydrogel (8.5 - 9.5') Centralizer	(2.0 - 15.0') 72.1 gallons	(2.0 - 15.0') 135 gallons (187%) Note: Grout seal. Used >20% of the calculated volume due to potential voids that formed during drilling and grout migration into the formation.
9							
10		Topock - Fluvial Deposits	SP-SC		(0.0 - 23.0') 12.0" Borehole		
11							
12							
13							
14							
15							
16		Topock - Fluvial Deposits	SP		(15.0 - 21.0') Cemex #0/30 MESH (30x50) Lapis Lustre Sand	(15.0 - 21.0') 8.9	(15.0 - 21.0') 9 (101%) Note: Transition sand between filter pack and grout seal
17							
18							
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: 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-81/IRZ-19 Pilot

WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/16/20 13:25

Date Started: 12/04/2019	Surface Elevation: 478.39 ft amsl	Well ID: MW-81-43, MW-81-98
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Drilling Co.: Cascade	Deep Well Elevation: 477.91 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102850.62	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615928.21	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 10-12 inches	
Logger: KK / SM / GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 1/8/2020	
Total Depth: 180 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
20		Topock - Fluvial Deposits	SP		(0.4 - 22.8') 2" PVC Sch 80 Casing	(15.0 - 21.0') 8.9	
21					(0.5 - 78.0') 2" PVC Sch 80 Casing		
22					(0.0 - 23.0') 12.0" Borehole		
23		Topock - Fluvial Deposits	SW		(22.8 - 42.8') 2" 0.020-Slot Sch 80 PVC Screen		
24							
25		Topock - Fluvial Deposits	SW-SC				
26							
27		Topock - Fluvial Deposits	SP				
28							
29	IRZ-19-VAS-27-32 (<0.033 U ppb) 9/6/2019 08:35	Topock - Fluvial Deposits	SM		(21.0 - 47.0') Cemex #3 MESH (8x10) Lapis Lustre Sand	(21.0 - 47.0') 28.3 bags	(21.0 - 47.0') 47 bags (166%) Note: Filter Pack. Used >20% of the calculated volume due to potential voids forming during drilling.
30							
31							
32		Topock - Fluvial Deposits	SM				
33							
34		Topock - Fluvial Deposits	SM				
35							
36		Topock - Alluvium Deposits	SW-SM				
37							
38	IRZ-19-VAS-37-42 (<0.033 U ppb) 9/6/2019 14:10	Topock - Alluvium Deposits	SW				
39							

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WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/16/20 13:25

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Drilling Co.: Cascade	Deep Well Elevation: 477.91 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102850.62	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615928.21	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 10-12 inches	
Logger: KK / SM / GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 1/8/2020	
Total Depth: 180 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	IRZ-19-VAS-37-42 (<0.033 U ppb) 9/6/2019 14:10	Topock - Alluvium Deposits	SW	[Pattern]	(22.8 - 42.8') 2" 0.020-Slot Sch 80 PVC Screen		
41					(0.5 - 78.0') 2" PVC Sch 80 Casing		
42							
43					(21.0 - 47.0') Cemex #3 MESH (8x10) Lapis Lustre Sand	(21.0 - 47.0') 28.3 bags	(21.0 - 47.0') 47 bags (166%) Note: Filter Pack. Used >20% of the calculated volume due to potential voids forming during drilling.
44				(43.5 - 44.5') Centralizer			
45					(42.8 - 45.1') Sump and SS End Cap		
46							
47							
48		Topock - Alluvium Deposits	SM	[Pattern]	(23.0 - 180.0') 10.0" Borehole		
49							
50							
51							
52							
53					(47.0 - 71.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(47.0 - 71.0') 20.1 buckets	(47.0 - 71.0') 22 buckets (109%) Note: Intermediate seal
54							
55		Topock - Alluvium Deposits	SW	[Pattern]			
56							
57		Topock - Alluvium Deposits	SM	[Pattern]			
58							
59							

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WELL CONSTRUCTION DETAILS_PG&E_TOPOCK_C:\USERS\SMCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/16/20_13:25

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Drilling Method: Sonic Drilling	Northing (NAD83): 2102850.62	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615928.21	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 10-12 inches	
Logger: KK / SM / GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 1/8/2020	
Total Depth: 180 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		Topock - Alluvium Deposits	SM		(0.5 - 78.0') 2" PVC Sch 80 Casing		
61							
62		Topock - Alluvium Deposits	ML				
63							
64		Topock - Alluvium Deposits	SM		(64.5 - 65.5') Centralizer (47.0 - 71.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(47.0 - 71.0') 20.1 buckets	(47.0 - 71.0') 22 buckets (109%) Note: Intermediate seal
65							
66		Topock - Alluvium Deposits	SM				
67							
68		Topock - Alluvium Deposits	SM				
69							
70		Topock - Alluvium Deposits	SM		(23.0 - 180.0') 10.0" Borehole		
71							
72		Topock - Alluvium Deposits	NR		(71.0 - 76.0') Cemex #0/30 MESH (30x50) Lapis Lustre Sand	(71.0 - 76.0') 5.2 bags	(71.0 - 76.0') 6 bags (115%) Note: Transition sand between filter pack and intermediate seal
73							
74		Topock - Alluvium Deposits	ML		(76.0 - 105.2') Cemex #3 MESH (8x10) Lapis Lustre Sand	(76.0 - 105.2') 30.8 bags	(76.0 - 105.2') 43 bags (140%) Note: Filter pack. Used >20% of the calculated volume due to potential voids forming during drilling.
75							
76		Topock - Alluvium Deposits	ML		(78.0 - 98.0') 2" 0.020-Slot Sch 80 PVC Screen		
77							
78		Topock - Alluvium Deposits	ML				
79							

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WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/18/20 13:25

Date Started: 12/04/2019	Surface Elevation: 478.39 ft amsl	Well ID: MW-81-43, MW-81-98
Date Completed: 01/09/2020	Shallow Well Elevation: 478.02 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 477.91 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102850.62	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615928.21	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 10-12 inches	
Logger: KK / SM / GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 1/8/2020	
Total Depth: 180 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	IRZ-19-VAS-82-87 (<0.033 U ppb) 9/7/2019 14:10	Topock - Alluvium Deposits	ML		(78.0 - 98.0') 2" 0.020-Slot Sch 80 PVC Screen		
81							
82							
83							
84		Topock - Alluvium Deposits	SM				
85							
86							
87		Topock - Alluvium Deposits	SM		(76.0 - 105.2') Cemex #3 MESH (8x10) Lapis Lustre Sand	(23.0 - 180.0') 10.0" Borehole	(76.0 - 105.2') 30.8 bags
88							
89							
90							(76.0 - 105.2') 43 bags (140%) Note: Filter pack. Used >20% of the calculated volume due to potential voids forming during drilling.
91		Topock - Alluvium Deposits	CL				
92							
93							
94		Topock - Alluvium Deposits	ML				
95							
96							
97		Topock - Alluvium Deposits	SM				
98							
99					(98.5 - 99.5') Centralizer		

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Editor: Sean McGrane	Development End Date: 1/8/2020	
Total Depth: 180 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
100		Topock - Alluvium Deposits	SM		(98.0 - 100.3') Sump and SS End Cap		
101		Topock - Alluvium Deposits	SW-SM		(76.0 - 105.2') Cemex #3 MESH (8x10) Lapis Lustre Sand	(76.0 - 105.2') 30.8 bags	(76.0 - 105.2') 43 bags (140%) Note: Filter pack. Used >20% of the calculated volume due to potential voids forming during drilling.
102							
103		Topock - Alluvium Deposits	SM				
104		Topock - Alluvium Deposits	NR				
105							
106		Topock - Alluvium Deposits	SW				
107		Topock - Alluvium Deposits	SM		(23.0 - 180.0') 10.0" Borehole		
108							
109							
110							
111							
112							
113							
114							
115							
116							
117					(105.2 - 180.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(105.2 - 180.0') 65.2 buckets	(105.2 - 180.0') 85.5 buckets (131%) Note: Decommissioned rathole, used >20% of the calculated volume due to potential voids forming during drilling.
118							
119							

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Logger: KK / SM / GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 1/8/2020	
Total Depth: 180 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
120		Topock - Alluvium Deposits	SM				(105.2 - 180.0') 85.5 buckets (131%) Note: Decommissioned rathole, used >20% of the calculated volume due to potential voids forming during drilling.
121		Topock - Alluvium Deposits	SM				
122		Topock - Alluvium Deposits	SM				
123		Topock - Alluvium Deposits	SM				
124	IRZ-19-VAS-122-127 (<0.17 U ppb) 9/8/2019 13:45	Topock - Alluvium Deposits	SM				
125		Topock - Alluvium Deposits	SM				
126		Topock - Alluvium Deposits	SM				
127		Topock - Alluvium Deposits	SM				
128		Topock - Alluvium Deposits	SM				
129		Topock - Alluvium Deposits	SM				
130		Topock - Alluvium Deposits	SM				
131		Topock - Alluvium Deposits	SM				
132		Topock - Alluvium Deposits	ML				
133	IRZ-19-VAS-131-136 (<0.17 U ppb) 9/9/2019 10:35	Topock - Alluvium Deposits	ML				
134		Topock - Alluvium Deposits	ML				
135		Topock - Alluvium Deposits	ML				
136		Topock - Alluvium Deposits	ML				
137		Topock - Alluvium Deposits	SM				
138		Topock - Alluvium Deposits	SM				
139		Topock - Alluvium Deposits	ML				

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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
140							
141							
142							
143	IRZ-19-VAS-142-147 (<0.17 U ppb) 9/9/2019 16:40	Topock - Alluvium Deposits	ML				
144							
145							
146							
147							
148		Topock - Alluvium Deposits	SM				
149							
150					(105.2 - 180.0') Bentonite seal pellets Pel-Plug (TR30) 3/8"	(23.0 - 180.0') 10.0" Borehole	(105.2 - 180.0') 85.5 buckets (131%) Note: Decommissioned rathole, used >20% of the calculated volume due to potential voids forming during drilling.
151							
152							
153	IRZ-19-VAS-152-157 (<0.17 U ppb) 9/10/2019 12:00	Topock - Alluvium Deposits	ML				
154							
155							
156							
157							
158							
159							

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160							
161							
162							
163	IRZ-19-VAS-162-167 (<0.17 U ppb) 9/11/2019 11:25	Topock - Alluvium Deposits	SW-SM	[USCS Class Pattern]	[Well Construction Pattern]		
164							
165							
166							
167							
168		Topock - Alluvium Deposits	SM	[USCS Class Pattern]	[Well Construction Pattern]		
169							
170							
171							
172		Topock - Alluvium Deposits	ML	[USCS Class Pattern]	[Well Construction Pattern]		
173							
174							
175							
176							
177		Topock - Weathered Bedrock - conglomerate	ML	[USCS Class Pattern]	[Well Construction Pattern]		
178							
179							
178	IRZ-19-VAS-177-182 (<0.17 U ppb) 9/12/2019 10:38						
179							

Final 01/16/20

(105.2 - 180.0')
Bentonite seal pellets Pel-Plug (TR30) 3/8"

(23.0 - 180.0')
10.0" Borehole

(105.2 - 180.0')
65.2 buckets

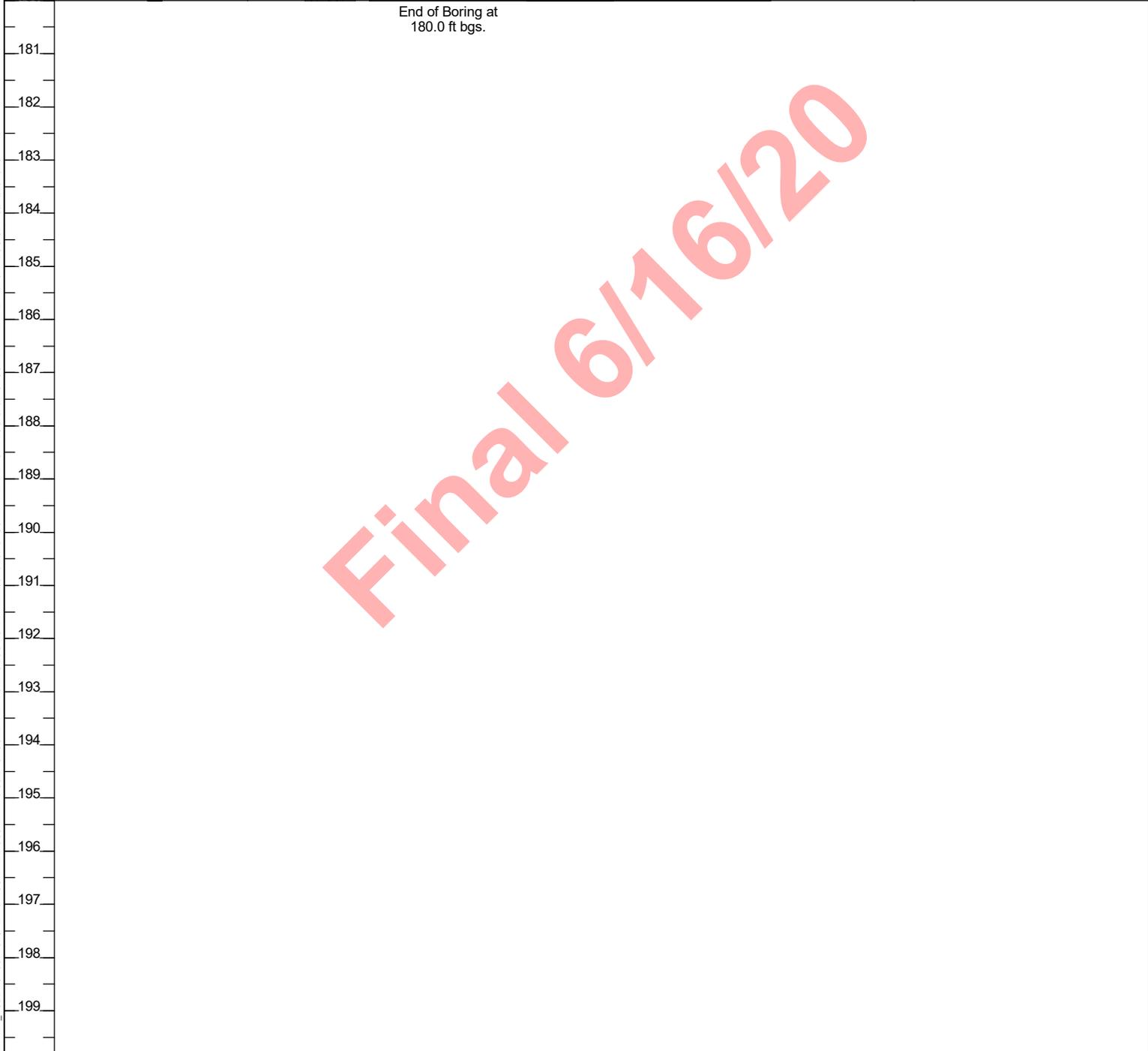
(105.2 - 180.0') 85.5 buckets (131%)
Note: Decommissioned rathole, used >20% of the calculated volume due to potential voids forming during drilling.

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WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/16/20 13:25

Date Started: 12/04/2019	Surface Elevation: 478.39 ft amsl	Well ID: MW-81-43, MW-81-98
Date Completed: 01/09/2020	Shallow Well Elevation: 478.02 ft amsl	
Drilling Co.: Cascade	Deep Well Elevation: 477.91 ft amsl	Client: PG&E
Drilling Method: Sonic Drilling	Northing (NAD83): 2102850.62	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Easting (NAD83): 7615928.21	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Candelaria	Borehole Diameter: 10-12 inches	
Logger: KK / SM / GW	Static Water Level: See Log for Depths	Project Number: RC000753.0051
Editor: Sean McGrane	Development End Date: 1/8/2020	
Total Depth: 180 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
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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-81/IRZ-19 Pilot

WELL CONSTRUCTION DETAILS_PG&E_TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/16/20 13:25

Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid				
1	(0.0 - 23.0) 0.00 mins/ft	SP-SC		(0.0 - 23.0') 12.0" Steel Casing	(0.0 - 8.0') Topock - Fill; Poorly graded sand with clay (SP-SC); light brown (7.5YR 6/3)	(1.0') Confirmed 12-inch conductor casing was lined up on pilot borehole, observed wildcat plastering sand at surface.	(0.0 - 180.0') 1500 gallons of water used; 1350 gallons of water recovered; 150 gallons of water lost				
2					(8.0 - 9.5') Topock - Fluvial Deposits; Clayey sand (SC); light brown (7.5YR 6/3)	(8.5') 12-inch conductor casing dropped approximately 10 ft. when drilling to 37 ft. with 10-inch casing.	(0.1 - 105.0') 1200 gallons of water used; 1080 gallons of water recovered; 120 gallons of water lost				
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16									(15.7 - 23.5') Topock - Fluvial Deposits; Poorly graded sand (SP); brown (7.5YR 5/3)	(16.0 - 17.0') Observed Cemex #3 Lapis Lustre Sand in drill cuttings.	
17											
18											
19											
20											

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, NR = no recovery; Notes: water level collected during the first VAS interval of the IRZ-19 pilot borehole

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Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
21	(0.0 - 23.0) 0.00 mins/ft	SP		(0.0 - 23.0') 12.0" Steel Casing			
22							
23	(23.0 - 180.0) mins/ft	SW-SC		(23.0 - 180.0') 10.0" Steel Casing	(23.5 - 24.0') Topock - Fluvial Deposits; Well graded sand with gravel (SW); light brown (7.5YR 6/3)	(22.0') Drilled trough gravelly zone.	
24					(24.0 - 27.0') Topock - Fluvial Deposits; Well graded sand with clay (SW-SC); brown (7.5YR 5/4)	(23.0') Total depth of conductor casing once it was retrieved and reset.	
25					(27.0 - 29.0') Topock - Fluvial Deposits; Poorly graded sand (SP); light brown (7.5YR 6/4)	(26.0 - 27.0') Observed Cemex #3 Lapis Lustre Sand in drill cuttings.	
26					(29.0 - 31.0') Topock - Fluvial Deposits; Silty sand (SM); light brown (7.5YR 6/4)		
27					(31.0 - 33.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); light brown (7.5YR 6/3)		
28					(33.0 - 36.2') Topock - Fluvial Deposits; Silty sand (SM); light brown (7.5YR 6/3)		
29					(34.5') brown (7.5YR 5/4)		
30					(36.2 - 38.0') Topock - Alluvium Deposits; Well graded sand with silt (SW-SM); brown (7.5YR 4/3)		
31					(38.0 - 47.0') Topock - Alluvium Deposits; Well graded sand (SW); brown (7.5YR 4/3)		
32							
33							
34							
35							
36							
37							
38							
39							
40							

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Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
41					(41') reddish brown (5YR 4/3)		
42							
43							
44		SW					
45							
46						(46.0 - 47.0') Observed trace amounts of Cemex #3 Lapis Lustre Sand in drill cuttings.	
47					(47.0 - 55.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/3)		
48							
49							
50	(23.0 - 180.0) mins/ft			(23.0 - 180.0') 10.0" Steel Casing	(50') brown (7.5YR 4/4)		
51		SM					
52							
53							
54							
55					(55.0 - 57.0') Topock - Alluvium Deposits; Well graded sand with silt and gravel (SW); brown (7.5YR 4/3)		
56		SW				(56.0 - 57.0') Observed trace amounts of Cemex #3 Lapis Lustre Sand in drill cuttings.	
57							
58					(57.0 - 62.4') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4)	(57.0 - 63.0') Core barrel cutting easy, driller states because of pilot borehole.	
59		SM					
60							

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Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
61		SM					
62							
63		ML			(62.4 - 63.1') Topock - Alluvium Deposits; Sandy silt (ML); brown (7.5YR 4/4)		
64					(63.1 - 67.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4)		
65		SM					
66						(66.0 - 67.0') Observed large amount of Cemex #3 Lapis Lustre Sand in drill cuttings.	
67					(67.0 - 72.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/3)		
68							
69							
70	(23.0 - 180.0) mins/ft	SM		(23.0 - 180.0') 10.0" Steel Casing			
71							
72							
73					(72.5 - 77.0') No recovery (NR)		
74		NR					
75							
76							
77					(77.0 - 84.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (7.5YR 4/4)		
78		ML					
79							
80							

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Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
81					(80') brown (7.5YR 4/3)		
82		ML					
83							
84					(84.0 - 87.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/3)		
85		SM					
86						(86.0 - 87.0') Observed very trace amounts of Cemex #3 Lapis Lustre Sand in drill cuttings.	
87					(87.0 - 92.1') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 4/3) to reddish brown / moderate brown (5YR 4/4)		
88							
89							
90	(23.0 - 180.0) mins/ft	SM		(23.0 - 180.0') 10.0" Steel Casing			
91							
92							
93		CL			(92.1 - 93.7') Topock - Alluvium Deposits; Sandy lean clay (CL); reddish brown / moderate brown (5YR 4/4)		
94							
95		ML			(93.7 - 96.1') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (5YR 4/3)		
96							
97					(96.1 - 101.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4) to reddish brown (5YR 4/3)	(96.0 - 97.0') Observed large amounts of Cemex #3 Lapis Lustre Sand in drill cuttings.	
98		SM					
99							
100							

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Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
101		SM					
102		SW-SM			(101.0 - 104.0') Topock - Alluvium Deposits; Well graded sand with silt and gravel (SW-SM); dark reddish brown / moderate brown (5YR 3/4)		
103							
104		SM			(104.0 - 104.5') Topock - Alluvium Deposits; Silty sand (SM); reddish brown / moderate brown (5YR 4/4)		
105		NR			(104.5 - 106.0') No recovery (NR)		
106		SW			(106.0 - 107.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW); reddish brown / moderate brown (5YR 4/4)	(106.0 - 107.0') Core fell out of core barrel and was retrieved with a flapper bit. Observed large amounts of Cemex #3 Lapis Lustre Sand in the retrieved drill cuttings.	
107					(107.0 - 121.3') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4)		
108							
109							
110	(23.0 - 180.0) mins/ft			(23.0 - 180.0') 10.0" Steel Casing			
111							
112							
113		SM					
114							
115							
116						(116.0 - 117.0') Observed large amounts of Cemex #3 Lapis Lustre Sand in drill cuttings.	
117					(117') reddish brown (5YR 4/3)		
118					(118') reddish brown (2.5YR 4/3) to reddish brown / moderate brown (5YR 4/4)		
119							
120							

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Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
121		SM					
122					(121.3 - 127.0') Topock - Alluvium Deposits; Silty sand (SM); reddish brown / moderate brown (5YR 4/4) to reddish brown (5YR 4/3)		
123							
124		SM					
125							
126						(126.0 - 127.0') Observed some Cemex #3 Lapis Lustre Sand in drill cuttings.	
127							
128					(127.0 - 133.7') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4)		
129							
130	(23.0 - 180.0) mins/ft	SM		(23.0 - 180.0') 10.0" Steel Casing			
131							
132							
133							
134		ML			(133.7 - 134.4') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (7.5YR 4/4)		
135					(134.4 - 137.0') Topock - Alluvium Deposits; Gravelly silt with sand (ML); reddish brown (5YR 5/3)		
136		ML				(136.0 - 137.0') Observed some Cemex #3 Lapis Lustre Sand in drill cuttings.	
137							
138		SM			(137.0 - 138.1') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 4/3)	(137.0 - 147.0') Core fell out of core barrel retrieved with flapper bit.	
139					(138.1 - 146.1') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown (5YR 4/4)		
140		ML					

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Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
141	(23.0 - 180.0) mins/ft	ML	[USCS Class Pattern]	(23.0 - 180.0') 10.0" Steel Casing	(146.1 - 150.6') Topock - Alluvium Deposits; Silty sand (SM); dark reddish brown (5YR 3/3) to reddish brown (5YR 4/3)	(146.0 - 147.0') Observed little to some Cemex #3 Lapis Lustre Sand in drill cuttings.	
142							
143							
144							
145							
146						(147.0 - 157.0') Core fell out of core barrel retrieved with flapper bit.	
147		SM	[USCS Class Pattern]		(150.6 - 154.4') Topock - Alluvium Deposits; Sandy silt (ML); dark reddish brown (5YR 3/3) to dark reddish brown / grayish brown (5YR 3/2)		
148							
149							
150							
151		ML	[USCS Class Pattern]		(154.4 - 157.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); dark reddish brown (5YR 3/3) to dark reddish brown / moderate brown (5YR 3/4)		
152							
153							
154							
155		SM	[USCS Class Pattern]		(157.0 - 167.5') Topock - Alluvium Deposits; Well graded sand with silt and gravel (SW-SM); dark reddish brown (5YR 3/3)	(156.0 - 157.0') Observed little to some Cemex #3 Lapis Lustre Sand in drill cuttings.	
156							
157							
158		SW-SM	[USCS Class Pattern]				
159							
160							

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, NR = no recovery; Notes: water level collected during the first VAS interval of the IRZ-19 pilot borehole

IRZ DRILLING LOG_PG&E_TOPOCK_C:\USERS\SMC\GRAND\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\06_16_20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/16/20 13:07

Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
161							
162							
163							
164		SW-SM					
165							
166						(166.0 - 167.0') Observed little to some Cemex #3 Lapis Lustre Sand in drill cuttings.	
167							
168					(167.5 - 171.1') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4)		
169		SM					
170	(23.0 - 180.0) mins/ft			(23.0 - 180.0') 10.0" Steel Casing			
171							
172					(171.1 - 178.5') Topock - Alluvium Deposits; Sandy silt (ML); reddish brown / moderate brown (5YR 4/4) with dark reddish brown (2.5YR 3/4)		
173							
174							
175		ML					
176						(176.0 - 177.0') Observed little to some Cemex 2/12 Lapis Lustre Sand in drill cuttings.	
177							
178							
179					(178.5 - 180.0') Topock - Weathered Bedrock - conglomerate; Sandy silt (ML); dark reddish brown / moderate brown (5YR 3/4) with reddish		
180		ML				(179.0 - 180.0') Observed abundant Cemex #2/12 Lapis Lustre Sand in drill cuttings.	

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IRZ DRILLING LOG - PG&E - TOPOCK - C:\USERS\SMC\GRAND\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\06_16_20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 13:07

Date Started:	11/21/2019	Surface Elevation:	478.39 ft amsl	Boring No.: MW-81
Date Completed:	12/05/2019	Northing (NAD83):	2102850.62	
Drilling Co.:	Cascade	Easting (NAD83):	7615928.21	Client: PG&E
Drilling Method:	Sonic Drilling	Total Depth:	180 ft bgs	Project: Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Conductor Casing Diameter:	12 inches	Location: PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Drill Casing Diameter:	10 inches	
Drilling Asst:	F. Sandoval/J. Candelaria	Drill Bit:	N/A	Project Number: RC000753.0051
Tool-Pusher:	NA	Depth to First Water:	24.1 ft bgs	
Rig Geologist:	KK / SM / GW	Converted to Well:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Depth (ft)	Drilling Run (ft) and Average Penetration Rate	USCS Code	USCS Class	Casing Diameter	Description (See Pilot boring log for full geologic descriptions)	Drilling notes and observations confirming presence of temporary backfill material in drill cuttings	Drilling Fluid
181					brown (2.5YR 4/4) End of Boring at 180.0 ft bgs.		
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							

Final 6/16/20

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, NR = no recovery; Notes: water level collected during the first VAS interval of the IRZ-19 pilot borehole

IRZ DRILLING LOG_PG&E_TOPOCK_C:\USERS\SMC\GRAND\DOCUMENTS\PG&E_TOPOCK\DRIFT BORING LOGS\GINT FILES\06_16_20\TOPOCK DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/16/20 13:07

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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				Topock - Fill	SP-SC		(0.0 - 8.0') Topock - Fill; Poorly graded sand with clay (SP-SC); light brown (7.5YR 6/3); very fine grained to medium grained, subangular to subround; little clay; trace silt; dry to moist	(0.0 - 8.0') Advanced conductor casing, the core was not collected the material was logged from cuttings collected from the hopper.	(0.0 - 192.0') No water used
2									
3									
4									
5				Topock - Fluvial Deposits	SC		(8.0 - 9.5') Topock - Fluvial Deposits; Clayey sand (SC); light brown (7.5YR 6/3); very fine grained to medium grained, subangular to subround; some clay; little silt; dry to moist; bentonite from mud tub seal found throughout		
6									
7									
8				Topock - Fluvial Deposits	SP-SC		(9.5 - 15.7') Topock - Fluvial Deposits; Poorly graded sand with clay (SP-SC); brown (7.5YR 5/4) and brown (7.5YR 5/3); very fine grained to medium grained, subangular to subround; little silt; little clay; dry to moist		
9									
10									
11									
12	108			Topock - Fluvial Deposits	SP		(15.7 - 23.5') Topock - Fluvial Deposits; Poorly graded sand (SP); brown (7.5YR 5/3); very fine grained to medium grained, subangular to subround; trace small to large pebbles, angular to subangular; trace coarse grained sand, angular to subangular; trace silt; trace clay; moist; bentonite at 17 ft	(17.0 - 27.0') Poor recovery, air in the core barrel resulted in the loss of part of core sample in the hopper. The additional no recovery is	
13									
14									
15									
16				Topock - Fluvial Deposits	SP		(15.7 - 23.5') Topock - Fluvial Deposits; Poorly graded sand (SP); brown (7.5YR 5/3); very fine grained to medium grained, subangular to subround; trace small to large pebbles, angular to subangular; trace coarse grained sand, angular to subangular; trace silt; trace clay; moist; bentonite at 17 ft	(17.0 - 27.0') Poor recovery, air in the core barrel resulted in the loss of part of core sample in the hopper. The additional no recovery is	
17									
18	54								
19									
20									

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SOIL BORING LOG: PG&E: TOPOCK C:\USERS\SSM\GRANED\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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	54	IRZ-19-SS-20-25 9/17/2019 10:10		Topock - Fluvial Deposits	SP			believed to be from core barrel clogging up.			
22							(21.5') Logged from core that was lost in the hopper.				
23											
24					Topock - Fluvial Deposits	SW		(23.5 - 24.0') Topock - Fluvial Deposits; Well graded sand with gravel (SW); light brown (7.5YR 6/3); very fine grained to very coarse grained; little granules to very large pebbles, angular to subangular; trace small cobbles, angular to subangular; trace silt; trace clay	(23.5') Logged from material collected during the clean out run highly disturbed.		
25	IRZ-19-SS-25-28 9/17/2019 10:15		Topock - Fluvial Deposits	SW-SC		(24.0 - 27.0') Topock - Fluvial Deposits; Well graded sand with clay (SW-SC); brown (7.5YR 5/4); very fine grained to coarse grained, angular to subround; little clay; trace silt					
26											
27	240	IRZ-19-SS-28-35 9/17/2019 10:20	IRZ-19-VAS-27-32 (<0.033 U ppb) 9/6/2019 08:35	Topock - Fluvial Deposits	SP		(27.0 - 29.0') Topock - Fluvial Deposits; Poorly graded sand (SP); light brown (7.5YR 6/4); very fine grained to medium grained, angular to subangular; trace granules to large pebbles, angular to subangular; trace silt; moist	(27.0 - 32.0') Soft drilling. Sample interval had poor water production, sample was collected without complete purge.			
28											
29						Topock - Fluvial Deposits	SM		(29.0 - 31.0') Topock - Fluvial Deposits; Silty sand (SM); light brown (7.5YR 6/4); very fine grained to medium grained, subangular to subround; some silt; moist to wet		
30						Topock - Fluvial Deposits	SM		(31.0 - 33.0') Topock - Fluvial Deposits; Silty sand with gravel (SM); light brown (7.5YR 6/3); very fine grained to very coarse grained, angular to subround; some silt; little granules to very large pebbles, angular to subround; trace small cobbles, angular to subangular; trace clay; moist	(32.0 - 37.0') Soft drilling	
31	IRZ-19-SS-33-37 9/17/2019 10:33			Topock - Fluvial Deposits	SM		(33.0 - 36.2') Topock - Fluvial Deposits; Silty sand (SM); light brown (7.5YR 6/3); very fine grained to very coarse grained, angular to subround; and silt; little granules to very large pebbles, angular to subround; moist				
32											
33				Topock - Fluvial Deposits	SM		(34.5') brown (7.5YR 5/4); trace granules to large pebbles, subangular to subround; moist; increase in silt				
34	IRZ-19-SS-37-45 9/17/2019 10:48	IRZ-19-VAS-37-42 (<0.033 U ppb) 9/6/2019 14:10		Topock - Alluvium Deposits	SW-SM		(36.2 - 38.0') Topock - Alluvium Deposits; Well graded sand with silt (SW-SM); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subangular; little silt; trace granules to very large pebbles, angular to subangular; trace clay; moist to wet	(37.0 - 57.0') Soft drilling			
35											
36				Topock - Alluvium Deposits	SW		(38.0 - 47.0') Topock - Alluvium Deposits; Well graded sand (SW); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; trace small cobbles, angular to subangular; trace silt; wet				
37											
38											
39											
40											

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SOIL BORING LOG: PG&E: TOPOCK - C:\USERS\MCGRANED\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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			IRZ-19-VAS-37-42 (<0.033 U ppb) 9/6/2019 14:10				(41') reddish brown (5YR 4/3); wet		
42		IRZ-19-SS-37-45 9/17/2019 10:48		Topock - Alluvium Deposits	SW				
43									
44									
45									
46									
47		IRZ-19-SS-45-50 9/17/2019 10:56		Topock - Alluvium Deposits	SM		(47.0 - 55.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subround; little granules to very large pebbles, angular to subangular; little silt; moist to wet		
48	240								
49									
50									
51		IRZ-19-SS-50-55 9/17/2019 11:04		Topock - Alluvium Deposits	SM		(50') brown (7.5YR 4/4); moist to wet		
52									
53									
54									
55									
56				Topock - Alluvium Deposits	SW		(55.0 - 57.0') Topock - Alluvium Deposits; Well graded sand with silt and gravel (SW); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subround; little silt; moist to wet		
57									
58	120	IRZ-19-SS-55-60 9/17/2019 11:09		Topock - Alluvium Deposits	SM		(57.0 - 62.4') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; trace small cobbles, angular to subangular; moist to wet (58'); some silt; moist to wet; increase in granules to small cobbles, decrease in sand		
59									
60									

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SOIL BORING LOG: PG&E: TOPOCK C:\USERS\SSMCR\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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	120	IRZ-19-SS-60-65 9/17/2019 11:13		Topock - Alluvium Deposits	SM		(61'); little silt; moist to wet; decrease in granules to small cobbles, increase in sand		
62				Topock - Alluvium Deposits	ML		(62.4 - 63.1') Topock - Alluvium Deposits; Sandy silt (ML); brown (7.5YR 4/4); low plasticity; some very fine to fine grained sand, subangular to subround; moist		
63				Topock - Alluvium Deposits	SM		(63.1 - 67.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; trace small cobbles, angular to subangular; moist to wet		
64	66	IRZ-19-SS-65-70 9/17/2019 11:16		Topock - Alluvium Deposits	SM		(67.0 - 72.5') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/3); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; wet; material logged from clean out run, highly disturbed	(67.0 - 77.0') Core barrel needed to be vibed to free from formation. During vibing material in core barrel was lost down hole. Retrieved material with a flapper bit on a second run. Recovered some material that was highly disturbed.	
65				Topock - Alluvium Deposits	SM				
66				Topock - Alluvium Deposits	SM				
67				Topock - Alluvium Deposits	SM				
68	120	IRZ-19-SS-70-75 9/17/2019 11:21		Topock - Alluvium Deposits	ML		(77.0 - 84.0') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (7.5YR 4/4); angular to subround; no plasticity; some very fine to very coarse grained sand, angular to subround; little granules to very large pebbles, angular to subangular; trace small cobbles, angular; moist	(77.0 - 84.0') Soft drilling	
69				Topock - Alluvium Deposits	ML				
70				Topock - Alluvium Deposits	ML				
71				Topock - Alluvium Deposits	ML				
72				NR	NR		(72.5 - 77.0') No recovery (NR); see drilling notes		
73				NR	NR				
74				NR	NR				
75				NR	NR				
76				NR	NR				
77				NR	NR				
78				NR	NR				
79				NR	NR				
80				NR	NR				

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SOIL BORING LOG: PG&E-TOPOCK C:\USERS\SSM\GRAND\DOCUMENTS\PG&E-TOPOCK\DRIFT BORING LOGS\GINT FILES\06_16_20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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
81	120	IRZ-19-SS-80-85 9/17/2019 11:36	IRZ-19-VAS-82-87 (<0.033 U ppb) 9/7/2019 14:10	Topock - Alluvium Deposits	ML		(80') brown (7.5YR 4/3); moist; decrease in silt, increase in granules to small cobbles and sand		
82							(84.0 - 87.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); brown (7.5YR 4/3); very fine grained to very coarse grained, subangular to subround; some silt; little granules to very large pebbles, angular to subangular; moist		
83	120	IRZ-19-SS-85-90 9/17/2019 11:42		Topock - Alluvium Deposits	SM		(87.0 - 92.1') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 4/3) to reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; trace clay; wet to moist		
84									
85									
86	120	IRZ-19-SS-90-95 9/17/2019 11:45		Topock - Alluvium Deposits	CL		(92.1 - 93.7') Topock - Alluvium Deposits; Sandy lean clay (CL); reddish brown / moderate brown (5YR 4/4); low plasticity; some silt; little granules to very large pebbles, angular to subangular; little very fine to very coarse grained sand, angular to subangular; moist		
87									
88									
89									
90	120	IRZ-19-SS-95-100 9/17/2019 12:52		Topock - Alluvium Deposits	ML		(93.7 - 96.1') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown (5YR 4/3); no plasticity; some very fine to very coarse grained sand, angular to subangular; little granules to very large pebbles, angular to subangular; trace small cobbles, angular to subangular; trace clay; moist		
91									
92	210			Topock - Alluvium Deposits	SM		(96.1 - 101.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4) to reddish brown (5YR 4/3); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; trace clay; wet		
93									
94									
95									
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: blue water table symbol represents depth to water measured during the first VAS interval; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-81-43, MW-81-98 installed in borehole

SOIL BORING LOG: PG&E: TOPOCK C:\USERS\MCGRANED\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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				Topock - Alluvium Deposits	SM				
102		IRZ-19-SS-100-105 9/17/2019 12:59		Topock - Alluvium Deposits	SW-SM		(101.0 - 104.0') Topock - Alluvium Deposits; Well graded sand with silt and gravel (SW-SM); dark reddish brown / moderate brown (5YR 3/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; trace small cobbles, angular; wet		
103									
104				Topock - Alluvium Deposits	SM		(104.0 - 104.5') Topock - Alluvium Deposits; Silty sand (SM); reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subangular; some silt; little granules, angular to subangular; wet		
105					NR		(104.5 - 106.0') No recovery (NR); see drilling notes	(104.5 - 106.0') Missing approximately 1.5 ft of material due to a ripped core bag.	
106				Topock - Alluvium Deposits	SW		(106.0 - 107.0') Topock - Alluvium Deposits; Well graded sand with gravel (SW); reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; trace silt; trace clay; wet		
107		IRZ-19-SS-105-110 9/17/2019 13:03					(107.0 - 121.3') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; trace small cobbles, angular to subangular; wet		
108	210								
109									
110									
111									
112		IRZ-19-SS-110-115 9/17/2019 13:08		Topock - Alluvium Deposits	SM		(112.7'); some silt; moist to wet; decrease in sand, no cobbles		
113									
114									
115									
116									
117		IRZ-19-SS-115-120 9/17/2019 13:13					(117') reddish brown (5YR 4/3); wet	(117.0 - 127.0') Normal drilling	
118	120								
119							(118') reddish brown (2.5YR 4/3) to reddish brown / moderate brown (5YR 4/4); some silt; wet; decrease in sand, increase in silt		
120									

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: blue water table symbol represents depth to water measured during the first VAS interval; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-81-43, MW-81-98 installed in borehole

SOIL BORING LOG: PG&E TOPOCK C:\USERS\MCGRANED\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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
121				Topock - Alluvium Deposits	SM				
122		IRZ-19-SS-120-125 9/17/2019 13:17	IRZ-19-VAS-122-127 (<0.17 U ppb) 9/8/2019 13:45	Topock - Alluvium Deposits	SM		(121.3 - 127.0') Topock - Alluvium Deposits; Silty sand (SM); reddish brown / moderate brown (5YR 4/4) to reddish brown (5YR 4/3); very fine grained to very coarse grained, angular to subangular; some silt; little granules to very large pebbles, angular to subangular; wet		
123	120								
124									
125									
126									
127		IRZ-19-SS-125-130 9/17/2019 13:23		Topock - Alluvium Deposits	SM		(127.0 - 133.7') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subangular; some silt; little granules to very large pebbles, angular to subangular; trace small cobbles, angular; wet		
128									
129									
130									
131									
132	120	IRZ-19-SS-130-135 9/17/2019 13:34	IRZ-19-VAS-131-136 (<0.17 U ppb) 9/9/2019 10:35	Topock - Alluvium Deposits	SM		(132.7'); moist to wet		
133									
134				Topock - Alluvium Deposits	ML		(133.7 - 134.4') Topock - Alluvium Deposits; Sandy silt with gravel (ML); brown (7.5YR 4/4); no plasticity; some very fine to very coarse grained sand, angular to subangular; little small to very large pebbles, angular to subangular; moist to wet		
135				Topock - Alluvium Deposits	ML		(134.4 - 137.0') Topock - Alluvium Deposits; Gravelly silt with sand (ML); reddish brown (5YR 5/3); no plasticity; some granules to very large pebbles, angular to subround; little small cobbles, angular to subround; little very fine to very coarse grained sand, angular to subangular; moist to wet		
136									
137		IRZ-19-SS-135-140 9/17/2019 13:44		Topock - Alluvium Deposits	SM		(137.0 - 138.1') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown (5YR 4/3); very fine grained to very coarse grained, angular to subangular; little granules to very large pebbles, angular to subangular; little silt; moist to wet		
138	120								
139				Topock - Alluvium Deposits	ML		(138.1 - 146.1') Topock - Alluvium Deposits; Sandy silt with gravel (ML); reddish brown / moderate brown (5YR 4/4); no plasticity; some very fine to very coarse grained sand, angular to subangular; little granules to very large pebbles, angular to subangular; moist to wet		
140									

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: blue water table symbol represents depth to water measured during the first VAS interval; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-81-43, MW-81-98 installed in borehole

SOIL BORING LOG: PG&E: TOPOCK - C:\USERS\SSMCRANE\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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
141							(140.5'); wet; decrease in granules to very large pebbles and silt, increase sand		
142									
143	120	IRZ-19-SS-140-146 9/17/2019 13:51		Topock - Alluvium Deposits	ML		(143.4'); moist		
144			IRZ-19-VAS-142-147 (<0.17 U ppb) 9/9/2019 16:40						
145									
146									
147							(146.1 - 150.6') Topock - Alluvium Deposits; Silty sand (SM); dark reddish brown (5YR 3/3) to reddish brown (5YR 4/3); very fine grained to very coarse grained, angular to subangular; some silt; little granules to large pebbles, angular to subangular; moist to wet	(147.0 - 157.0') Soft drilling	
148		IRZ-19-SS-146-150 9/17/2019 13:55		Topock - Alluvium Deposits	SM				
149									
150									
151									
152	120	IRZ-19-SS-150-155 9/17/2019 13:59		Topock - Alluvium Deposits	ML		(150.6 - 154.4') Topock - Alluvium Deposits; Sandy silt (ML); dark reddish brown (5YR 3/3) to dark reddish brown / grayish brown (5YR 3/2); no plasticity; some very fine to very coarse grained sand, angular to subangular; little granules to large pebbles, angular to subangular; moist to wet		
153									
154			IRZ-19-VAS-152-157 (<0.17 U ppb) 9/10/2019 12:00						
155				Topock - Alluvium Deposits	SM		(154.4 - 157.0') Topock - Alluvium Deposits; Silty sand with gravel (SM); dark reddish brown (5YR 3/3) to dark reddish brown / moderate brown (5YR 3/4); very fine grained to very coarse grained, angular to subround; some silt; little granules to very large pebbles, angular to subangular; wet to moist		
156									
157		IRZ-19-SS-155-160 9/17/2019 14:04		Topock - Alluvium Deposits	SW-SM		(157.0 - 167.5') Topock - Alluvium Deposits; Well graded sand with silt and gravel (SW-SM); dark reddish brown (5YR 3/3); very coarse grained to very coarse grained; little granules to very large pebbles, angular to subangular; little silt; wet	(157.0 - 167.0') Soft drilling	
158	120						(158.5') dark reddish brown / moderate brown (5YR 3/4)		
159									
160									

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SOIL BORING LOG: PG&E: TOPOCK: C:\USERS\SSM\GRAND\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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
161									
162		IRZ-19-SS-160-165 9/17/2019 14:09		Topock - Alluvium Deposits	SW-SM	[Symbol]			
163	120								
164			IRZ-19-VAS-162-167 (<0.17 U ppb) 9/11/2019 11:25						
165									
166									
167									
168		IRZ-19-SS-165-171 9/17/2019 14:16		Topock - Alluvium Deposits	SM	[Symbol]	(167.5 - 171.1') Topock - Alluvium Deposits; Silty sand with gravel (SM); reddish brown / moderate brown (5YR 4/4); very fine grained to very coarse grained, angular to subround; and silt; little granules to very large pebbles, angular to subround; trace small cobbles, angular to subangular; wet	(167.0 - 177.0') Soft drilling	
169									
170									
171									
172		IRZ-19-SS-171-177 9/17/2019 14:24		Topock - Alluvium Deposits	ML	[Symbol]	(171.1 - 178.5') Topock - Alluvium Deposits; Sandy silt (ML); reddish brown / moderate brown (5YR 4/4) with dark reddish brown (2.5YR 3/4); no plasticity; and very fine to very coarse grained sand, angular to subround; little granules to very large pebbles, angular to subround; wet		
173	120								
174									
175									
176									
177									
178			IRZ-19-VAS-177-182 (<0.17 U ppb) 9/12/2019 10:38	Topock - Weathered Bedrock - conglomerate	ML	[Symbol]	(173.8'); moist		
179	84								
180									
							(178.5 - 184.0') Topock - Weathered Bedrock - conglomerate; Sandy silt (ML); dark reddish brown / moderate brown (5YR 3/4) with reddish brown (2.5YR 4/4); no plasticity; some very fine to very coarse grained sand, angular to subangular; little small to large pebbles, angular to subangular; wet to moist	(177.0 - 184.0') Contacts adjusted based on QC review of photo log and notes.	

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: blue water table symbol represents depth to water measured during the first VAS interval; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-81-43, MW-81-98 installed in borehole

SOIL BORING LOG: PG&E TOPOCK C:\USERS\MCGRANED\DOCUMENTS\PG&E TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started:	09/04/2019	Surface Elevation:	478.40 ft amsl	Boring No.: MW-81/IRZ-19 Pilot	
Date Completed:	09/12/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Drill Rig Type:	Boart Longyear Track	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Driller Name:	Eddie Ramos	Depth to First Water:	24.1 ft bgs		
Drilling Asst:	F. Sandoval/J. Colon	Sampling Method:	4 inch x 10 ft Core Barrel	Project Number:	RC000753.0051
Logger:	Kendra Keon	Sampling Interval:	Continuous		
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
181			IRZ-19-VAS-177-182 (<0.17 U ppb) 9/12/2019 10:38	Topock - Weathered Bedrock - conglomerate	ML				
182								(182.0 - 185.0') Rough drilling	
183	84								
184							(184.0 - 192.0') Topock - Competent Bedrock - conglomerate; dry; friable, pulverized by drilling process		
185								(185.0 - 187.0') Really rough drilling and chattering, tight formation, needed to vibrate out	
186									
187				Topock - Competent Bedrock - conglomerate			(186.5'); moist (187'); moist; moisture from exposure to water in the casing overnight	(187.0 - 192.0') Rough drilling	
188							(188.1'); dry		
189	60								
190									
191									
192									

End of Boring at 192.0 ft bgs.

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: blue water table symbol represents depth to water measured during the first VAS interval; apparent partial recoveries can be the result of potential compaction of sediments in the core bag; wells MW-81-43, MW-81-98 installed in borehole

SOIL BORING LOG: PG&E-TOPOCK C:\USERS\SSM\GRAND\DOCUMENTS\PG&E-TOPOCK\DRIFT BORING LOGS\GINT FILES\06.16.20\TOPOCK DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/16/20 08:43

Date Started: 09/17/2019	Surface Elevation: 478.40 ft amsl	Well ID: MW-81/IRZ-19 Pilot
Date Completed: 09/18/2019	Northing (NAD83): 2102850.39	
Drilling Co.: Cascade	Easting (NAD83): 7615927.95	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 192 ft bgs	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Borehole Diameter: 6-12 inches	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Colon	Depth to First Water: 24.1 ft bgs	
Logger: Kendra Keon	Editor: Grant Willford	Project Number: RC000753.0051

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					(0.0 - 0.5') Temporary well vault		Note: BMPs in place
1 - 3		Topock - Fill	SP-SC		(0.5 - 5.0') Wildcat Washed Plastering Sand	(0.5 - 5.0') 7.9	(0.5 - 5.0') 7 (89%) Note: Surface seal sand
3 - 8		Topock - Fluvial Deposits	SC		(0.0 - 8.0') 12.0" Borehole		
8 - 13		Topock - Fluvial Deposits	SP-SC		(5.0 - 170.0') Cemex #3 MESH (8x10) Lapis Lustre Sand Lapis	(5.0 - 170.0') 72.6 bags	(5.0 - 170.0') 81 bags (112%) Note: Backfill sand
13 - 16		Topock - Fluvial Deposits	SP		(8.0 - 187.0') 6.0" Borehole		

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

TEMP ABANDONMENT LOG_PG&E_TOPOCK_C:\USERS\SMC\GRAND\DOCUMENTS\SP\G&E_TOPOCK\DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/12/20 07:42

Date Started:	09/17/2019	Surface Elevation:	478.40 ft amsl	Well ID: MW-81/IRZ-19 Pilot	
Date Completed:	09/18/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Driller Name:	Eddie Ramos	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Drilling Asst:	F. Sandoval/J. Colon	Depth to First Water:	24.1 ft bgs		
Logger:	Kendra Keon	Editor:	Grant Willford	Project Number:	RC000753.0051

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	
21		Topock - Fluvial Deposits	SP	[Dotted Pattern]	[Dotted Pattern]			
22								
23		Topock - Fluvial Deposits	SW	[Cross-hatched Pattern]	[Cross-hatched Pattern]			
24								
25		Topock - Fluvial Deposits	SW-SC	[Diagonal Hatched Pattern]	[Diagonal Hatched Pattern]			
26								
27		Topock - Fluvial Deposits	SP	[Dotted Pattern]	[Dotted Pattern]			
28								
29	IRZ-19-VAS-27-32 (<0.033 U ppb) 9/6/2019 08:35	Topock - Fluvial Deposits	SM	[Dotted Pattern]	[Dotted Pattern]			
30								
31								
32		Topock - Fluvial Deposits	SM	[Dotted Pattern]	[Dotted Pattern]			
33								
34		Topock - Fluvial Deposits	SM	[Dotted Pattern]	[Dotted Pattern]			
35								
36		Topock - Alluvium Deposits	SW-SM	[Dotted Pattern]	[Dotted Pattern]			
37								
38	IRZ-19-VAS-37-42 (<0.033 U ppb) 9/6/2019 14:10	Topock - Alluvium Deposits	SW	[Dotted Pattern]	[Dotted Pattern]			
39								
40								

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

TEMP ABANDONMENT LOG_PG&E_TOPOCK_C:\USERS\SMC\GRAND\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/12/20 07:42

Date Started: 09/17/2019	Surface Elevation: 478.40 ft amsl	Well ID: MW-81/IRZ-19 Pilot
Date Completed: 09/18/2019	Northing (NAD83): 2102850.39	
Drilling Co.: Cascade	Easting (NAD83): 7615927.95	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 192 ft bgs	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Borehole Diameter: 6-12 inches	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Colon	Depth to First Water: 24.1 ft bgs	
Logger: Kendra Keon	Editor: Grant Willford	Project Number: RC000753.0051

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	
41	IRZ-19-VAS-37-42 (<0.033 U ppb) 9/6/2019 14:10	Topock - Alluvium Deposits	SW	[Pattern]	[Pattern]			
42								
43		Topock - Alluvium Deposits	SM	[Pattern]	(5.0 - 170.0') Cemex #3 MESH (8x10) Lapis Lustre Sand Lapis	(8.0 - 187.0') 6.0" Borehole	(5.0 - 170.0') 72.6 bags	(5.0 - 170.0') 81 bags (112%) Note: Backfill sand
44								
45								
46								
47		Topock - Alluvium Deposits	SW	[Pattern]				
48								
49		Topock - Alluvium Deposits	SM	[Pattern]				
50								
51		Topock - Alluvium Deposits	SW	[Pattern]				
52								
53		Topock - Alluvium Deposits	SM	[Pattern]				
54								
55		Topock - Alluvium Deposits	SW	[Pattern]				
56								
57		Topock - Alluvium Deposits	SM	[Pattern]				
58								
59		Topock - Alluvium Deposits	SM	[Pattern]				
60								

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

TEMP ABANDONMENT LOG_PG&E_TOPOCK_C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/12/20 07:42

Date Started: 09/17/2019	Surface Elevation: 478.40 ft amsl	Well ID: MW-81/IRZ-19 Pilot
Date Completed: 09/18/2019	Northing (NAD83): 2102850.39	
Drilling Co.: Cascade	Easting (NAD83): 7615927.95	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 192 ft bgs	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Borehole Diameter: 6-12 inches	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Colon	Depth to First Water: 24.1 ft bgs	
Logger: Kendra Keon	Editor: Grant Willford	Project Number: RC000753.0051

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
61		Topock - Alluvium Deposits	SM			(5.0 - 170.0') 72.6 bags	(5.0 - 170.0') 81 bags (112%) Note: Backfill sand
62		Topock - Alluvium Deposits	ML				
63		Topock - Alluvium Deposits	SM				
64		Topock - Alluvium Deposits	SM				
65		Topock - Alluvium Deposits	SM				
66		Topock - Alluvium Deposits	SM				
67		Topock - Alluvium Deposits	SM				
68		Topock - Alluvium Deposits	SM				
69		Topock - Alluvium Deposits	SM				
70		Topock - Alluvium Deposits	SM				
71		Topock - Alluvium Deposits	SM				
72		Topock - Alluvium Deposits	SM				
73							
74							
75			NR				
76			NR				
77			NR				
78		Topock - Alluvium Deposits	ML				
79		Topock - Alluvium Deposits	ML				
80		Topock - Alluvium Deposits	ML				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

TEMP ABANDONMENT LOG_PG&E_TOPOCK_C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ_TOPOCK DATA TEMPLATE FOR PLOG.GDT_06/12/20 07:42

Date Started:	09/17/2019	Surface Elevation:	478.40 ft amsl	Well ID: MW-81/IRZ-19 Pilot	
Date Completed:	09/18/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Driller Name:	Eddie Ramos	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Drilling Asst:	F. Sandoval/J. Colon	Depth to First Water:	24.1 ft bgs		
Logger:	Kendra Keon	Editor:	Grant Willford	Project Number:	RC000753.0051

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
81	IRZ-19-VAS-82-87 (<0.033 U ppb) 9/7/2019 14:10	Topock - Alluvium Deposits	ML				
82							
83		Topock - Alluvium Deposits	SM				
84							
85		Topock - Alluvium Deposits	SM				
86							
87		Topock - Alluvium Deposits	SM		(5.0 - 170.0') Cemex #3 MESH (8x10) Lapis Lustre Sand Lapis	(8.0 - 187.0') 6.0" Borehole	(5.0 - 170.0') 72.6 bags (5.0 - 170.0') 81 bags (112%) Note: Backfill sand
88							
89		Topock - Alluvium Deposits	SM				
90							
91		Topock - Alluvium Deposits	CL				
92							
93		Topock - Alluvium Deposits	ML				
94							
95		Topock - Alluvium Deposits	SM				
96							
97		Topock - Alluvium Deposits	SM				
98							
99		Topock - Alluvium Deposits	SM				
100							

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TEMP ABANDONMENT LOG_PG&E_TOPOCK C:\USERS\SMCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/12/20 07:42

Date Started: 09/17/2019	Surface Elevation: 478.40 ft amsl	Well ID: MW-81/IRZ-19 Pilot
Date Completed: 09/18/2019	Northing (NAD83): 2102850.39	
Drilling Co.: Cascade	Easting (NAD83): 7615927.95	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 192 ft bgs	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Borehole Diameter: 6-12 inches	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Colon	Depth to First Water: 24.1 ft bgs	
Logger: Kendra Keon	Editor: Grant Willford	Project Number: RC000753.0051

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
101		Topock - Alluvium Deposits	SM		(5.0 - 170.0') Cemex #3 MESH (8x10) Lapis Lustre Sand Lapis	(8.0 - 187.0') 6.0" Borehole	(5.0 - 170.0') 72.6 bags
102		Topock - Alluvium Deposits	SW-SM				
103		Topock - Alluvium Deposits	SM				
104		Topock - Alluvium Deposits	NR				
105		Topock - Alluvium Deposits	SW				
106		Topock - Alluvium Deposits	SM				(5.0 - 170.0') 81 bags (112%) Note: Backfill sand
107		Topock - Alluvium Deposits	SM				
108		Topock - Alluvium Deposits	SM				
109		Topock - Alluvium Deposits	SM				
110		Topock - Alluvium Deposits	SM				
111		Topock - Alluvium Deposits	SM				
112		Topock - Alluvium Deposits	SM				
113		Topock - Alluvium Deposits	SM				
114		Topock - Alluvium Deposits	SM				
115		Topock - Alluvium Deposits	SM				
116		Topock - Alluvium Deposits	SM				
117		Topock - Alluvium Deposits	SM				
118		Topock - Alluvium Deposits	SM				
119		Topock - Alluvium Deposits	SM				
120		Topock - Alluvium Deposits	SM				

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

TEMP ABANDONMENT LOG_PG&E_TOPOCK C:\USERS\MCGRANE\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/12/20 07:42

Date Started:	09/17/2019	Surface Elevation:	478.40 ft amsl	Well ID: MW-81/IRZ-19 Pilot	
Date Completed:	09/18/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Driller Name:	Eddie Ramos	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Drilling Asst:	F. Sandoval/J. Colon	Depth to First Water:	24.1 ft bgs		
Logger:	Kendra Keon	Editor:	Grant Willford	Project Number:	RC000753.0051

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	
121		Topock - Alluvium Deposits	SM					
122								
123								
124	IRZ-19-VAS-122-127 (<0.17 U ppb) 9/8/2019 13:45	Topock - Alluvium Deposits	SM					
125								
126								
127								
128								
129								
130		Topock - Alluvium Deposits	SM		(5.0 - 170.0') Cemex #3 MESH (8x10) Lapis Lustre Sand Lapis	(8.0 - 187.0') 6.0" Borehole	(5.0 - 170.0') 72.6 bags	(5.0 - 170.0') 81 bags (112%) Note: Backfill sand
131								
132								
133	IRZ-19-VAS-131-136 (<0.17 U ppb) 9/9/2019 10:35	Topock - Alluvium Deposits	ML					
134								
135		Topock - Alluvium Deposits	ML					
136								
137								
138		Topock - Alluvium Deposits	SM					
139								
140		Topock - Alluvium Deposits	ML					

Abbreviations: USCS = Unified Soil Classification System, ft = feet, bgs = below ground surface, amsl = above mean sea level, GW = groundwater, ppb = parts per billion, BMP = Best Management Practices for stormwater, U = not detected above the laboratory reporting limit, NR = no recovery; Notes: blue water table symbol represents depth to water measured during the first VAS interval; granular backfill material was removed during overdrilling of the pilot borehole

TEMP ABANDONMENT LOG_PG&E_TOPOCK_C:\USERS\SMC\GRAND\DOCUMENTS\PG&E_TOPOCK\DATABASE FOR PLOG.GPJ TOPOCK DATA TEMPLATE FOR PLOG.GDT 06/12/20 07:42

Date Started:	09/17/2019	Surface Elevation:	478.40 ft amsl	Well ID: MW-81/IRZ-19 Pilot	
Date Completed:	09/18/2019	Northing (NAD83):	2102850.39		
Drilling Co.:	Cascade	Easting (NAD83):	7615927.95	Client:	PG&E
Drilling Method:	Sonic Drilling	Total Depth:	192 ft bgs	Project:	Final GW Remedy Phase 1
Driller Name:	Eddie Ramos	Borehole Diameter:	6-12 inches	Location:	PG&E Topock, Needles, California
Drilling Asst:	F. Sandoval/J. Colon	Depth to First Water:	24.1 ft bgs		
Logger:	Kendra Keon	Editor:	Grant Willford	Project Number:	RC000753.0051

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
141							
142							
143	IRZ-19-VAS-142-147 (<0.17 U ppb) 9/9/2019 16:40	Topock - Alluvium Deposits	ML		(5.0 - 170.0') Cemex #3 MESH (8x10) Lapis Lustre Sand Lapis	(5.0 - 170.0') 72.6 bags	(5.0 - 170.0') 81 bags (112%) Note: Backfill sand
144							
145							
146							
147							
148		Topock - Alluvium Deposits	SM				
149							
150							
151							
152	IRZ-19-VAS-152-157 (<0.17 U ppb) 9/10/2019 12:00	Topock - Alluvium Deposits	ML		(8.0 - 187.0') 6.0" Borehole	(5.0 - 170.0') 72.6 bags	(5.0 - 170.0') 81 bags (112%) Note: Backfill sand
153							
154							
155		Topock - Alluvium Deposits	SM				
156							
157							
158							
159		Topock - Alluvium Deposits	SW-SM				
160							

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Date Started: 09/17/2019	Surface Elevation: 478.40 ft amsl	Well ID: MW-81/IRZ-19 Pilot
Date Completed: 09/18/2019	Northing (NAD83): 2102850.39	
Drilling Co.: Cascade	Easting (NAD83): 7615927.95	Client: PG&E
Drilling Method: Sonic Drilling	Total Depth: 192 ft bgs	Project: Final GW Remedy Phase 1
Driller Name: Eddie Ramos	Borehole Diameter: 6-12 inches	Location: PG&E Topock, Needles, California
Drilling Asst: F. Sandoval/J. Colon	Depth to First Water: 24.1 ft bgs	
Logger: Kendra Keon	Editor: Grant Willford	Project Number: RC000753.0051

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
161-167	IRZ-19-VAS-162-167 (<0.17 U ppb) 9/11/2019 11:25	Topock - Alluvium Deposits	SW-SM	SM	(5.0 - 170.0') Cemex #3 MESH (8x10) Lapis Lustre Sand Lapis	(5.0 - 170.0') 72.6 bags	(5.0 - 170.0') 81 bags (112%) Note: Backfill sand
168-170		Topock - Alluvium Deposits	SM	SM	(8.0 - 187.0') 6.0" Borehole		
171-177		Topock - Alluvium Deposits	ML	ML	(170.0 - 180.0') Cemex # 2/12 MESH (16x30) Lapis Lustre Sand	(170.0 - 180.0') 4.2 bags	(170.0 - 180.0') 6 bags (143%) Note: Indicator sand, used >20% of the calculated volume due to potential voids forming during drilling.
178-180	IRZ-19-VAS-177-182 (<0.17 U ppb) 9/12/2019 10:38	Topock - Weathered Bedrock - conglomerate	ML	ML			

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