



GEOLOGIC BOREHOLE LOG

Location: RHFSF	Station Name: RHMW04	Location Type: Monitoring Well
Location Description: west. access rd., S of Navy Firing Range		Establishing Company: TEC Inc.
Drilling Foreman: Tomas Fernandez		Drilling Company: Valley Well Drilling
Geologist: N. Griffin/S. MacMillan	Ground Surface Elevation (ft): 313.03	Datum: MSL
Drilling Sampling Method: Rock Coring		Borehole Diameter (in): 8
Total Depth (ft): 320.5	Date Drilling Started: 22 July 2005	Date Drilling Ended: 26 July 2005

Remarks:

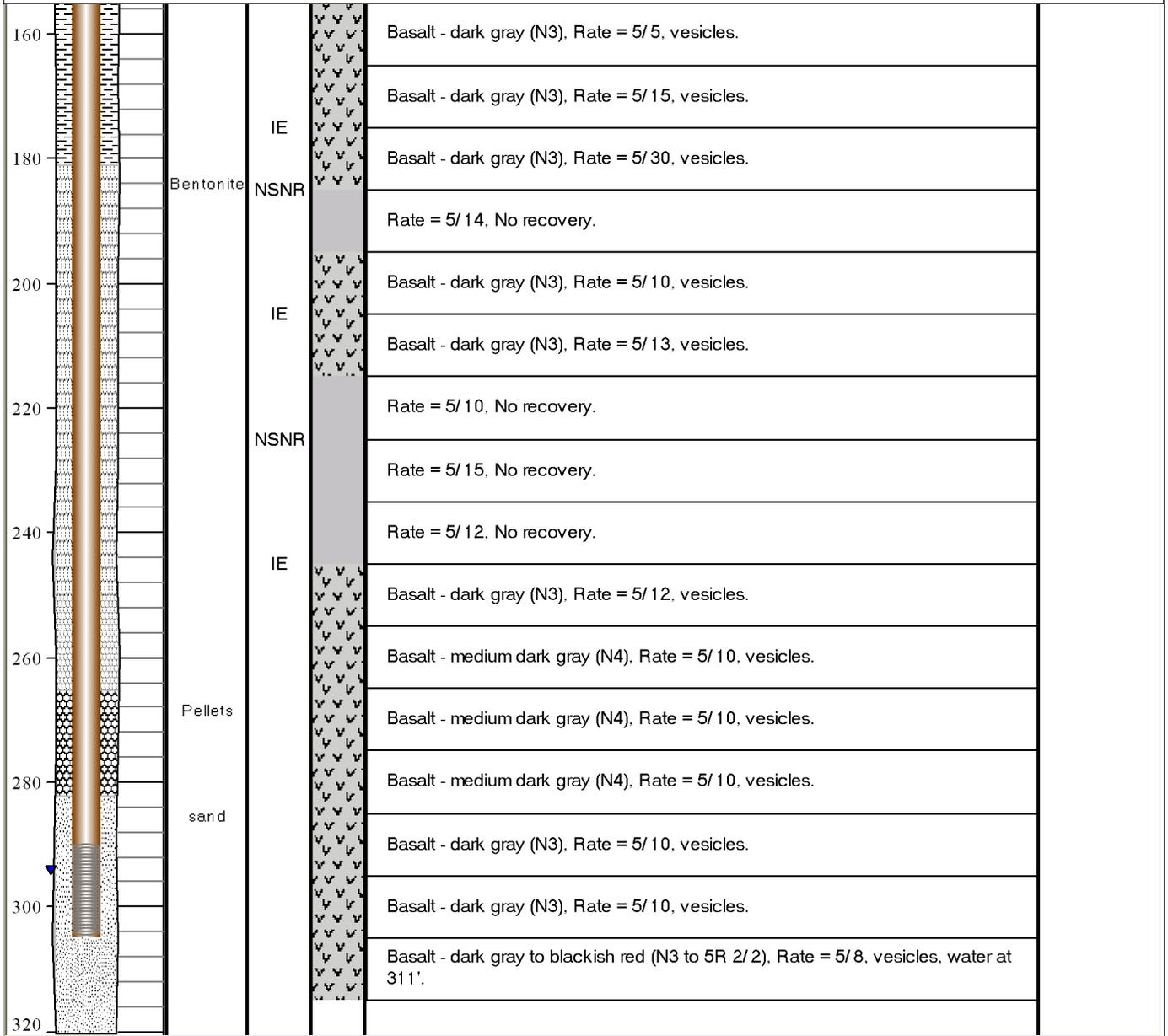
Well Construction	Well Fill	USCS	Soil Description	Soil Sample	
	Cement Grout	GW	Well-graded gravel with sand - dark reddish brown (5YR 2.5/2), medium stiff, moist, 80% gravel, 15% fines, 5% fines, road base.	RHMW04S02	
					Basalt bedrock.
					Basalt - moderate brown (5YR 3/4), Rate = 5/5, 50 - 80% vesicles.
			IE		Basalt - dark gray (blue rock) (N3), Rate = 5/10, massive, 5% small crystals.
					Basalt - dark gray (N3), Rate = 5/10, 70 - 90% vesicles:small.
					Basalt - dark gray (N3), Rate = 5/7, massive.
					Basalt - dark gray (N3), Rate = 5/10, 70 - 90% vesicles.
					Basalt - dark gray (N3), Rate = 5/10, vesicles.
					Basalt - dark gray (N3), Rate = 5/10, vesicles.
			NSNR		Basalt - dark gray (N3), Rate = 5/12, vesicles.
					Rate = 5/18, no recovery.
					Basalt - moderate brown to dark gray (5YR 3/4 to N3), Rate = 5/12, vesicles.
					Basalt - dark gray (N3), Rate = 5/16, vesicles with min. deposits, Perched water encountered - to approx. 130 feet.
					Basalt - dark gray (N3), Rate = 5/15, massive.
					Basalt - dark reddish brown to dark gray (10YR 3/4 to N3), Rate = 5/20, vesicles.
			IE		Basalt - medium dark gray to dark gray (N4 to N3), Rate = 5/15, vesicles.
		Basalt - dark reddish brown to dark gray (10YR 3/4 to N3), Rate = 5/15, massive and vesicles.			
		Basalt - dark reddish brown (10YR 3/4), Rate = 5/10, vesicles.			
		Basalt - dark gray (N3), Rate = 5/12, vesicles.			



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Borehole/Well Construction Log

Project Name Red Hill Phase II RI/FS		Project Number CTO-0034		Borehole Number: MW08	
Borehole Location Near AST		Northing 75254 41 Easting 530845 19		Sheet 1 of 9	
Drilling Agency Valley Well Drilling			Driller Dean McClure, David Brown		
Drilling Equipment B59, Jaswell 3000			Date & Time Started 4/7/98	Total Depth (feet) 142.8	
Drilling Method Air Rotary, Hollow Stem Auger		Top of Casing Elevation (feet msl) 138.06	Date & Time Finished 4/24/98	Depth to Water (feet) See remarks	
Size and Type of Bit -		Borehole Diameter (m) 10	Sample Type SS	Bulk NA	Derive x
Drilling Fluid Air		Drilling Angle (degrees) 90	Number of Samples 16	Sample Length (ft) 1.5 or 5	Core Length NA
Completion Information See remarks			Logged By W Wen		Checked By B Tsutsui

Depth (feet)	Samples				Estimated %			Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Percent Recovery	Time	Gravel	Sand	Fines	Graphic				USCS or Rock Type
1	50/5	40	1352	5	TR	95			CL	<p>Topsoil</p> <p>LOW PLASTIC INORGANIC CLAY, black, 5YR 2.5/1, dry, hard, CL, 95% low plastic inorganic clay, 5% fine, subangular gravel, trace amount of sand and roots</p>		<p>Ground surface elevation 135.67 feet msl</p>	
2													Steel casing (12 inch diameter)
3													PVC Casing
4													Grout
5	50/5	35	1359	TR	80	20			SC	<p>CLAYEY SAND, dark yellowish brown, 10YR 4/6, dry, dense, SC, 80% fine, medium, coarse, subrounded sand, 20% low plastic inorganic clay, trace amount of fine, subangular gravel</p>			
6													
7													
8													
9													
10	50/6	15	1410						IE	<p>EXTRUSIVE, basalt, gray, 10YR 6/1, vesicular basalt, fresh, hard, dry, IE</p>			
11													
12													
13													
14													
15													

Red Hill Phase II RI/FS CTO-0034

Borehole/Well Construction Log (Continuation Sheet)

Project Name: Red Hill Phase II RI/FS	Project Number: CTO-0034	Borehole Number: MW08	
Borehole Location: Near AST		Sheet 2 of 9	

Depth (feet)	Samples				Estimated %			Log	Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Percent Recovery	Time	Gravel	Sand	Fines				Graphic USCS or Rock Type
16			NA	5	1420	-	-	-	IE		Same as above	
17												
18			50/3	0		-	-	-			No Recovery	
19											Called off at 1435, 4/7/98	
20			NA	70	1300	-	-	-			No recovery	
21												
22											No Recovery	
23												
24												
25			NA	0	1442	40	-	60	CL		GRAVELLY CLAY , strong brown and dark gray, 7 5YR 5/6, 4/1, dry, soft, CL, 60% high plastic inorganic clay; 40% fine, subrounded basalt gravel.	
26											No Recovery	
27											Called off at 1442, 4/13/98	
28												
29												
30												
31												Bottom of steel casing
32			NA	80	1430	-	TR	100	CH		HIGH PLASTIC INORGANIC CLAY , dark	

Borehole/Well Construction Log (Continuation Sheet)

Project Name		Red Hill Phase II RI/FS		Project Number		CTO-0034		Borehole Number:		MW08	
Borehole Location								Near AST		Sheet 3 of 9	
Depth (feet)	Samples			Estimated %			Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Gravel	Sand	Fines	Graphic	USCS or Rock Type			
33											
34											
35											
36				30	TR	70		CL			
37		NA	80					IE			
38								IE			
39				100	TR			GP			
40								IE			
41											
42		NA	70	80	10	10		GC			
43											
44				100				GW			
45								IE			
46								GP			
47		NA	80					IE			
48											
49								CH			
50								IE			

Red Hill Phase II RI/FS CTO-0034

Borehole/Well Construction Log (Continuation Sheet)

Project Name	Red Hill Phase II RI/FS	Project Number	CTO-0034	Borehole Number	MW08
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Borehole Location	Near AST	Sheet	4 of 9
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Depth (feet)	Samples				Estimated %			Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Percent Recovery	Time	Gravel	Sand	Fines	Graphic			
51												
52			NA	100	1700	-	-	-		IE	Same as above	
53												
54										IE	EXTRUSIVE basalt, gray, 10YR 5/1, most massive basalt with some vesicular fabric, fresh, hard, moist, IE	
55												
56										IE	EXTRUSIVE basalt, olive gray, 5YR 5/2, fresh, vesicular, moist, IE	
57			NA	80	0917	-	-	-		IE	No Recovery	
58										IE	Grading to faintly weathered, well developed fracture in basalt	
59												
60												
61						70	10	20		GC	Color changes to brown (7 5YR 4/4), grading to highly weathered and soft. CLAYEY GRAVEL , dark gray, 5YR 4/1, dry, dense; GC, 70% fine, subangular and subrounded gravel, 20% low plastic, inorganic clay, 10% fine, subangular sand	
62			NA	85	0947	-	-	-		IE	EXTRUSIVE basalt, brown, 7 5YR 4/4, massive basalt, highly weathered, medium hard, moist, IE	
63										IE	EXTRUSIVE volcanic breccia, gray, 5YR 5/1, 60% basalt clast, 20% matrix, 20% porosity, faintly weathered, hard, dry, IE	
64												
65												
66												
67			NA	80	1040	-	-	-			No recovery	

Borehole/Well Construction Log (Continuation Sheet)

Project Name				Project Number				Borehole Number:				
Red Hill Phase II RI/FS				CTO-0034				MW08				
Borehole Location								Sheet				
Near AST								5 of 9				
Depth (feet)	Samples			Estimated %			Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Percent Recovery	Time	Gravel	Sand	Fines				Graphic
68									IE	EXTRUSIVE , volcanic breccia, gray, 7 5YR 5/1, 40% basalt clast, 40% matrix, 20% porosity, faintly weathered, hard, wet, IE		
69									IE	EXTRUSIVE , basalt, dark gray, 7 5YR 4/1, massive basalt, fresh, hard, wet, IE		
70												
71												
72			NA	90	1130				IE	Same as above		
73												
74												
75												
76												
77									IE	Same as above		
78										Switch to Jaswell, no sample taken after 77 feet Lithology was estimated from blown hole		
79												
80												
81												
82												
83												
84												
85												

Red Hill Phase II RI/FS CTO-0034

Borehole/Well Construction Log (Continuation Sheet)

Project Name: Red Hill Phase II RI/FS	Project Number: CTO-0034	Borehole Number: MW08	
Borehole Location: Near AST			Sheet 6 of 9

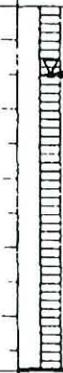
Depth (feet)	Samples				Estimated %			Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Percent Recovery	Time	Gravel	Sand	Fines	Graphic			
86									IE	Same as above (Basalt)		
87												
88												
89												
90												
91												
92												
93												
94												
95												
96												
97												
98												
99												
100												
101												
102												Top of Bentonite seal

Borehole/Well Construction Log (Continuation Sheet)

Project Name				Project Number				Borehole Number:				
Red Hill Phase II R/FS				CTO-0034				MW08				
Borehole Location							Sheet					
Near AST							7 of 9					
Depth (feet)	Samples			Estimated %			Log		Lithologic Description	Well Construction Diagram	Remarks	
	Number	Type	Blow Count	Percent Recovery	Time	Gravel	Sand	Fines				Graphic
103								IE	Same as above (basalt)			
104												
105												
106												
107												
108												
109												
110												
111												
112												
113												
114												
115												
116												
117												
118												
119												
120												

Red Hill Phase II R/FS CTO-0034

Borehole/Well Construction Log (Continuation Sheet)

Project Name					Project Number					Borehole Number:		
Red Hill Phase II RI/FS					CTO-0034					MW08		
Borehole Location										Sheet		
Near AST										9 of 9		
Depth (feet)	Samples				Estimated %			Log		Lithologic Description	Well Construction Diagram	Remarks
	Number	Type	Blow Count	Percent Recovery	Time	Gravel	Sand	Fines	Graphic			
138									IE	Same as above (basalt)		First encountered depth of basal groundwater (138.5 feet bgs)
139												
140												
141												
142												
										Boring finished at 143 feet on 4/24/88		Bottom of well
												Total depth of borehole

Red Hill Phase II RI/FS/CTO-0034