Appendix D Soil Boring Logs



BORING ID:

11AU

**SOIL BORING LOG** 

Sheet 1 of 7

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: Bernbeck Residence ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Peters Drilling and Pump Service, Inc. DRILLING METHOD AND EQUIPMENT USED: Air Rotary START: 4/27/2001 END: 4/1/2701 WATER LEVELS: LOGGER: Meier STANDARD PENETRATION DEPTH BGS (ft) CORE DESCRIPTION: COMMENTS: INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 0.0-28.0 Overburden. 1 -2 -3 -5 -10 -12 -13 -15 -16 -17 -18 -19 -20 -21 -22 -23 -24 -25 -



BORING ID:

11AU

Sheet 2 of 7

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Bernbeck Residence ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Peters Drilling and Pump Service, Inc. Air Rotary DRILLING METHOD AND EQUIPMENT USED: START: 4/27/2001 END: 4/1/2701 WATER LEVELS: LOGGER: Meier DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26 -27 -28 - 28.0-45.0 Weathered slate. 29 -30 -31 -32 -33 -34 -35 🗕 36 -37 -38 -39 -40 -41 -42 -43 -44 -45 - 45.0-160.0 Slate. 46 -47 -48 -49 -50 -



BORING ID:

11AU

Sheet 3 of 7

PROJE	PROJECT: Lava Cap Mine LOCATION: Bernbeck Residence								
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CO	ONTRAC	TOR: Peters Drilling and Pump Service, Inc.		
DRILLII	NG METHO	DD AN	D EQUIPMI	ENT USED: A	ir Rotary				
WATER	R LEVELS:	40			START: 4/27/2001 END: 4/1/2	2701	LOGGER: Meier		
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:		COMMENTS:		
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,		DEPTH OF CASING, DRILLING RATE,		
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,		DRILLING FLUID LOSS,		
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.		TESTS, AND INSTRUMENTATION.		
			SS=Split Spoon ST=ShelbyTube	(N)	WINTER COURT				
51 -						_			
52 <b>–</b>						_			
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54 -						_			
55 <b>–</b>						_			
56 <b>–</b>						_			
57 <b>–</b>									
37 -						_			
58 🗕						_			
59 🗕						_			
60 -						_			
61 🗕						_			
62 -									
02 -						_			
63 -						_			
64 -						_			
65 🗕									
66 –						_			
67 <b>–</b>									
0, -						_			
68 –						_			
69 <b>–</b>						_			
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74 🗕						_			
75 <b>–</b>						_			
76 <b>–</b>						_			



BORING ID:

11AU

Sheet 4 of 7

PROJE	PROJECT: Lava Cap Mine LOCATION: Bernbeck Residence									
ELEVA	TION:		NORT	HING:	EASTING:	DRILLING CONTRAC	TOR: Peters Drilling and Pump Service, Inc.			
DRILLII	NG METHO	DD AN	D EQUIPMI	ENT USED: A	ir Rotary					
WATER	R LEVELS:	40			START: 4/27/2001	END: 4/1/2701	LOGGER: Meier			
DEPTH	BGS (ft)			STANDARD	CORE DESCR	RIPTION:	COMMENTS:			
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYME		DEPTH OF CASING, DRILLING RATE,			
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE	E DENSITY,	DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.			
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUC MINERALOGY.	, TURE,	TESTS, AND INSTRUMENTATION.			
			SS=Split Spoon ST=ShelbyTube	(N)						
77 🗕						_				
78 –						_				
79 <b>–</b>						_				
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81 –						_				
82 –						_				
83 -						_				
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87 -						_				
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101 -						_				



BORING ID:

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Sheet 5 of 7

PROJE	CT: Lav	a Cap	Mine		LOCATION: Bernbeck Residence						
ELEVA			NORT		EASTIN	G:	DRILLI	NG CONTRAC	TOR: Peters Drilling and Pump Service, Inc.		
DRILLII	NG METHO	DD AN	D EQUIPMI	ENT USED: A	ir Rotary						
WATER	R LEVELS:	40			START: 4/27/20	001	END:	4/1/2701	LOGGER: Meier		
DEPTH	BGS (ft)			STANDARD		CORE DESCRIPTION	N:		COMMENTS:		
	INTERVA	AL (ft)		PENETRATION TEST	SOIL NAME (US	CS GROUP SYMBOL),	COLOR,		DEPTH OF CASING, DRILLING RATE,		
		RECO	VERY	RESULTS	MOISTURE CON	ITENT, RELATIVE DEN	SITY,		DRILLING FLUID LOSS,		
			TYPE-#	6-6-6 (in)	MINERALOGY.	CY, SOIL STRUCTURE	ı		TESTS, AND INSTRUMENTATION.		
			SS=Split Spoon ST=ShelbyTube	(N)							
102 -								_			
103 -											
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105 -								_			
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126 -								_			
127 🗕											
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BORING ID:

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Sheet 6 of 7

PROJE	PROJECT: Lava Cap Mine LOCATION: Bernbeck Residence								
ELEVA			NORT		EASTING:	DRILLING	CONTRACT	OR: Peters Drilling and Pump Service, Inc.	
DRILLI	NG METH	NA DC	D EQUIPM	ENT USED: A	ir Rotary				
WATER	R LEVELS:	40			START: 4/27/2001	END: 4/	/1/2701	LOGGER: Meier	
DEPTH	BGS (ft)			STANDARD	CORE DES	SCRIPTION:		COMMENTS:	
	INTERV			PENETRATION TEST	SOIL NAME (USCS GROUP S	YMBOL), COLOR,		DEPTH OF CASING, DRILLING RATE,	
		RECC	VERY	RESULTS	MOISTURE CONTENT, RELATOR CONSISTENCY, SOIL STR	RUCTURE,		DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.	
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.				
128 -			31=3HelbyTube				_		
129 -							_		
130 -							_		
131 -							-		
132 -							-		
133 -							_		
134 -							-		
135 -							-		
136 -							_		
137 <b>–</b>							_		
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149 -							_		
150 -							_		
151 -							_		
152 -							-		



PROJECT NUMBER
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BORING ID:

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Sheet 7 of 7

PROJECT: Lava Cap Mine LOCATION: Bernbeck Residence									
ELEVA	TION:		NORT	HING:	EASTING:	DRILLING CONTR	ACTOR: Peters Drilling and Pump Service, Inc.		
DRILLII	NG METHO	DD AN	D EQUIPME	ENT USED: A	ir Rotary				
WATER	R LEVELS:	40			START: 4/27/2001	END: 4/1/2701	LOGGER: Meier		
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTIO	N:	COMMENTS:		
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL),	COLOR.	DEPTH OF CASING, DRILLING RATE,		
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DEN	SITY,	DRILLING FLUID LOSS,		
			TYPE-#	( ( ( ( ) )	OR CONSISTENCY, SOIL STRUCTURE MINERALOGY.	-1	TESTS, AND INSTRUMENTATION.		
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	WIINERALOGT.				
153 -			31=3Helby Tube						
154 🗕							_		
155 🗕									
100									
156 🗕							_		
157 <b>–</b>							_		
158 🗕									
159 🗕							_		
160 🗕					Total depth=160 ft. bgs.				
100 =					Total deptit=100 ft. bys.		_		
161 🗕							_		



BORING ID:

11AV

## **SOIL BORING LOG**

Sheet 1 of 14

PROJECT: Lava Cap Mine LOCATION: Lofton Residence ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Peters Drilling and Pump Service, Inc. DRILLING METHOD AND EQUIPMENT USED: Air Rotary START: 7/23/1998 END: 7/24/1998 WATER LEVELS: LOGGER: Meier STANDARD PENETRATION DEPTH BGS (ft) CORE DESCRIPTION: COMMENTS: INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 0.0-7.0 Red clay. 1 -2 -3 -5 -7.0-55.0 Overburden. 8 -10 -11 -12 -13 -15 -16 -17 -18 -19 -20 -21 \_ 22 -23 -24 -25 -



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IMBER BORING ID:

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Sheet 2 of 14

PROJECT: Lava Cap Mine LOCATION: Lofton Residence										
ELEVA			NORT			EASTING:		DRILLII	NG CONTRAC	TOR: Peters Drilling and Pump Service, Inc.
DRILLII	NG METHO	DD AN	D EQUIPMI	ENT USED: A	ir Rotary					
WATER	R LEVELS:	40			START:	7/23/1998		END:	7/24/1998	LOGGER: Meier
DEPTH				STANDARD		CO	ORE DESCRIPTIO	N:		COMMENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NA	ME (USCS GI	ROUP SYMBOL), (	COLOR,		DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	RESULTS	MOISTU	RE CONTENT	T, RELATIVE DEN	SITY,		DRILLING FLUID LOSS,
			TYPE-#	6-6-6 (in)	MINERA	ISISTENCY, S LOGY.	SOIL STRUCTURE	1		TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	(N) ´						
26 🗕									_	
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BORING ID:

Sheet 3 of 14

PROJE	CT: Lav	a Cap	Mine	<u>-</u>	LOCATION: Lofton Residence  EASTING: DRILLING CONTRACTOR: Peters Drilling and Pump Service, Inc.					
ELEVA	TION:		NORT	HING:	EASTING:	DRILLII	NG CONTRAC	TOR: Peters Drilling and Pump Service, Inc.		
DRILLII	NG METH	NA DC	D EQUIPM	ENT USED: A	ir Rotary					
WATER	R LEVELS:	40			START: 7/23/1998	END:	7/24/1998	LOGGER: Meier		
DEPTH	BGS (ft)			STANDARD	CORE	DESCRIPTION:		COMMENTS:		
	INTERV	AL (ft)		PENETRATION	SOIL NAME (USCS GROU			DEPTH OF CASING, DRILLING RATE,		
			VERY	TEST RESULTS	MOISTURE CONTENT, RE	ELATIVE DENSITY,		DRILLING FLUID LOSS,		
			TYPE-#		OR CONSISTENCY, SOIL	STRUCTURE,		TESTS, AND INSTRUMENTATION.		
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.					
51 -			S1=ShelbyTube	(-7						
52 <b>–</b>							_			
53 <b>–</b>							_			
54 -							_			
55 <b>–</b>	55.0-67.0				Fractured Weathered rock (slate	e).	_			
56 -										
50 -							_			
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37_							_			
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BORING ID:

11AV

Sheet 4 of 14

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Lofton Residence ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Peters Drilling and Pump Service, Inc. DRILLING METHOD AND EQUIPMENT USED: Air Rotary START: 7/23/1998 END: 7/24/1998 WATER LEVELS: LOGGER: Meier STANDARD PENETRATION DEPTH BGS (ft) CORE DESCRIPTION: COMMENTS: INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY **RESULTS** DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 77 -78 -79 -80 -81 -82 -83 -84 -85 -86 -87 -90 -91 -92 -93 -94 -95 -96 -97 -98 -99 -100 -101 -



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BORING ID:

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Sheet 5 of 14

PROJE	PROJECT: Lava Cap Mine LOCATION: Lofton Residence									
ELEVA	TION:		NORT	HING:		EASTING:		DRILLI	NG CONTRAC	TOR: Peters Drilling and Pump Service, Inc.
DRILLI	NG METHO	DD AN	D EQUIPMI	ENT USED: A	ir Rotary					
WATE	R LEVELS:	40			START:	7/23/1998		END:	7/24/1998	LOGGER: Meier
DEPTH	BGS (ft)			STANDARD		C	ORE DESCRIPTIO	V:		COMMENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NA	ME (USCS G	ROUP SYMBOL), (	COLOR,		DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	RESULTS	MOISTU	RE CONTENT	T, RELATIVE DENS	SITY,		DRILLING FLUID LOSS,
			TYPE-#	6-6-6 (in)	MINERA	ISISTENCY, S LOGY	SOIL STRUCTURE,			TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	(N)						
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127 -										



BORING ID: 11AV

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Sheet 6 of 14

PROJE	CT: Lav	a Cap	Mine			LOCATION: Lofton Residence			
ELEVA	TION:		NORT	HING:	EASTING:	DRILLII	NG CONTRAC	TOR: Peters Drilling and Pump Service, Inc.	
DRILLI	NG METHO	DD AN	D EQUIPM	ENT USED: A	Air Rotary				
WATER	R LEVELS:	40			START: 7/23/1998	END:	7/24/1998	LOGGER: Meier	
DEPTH	BGS (ft)			STANDARD	CORE DE	ESCRIPTION:		COMMENTS:	
	INTERVA	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP S	SYMBOL), COLOR,		DEPTH OF CASING, DRILLING RATE,	
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELA	ATIVE DENSITY,		DRILLING FLUID LOSS,	
			TYPE-#	6-6-6 (in)	<ul> <li>OR CONSISTENCY, SOIL ST MINERALOGY.</li> </ul>	RUCTURE,		TESTS, AND INSTRUMENTATION.	
			SS=Split Spoon ST=ShelbyTube	(N)	WINVERVILES GT.				
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129 -							_		
130 -							_		
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152							_		



BORING ID:

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## **SOIL BORING LOG**

Sheet 7 of 14

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: Lofton Residence ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Peters Drilling and Pump Service, Inc. DRILLING METHOD AND EQUIPMENT USED: Air Rotary START: 7/23/1998 END: 7/24/1998 WATER LEVELS: LOGGER: Meier DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 153 -154 -155 -156 -157 -158 -159 -160 -161 -162 -163 -164 -165 -166 -167 -168 -169 -170 -171 -172 -173 -174 -175 -176 -177 -178 -



151319.FI.03

BORING ID:

11AV

Sheet 8 of 14

PROJECT: Lava Cap Mine LOCATION: Lofton Residence									esidence	
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRACTOR: Peters Drilling and Pump Service, Inc.					
DRILLII	NG METHO	D AN	D EQUIPMI	ENT USED: A	ir Rotary					
WATER	R LEVELS:	40			START:	7/23/1998		END:	7/24/1998	LOGGER: Meier
DEPTH I	BGS (ft)			STANDARD		CO	RE DESCRIPTIO	N:		COMMENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NA	ME (USCS GR	ROUP SYMBOL),	COLOR,		DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	RESULTS	MOISTU	RE CONTENT	, RELATIVE DEN	SITY,		DRILLING FLUID LOSS,
		ĺ	TYPE-#	6-6-6 (in)	MINERA	ISISTENCY, SO LOGY	OIL STRUCTURE	1		TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	(N)						
179 🗕									_	
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BORING ID:

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Sheet 9 of 14

PROJECT: Lava Cap Mine LOCATION: Lofton Residence											
ELEVA	TION:		NORT	HING:	E <i>P</i>	ASTING:		DRILLI	NG CONTRAC	TOR: Peters Drilling and	Pump Service, Inc.
DRILLI	NG METH	DD AN	D EQUIPME	ENT USED: A	ir Rotary						
WATER	R LEVELS:	40			START: 7/	/23/1998		END:	7/24/1998	LOGGER:	Meier
DEPTH	BGS (ft)			STANDARD		CORE	DESCRIPTION	:		COMM	ENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME	E (USCS GROU	P SYMBOL), CO	OLOR.		DEPTH OF CASING, DRI	LLING RATE.
		RECO	VERY	RESULTS	MOISTURE	CONTENT, RE	LATIVE DENSI	TY,		DRILLING FLUID LOSS,	
			TYPE-#	6-6-6 (in)	OR CONSI: MINERALO	STENCY, SOIL	STRUCTURE,			TESTS, AND INSTRUME	NTATION.
			SS=Split Spoon ST=ShelbyTube	(N)	WIINLINALO	701.					
204 -									_		
205 —									_		
206 -									_		
207 -									_		
208 -											
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209 -									_		
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211 -									_		
212 -									_		
213 -											
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214 -									_		
215 -	215.0-340.				Greenstone.				_		
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226 -											
220									_		
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228 -									_		
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BORING ID:

Sheet 10 of 14

PROJECT: Lava Cap Mine				<u>-</u>	LOCATION: Lofton Residence			
ELEVA	ATION: NORTHING:			HING:	EASTING:	DRILLII	NG CONTRAC	TOR: Peters Drilling and Pump Service, Inc.
DRILLII	DRILLING METHOD AND EQUIPMENT USED: A			ENT USED: A	Air Rotary			
WATER	R LEVELS:	40			START: 7/23/1998	END:	7/24/1998	LOGGER: Meier
DEPTH	BGS (ft)			STANDARD	CORE DE	ESCRIPTION:		COMMENTS:
	INTERV	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP	SYMBOL), COLOR.		DEPTH OF CASING, DRILLING RATE,
		RECC	VERY	RESULTS	MOISTURE CONTENT, RELA	ATIVE DENSITY,		DRILLING FLUID LOSS,
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL ST MINERALOGY.	RUCTURE,		TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	(N)	WINVERVIEWOT.			
230 -							_	
231 -							_	
232 -							_	
233 –							_	
234 -							_	
235 -							_	
236 -							_	
237 -							_	
238 -							_	
239 -							_	
240 -							_	
241 -							_	
242 -							_	
243 -							_	
244 -							_	
245 -							_	
246 -							_	
247 -							_	
248 -							_	
249 -							_	
250 -							_	
251 -							_	
252 -							_	
253 -							_	
254 -								



151319.FI.03

BORING ID:

11AV

Sheet 11 of 14

PROJECT: Lava Cap Mine				<del>-</del>	LOCATION: Lofton Residence				
ELEVA	EVATION: NORTHING:			HING:	EASTING:	DRILLI	NG CONTRAC	TOR: Peters Drilling and Pump Service, Inc.	
DRILLI	DRILLING METHOD AND EQUIPMENT USED: Ai				ir Rotary				
WATER	R LEVELS:	40			START: 7/23/1998	END:	7/24/1998	LOGGER: Meier	
DEPTH	BGS (ft)			STANDARD	CORE DE	SCRIPTION:		COMMENTS:	
	INTERVA	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP S	YMBOL), COLOR.		DEPTH OF CASING, DRILLING RATE,	
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELA	TIVE DENSITY,		DRILLING FLUID LOSS,	
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STI MINERALOGY.	RUCTURE,		TESTS, AND INSTRUMENTATION.	
			SS=Split Spoon ST=ShelbyTube	(N)	WIINLINALOOT.				
255 -							_		
256 <del>-</del>							_		
257 -							_		
258 -							_		
259 -									
257							<u> </u>		
260 -							_		
2/1									
261 -							_		
262 -							_		
263 -							_		
264 -									
201							_		
265 -							_		
2//									
266 -							_		
267 -							_		
268 -							_		
269 -							_		
270 -							_		
271 -									
2/1-							_		
272 -							_		
273 -							_		
274 -							_		
275 -							_		
276 -									
270							_		
277 -							_		
278 -							_		
279 -							_		
280 -							_		



151319.FI.03

BORING ID:

11AV

Sheet 12 of 14

PROJECT: Lava Cap Mine				LOCATION: Lofton Residence				
	ELEVATION: NORTHING:				EASTING:	DRILLING C	CONTRACT	OR: Peters Drilling and Pump Service, Inc.
DRILLI	NG METH	NA DC	D EQUIPM	ENT USED: A	ir Rotary			
WATER	R LEVELS:	40			START: 7/23/1998	END: 7/2	24/1998	LOGGER: Meier
DEPTH	BGS (ft)			STANDARD	CORE DES	CRIPTION:		COMMENTS:
	INTERVA		VERY	PENETRATION TEST RESULTS	SOIL NAME (USCS GROUP SY MOISTURE CONTENT, RELATI	VE DENSITY,		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	OR CONSISTENCY, SOIL STRI MINERALOGY.	JCTURE,		TESTS, AND INSTRUMENTATION.
281 -							_	
282 -							_	
283 -							-	
284 –							-	
285 -							-	
286 -							-	
287 -							_	
288 -							_	
289 -							-	
290 -							-	
291 –							-	
292 -							-	
293 -							-	
294 -							-	
295 -							-	
296 -							-	
297 -							-	
298 -							-	
299 -							-	
300 -							-	
301 -							_	
302 -							_	
303 -							_	
304 -							_	
305 -							-	



151319.FI.03

BORING ID:

11AV

Sheet 13 of 14

PROJE	PROJECT: Lava Cap Mine			LOCATION: Lofton Residence					
ELEVA				EASTING: DRILLING CONTRACTO				ACTOR: Peters Drilling and Pump Service, Inc.	
			D EQUIPMI	ENT USED: A	ir Rotary				
	R LEVELS:	40			START:	7/23/1998		D: 7/24/1998	LOGGER: Meier
DEPTH				STANDARD PENETRATION		COF	RE DESCRIPTION:		COMMENTS:
	INTERVA			TEST			OUP SYMBOL), COLO	R,	DEPTH OF CASING, DRILLING RATE,
		RECO		RESULTS			RELATIVE DENSITY, DIL STRUCTURE,		DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERA	LOGY.	ME STROOTORE,		12313,7NVD INSTRUMENTATION.
306 -			ST=ShelbyTube						
307 -								•	_
308 -								•	_
309 -								•	_
310 -									_
311 -									_
312 -									_
313 -									_
314 -									_
315 🗕									_
316 -									_
317 -									_
318 -								•	_
319 -									_
320 -									_
321 -									_
322 -								•	_
323 -								•	_
324 🗕								•	_
325 🗕									_
326 -									_
327 🗕								•	_
328 🗕								•	_
329 🗕									_
330 -								•	_
331 -									_



151319.FI.03

BORING ID:

11AV

Sheet 14 of 14

PROJE	PROJECT: Lava Cap Mine			<u>-</u>	LOCATION: Lofton Residence			
ELEVA	TION: NORTHING:			HING:	EASTING: DRILLING CONTRAC			TOR: Peters Drilling and Pump Service, Inc.
DRILLII	DRILLING METHOD AND EQUIPMENT USED:			ENT USED: A	ir Rotary			
WATER	R LEVELS:	40			START: 7/23/1998	END:	7/24/1998	LOGGER: Meier
DEPTH	BGS (ft)			STANDARD	COF	RE DESCRIPTION:		COMMENTS:
	INTERVA	AL (ft)		PENETRATION TEST		OUP SYMBOL), COLOR,		DEPTH OF CASING, DRILLING RATE,
			VERY	RESULTS	MOISTURE CONTENT,	RELATIVE DENSITY,		DRILLING FLUID LOSS,
			TYPE-#		OR CONSISTENCY, SO	OIL STRUCTURE,		TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.			
			ST=ShelbyTube	(.,)				
332 -							_	
333 -							_	
334 -							_	
335 -							_	
336 -							_	
337 -							_	
338 -								
339 -							_	
340 -					Total depth=340 ft. bgs.			
341 -								



151319.FI.09

BORING ID:

11DAM1

Sheet 1 of 1

#### **SOIL BORING LOG**

CH2MHILI Lava Cap Mine LOCATION: PROJECT: Lost Lake Dam ELEVATION: 2468' NORTHING: EASTING: DRILLING CONTRACTOR: **Taber Consultants** DRILLING METHOD AND EQUIPMENT USED: CME 55 Hi Torque, Air Rotary, 4" Casing, Ring Bit WATER LEVELS: 9/18/2001 9:30:00 AM END: 9/18/2007 11:30:00 AM LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 0 -1 -2. 1.3 SS-1 25-34-35 (69) SILTY GRAVEL (GM). Brown, slightly moist, very dense, Rock in shoe. 2.5-4.0 angular gravel. 3 Same as above. 5 - 5.0-6.5 1.0 MC-2 20-32-42 (74) Jar sample 0950. 6 -7.5-9.0 0.6 SS-3 18-50/5" SILTY GRAVEL (GM). Red-brown, slightly moist, very dense. Driller notes sampler bouncing on rock. 10 - 10.0-11.5 0 MC-4 50/0 Boulders. Sampler on rock. No recovery. 11 12.5-14.0 0 SS-5 29-50/1" Driller notes boulder ~2'. Blue-gray cuttings. No recovery. Blue-gray to white cuttings. Lost air circ 14 Bedrock. temporarily. Continue blue-gray and white 15 cuttings. Rock. 16 -17 -18 -19 20. Total depth=20 ft. bgs. Grout to surface. 21 -



151319.FI.09

BORING ID:

11DAM2

Sheet 1 of 2

	CH2	2M	IHILL	.	<b>301</b>	L BURING	LUG			
PROJECT: Lava Cap Mine				•	LOCATION: Lost Lake Dam ~75' East of Sp					
ELEVATION: 2470' NORTHING:										
			ND EQUIPM	ENT USED: (	CME 55 Hi Torque, Air Rotary, 4" Casing,	-				
WATER	RLEVELS				START: 9/18/2001 11:30:00 AM	END: 9/18/2001 3:3				
DEPTH	BGS (ft)			STANDARD PENETRATION	CORE DESCRIPT	ON:	COMMENTS:			
	INTERV			TEST	SOIL NAME (USCS GROUP SYMBOL)		DEPTH OF CASING, DRILLING RATE,			
		RECO	OVERY	RESULTS	MOISTURE CONTENT, RELATIVE DE OR CONSISTENCY, SOIL STRUCTUR		DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.			
			TYPE-#	6-6-6 (in)	MINERALOGY.	,	1.20.0//			
			SS=Split Spoon ST=ShelbyTube	(N)						
0 -										
1 –										
2 -	2.5-4.0	0.6	SS-1	13-26-22 (48)	SILTY GRAVEL (GM). Brown, dry, dense, and	ular gravel	•			
3 -	2.5-4.0	0.0	33-1	13-20-22 (40)	SIETT GIAVEE (GW). Brown, dry, dense, and	ulai gravei.				
4 -							•			
5 -	5.0-6.5	0.3	MC-2	9-8-8 (16)	Similar.	_	Poor recovery. Gravels.			
Ü	0.0 0.0	0.0		7 0 0 (10)			- Con receivery. English			
6 –						_				
7 -										
/-	7.5-9.0	0	SS-3	50/3"			Sampler on rock. No recovery.			
8 –						_				
0										
9 -							Driller notes drilling through boulder. Blue-gray cuttings.			
10 -							-			
11 -							Driller notes small zone (6") dirt, then boulders			
12 -							again.			
13 -							•			
14 -							Continue nesting of boulders with soil between.			
							Gorial de l'estaing di Bediders With Soil Between.			
15 –										
16 –										
10 -										
17 –						_				
10	17.5-19.0	0.2	SS-4	11-50/2"	SILTY GRAVEL (GM). Gray-brown, moist, de	nse, angular gravel				
18 🗕					(gray).		•			
19 🗕										
20 –	20.0-21.5	0.1	SS-5	21-10-7 (17)	Similar.	_	. 1320. Poor recovery. Gravels in shoe.			
21 –										
•										
22 -				05		_				
23 -	22.5-24.0	8.0	MC-6	25-16-25 (41)	Similar. Brown, moist, dense.		Jar sample. 1415.			
23 =						_				
24 –						_	Continue nested boulders (2- 5' with soil layers			
	05 0 05 5			50/0			up to 1' thick).			
25 -	25.0-25.5	U	MC-7	50/0			•			



BORING ID:

11DAM2

Sheet 2 of 2

	<i>5</i> H2	<u> 4 V </u>	HILL				
PROJE	CT: Lav	/a Cap	Mine		LOCATION: Lost Lake	e Dam ~75' East of Spillway	
ELEVA	TION: 24	70'	NORT	HING:	EASTING: DRILLING CONTRAC	TOR: Taber Consultants	
DRILLI	NG METH	OD AN	D EQUIPM	ENT USED: C	CME 55 Hi Torque, Air Rotary, 4" Casing, Ring Bit		
WATER	LEVELS				START: 9/18/2001 11:30:00 AM END: 9/18/2001 3:3	30:00 PM LOGGER: K. Porter	
DEPTH I				STANDARD	CORE DESCRIPTION:	COMMENTS:	
	INTERV	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,	
			VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,	
			TYPE-#		OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION.		
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.		
			S1=ShelbyTube	( )			
26 -					_		
27 -		0	MC-9	50/3"	_	No recovery. Rock in shoe.	
28 -		0	IVIC-9	30/3		No recovery. Rock in since.	
29 -					_		
30_	30.0-30.5	0	MC-9	50/0	Total depth=30 ft. bgs. Grout to surface.		
30-	30.0-30.3	0	IVIC-9	30/0	Total depiti-30 it. bgs. Grout to surface.		
31 -							



25 **-** 25.0-26.5 SS-9

1.5

3-7-5 (12)

PROJECT NUMBER

151319.FI.09

BORING ID:

11DAM3

**SOIL BORING LOG** 

Sheet 1 of 2

PROJECT: Lava Cap Mine LOCATION: Lost Lake Dam ~115' East of Spillway

NORTHING: DRILLING CONTRACTOR: ELEVATION: 2471' EASTING: **Taber Consultants** DRILLING METHOD AND EQUIPMENT USED: CME 55 Hi Torque, Air Rotary, 4" Casing, Ring Bit WATER LEVELS: 9/19/2001 8:30:00 AM END: 9/19/2001 11:00:00 AM LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY RESULTS DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 0 -1 -2 -3. 4 -5 - 5.0-6.5 Jar sample. 0840. 1.0 MC-1 47-46-34 (80) SILTY GRAVEL (GM). Brown, slightly moist, very dense, angular gravel. 6 -SS-2 50/4" No recovery. Gravels. 7.5-9.0 10 - 10.0-11.5 1.0 MC-3 33-37-34 (71) SILTY GRAVEL (GM). Brown, moist, very dense, friable, some 11 12.5-14.0 1.3 MC-4 16-20-25 (45) Same as above. Jar sample=0920. 14 -15 - 15.0-16.5 1.0 SS-5 14-14-23 (37) Same as above. 16 17 -17.5-19.0 0 MC-6 50/4" No recovery, rocky cuttings, probably gravels/cobbles. 18 19 -20 - 20.0-21.5 0 MC-7 50/3" 21. 22 -22.5-24.0 1.3 MC-8 27-20-14 (34) SILTY GRAVEL (GM). Brown, very moist, dense, some clay. Jar sample 1010. 23 -24 -

SILTY SAND (SM). Brown, wet, medium, some gravel, some clay.



BORING ID:

11DAM3

Sheet 2 of 2

#### **SOIL BORING LOG**

CH2MHILI PROJECT: Lava Cap Mine LOCATION: Lost Lake Dam ~115' East of Spillway ELEVATION: 2471' NORTHING: EASTING: DRILLING CONTRACTOR: **Taber Consultants** DRILLING METHOD AND EQUIPMENT USED: CME 55 Hi Torque, Air Rotary, 4" Casing, Ring Bit START: 9/19/2001 8:30:00 AM END: 9/19/2001 11:00:00 AM WATER LEVELS: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26 -27 -27.5-29.0 SS-10 1.5 2-1-3 (4) SILTY SAND (SM). Brown, wet, loose, some gravel, some clay. 28 -29 -30 -30 - 30.0-31.5 1.0 MC-11 9-10-13 (23) SILTY GRAVEL (GM). Brown, wet, medium, angular gravel Rock in shoe. (gray), some clay. Total depth=30 ft. bgs. Grout to 31 surface. 32 -



BORING ID:

13Q

Sheet 1 of 2

PROJE		va Cap				Deposition
ELEVA			NORTI		EASTING: DRILLING CONTRA	ACTOR: Water Development Corp., Woodland, CA
			ID EQUIPME	ENT USED: F	Iollow Stem Auger CME 85	
WATER	LEVELS				START: 5/11/2000 1:30:00 PM END: 5/11/2000 3	3:00:00 PM LOGGER: Meier
DEPTH I				STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:
	INTERV		OVERY  TYPE-#  SS=Split Spoon ST=ShelbyTube	TEST RESULTS 6-6-6 (in) (N)	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0 –	0.0-4.0		ST=ShelbyTube	(14)	SILTY SAND (SM). Brown (10YR 4/3), dry, 70% fine to very	Sunny, 70 degrees F.
					fine sand, subrounded, 30% silt.	
1 –					-	-
2 -					_	_
-						
3 🗕					-	_
,	4.0-5.5	1.5		1-2-3	SILTY SAND (SM). Dark grayish brown (10YR 4/2), moist,	8" layer of tailings.
4 -	4.0-0.0	1.5		1-2-3	soft, 50% fine to very fine sand, subrounded, 50% silt.	o layer or tallings.
5 –					FAT CLAY (CL). Bluish gray (Gley 2 5/1), wet, very soft, 100% fat clay	_
,					SILTY SAND (SM). Dark grayish brown (10YR 4/2). Same as above.	
6 –					-	_
7 _					_	_
8 –					-	-
9 🗕	9.0-10.5	1.5		3-3-2	SILTY SAND (SM). Dark gray (Gley 1 4/), wet, very soft,	1425: Collected sample 13Q1-1, 9 to 10 ft. bgs.
					85% fine to very fine sand, well rounded, 15% silt.	
10 🗕					-	-
11 -						
12 🗕					-	_
13 -						
13 -					-	_
14 –	14.0-15.5			3-4-4	FAT CLAY (CH). Bluish gray (Gley 2 5/1), wet, very soft,	_
4-					80% fat clay, 20% silt.	
15 -					SILTY SAND (SM). Dark gray (Gley 1 4/), wet, very soft, 85% fine to very fine sand, well rounded, 15% silt.	_
16 –						_
17 –					-	-
18 🗕					_	
19 🗕	10 5 00 5			0.4.0	- CHITY CAND (CAN Come	_
20 🗕	19.5-20.5			3-4-3	SILTY SAND (SM). Same as above.	Augers sinking into hole, very soft material.
						Roots in sample. 1445: Collected sample 13Q1-2,
21 🗕					-	13Q1-2 ?, 13Q1-2 ?.
22 🗕						
22 <b>-</b>					-	_
23 🗕					-	_
24 –	24.0-25.5		5-5-16		WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM). Dark gray <b>.</b>	
					(10YR 4/1), wet, soft, 75% well graded sand, well rounded, 10% subangular gravel (0.25 to 0.5 cm diameter), 15% silt.	



PROJECT NUMBER
151319.FI.03

BORING ID:

13Q

Sheet 2 of 2

PROJECT: Lava Cap Mine LOCATION: Lower Deposition						eposition			
ELEVA	TION:		NORT		EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA				
DRILLI	DRILLING METHOD AND EQUIPMENT USED: Hollow Stem Auger CME 85								
WATER	R LEVELS:				START: 5/11/2000 1:30:00 PM END: 5/11/2000 3:0	0:00 PM LOGGER: Meier			
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:			
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,			
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,			
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.			
			SS=Split Spoon ST=ShelbyTube	(N)					
25 –	25.0-25.0				WELL GRADED GRAVEL WITH SILT AND SAND (GW-GM). Very dark — grayish brown (10YR 3/2), 50% gravel, angular, 0.5 to 3 cm diameter,	Auger refusal, no sample possible.			
					30% well graded sand, well rounded, 20% silt, wet, loose.				
26 <b>–</b>					_				
27 🗕					<u> </u>				
28 –					Total depth=28 ft. bgs.				
29 <del>-</del>									
27					_				



PROJECT NUMBER

151319.FI.03

BORING ID:

13R

Sheet 1 of 1

#### **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Lower Deposition Area ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA DRILLING METHOD AND EQUIPMENT USED: Hollow Stem Auger CME 85 START: 5/11/2000 5:30:00 PM END: 5/11/2000 6:40:00 PM WATER LEVELS: LOGGER: Meier DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, DRILLING FLUID LOSS RECOVERY OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) Sunny, 70 degrees F, intermittent showers all 0 week. 1 -2 -3 -4 - 4.0-5.5 0.5 1-2-1 SILTY SAND (SM). Dark grayish brown (10YR 4/2), 85% fine to very fine sand, well rounded, wet, 15% silt, very soft. 5 -6 -9.0-10.5 4-7-17 Same as above (9 to 9.5 ft. bgs). 1800: Collected samp 13R1-1, 9 to 10 ft. bgs. 10 -SILTY SAND (SM). Dark gray (Gley 1 4/), 85% fine to very fine sand, well rounded, wet, soft, 15% silt. 12 -13 -14 -15 - 15.0-15.0 FAT SILTY CLAY (CH). Bluish gray (Gley 2). Tailings slurry coming up inside augers. Impossible to sample and to install a well. 16 -Driller pulled augers, redrilled with wooden plug, no sampling possible. Collected sample from augers 13R1-2, x-15 ft. bgs. 17 -18 -19 20 -



151319.FI.09

BORING ID:

13S

Sheet 1 of 3

#### **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Desposition Area ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: **Taber Consultants** DRILLING METHOD AND EQUIPMENT USED: CME 55 Hi Torque, Air Rotary, 4" Casing, Ring Bit START: 9/19/2001 3:00:00 PM WATER LEVELS: END: 9/21/2001 LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 0.0-0.0 Begin using 8" HSA. Tailings. 1 -2 -3 -4 -5 - 5.0-6.5 1.5 SS-1 2-3-2 (5) SILTY SAND (SM). Gray, moist, loose, fine sand, few organics. 6 -8 -10 - 10.0-11.5 1.5 SS-2 1-1-1 (2) SILTY SAND (SM). Gray, wet, very loose, fine sand. 11 -13 -14 -15 - 15.0-16.5 1.5 SS-3 Same as above with ~2" zone of SILTY CLAY (CL). Gray, soft. 1-2-2 (4) 16 17 -18 -19 \_ 20 - 20.0-21.5 1.0 SS-4 1-2-2 (4) SILTY SAND (SM). Gray, wet, very loose, fine sand. Driller notes heaving sands. 21. 22 -23 -24 -25 -Heaving sands. End day 4:40 pm. Resume drilling 9/20/01 7:30 am.



PROJECT NUMBER
151319.FI.09

BORING ID:

13S

Sheet 2 of 3

#### **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Desposition Area ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: **Taber Consultants** DRILLING METHOD AND EQUIPMENT USED: CME 55 Hi Torque, Air Rotary, 4" Casing, Ring Bit START: 9/19/2001 3:00:00 PM END: 9/21/2001 WATER LEVELS: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) No sample at 25', heaved sands. 26 -Grinding, harder drilling. 27 -28 -29 -30 - 30.0-31.5 1.0 SS-5 9-26-40 (66) CLAYEY SAND (SC). Blue-gray and olive, wet, firm, trace Weathered rock. brown organics, becoming hard (thin rock zone). 31 -Smooth, hard drilling. 32 -33 -34 -35 - 35.0-36.5 0.2 SS-6 50/3" Bedrock. Blue-gray with brown-orange staining, highly Switch over to air, 4" bit, no casing. fractured. 36 -37 -38 -39 -40 -41 -42 -43 -44 -45 -46 -47 -48 -49 -50 -



151319.FI.09

BORING ID:

13S

Sheet 3 of 3

PROJE	CT: Lav	a Cap	Mine	=======================================	LOCATION: Desposition Area								
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRACTOR: Taber Consultants								
DRILLING METHOD AND EQUIPMENT USED: CME 55 Hi Torque, Air Rotary, 4" Casing, Ring Bit													
WATER LEVELS: 10 START: 9/19/2001 3:00:00 PM END: 9/21/2001 LOGGER: K. Porter													
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:							
	INTERVAL (ft)			PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE,								
	RECOVERY		RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, DRILLING FLUID LOSS,									
		ĺ	TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.							
			SS=Split Spoon ST=ShelbyTube	(N)	2.0.200								
51 <b>–</b>													
52 <b>–</b>													
32 -					<del>-</del>								
53 -					_								
54 <b>–</b>					<del>-</del>								
55 <b>–</b>						Discharge water clearing up.							
						3							
56 <b>–</b>					_								
57 <b>–</b>													
J/ =													
58 <b>–</b>													
59 <b>–</b>													
60 🗕					<u> </u>								
61 🗕	61.0-61.0				_	Rock becoming harder. Gray in color.							
62 <b>–</b>													
02													
63 <b>–</b>													
64 <b>–</b>													
04 =													
65 <b>–</b>													
66 –					_								
67 <b>–</b>					<u> </u>								
68 –					<del>-</del>								
69 <b>–</b>					<u> </u>								
70 <b>–</b>					<del>-</del>								
71 <b>–</b>													
/ · -					<del>-</del>								
72 <b>–</b>					<del>-</del>	11:30. End drilling. Trip out for well							
70						installation.							
73 🗕					_								



BORING ID:

13T

Sheet 1 of 4

CH2MHILL					SOIL BURING LUG							
PROJECT: Lava Cap Mine				<del>-</del>	LOCATION: Grass Valley, CA							
ELEVATION: NORTHIN			NORT	HING:	EASTING: DRILLING CONTRACTOR: Water Development Corp., Woo			Water Development Corp., Woodland, CA				
DRILLING METHOD AND EQUIPMENT USED: ARCH/Star 30 KDH rig												
WATER LEVELS:					START: 2/7/2007 9:00:00 AM	END:			LOGGER: L. Elliott			
DEPTH	DEPTH BGS (ft) STANDARD				CORE DESCRIPTI	ION:			COMMENTS:			
				PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,			DEPTH OF CASING, DRILLING RATE,				
	RECOVERY		RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,			DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.					
			TYPE-#	6-6-6 (in)	MINERALOGY.	<b>\L</b> ,		ILOI	S, AND INSTRUMENTATION.			
			SS=Split Spoon ST=ShelbyTube	(N)								
0 -							-					
1-							_					
2 -							_					
3 –							_					
4 –							_					
5 <b>–</b>	5.0-10.0				VERY FINE SAND WITH SILT (SM). Mine tail		_	0908				
6 –					as, damp, very loose sand, ~30% silt, subangu sorted, Gley 2 4/10B.		_					
7 _							_					
8 –							_					
9 <b>_</b>							_					
10 -	10.0-18.0				Same as above.		_	0915				
11 _							_					
12 –							_					
13 –												
14 –							_					
15 🗕							_	15 ft. b	gs. driller reports hitting water.			
16 –							_					
17 –							_					
18 _	18.0-21.0				Same as above. Wet.		_	0920				
19 🗕							_					
20 🗕							_					
21 –	21.0-25.0				Very dark blue-gray siltstone (dolomite?) apper fractured, staining and weathering apparent in lineations. Some clasts up to 2" diameter subr have been cut by rig. Gley 2 3/5PB.  Average clast size 1 to 1.5 inch diameter.	orange oxidation		21 ft. b	gs. Driller reports hitting bedrock. 0945.			
22 🗕					Average clast size i to 1.3 ilich didirieter.							
23 –									Driller pumping water off of 3 yd. ion bin. 1000 Resume drilling.			



BORING ID:

13T

Sheet 2 of 4

#### **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Grass Valley, CA **ELEVATION:** NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA DRILLING METHOD AND EQUIPMENT USED: ARCH/Star 30 KDH rig WATER LEVELS: START: 2/7/2007 9:00:00 AM END: LOGGER: L. Elliott DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, **TEST** RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 24 -1005 25 - 25.0-30.0 Same lithology as at 21 ft. bgs., but ground up into very coarse angular sand. No clasts over 1/4" diameter, ~20% fine gravel with diameters between 0.19 and 0.25". 26. 27 28 29 -30 - 30.0-31.0 Same lithology. Evidence of orange oxidation and staining, 1015 angular coarse sand and fine gravel. Change in lithology. Siltstone with clasts quartz and black mineral (or 31 - 31.0-33.0 Driller is going to stop advancing casing at 40 may be very dark blue gray seen above). Matrix is Gley1 5/N. Coarse sand of some 3 mineralogies 20 to 30% of sample. Coarse sand and fine gravel is subrounded. Orange oxidation/staining, evidence of weathering. ~10 to 15% quartz, ft. bgs. to expedite drilling. He is confident ~10% dark black/blue mineral. 32 formation will not cave, is competent. 31 ft. bgs at 1017. 33 - 33.0-34.0 SILTSTONE. ~20% Gley 1 5/N seen above. ~10% quartz. 70% 1023 Gley 2 2.5/5PB, similar 50% fine gravel, 50% coarse sand. All angular, 34 - 34.0-37.0 Same as above. Lots of weathering indication, orange staining. Driller reports water coming out of hole changed Mineralogy is more consistent then at 33 ft. bgs. Few medium rounded gravels with diameter 1 to 2" exhibit oxidation/weathering staining. No light gray material observed above present. color to rust colored. Thinks we hit fracture. 1028. 35 35 ft. bgs. Water color changed back to normal. 36 -37.0-40.0 Same as above. 1052. Driller reports water smells sulfurous. CH2M HILL field staff doesn't smell it. 38 -39 -40 - 40.0-45.0 Same as above. 1058. Stop drilling, readjust rig jacks, surface has settled, causing feet to drop. Driller switching from 9 5/8" bit to 7 7/8" to expedite 41 drilling and stop casing the hole. 42 -43 -44 -45 - 45.0-50.0 Same mineralogy as above. Appears to be competent bedrock, 1200. Driller says water smells sulfurous. Again, no evidence of weathering upon 2nd inspection, I think CH2M HILL does not smell it but maybe his nose is 46 bedrock may be the same as meta sediments (slate) seen 5K-S more well trained than ours?



BORING ID:

13T

Sheet 3 of 4

#### **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Grass Valley, CA ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA ARCH/Star 30 KDH rig DRILLING METHOD AND EQUIPMENT USED: WATER LEVELS: START: 2/7/2007 9:00:00 AM END: LOGGER: L. Elliott DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) and 5k-D instead of siltstone. 47 -48 -49 -50 - 50.0-60.0 1230 Same as above. 51 -52 -1240 at 53 ft. bgs: Cease. 1415 at 53 ft. bgs: 53 -55 -57 58 -59 -60.0-65.0 Same as above. Black (Gley 1 2.5/N), metasedimentary rock 1440. Cuttings consistent, probable competent (slate). bedrock. 61 -62 -63 -64 -65 - 65.0-70.0 Same as above. 1510 66 - 66.0-66.0 1515 at 66 ft. bgs: Cease. 1520 at 66 ft. bgs: Drilling resumes. 67 -68 -69 -70 - 70.0-75.0 1545 Same as above. Slightly more angular and slightly larger fragments (0.5 to 3 mm) as above. 71 -



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Sheet 4 of 4

CH2MHILL STILL STI								
PROJE	CT: Lav	а Сар	Mine			LOCATION: Grass Va	lley, CA	
ELEVATION: NORTHING:					EASTING:	DRILLING CONTRACT	TOR: Water Development Corp., Woodland, CA	
		D AN			RCH/Star 30 KDH rig			
	WATER LEVELS: START: 2/7/2007 9:00:00 AM END: LOGGER: L. Elliott							
DEPTH				STANDARD	CORE DESCRIPTI		COMMENTS:	
	INTERVA	L (ft)		PENETRATION	SOIL NAME (USCS GROUP SYMBOL)		DEPTH OF CASING, DRILLING RATE,	
	IIII I	RECO	\/EDV	TEST RESULTS	MOISTURE CONTENT, RELATIVE DE		DRILLING FLUID LOSS,	
		ILLUU	TYPE-#		OR CONSISTENCY, SOIL STRUCTUR	E,	TESTS, AND INSTRUMENTATION.	
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.			
72 -			ST=ShelbyTube	(14)				
12-						_		
73 <b>–</b>						_		
74 –						_		
75_	75.0-80.0				Same as above. Angularity returns as seen ab	love at 70 ft	1610	
75-	7 3.0-00.0				bgs.	ove at 70 it.	1010	
76 <b>–</b>	76.0-76.0				Total depth=76 ft. bgs.	_		
77 –						_		
78 <b>–</b>								
70-						_		
79 <b>–</b>						_		
80 -						_		
81 <b>–</b>								
01-						_		



<b>PROJECT</b>	NUMBER
INOJECI	NUMBER

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Sheet 1 of 6

PROJECT: Lava Cap Mine Road LOCATION:						100 ft. south of main gate			
ELEVA			NORT		EASTING: DRILLING CONTRAC	CTOR: Diamond Well Drilling			
DRILLII	DRILLING METHOD AND EQUIPMENT USED: Air Rotary								
WATER	R LEVELS:				START: 11/28/2001 END: 11/28/2001	LOGGER: T. Lae			
DEPTH				STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:			
	INTERVA			TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,			
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.			
			TYPE-# SS=Split Spoon ST=ShellbyTube	6-6-6 (in) (N)	MINERALOGY.				
0 -	0.0-20.0		S1=SneibyTube	, ,	LEAN CLAY (CL). Strong brown (7.5YR 5/4), moist, soft,				
					plastic, no dilatancy.				
1 -					<del>-</del>	-			
2 <b>-</b>					<del>-</del>				
3 <b>–</b>					<u> </u>				
4 -					<u>-</u>				
5 <b>–</b>					<u> </u>				
6 -					<u> </u>				
7_					<u>_</u>				
8 <b>–</b>					Drier at 8 ft. bgs.				
9_									
10 -					_				
					_				
11 -					_				
12 -					Cobbles and gravel 12 to 14 ft. bgs.				
13 -					<del>-</del>	•			
14 -					<del>-</del>	•			
15 🗕					<del>-</del>				
16 <b>–</b>					<del>-</del>	•			
17 -					_	•			
18 🗕					<del>-</del>	Easy, rapid drilling.			
19 🗕					<del>-</del>	•			
20 -	20.0-46.0				LEAN CLAY (CL). Brown (7.5YR 4/2), damp, soft, little sand and gravel to 1 inch. Color change to pale yellow (5Y 7/3)				
21 <b>–</b>					at 23 ft. bgs. Some black mottling. Gravel is dark gray  matrix with high quartz content.				
22 🗕					maux wur ngn quarz content. —				
23 <b>–</b>					<u> </u>				
24 <b>–</b>					<del>-</del>				
25 <b>–</b>					<u> </u>				



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Sheet 2 of 6

PROJECT: Lava Cap Mine Road					LOCATION: Approx 100 ft. south of main gate			
ELEVATION: NORTHING:					EASTING:	DRILLI	NG CONTRAC	TOR: Diamond Well Drilling
DRILLING METHOD AND EQUIPMENT USED: Air Rotary								
	R LEVELS:				START: 11/28/2001		11/28/2001	LOGGER: T. Lae
DEPTH				STANDARD PENETRATION	CORE DES	CRIPTION:		COMMENTS:
	INTERVA	AL (ft) RECO	VERY	TEST RESULTS	SOIL NAME (USCS GROUP SY MOISTURE CONTENT, RELATI	IVE DENSITY,		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	OR CONSISTENCY, SOIL STRI MINERALOGY.	JCTURE,		TESTS, AND INSTRUMENTATION.
26 -			S1=SnelbyTube	,,,			_	
27 -							_	
28 -							_	
29 -							_	
30 -							_	Slow drilling.
31 -							_	
32 -							_	
33 -							_	
34 -							_	
35 -							_	
36 <b>–</b>							_	
38 -							_	
39 -							_	
40 -							_	Injecting foam to circulate clay, not successful.
41 -							_	
42 -							_	
43 -							_	
44 -							_	
45 -							_	
46 -	46.0-70.0						_	
47 -							_	
48 –							_	
49 -							_	
50 -								



PROJECT	NUMBER	

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Sheet 3 of 6

CHZIVIFILL								
PROJE	PROJECT: Lava Cap Mine Road LOCATION: Approx 100 ft. south of main gate							
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRAC	TOR: Diamond Well Drilling		
DRILLII	NG METHO	D AN	D EQUIPMI	ENT USED: A	ir Rotary	-		
	R LEVELS:				START: 11/28/2001 END: 11/28/2001	LOGGER: T. Lae		
DEPTH				STANDARD	CORE DESCRIPTION:	COMMENTS:		
	INTERVA	L (ft)		PENETRATION				
		RECO	VEDV	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,		
		KLCO			OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.		
			TYPE-# SS=Split Spoon	6-6-6 (in)	MINERALOGY.			
51 <b>–</b>			SS=Split Spoon ST=ShelbyTube	(N)				
51-					_			
52 <b>–</b>								
53 <b>–</b>								
54 <b>–</b>					WEATHERED BEDROCK. Greenish gray (10G 5/1), dry, loose,			
55 <b>–</b>					fine grained, angular, breaks to smaller pieces easily.  Grades to BEDROCK. Greenish gray (10G 5/1).			
33 —					Clades to Bebrook. Greenish gray (100 % 1).			
56 <b>–</b>								
57 <b>–</b>								
58 <b>–</b>								
30 =								
59 <b>–</b>								
60 🗕					Metasedimentary CLAYSTONE. Dry, very dusty, massive, fine			
61 <b>–</b>					grained, trace FeOx staining.			
01-					_			
62 <b>–</b>								
63 <b>–</b>								
64 <b>–</b>								
01								
65 <b>–</b>								
66 <b>–</b>								
67 <b>–</b>								
07								
68 <b>–</b>								
69 <b>–</b>					<del>-</del>			
70 🗕	70.0-98.0							
	2.2 /3.0				_			
71 <b>–</b>					_			
72 <b>–</b>					<del>-</del>			
73 <b>–</b>								
74 <b>–</b>					<u> </u>			
75 <b>–</b>					_			
76 <b>–</b>					<u> </u>			



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PROJECT	NOMREK	

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Sheet 4 of 6

PROJECT: Lava Cap Mine Road LOCATION: Approx 100 ft. south of main gate							00 ft. south of main gate
ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Diamond Well Drilling						TOR: Diamond Well Drilling	
DRILLING METHOD AND EQUIPMENT USED: Air Rotary							
	R LEVELS:					11/28/2001	LOGGER: T. Lae
DEPTH				STANDARD PENETRATION	CORE DESCRIPTION:		COMMENTS:
	INTERVA	L (ft) RECO	VERY	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.		TESTS, AND INSTRUMENTATION.
77 -			ST=ShelbyTube	(14)			
78 <b>–</b>							
79 <b>–</b>							
80 -						_	
81 <b>–</b>							
82 <b>–</b>					Color change to dark bluish gray (5B 4/1) at 82 ft. bgs.	_	
83 -					3 3 7, 4,444 1 23		
84 🗕							
85 <b>–</b>						_	
86 🗕						_	
87 <b>–</b>							
88 🗕						_	
89 –						_	
90 –							
91 <b>–</b>						_	
92 –						_	
93 –						_	
94 🗕							
95 🗕						_	
96 =							
97 <b>–</b>	98.0-141.0				Cutting damp to moist at 98 feet bgs. Crumbles with		
99 -	70.0-141.U				thumb/finger pressure.		
100 -						_	
101 –						_	



PROJECT NUMBER BORI	ING ID:
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Sheet 5 of 6

CHZIVIHILL							
PROJE	CT: Lav	a Cap	Mine Road		LOCATION: Approx 1	00 ft. south of main gate	
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRACT	TOR: Diamond Well Drilling	
DRILLII	NG METHO	D ANI	D EQUIPME	ENT USED: A	ir Rotary		
WATER	R LEVELS:				START: 11/28/2001 END: 11/28/2001	LOGGER: T. Lae	
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:	
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,	
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,	
		ĺ	TYPE-#		OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.	
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.		
102 -			S1=ShelbyTube	. ,	_		
103 -					<del>-</del>		
104 –							
104 -							
105 -					_		
106 -					<del>-</del>		
107 <b>–</b>							
107 =					_		
108 🗕					_		
109 🗕					<del>-</del>		
110 -							
110-					_		
111 🗕					<del>-</del>		
112 🗕					_		
113 -							
114 -					<del>-</del>		
115							
115 -					_		
116 -					_		
117 -					<del>-</del>		
118 -							
110-					_		
119 🗕					<u> </u>		
120 🗕					<del>-</del>		
121 🗕					Making water from 121 ft. bgs.	Stop for the day 11/28/01 due to hydraulic hose	
						breaking. Resume 11/29/01. Driller reports 20 to	
122 🗕					<del>-</del>	25 ft. of water in hole.	
123 🗕					<del>-</del>		
124 🗕					<u> </u>		
125 🗕					<u> </u>		
10/							
126 🗕					_		
127 🗕					_		



PRO	<b>IFCT</b>	NUMBER	

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Sheet 6 of 6

PROJECT: Lava Cap Mine Road LOCATION: Approx 100 ft. south of main gate								
ELEVA		и опр	NORT				NG CONTRAC	
		D AN			ir Rotary	(ILLII	VO CONTINAC	Tok. Damond well brilling
	R LEVELS:		2 2 2 3 1 1 1 1			ND:	11/28/2001	LOGGER: T. Lae
DEPTH				STANDARD	CORE DESCRIPTION:			COMMENTS:
02	INTERVA	L (ft)		PENETRATION	SOIL NAME (USCS GROUP SYMBOL), COLO	ΛD		DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	TEST RESULTS	MOISTURE CONTENT, RELATIVE DENSITY	ΟΚ, ',		DRILLING FLUID LOSS,
			TYPE-#		OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.			TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	WIINERALOGY.			
128 -		<u> </u>	51-Shebyrube				_	
129 🗕							_	
130 -							_	
131 <b>–</b>							_	
132 -							_	
133 –							_	
134 🗕							_	
135 🗕							_	
136 🗕							_	
137 🗕							_	
138 –							_	
139 🗕							_	
140 -							_	
141 <b>–</b>					Total depth=141 ft. bgs. Install a 6 inch PVC clay 1120	-11	_	
142 🗕					liner. Hand perforated from 115 to 135 ft. bgs. See we completion diagram.	<del>)</del> II	_	
l								



BORING ID:

5 PZ 1

Sheet 1 of 2

# **SOIL BORING LOG**

PROJECT: Lava Cap Mine Road

LOCATION: 5 PZ 1-Waste Rock Area

ELEVATION: 2784.9' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR

DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque

			ID EQUIPM	ENTUSED: (	CME 7500 High Torque	
WATER LEVELS:			START: 8/17/2001 END: 8/17/20	001 LOGGER: A. Evans		
DEPTH				STANDARD	CORE DESCRIPTION:	COMMENTS:
	INTERV	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,
		RECO	OVERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
			TYPE-#	6-6-6 (in)	MINERALOGY.	TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	(N)		
0 —						_
1-						Waste Rock (8").
	1.5-3.0	7"	SS-1	24-25-15 (40)	SANDY GRAVEL (SP) (3/4") and sand. Blue-gray angular	
2 -					gravel, gray-brown sand, dry, dense.	_
3 -						
4 -						-
5 -	5.0-6.5	12"	SS-2	15-21-25 (46)	Same as above.	_
J		1				
6 –						_
7 -						_
	7.5-9.0	1"	SS-3	50/2"	SANDY GRAVEL. Broken rock particles, orange-gray, dry,	Hard drilling.
8 –					sampled particles soft broken rock plate-like structure.	_
9 🗕						_
, –						
10 -						_
11 -						
						_
12 -						_
13 –	12.5-14.0	NR	SS-4	8-13-25 (38)	SANDY GRAVEL (SP) (3/4"). Some blue gray gravel/gray brown sand, dry, dense.	
13 —					Surid, dry, derise.	
14 -						_
15	15.0-16.5	3"	SS-5	22-21-33 (54)	SANDY GRAVEL (GP) (3/4"). Orange, moist, dense, angular	_
13	13.0 10.3		33 3	22 21 33 (34)	shapes.	
16 –						_
17 –						_
.,_	17.5-19.0	4"	SS-6	11-15-18 (33)	GRAVEL-BROKEN ROCK (GP) (3/4"). Gravel: small broken rock	
18 🗕					particles, gray-black, moist, dense.	_
19 🗕						_
1/-						
20 —	20.0-21.5	2"	SS-7	12-12-15 (27)	Same as above.	_
21 –						
<u>-</u> ا ـ						_
22 🗕						_
23 🗕	22.5-24.0	2"	SS-8	12-15-19 (34)	Same as above.	
23 <del>-</del>						
24 –						_
ar.	25 0 27 5	2"	SC 0	7.0.0 /4.0\	CLAY (CL) Oranga majet eliff plastic	Clay lance native?
25 <b>–</b>	25.0-26.5	Ľ	SS-9	7-9-9 (18)	CLAY (CL). Orange, moist, stiff, plastic.	— Clay lense, native?



PROJECT NUMBER

151319.FI.09

5 PZ 1

BORING ID:

**SOIL BORING LOG** 

Sheet 2 of 2

PROJECT: Lava Cap Mine Road LOCATION: 5 PZ 1-Waste Rock Area

ELEVATION: 2784.9' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR

AIER	R LEVELS:				START: 8/17/2001 END: 8/17/20	01 LOGGER: A. Evans
PTH I	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:
INTERVAL (II)		PENETRATION TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.		
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.	
26 <b>–</b> 27 <b>–</b> 28 <b>–</b>	27.5-29.0	7"	SS-10	24-30-33 (63)	ROCK AND SANDY GRAVEL (GP) (3/4"). Gravel broken rock, gray black, moist, very dense.	Total depth=27.5 ft. bgs. Grout backfill.
29 <b>–</b> 30 <b>–</b>						



25 - 25.0-26.5 6"

MC-10

14-12-19 (31)

Same as above.

PROJECT NUMBER

151319.FI.09

BORING ID:

5 PZ 2

2 Sheet 1 of 2

**SOIL BORING LOG CH2MHILL** Lava Cap Mine (Data Gaps) LOCATION: PROJECT: 5 PZ 2-Tailings Area ELEVATION: 2756.3' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque WATER LEVELS: START: 8/17/2001 END: 8/17/2001 LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY RESULTS DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) Waste rock, 3' thick. 0 -1. 2. SS-1 50/4" SANDY GRAVEL (GP) (3/4"). Blue-gray gravel, dry, dense, Tailings. 2.5-4.0 sand. 3 5 - 5.0-6.5 13" SS-2 11-12-15 (27) SILTY SAND (SM). Gray, moist, dense. 6 -10" MC-3 13-14-19 (33) 7.5-9.0 Same as above. 10 - 10.0-12.5 0 SH-4 Same as above. No recovery. 11. 12.5-14.5 15" SS-5 3-2-2 (4) CLAY-SILTY SAND (CL-SM). Orange-gray, moist, stiff, Top 1/2 of sample: clay. Bottom 1/2: Sand. clay-dense sand. 14 -15 - 15.0-17.5 2' 3" SH-6 SILTY SAND (SM). Gray, moist, medium density. 16 17 -17.5-20.0 14" SS-7 6-4-8 (12) Same as above. 18 19 -20 - 20.0-21.5 | 12" MC-8 11-15-21 (36) Same as above. 21. 22 -22.5-24.0 18" SS-9 7-9-15 (24) Same as above. 23 -24 -



PROJECT NUMBER

151319.FI.09

BORING ID:

5 PZ 2

Sheet 2 of 2

# **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine (Data Gaps) LOCATION: 5 PZ 2-Tailings Area ELEVATION: 2756.3' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque START: 8/17/2001 END: 8/17/2001 WATER LEVELS: LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26 -27 -27.5-29.0 16" SS-11 29-50/3" Clay at bottom of sample, native. Same as above. 28 Bedrock. 29 -Total depth=29 ft. bgs. Grout backfill. 30 -



21.

22 -

23 -

24 -

25 -

22.5-24.0 12"

SS-9

6-16-25 (41)

Same as above.

PROJECT NUMBER

151319.FI.09

BORING ID:

5 PZ 3

Sheet 1 of 2

### **SOIL BORING LOG**

**CH2MHILL** Lava Cap Mine (Data Gaps) LOCATION: PROJECT: 5 PZ 3-Tailings Area NORTHING: DRILLING CONTRACTOR: ELEVATION: 2751.3' EASTING: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque WATER LEVELS: START: 8/17/2001 END: 8/17/2001 LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY **RESULTS** DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 0 -Waste rock to 8". Tailings. 1 -2. SS-1 4-4-6 (10) SILTY SAND (SM). Gray, moist, dense. 2.5-4.0 3 5 - 5.0-6.5 MC-2 6-4-6 (10) GRAVELLY SILTY SAND (GP-SP). Blue gray-gray, moist, loose, Top 1/2 gravel. medium dense. 6 -18" SS-3 1-1-4 (5) SILTY SAND (SM). Gray, moist, medium dense. 7.5-9.0 10 - 10.0-12.5 | 20" SH-4 Same as above. 10' approximate water level. 11 -12.5-14.0 16" SS-5 2-3-6 (9) SANDY SILT (ML). Gray, wet, firm. 13 -14 -15 - 15.0-16.5 6" MC-6 5-4-5 (9) Same as above. 16 17 -17.5-19.0 12" SS-7 3-3-6 (9) Similar to above. Less sand. 18 19 -20 - 20.0-21.5 6" MC-8 NR SANDY SILT (ML). Gray, very moist, loose.



PROJECT	NUMBER

151319.FI.09

BORING ID:

5 PZ 3

Sheet 2 of 2

# **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine (Data Gaps) LOCATION: 5 PZ 3-Tailings Area ELEVATION: 2751.3' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque START: 8/17/2001 END: 8/17/2001 WATER LEVELS: LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) Rock. Total depth=25.5 ft. bgs. Grout backfill. 26 -



21.

22 -

23 -

24 -

25 -

22.5-24.0 12"

SS-9

6-16-25 (41)

Same as above.

PROJECT NUMBER

151319.FI.09

BORING ID:

5 PZ 3

Sheet 1 of 2

### **SOIL BORING LOG**

**CH2MHILL** Lava Cap Mine (Data Gaps) LOCATION: PROJECT: 5 PZ 3-Tailings Area NORTHING: DRILLING CONTRACTOR: ELEVATION: 2751.3' EASTING: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque WATER LEVELS: START: 8/17/2001 END: 8/17/2001 LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY **RESULTS** DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 0 -Waste rock to 8". Tailings. 1 -2. SS-1 4-4-6 (10) SILTY SAND (SM). Gray, moist, dense. 2.5-4.0 3 5 - 5.0-6.5 MC-2 6-4-6 (10) GRAVELLY SILTY SAND (GP-SP). Blue gray-gray, moist, loose, Top 1/2 gravel. medium dense. 6 -18" SS-3 1-1-4 (5) SILTY SAND (SM). Gray, moist, medium dense. 7.5-9.0 10 - 10.0-12.5 | 20" SH-4 Same as above. 10' approximate water level. 11 -12.5-14.0 16" SS-5 2-3-6 (9) SANDY SILT (ML). Gray, wet, firm. 13 -14 -15 - 15.0-16.5 6" MC-6 5-4-5 (9) Same as above. 16 17 -17.5-19.0 12" SS-7 3-3-6 (9) Similar to above. Less sand. 18 19 -20 - 20.0-21.5 6" MC-8 NR SANDY SILT (ML). Gray, very moist, loose.



PROJECT	NUMBER

151319.FI.09

BORING ID:

5 PZ 3

Sheet 2 of 2

# **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine (Data Gaps) LOCATION: 5 PZ 3-Tailings Area ELEVATION: 2751.3' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque START: 8/17/2001 END: 8/17/2001 WATER LEVELS: LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) Rock. Total depth=25.5 ft. bgs. Grout backfill. 26 -



25 - 25.0-26.5

MC-10

8-12-13 (25)

SANDY SILT (ML). Gray, wet, stiff, rocky.

PROJECT NUMBER

151319.FI.09

BORING ID:

5ABUT1

Sheet 1 of 2

### **SOIL BORING LOG**

CH2MHILI Lava Cap Mine LOCATION: 5ABUT 1 (Left) PROJECT: ELEVATION: 2746.8 ft. EASTING: NORTHING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA WATER LEVELS: START: 8/14/2001 12:00:00 PM END: 8/14/2001 1:45:00 PM LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY RESULTS DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) Waste rock <1 ft. 0 -1. 2. SS-1 3-3-3 (6) SANDY SILT (ML). Gray, moist, stiff. Tailings. 2.5-4.0 3 5 - 5.0-6.5 1.5 MC-2 7-9-13 (22) Similar. Mottled gray-tan, more moist. 6 -SS-3 4-4-6 (10) SILTY SAND (SM). Gray, slightly moist, loose, finer sand. 7.5-8.5 10 - 10.0-12.5 2.5 4-SH SILTY SAND (SM). Gray, slightly moist, medium. Shelby-full recovery. 11 -12.5-14.0 1.5 SS-5 6-9-7 (16) SANDY SILT (ML). Gray, moist, very stiff. Sampler, wet. 13 14 -15 - 15.0-16.5 1 MC-6 5-7-8 (15) Zones of: SILTY SAND (SM), same as above and SILT (ML). 16 17 -17.5-19.0 1.5 SS-7 4-5-8 (13) Similar. 18 19 -20 - 20.0-22.5 2 SH-8 Shelby. 21. 22 -22.5-24.0 1.5 SS-9 3-3-3 (6) Similar. 23 -24 -



BORING ID:

5ABUT1

Sheet 2 of 2

# **SOIL BORING LOG**

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: 5ABUT 1 (Left) ELEVATION: 2746.8 ft. NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA START: 8/14/2001 12:00:00 PM END: 8/14/2001 1:45:00 PM WATER LEVELS: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26 -27 -27.5-29.0 SS-11 8-50/6" BEDROCK. Yellowish. Native? Rock fragments. 28 -29 -30 - 30.0-30.5 .5 50/6" BEDROCK. Total depth=30 ft. bgs. Grout backfill. 31 -



SS-10

50/5"

PROJECT NUMBER 151319.FI.09

BORING ID:

5ABUT2

Sheet 1 of 2

	CH2		HILL		SOIL BORING LOG					
PROJE		/a Cap		· !	LOCATION: 5ABUT 2 (Right)					
ELEVATION: 2746.5 NORTHING:					EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO CO					
DRILLII	NG METH	OD AN	D EQUIPM	ENT USED: (	CME 75 High Torque using 8" HSA					
WATER	R LEVELS:			_	START: 8/14/2001 2:00:00 PM END: 8/14/2001 4:0	00:00 PM LOGGER: K. Porter				
DEPTH				STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:				
	INTERV			TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,				
		RECC	VERY TYPE-#		OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.				
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.					
0 -			S1=ShelbyTube	( )	SILTY SAND/GRAVEL (GM). Brown-gray, dry to moist, medium,	Waste rock (8"). PDM=0.0				
					angular gravel.					
1-					_					
2 -					_					
3 -	2.5-4.0	0	SS-1	50/3"		No recovery.				
3-					_					
4 -					_					
5-	5.0-6.5	1.5	MC-2	23-14-9 (23)	SILT (ML). Tan-gray, slightly moist, stiff.	Tailings.				
	0.0 0.0	1.0		20 11 7 (20)	energy (may, ran gray, ongress) motor, out.	, .ago.				
6 -					_					
7_					_					
	7.5-8.5	1.5	SS-3	8-10-8 (18)	Similar. More gray.					
8 -					_					
9_					_					
10-	10.0-12.5	1.5	SH-4		_	Easy push, soft.				
11 -					_					
4.0										
12 -	12.5-14.0	1.5	SS-5	3-3-5 (8)	SILT (ML). Dark brown, moist, firm, trace sand.	· Native?				
13 -					_					
14 -										
14-					_					
15 -	15.0-16.5	1.5	SS-6	9-19-23 (42)	Similar. Stiff, few finer gravels.					
16 -					_					
17 -	17.5-19.0	1.5	MC-7	10 / 15 /21)	Cimiles Van maist increasing and					
18 -		1.5	IVIC-7	10-6-15 (21)	Similar. Very moist, increasing sand.					
19 -					_	•				
20 -	20.0-22.5	1.0	SH-8		_	Poor recovery.				
21 -					_	•				
22 -					_					
22	22.5-24.0	0.2	SS-9	31-50/3"	CLAYEY SAND with gravel. Brown, wet, very dense, angular	Harder pushing last 6". Bedrock.				
23 -					gravels	1				
24 -					_					

CLAYEY SAND with gravels. Red-brown, wet. Total depth=25



BORING ID:

5ABUT2

**SOIL BORING LOG** 

Sheet 2 of 2

PROJECT: Lava Cap Mine LOCATION: 5ABUT 2 (Right)

LEVA	ΓΙΟΝ: 27	46.5	NORT	HING:	EASTING:	DRILLIN	NG CONTRACT	TOR: CASCADE DRILLING, INC., RANCHO C	
					ME 75 High Torque using 8" HSA				
	LEVELS				START: 8/14/2001 2:00:00 PM	END:	8/14/2001 4:0	0:00 PM LOGGER: K. Porter	
	BGS (ft)			STANDARD	CORE DESCRIPTIO			COMMENTS:	
· · · · · ·	INTERV	AL (ft)		PENETRATION					
		RECO	VERV	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), MOISTURE CONTENT, RELATIVE DEN	L), COLOR, DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,			
		KLCO	TYPE-#		OR CONSISTENCY, SOIL STRUCTURE	,	TESTS, AND INSTRUMENTATION.		
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.				
			ST=ShelbyTube	(14)	ft. bgs. Grout backfill.				
26 🗕					n. bgs. Grout backiii.		_		
27 -							_		



22.5-24.0 0

25 - 25.0-26.5 0.7

23 -

24 -

SS-9

SS-10

23-17-12 (29)

18-24-37 (61)

PROJECT NUMBER 151319.FI.09

**BORING ID:** 

5GE01

Sheet 1 of 2

### **SOIL BORING LOG**

CH2MHILI Lava Cap Mine LOCATION: PROJECT: 5GE01 NORTHING: EASTING: ELEVATION: 2785.5' DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA WATER LEVELS: START: 8/15/2001 2:20:00 PM END: 8/15/2001 4:00:00 PM LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY RESULTS DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 0 -1 - 1.0-1.0 SILTY SAND/GRAVEL (GM). Brown-gray, dry, medium, angular. Waste rock (8"). 2. SS-1 50/1" SILTY SAND/GRAVEL (GM). Brown-gray, dry, medium, angular Waste rock (8"). 2.5-4.0 gravel. Driller notes softer zones at 4'. 4 -5 - 5.0-6.5 0.6 SS-2 15-10-16 (26) SILTY SAND/GRAVEL (GM). Brown, gray, slightly moist, medium, angular gravel. 6 -7.5-9.0 0.5 SS-3 26-13-24 (37) Same as above. 10 - 10.0-11.5 0.7 SS-4 14-24-15 (39) Same as above. 11 -12.5-14.0 0.5 SS-5 7-9-15 (24) Same as above. 13 14 -15 - 15.0-16.5 1.0 SS-6 20-10-13 (23) Same as above. Moist. 16 17 -17.5-19.0 0.8 SS-7 10-19-15 (34) Same as above. 18 19 -20 - 20.0-21.5 0 SS-8 33-38-50/3" 21. 22 -



BORING ID:

5GE01

Sheet 2 of 2

### **SOIL BORING LOG**

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: 5GE01 ELEVATION: 2785.5' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA END: 8/15/2001 4:00:00 PM WATER LEVELS: START: 8/15/2001 2:20:00 PM LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY **RESULTS** DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26 -27 -27.5-29.0 0.6 SS-11 42-50 More brown silty sand. 28 -29 -30 - 30.0-31.5 0.5 SS-12 50/5" 31 -32 -32.5-34.0 0.5 SS-13 50-12-28 (40) Similar. SILTY SAND WITH GRAVEL (GM). Brown, wet, dense, Woody debris in sample. angular gravel. 33 -34 -35 - 35.0-36.5 1.2 SS-14 14-15-27 (42) SILTY SAND (SM). Gray-brown, wet, dense, finer sand. Total depth=35 ft. bgs. Grout backfill. 36 -37 -



BORING ID:

5GE02

Sheet 1 of 1

### **SOIL BORING LOG**

CH2MHILI Lava Cap Mine LOCATION: 5GE01 PROJECT: ELEVATION: 2756.9' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA WATER LEVELS: START: 8/15/2001 1:00:00 PM END: 8/15/2001 LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 0 -Waste rock (8"). 1. 0.3 SS-1 50/5" SILTY SAND/GRAVEL. Brown, slightly moist, dense, angular. 2.5-4.0 SS-2 5 - 5.0-6.5 50/1" Same as above. Sampler "bouncing" on rock. 6 -7.5-9.0 SS-3 50/5" Same as above. 10 - 10.0-11.5 0 SS-4 50/5" Tailings. 11 12.5-14.0 1.5 Organics-wood debris in sample TCLP/STLC Sample MC-5 16-43-10 (53) SILTY SAND (SM). Gray, wet, dense, fine sand. 1:30 pm. 14 -15 - 15.0-16.5 1.5 SS-6 11-13-9 (22) Same. 16 17 -17.5-19.0 1.0 MC-7 20-50/3" SANDY SILT (ML). Gray, wet, stiff. Native, debris. 18 19 -CLAYEY SAND/GRAVEL (GC). Brown, wet, very dense. Total 20 - 20.0-21.5 0.3 SS-8 50/3" depth=20 ft. bgs. Grout backfill. 21 -22 -



25 -

PROJECT NUMBER

151319.FI.09

**BORING ID:** 

5GE03

Sheet 1 of 1

### **SOIL BORING LOG**

CH2MHILI Lava Cap Mine LOCATION: PROJECT: 5GE03 ELEVATION: 2748.3' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA WATER LEVELS: START: 8/15/2001 9:00:00 AM END: 8/15/2001 10:00:00 AM LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY RESULTS DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 0 -1. 2. SS-1 1.5 7-10-15 (25) SILTY SAND (SM). Brown, moist, dense. 2.5-4.0 5 - 5.0-6.5 1.2 MC-2 18-19-22 (41) SILTY SAND (SM) and SANDY SILT ML). Similar as above. 6 -1.5 SS-3 4-4-3 (7) SILTY SAND (SM). Gray, wet, medium, fine sand. TCLP/STCL Sample. 7.5-9.0 CLAY (CL). Gray, wet, firm. 10 - 10.0-12.5 0 SH-4 No recovery. 11 12.5-14.0 1.5 SS-5 4-4-5 (9) SILTY SAND (SM). Gray, wet, loose, becoming CLAYEY SAND Native? (SC). Brown, wet, loose. 14 -15 - 15.0-16.5 1.3 MC-6 8-10-11 (21) SANDY CLAY (CL). Brown, wet, stiff. 16 17 -17.5-19.0 1.5 SS-7 17-24-18 (42) CLAYEY SAND WITH GRAVEL (GC). Brown, wet, dense, angular gravel. 18 19 -20 - 20.0-21.5 1.0 MC-8 21-24-29 (53) Same as above. 21. 22 -22.5-24.0 0.4 SS-9 50/4" Weathered bedrock, orange-brown, very dense. Total 23. depth=22.5 ft. bgs. Grout backfill. 24 -



PROJECT NUMBER

151319.FI.09

BORING ID:

5GE04

Sheet 1 of 2

CI	H2	M	IHILL		SOIL BORING LOG					
PROJECT:		Lava Cap Mine LOCATION:								
ELEVATIO			NORT			G CONTRAC	TOR: CASCADE DRILLING, INC., RANCHO COR			
DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA										
WATER LE		10		T	1	8/15/2001 12:				
DEPTH BGS		(tr)		STANDARD PENETRATION	CORE DESCRIPTION:		COMMENTS:			
	NTERVA		OVERY	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,			
		NEGC	TYPE-#		OR CONSISTENCY, SOIL STRUCTURE,		TESTS, AND INSTRUMENTATION.			
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.					
0 -						_				
1_						_	Waste rock (8").			
2 - 2.5-	-4 0	1.5	SS-1	14-11-10 (21)	SILTY SAND (SM) with gravel. Brown, slightly moist, mediun	— n				
3 -					angular gravel.	<u> </u>				
4 –										
"-						_				
5 - 5.0-	-6.5	0.6	MC-2	24-10-10 (20)	Similar. Becoming more silty.	_	Tailings?			
6 –						_				
7										
7 - 7.5-	-10.0	0	SH-3		No recovery.	_				
8 –						_				
9_										
						_				
10 - 10.0	0-11.5	1.5	SS-4	11-7-9 (16)	SILTY SAND (SM). Gray, wet, medium, fine sand.	_	TCLP/STLC Sample.			
11 _						_				
12										
12 -	5-14.0	1.0	MC-5	11-12-9 (21)	Similar. More silty.	_				
13 -						_				
14 -						_				
15 - 15.0	0-16.5	2.5	SH-6			_				
16 -						_				
17 -										
	5-19.0	1.5	SS-7	2-2-2 (4)	SILTY SAND (SM). Gray, wet, loose, fine sand, trace clay.	_				
18 –						_				
19 🗕						_				
	0 24 5	0.5	MC 0	7 5 5 /40\	Como ao abaya					
20 - 20.0	U-21.5	0.5	MC-8	7-5-5 (10)	Same as above.	_				
21 -						_				
22 -						_				
22.5	5-24.0	1.5	SS-9	4-3-8 (11)	Same as above.	_				
23 -						_				
24 -						_				
25 – 25.0	0-26 5	1.5	MC-10	7-16-18 (34)	SANDY SILT (ML). Gray, wet, very stiff.					
1	0.0		10	. 10 10 (01)	zz. o.z. (me). oraj, wor, vor joun.	_	<u> </u>			



BORING ID:

5GE04

Sheet 2 of 2

# **SOIL BORING LOG**

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: 5GE04 ELEVATION: 2750.7' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA END: 8/15/2001 12:00:00 PM START: 8/15/2001 10:00:00 AM WATER LEVELS: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26 -26.5-26.5 CLAYEY SAND AND GRAVEL (GC). Brown, wet, medium. Native. 27 -27.5-29.0 0 SS-11 50/2" Total depth=27.5 ft. bgs. Grout backfill. 28 -29 -30 -



PROJECT NUMBER

151319.FI.09

BORING ID:

5GE04

Sheet 1 of 2

CI	H2	M	IHILL		SOIL BORING LOG					
PROJECT:		Lava Cap Mine LOCATION:								
ELEVATIO			NORT			G CONTRAC	TOR: CASCADE DRILLING, INC., RANCHO COR			
DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA										
WATER LE		10		T	1	8/15/2001 12:				
DEPTH BGS		(tr)		STANDARD PENETRATION	CORE DESCRIPTION:		COMMENTS:			
	NTERVA		OVERY	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,			
		NEGC	TYPE-#		OR CONSISTENCY, SOIL STRUCTURE,		TESTS, AND INSTRUMENTATION.			
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.					
0 -						_				
1_						_	Waste rock (8").			
2 - 2.5-	-4 0	1.5	SS-1	14-11-10 (21)	SILTY SAND (SM) with gravel. Brown, slightly moist, mediun	— n				
3 -					angular gravel.	<u> </u>				
4 –										
"-						_				
5 - 5.0-	-6.5	0.6	MC-2	24-10-10 (20)	Similar. Becoming more silty.	_	Tailings?			
6 –						_				
7										
7 - 7.5-	-10.0	0	SH-3		No recovery.	_				
8 –						_				
9_										
						_				
10 - 10.0	0-11.5	1.5	SS-4	11-7-9 (16)	SILTY SAND (SM). Gray, wet, medium, fine sand.	_	TCLP/STLC Sample.			
11 _						_				
12										
12 -	5-14.0	1.0	MC-5	11-12-9 (21)	Similar. More silty.	_				
13 -						_				
14 -						_				
15 - 15.0	0-16.5	2.5	SH-6			_				
16 -						_				
17 -										
	5-19.0	1.5	SS-7	2-2-2 (4)	SILTY SAND (SM). Gray, wet, loose, fine sand, trace clay.	_				
18 –						_				
19 🗕						_				
	0 24 5	0.5	MC 0	7 5 5 /40\	Como ao abaya					
20 - 20.0	U-21.5	0.5	MC-8	7-5-5 (10)	Same as above.	_				
21 -						_				
22 -						_				
22.5	5-24.0	1.5	SS-9	4-3-8 (11)	Same as above.	_				
23 -						_				
24 -						_				
25 – 25.0	0-26 5	1.5	MC-10	7-16-18 (34)	SANDY SILT (ML). Gray, wet, very stiff.					
1	0.0		10	. 10 10 (01)	zz. o.z. (me). oraj, wor, vor joun.	_	<u> </u>			



BORING ID:

5GE04

Sheet 2 of 2

# **SOIL BORING LOG**

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: 5GE04 ELEVATION: 2750.7' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA END: 8/15/2001 12:00:00 PM START: 8/15/2001 10:00:00 AM WATER LEVELS: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26 -26.5-26.5 CLAYEY SAND AND GRAVEL (GC). Brown, wet, medium. Native. 27 -27.5-29.0 0 SS-11 50/2" Total depth=27.5 ft. bgs. Grout backfill. 28 -29 -30 -



PROJECT NUMBER

151319.FI.09

BORING ID:

5GE05

Sheet 1 of 2

СН	12N	1HILL	SOIL BORING LOG						
PROJECT:	Lava Ca		<u> </u>	LOCATION: 5GE05					
ELEVATION:	2754.6	NORT	HING:	EASTING:	DRILLING CONTRAC	CTOR: CASCADE DRILLING, INC., RANCHO COR			
DRILLING ME	ETHOD A	ND EQUIPM	ENT USED: (	ME 75 High Torque using 8" HSA					
WATER LEVI	ELS: 1	2.5		START: 8/15/2001 12:00:00 PM	END: 8/15/2001 1:	00:00 PM LOGGER: K. Porter			
DEPTH BGS (ff			STANDARD PENETRATION	CORE DESCRIPTION:	:	COMMENTS:			
INT	ERVAL (ft)		TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), CO MOISTURE CONTENT, RELATIVE DENSI		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,			
	REC	TYPE-#	KLJULIJ	OR CONSISTENCY, SOIL STRUCTURE,	11,	TESTS, AND INSTRUMENTATION.			
		SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.					
0 -		31=3HelbyTube			_	Waste rock (8").			
1_									
'-									
2 - 2.5-4.0	1.5	SS-1	10 20 25 (45)	CILTY CAND (CM) Prouve climbtly majet dense	_	-			
3 - 2.5-4.0	1.5	33-1	18-20-25 (45)	SILTY SAND (SM). Brown, slightly moist, dense.	_	_			
4 -					_				
5 - 5.0-6.5	5 1.0	MC-2	23-27-24 (51)	Same as above.	_	-			
6 –									
					_				
7 - 7.5-9.0	) 1.5	SS-3	E E 7 /10\	CILTY CAND (CM) Crow brown maint madium	_	Tollings			
8 - 7.5-9.0	1.5	33-3	5-5-7 (12)	SILTY SAND (SM). Gray-brown, moist, medium.	_	Tailings.			
9 –					_	-			
10 - 10.0-1	2.5 2.5	SH-4		Similar.	_	-			
11 _									
''-					<u> </u>				
12 -	4.0 1.5	SS-5	2-2-11 (13)	Similar. Wet, grading to gray.	_	-			
13 -	4.0 1.5	33-0	2-2-11 (13)	Similar. Wet, grading to gray.	_				
14									
14 -					_	-			
15 - 15.0-1	6.5 1.5	MC-6	3-3-5 (8)	SANDY SILT (ML). Gray, wet, firm.	_	-			
16 -					_				
17 <b>–</b> 17.5-1	9.0 1.5	SS-7	6-6-8 (14)	Same as above.	_	- TCLP/STLC Sample 12:30 pm.			
18 -	7.0	00 /	000(1.1)	Same as assers.	_	-			
19 _									
'7-					_	1			
20 - 20.0-2	2.5 0	SH-8		No recovery.	_	-			
21 _					<u>-</u>	_			
22 -	4.0 1.5	SS-9	6-7-9 (16)	Same as above.	_	-			
23 -			(,		_	-			
24 -									
					_	<u> </u>			
25 <b>–</b> 25.0-2	6.5 1.5	SS-10	19-23-20 (43)	CLAYEY SAND/GRAVEL (GC). Brown, wet, dense	e. <u> </u>	-			



BORING ID:

5GE05

Sheet 2 of 2

# **SOIL BORING LOG**

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: 5GE05 ELEVATION: 2754.6' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA END: 8/15/2001 1:00:00 PM WATER LEVELS: START: 8/15/2001 12:00:00 PM LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26 -Native. 27 -27.5-29.0 0.5 SS-11 50/5" Weathered bedrock. Total depth=27.5 ft. bgs. Grout backfill. 28 -29 -30 -



BORING ID:

5GE06

**SOIL BORING LOG** 

Sheet 1 of 1

LOCATION: 5GE06 PROJECT: Lava Cap Mine

ELEVATION: 27		NORTHI		EASTING:	DRILLING CONTRAC	CTOR: CASCADE DRILLING, INC., RANCHO COR			
DRILLING METHO	DRILLING METHOD AND EQUIPMENT USED: CME 75 High Torque using 8" HSA								
WATER LEVELS: 7.5 START: 8/14/2001 4:00:00 PM END: 8/14/2001 LOGGER: K. Porter									
DEPTH BGS (ft)			STANDARD PENETRATION	CORE DESCRIPTIO	N:	COMMENTS:			
INTERVAL (ft)  RECOVERY			TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), ( MOISTURE CONTENT, RELATIVE DENS		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,			
	TYF	PE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE MINERALOGY.		TESTS, AND INSTRUMENTATION.			
0 –	SS=S ST=SI	plit Spoon helbyTube	(N)						
0-						-			
1 - 0.8-0.8					_	- Waste rock (8").			
2 -					_	-			
3 - 2.5-4.0	0.2 SS-	-1	13-21-17 (38)	SILTY SAND AND GRAVEL. Brown, moist, dens	se, angular gravel.	Poor recovery.			
4 -					_	•			
5 - 5.0-6.5	0.6 MC	:-2	20-23-15 (38)	Similar.	_	-			
6 –						_			
7_									
7.5-8.5	1.5 SS-	-3		SILT (ML). Gray, wet, firm, few thin zones of fine	gray	Tailings.			
8 –				sand.	_	-			
9 –					_	-			
10 - 10.0-11.5	1.5 MC	5-4	21-18-15 (33)	Same as above.	_				
11									
11 -					_	-			
12 -	2.4 SH	-5		Same as above.	_	Soft.			
13 -				Came as above.	_	-			
14 -					_	_			
			44 45 45 (00)						
15 - 15.0-16.5	0.5 SS	-6	11-15-15 (30)	Similar. With few gravels.	_	-			
16 -					_	-			
17 –						_			
17.5-19.0	0.4 MC	C-7	19-19-25 (44)	Becoming brown, gravelly.		Poor recovery, sluff. Native?			
					_				
19 –					_	-			
20 - 20.0-21.5	0.3 SS	-8	50/5"	Same as above.	_	-			
21 -					_	_			
22 -				Total depth=22 ft. bgs. Refusal. Grout backfill.					
				. S.a. aspiri-22 it. bys. Norusui. Grout bdokiii.		_			
23 –					_	-			



51

Sheet 1 of 4

PROJECT: Lava Cap Mine				•	LOCATION:		
ELEVATION: NORTHING:				HING:	EASTING: DRILLING CON	TRACTOR: Water Development Corp., Woodland, CA	
DRILLING METHOD AND EQUIPMENT USED: Hollow Stem Auger CME 85							
WATER	R LEVELS:				START: 5/8/2000 2:00:00 PM END:	LOGGER: Meier	
DEPTH BGS (ft)		STANDARD	CORE DESCRIPTION:	COMMENTS:			
	INTERVA	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,	
		RECC	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,	
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.	
			SS=Split Spoon ST=ShelbyTube	(N)			
0-						— Partly cloudy. 75 degrees. Rain this morning.	
1-							
'-							
2-						_	
3-	3.0-3.5				WELL GRADED GRAVEL AND SAND (GW). Very dark grayish brov (2.5Y 3/2), 60% angular gravel (1 to 3 cm), 40% angular, medium to	n —	
					very coarse sand, wet.		
4	4.0-6.0	2		1-18"	FAT CLAY (CH). Gray (Gley 1 5/N), 70% fat clay, 30% silt, wet, very soft.	_	
					3011.		
5 -						_	
,							
6-						_	
7-						_	
8-						<ul> <li>No sample collected while still drilling through tailings.</li> </ul>	
9_						tailings.	
10 -						_	
11 -							
''-							
12 -						_	
13 -						_	
14 -						_	
15 -						_	
16 -							
17 -						_	
10							
18 -							
19 -						_	
20 -						Still in tailings.	
21 -							
22 -						_	
23 -							
23							
24 -	24.0-26.0	1.5		7-9-11	SILTY SAND (SM). Very dark gray (Gley1 3/N), 60% fine to	-	



<b>PROJECT</b>	NUMBER
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51

Sheet 2 of 4

PROJECT: Lava Cap Mine					LOCATION:		
ELEVATION: NORTHING:			NORT	HING:	EASTING: DRILLING CONTR	ACTOR: Water Development Corp., Woodland, CA	
DRILLING METHOD AND EQUIPMENT USED: Hollow Stem Auger CME 85							
	R LEVELS:		,		START: 5/8/2000 2:00:00 PM END:	LOGGER: Meier	
DEPTH				STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:	
	INTERVAL (ft)  RECOVERY		TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,		
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.	
25 🗕					very fine sand, subrounded, 40% silt, very moist, soft.		
26 -					SILTY SAND WITH CLAY AND GRAVEL (SW-SC). Dark grayish brown (10YR 4/2), 40% fine to coarse sand, 30% clay, 30% gravel		
27 -					(1 to 3 cm), subrounded to subangular, very moist, medium soft.		
	29.0-31.0			10-17-78	Same as above.	_	
30 -	30.0-30.0				WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC). Darkcan't read.	_	
31 –					reau.	Drilling through much harder material.	
32 –						_	
33 –						_	
34 –	34.0-35.5			2-37-42	POORLY GRADED GRAVEL WITH CLAYEY SAND (GP-GC). Dark grayish	Broken up rock, bedrock? Definitely igneous, high	
35 -					brown (10YR 4/2), 70% gravel (1 to 5 cm), angular gravel, 20% clay, 10% fine to coarse sand, angular, stiff, wet.	quartz content, very hard, light gray colored granite?	
36 -						_	
37 -						_	
38 -							
39 -	39.0-40.0			52-6"	WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC). Light olive	Rock=granite rock. Black argillitic vein.	
40 -					brown (2.5Y 5/4), 50% gravel, 30% clay, 20% fine to coarse sand, angular, very moist, very soft.	_	
41 -						_	
42 -							
43 -						Drilled with augers to 45 ft. bgs. very hard     matrix, no sample collected, will switch to air     in the morning.	
45 -							
46 -	46.0-46.5				Same as above.	_	
47 -						Drilling with air 5/9/00. Rig chatter.	
48 -							



51

Sheet 3 of 4

PROJECT: Lava Cap Mine				=======================================	LOCATION:	
ELEVATION: NORTHING:				HING:	EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA	
DRILLII	NG METHO	DD AN	D EQUIPMI	ENT USED: H	Iollow Stem Auger CME 85	
					START: 5/8/2000 2:00:00 PM END:	LOGGER: Meier
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, DRILLING FLUID LOSS,	
			TYPE-#		OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.	
			S1=SneibyTube			
49 🗕						
50 -	50.0-50.5				POORLY GRADED GRAVEL (GP). Dark gray (Gley 4/N), 100% gravel, angular, wet, very hard.	Bedrock=Gray igneous rock with quartz and feldspar and sulfide minerals (pyrite).
51 <b>-</b>	51.0-51.5				Same as above.	Occasional fractures.
52 <b>–</b>					_	
E2						
53 <b>–</b>					_	1
54 <b>–</b>					_	
55 <b>–</b>					_	
56 <b>–</b>					_	
57 <b>–</b>	57.0-58.0				Same as above.	
F0						
58 <b>–</b>					_	
59 <b>–</b>					_	
					Same as above.	
60 🗕					_	
61 <b>–</b>	61.0-62.0				Same as above.	
62 <b>–</b>					_	
63 <b>–</b>						
03 -					_	
64 <b>–</b>					_	
65 🗕	65.0-66.0				Same as above.	Occasional iron oxide staining along fractures.
66 -					_	
67 <b>–</b>					_	•
68 <b>–</b>						
					_	
69 <b>–</b>					_	
	70.0.70.5					
70 -	70.0-70.5				Same as above.	•
71 <b>–</b>					_	
72 <b>–</b>					_	•
73_	73.0-73.5				Same as above.	
,,,_	. 5.5 75.5					



PROJECT NUMBER	ВС

Sheet 4 of 4

# **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA DRILLING METHOD AND EQUIPMENT USED: Hollow Stem Auger CME 85 START: 5/8/2000 2:00:00 PM WATER LEVELS: END: LOGGER: Meier DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 74 -75 - 75.0-75.5 Same as above. 76 -77 -78 -79 - 79.0-79.5 Same as above. 80 -81 -82 -83 - 83.0-83.5 POORLY GRADED GRAVEL (GP). Some gray gravel containing Evidence of pyrite veins. pyrite (occasional) with trace quartz gravel. 84 -86 -Increased quartz content. Collected sample 5I-3. 87 -88 -89 -90 -Total depth=90 ft. bgs. 91 -



PROJECT NUMBER

151319.FI.09

BORING ID:

5J

Sheet 1 of 6

CH2MHILL				SOIL BORING LOG		
		Mine Road		LOCATION: 5J-Tailings Area Monitoring Well		
ELEVATION: 27	751.1	NORT	THING:	EASTING: DRILLING CONTRAC	CTOR: CASCADE DRILLING, INC., RANCHO COR	
DRILLING METH		ID EQUIPM	ENT USED:	CME 7500 High Torque; HSA & Air Hammer		
WATER LEVELS	:		I	START: 8/20/2001 END: 8/25/2001	LOGGER: A. Evans	
DEPTH BGS (ft)  INTERVAL (ft)			STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:	
RECOVERY		TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.		
		TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.		
0 –				_	Waste rock to 20". Hollow stem auger.	
1 –				_	_	
2 –				_		
3 –				_	-	
4 -				_	-	
5 - 5.0-6.5	12"	SS-1	7-7-8 (15)	SILTY SAND (SM). Gray, some moisture, medium.	_	
6 –				_	<u> </u> -	
7_				_	_	
8 =						
				_	<del>-</del>	
9 –				_	-	
10 - 10.0-11.5	18"	SS-2	8-5-8 (13)	SILTY SAND-CLAY (SM-CL). Gray, moist to very moist, medium to soft.	Top 1/2 silty sand.	
11 _				-	_	
12 -				_	_	
13 –				_		
14 -				_	-	
15 - 15.0-16.5	12"	SS-3	9-11-15 (26)	CLAY (CL). Gray, very moist, stiff.	-	
16 -				_	-	
17 -				_	-	
18 🗕				_	-	
19 🗕				_	_	
	15"	SS-4	9-11-11 (22)	SILTY SAND (SM). Gray, medium.		
	10		, 11 11 (22)	S.C. Sittle (only, oray, moduli).	-	
21 –				-	-	
22 -				_	-	
23 -				_	-	
24 -				_	_	
25 <b>–</b> 25.0-26.5	10"	SS-5	50/5"	Same as above.	_	



PROJECT NUMBER

151319.FI.09

BORING ID:

5J

Sheet 2 of 6

# **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine Road LOCATION: 5J-Tailings Area Monitoring Well ELEVATION: 2751.1 NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque; HSA & Air Hammer WATER LEVELS: START: 8/20/2001 END: 8/25/2001 LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 26 -NATIVE ROCK. Brown-orange cuttings. Changed to 6" Air Hammer uncased. 27 -28 -29 -30 -31 -ROCK. Blue gray. Hole reamed out to 8"+ with hammer bit. 32 -33 -34 -35 -36 -37 -38 -39 -40 -41 -42 -43 -44 -45 -46 -47 -48 -49 -50 -



PROJECT NUMBER
151319.FI.09

5J

Sheet 3 of 6

# **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine Road LOCATION: 5J-Tailings Area Monitoring Well ELEVATION: 2751.1 NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque; HSA & Air Hammer START: 8/20/2001 WATER LEVELS: END: 8/25/2001 LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY **RESULTS** DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 51 **–** 52 -53 -54 -55 -56 -57 -58 -59 -60 -61 -62 -63 -ROCK. Blue gray. Increase in water in hole. 65 -66 -67 -68 -69 -70 -71 -72 -73 -74 -75 -76 -



PROJECT NUMBER

BORING ID:

5J

Sheet 4 of 6

# **SOIL BORING LOG**

**CH2MHILI** PROJECT: Lava Cap Mine Road LOCATION: 5J-Tailings Area Monitoring Well ELEVATION: 2751.1 NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque; HSA & Air Hammer START: 8/20/2001 WATER LEVELS: END: 8/25/2001 LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY **RESULTS** DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 77 -78 -79 -80 -81 -82 -83 -84 -85 -86 -87 -90 -91 -92 -SAND. Black, 90 to 100 ft. bgs. 93 -94 -95 -96 -97 -98 -99 -100 -101 -



PROJECT NUMBER
151319.FI.09

5J

Sheet 5 of 6

# **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine Road LOCATION: 5J-Tailings Area Monitoring Well ELEVATION: 2751.1 NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque; HSA & Air Hammer START: 8/20/2001 WATER LEVELS: END: 8/25/2001 LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 102 -103 -104 -105 -106 -107 -108 -109 -110 -111 -112 -ROCK. Blue gray. 113 -114 -115 -116 -117 -118 -119 -120 -ROCK. Blue gray, heavily fractured, larger rock particles Hole collapsed at ~120 to 132 feet behind 8" 121 at surface. hammer 122 -123 -124 -125 -126 -127 -



BORING ID:

5J

Sheet 6 of 6

# **SOIL BORING LOG**

CH2MHILI PROJECT: Lava Cap Mine Road LOCATION: 5J-Tailings Area Monitoring Well ELEVATION: 2751.1 NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: CME 7500 High Torque; HSA & Air Hammer START: 8/20/2001 WATER LEVELS: END: 8/25/2001 LOGGER: A. Evans DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 128 -129 -130 -131 -132 -133 -134 -135 -136 -137 -138 -139 -140 -141 -142 -143 -144 -145 -End of hole=146 ft. bgs. 146 -147 -148 -149 -150 -Well bottom=151 ft. bgs. Construction Monitoring Well. 151 -152 -



PROJECT NUMBER	

5K-D

BORING ID:

Sheet 1 of 9

## **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine Monitoring Well Installation LOCATION: Grass Valley, CA ELEVATION: TBD NORTHING: EASTING: DRILLING CONTRACTOR: Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS WATER LEVELS: START: 5/27/2005 2:00:00 PM END: LOGGER: H. Perry DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 0 -1 -2 -3 -4 -5 - 5.0-10.0 SILT (ML), dark reddish brown (5YR 2.5/2), dry, loose, plant debris 6 -8 -10 - 10.0-15.0 CLAY (CL), strong brown (7.5YR 5/6), damp, moderate plasticity, soft 11 -12 13 -14 -15 - 15.0-20.0 SANDY CLAY (CL), strong brown (7.5YR 4/6), damp, moderate plasticity, loose, ~5% sand 16 17 -18 -19 \_ 20 - 20.0-25.0 Same as above 14:26 21 -22 -23 -24 -25 - 25.0-30.0 CLAY with GRAVEL (CL), strong brown (7.5YR 4/6), moist, Cuttings coming up in "balls"



PROJECT NUMBER
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5K-D

184646.FI.02

Sheet 2 of 9

**BORING ID:** 

**SOIL BORING LOG CH2MHILL** Lava Cap Mine Monitoring Well Installation LOCATION: PROJECT: Grass Valley, CA ELEVATION: NORTHING: DRILLING CONTRACTOR: TBD EASTING: Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS WATER LEVELS: START: 5/27/2005 2:00:00 PM END: LOGGER: H. Perry DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) moderate plasticity, soft, trace (~5%) fine gravel, subrounded up to 0.25" diameter 26 -27. 28 -29 -30 - 30.0-35.0 CLAY with SAND and GRAVEL (CL), brown (7.5YR 4/4), moist, Cuttings coming out of hole in "balls" moderate plasticity, soft, trace (5-10%) fine gravel (subrounded) up to 0.25" diameter 31 -32 -33 -34 -35.0-40.0 GRAVELLY CLAY (CL), brown (7.5YR 5/4), wet, non-plastic, Difficult drilling conc: 0.015 mg/m3, TWA: 0.000 non-cohesive, large 2" diameter nodules of cohesive, highly mg/m3, water encountered, Dust meter conc: 0.015 36 plastic clay, greenish gray (Gley 6/1), 20% gravel, mg/m3 subrounded, up to 1" diameter, grayish crystalline rock 37 -38 -39 -CLAY (CL), dark yellowish brown (10YR 4/4), wet, moderate 40.0-45.0 plasticity, cohesive, trace (<5%) coarse sand 41 -42 -43 -44 45 - 45.0-50.0 GRAVELLY CLAY (CL), dark yellowish brown (10YR 4/4), wet, low to moderate plasticity, slightly cohesive, ~10% gravel 46 up to 0.25" diameter, subrounded 47 -48 -49 -50 - 50.0-55.0 GRAVELLY CLAY (CL), dark yellowish brown (10YR 4/4), wet, 15:30

low plasticity, slightly cohesive, ~25% gravel up to 1"



184646.FI.02

BORING ID:

5K-D

Sheet 3 of 9

CHZIVIFILL						
PROJECT: Lava Cap Mine Monitoring Well Installation LOCATION: Grass Valley, CA						
ELEVATION: TBD NORTHING: EASTING: DRILLING CONTRACTOR: Diamond Well Drilling						
DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS						
WATER	R LEVELS:				START: 5/27/2005 2:00:00 PM END:	LOGGER: H. Perry
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,
			TYPE-#		OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.	
51 -			ST=ShelbyTube	(14)	diameter, subrounded	
0.						
52 <b>–</b>					_	
53 <b>–</b>					_	
54 🗕					<u> </u>	
55 <b>–</b>	55.0-60.0				GRAVELLY CLAY (CL), dark yellowish brown (10YR 4/4), wet,	
56 <b>–</b>					low plasticity, slightly cohesive, ~15% gravel, subrounded up to 1" diameter (mostly <0.25")	
50 =					Lup to 1 diameter (mostly <0.23)	
57 <b>–</b>					_	
58 🗕					_	
59 <b>–</b>					_	
0,					_	
60 🗕	60.0-65.0				GRAVELLY CLAY with SAND (CL), dark yellowish brown (10YR	Conc: 0.018 mg/m3, TWA: 0.002 mg/m3
					4/4), wet, low plasticity, non-cohesive, 15% coarse sand,	
61 🗕					10% gravel up to 0.5" diameter	•
62 <b>–</b>					<u> </u>	
63 <b>–</b>					_	•
64 🗕						
01					_	
65 <b>–</b>	65.0-70.0				CLAYEY SAND with GRAVEL (SP), dark yellowish brown (10YR —	
					4/4), wet, 70% coarse sand, subrounded, 15% clay, 15%	
66 –					gravel, subangular up to 1.5" diameter, dark gray  crystalline clasts (look igneous)	
67 <b>–</b>					Li ystamine ciasts (look igneous)	
68 –					_	•
69 <b>–</b>						
U7 <b>-</b>					_	
70 <b>–</b>	70.0-75.0				Same as above	
71 🗕					_	
72 -					_	
73 <b>–</b>					_	
74						
74 🗕					_	1
75 <b>–</b>	75.0-80.0				SANDY CLAY (CL), olive brown (2.5Y 4/4), wet, non-plastic,	
					non-cohesive, ~25% coarse sand, trace gravel up to 0.5"	
76 <b>–</b>					diameter, subrounded	



184646.FI.02

5K-D

Sheet 4 of 9

## **SOIL BORING LOG**

BORING ID:

**CH2MHILL** PROJECT: Lava Cap Mine Monitoring Well Installation LOCATION: Grass Valley, CA ELEVATION: TBD NORTHING: EASTING: DRILLING CONTRACTOR: Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS WATER LEVELS: START: 5/27/2005 2:00:00 PM END: LOGGER: H. Perry DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 77 -78 -79 -80 - 80.0-85.0 15:53 Same as above, dark grayish brown (2.5Y 4/2) 81 -82 -83 -84 -85 - 85.0-90.0 SANDY CLAY (CL) with GRAVEL, olive brown (2.5Y 4/3), wet, non-plastic, non-cohesive, 20% coarse sand, trace gravel, subrounded up to 1" diameter, "clumps" of cohesive, 86 moderate plasticity clay 87 -89 -SANDY CLAY with GRAVEL (CL), olive brown (2.5YR 4/3), wet, 90.0-95.0 non-plastic, non-cohesive, 20% coarse sand, ~10% gravel, 91 subrounded up to 1" diameter, igneous clasts 92 -93 -94 -95 - 95.0-100.0 Same as above 96 -97 -98 -99 -100 - 100.0-105. Same as above, more sand ~30% 101 -



PROJECT I	NUMBER

BORING ID: 5K-D

184646.FI.02

**SOIL BORING LOG** 

Sheet 5 of 9

DDD IECT: Lava Can Mine Monitoring Well Installation LOCATION: Grass Valley CA

Lava Cap Mine Monitoring Well Installation LOCATION: PROJECT: Grass Valley, CA ELEVATION: NORTHING: DRILLING CONTRACTOR: TBD EASTING: Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS WATER LEVELS: START: 5/27/2005 2:00:00 PM END: LOGGER: H. Perry DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 102 -103 -104 -105 - 105.0-110. CLAYEY SAND with GRAVEL (SP), olive brown (2.5YR 4/3), wet, loose, 65% coarse sand, 25% clay, ~10% gravel up to 1" diameter, subround to subangular, igneous 106 -107 -108 -109 -110 - 110.0-115. CLAYEY SAND with GRAVEL (SP), black (Gley 2.5/N), wet, Sand could be ground up meta sediment rock (slate) loose, 75% very coarse grained sand, angular, 15% clay 111 -(olive brown), 10% gravel, subrounded, up to 0.5" diameter, 112 -113 -114 -115 - 115.0-120. CLAYEY SAND (SP), black (Gley 2.5/N), wet, loose, 85% very Not competent bedrock coarse sand, angular (ground up slate), 15% clay, olive 116brown 117 -118 -119 -120 - 120.0-125. Same as above Jim indicates that we are not in competent bedrock, drilling difficulty fluctuates between hard and easy - not "steady", pressure fluctuates 121 -122 -123 -124 -125 - 125.0-130. SAND (SW), black (Gley1 2.5/N), wet, loose, very coarse Jim indicates that we probably hit competent grained, angular [meta sed rock (slate) ground up by drill bedrock ~123 ft bgs - drilling and cuttings 126 bit] consistent 127 -



184646.FI.02

BORING ID:

5K-D

Sheet 6 of 9

## **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine Monitoring Well Installation LOCATION: Grass Valley, CA ELEVATION: TBD NORTHING: EASTING: DRILLING CONTRACTOR: Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS WATER LEVELS: START: 5/27/2005 2:00:00 PM END: LOGGER: H. Perry DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 128 -129 -130 - 130.0-135. Same as above 131 -132 -133 -134 -135 - 135.0-140. Same as above 136 -137 -138 -139 -End 5/27/05 @ 17:00. Start 5/31/05 @ 11:30. 140 - 140.0-145. Same as above Difficult drilling - rig chatter 141 -142 -143 -144 -145 - 145.0-150. SAND (SW), black (Gley1 2.5/N), wet, loose, very coarse Difficult drilling - rig chatter grained, subangular to angular, trace gravel, subrounded, up to 0.5" diameter, ~10% of sand is reddish brown in 146 color, gravel clasts are igneous 147 -148 -149 -150 - 150.0-155. Same as above, more gravel (~10%) Difficult drilling (difficult to tell whether igneous clasts are inclusions in meta sed. 151 bedrock or from a shallower depth interval) 152 -



PROJECT NUMBER
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5K-D

BORING ID:

Sheet 7 of 9

## **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine Monitoring Well Installation LOCATION: Grass Valley, CA ELEVATION: TBD NORTHING: EASTING: DRILLING CONTRACTOR: Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS WATER LEVELS: START: 5/27/2005 2:00:00 PM END: LOGGER: H. Perry DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 153 -154 -155 - 155.0-160. SAND (SW), very dark gray (Gley1 2.5/3) to black (Gley1 2.5/N), wet, loose, very coarse grained, angular (ground up slate), 10-15% reddish brown sand, coarse, subrounded, 156 trace gravel up to 0.5" diameter, subrounded, igneous 157 -158 -159 -160 - 160.0-165. Same as above, finer sand (being ground up more by bit), 12:00 ~20% reddish brown subrounded sand, less gravel 161 -162 -163 -164 -165 - 165.0-170. Same as above, coarse, not ground up by bit as much 12:10 166 -167 -168 -169 -170 - 170.0-175. Same as above, slate with igneous inclusions ground up to 12:15 very coarse sand by drill bit 171 -172 -173 -174 -175 -176 -177 -178 - 178.0-200. 170-200 ft bgs: Same as above Difficulty logging due to foam



PROJECT NUMBER
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BORING ID: 5K-D

184646.FI.02

Sheet 8 of 9

# **SOIL BORING LOG**

CH2MHILL PROJECT: Lava Cap Mine Monitoring Well Installation LOCATION: Grass Valley, CA ELEVATION: TBD NORTHING: EASTING: DRILLING CONTRACTOR: Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS START: 5/27/2005 2:00:00 PM WATER LEVELS: END: LOGGER: H. Perry DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY **RESULTS** DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 179 🗕 180 -181 -182 -183 -184 -185 -186 -187 -188 -189 -190 -191 -192 -193 -194 -195 -196 -197 -198 -199 -200 -201 -202 -203 -



PROJECT N	UMBER
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BORING ID: 5K-D

Sheet 9 of 9

184646.FI.02

CH2MHILL						SC	)IL I	BOR	ING	LOG
PROJECT: Lava Cap Mine Monitoring Well I					Vell Installati	on	LO	CATION:	Grass Va	lley, CA
ELEVATION: TBD NORTHING:				EASTING:		ORILLING C	CONTRACT	FOR: Diamond Well Drilling		
DRILLIN	G METHO	)D AN	D EQUIPMI	ENT U	SED: R	otodrill Schramm T450 WS				
WATER LEVELS: START: 5/27/2005 2:00:00 PM END: LOGGER: H. Perry									LOGGER: H. Perry	
DEPTH B					ANDARD ETRATION	CORE DESCR	RIPTION:			COMMENTS:
	INTERVA				TEST	SOIL NAME (USCS GROUP SYMI	30L), CO	LOR,		DEPTH OF CASING, DRILLING RATE,
		RECO		RI	ESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,				DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-	-6-6 (in) (N)	MINERALOGY.	,			
204 -									_	
205 –									_	
206 -									_	
207 -									_	
208 -									_	
209 –										
210 - 2	210.0-215.					Very dark gray (Gley1 2.5/3) to black (Glevery few inclusions <5% ground up to very			_	
211 -						drill bit			_	
212 -									_	
213 -										
214 -										
216 -									_	



184646.FI.02

BORING ID:

5K-S

Sheet 1 of 5

CHZIVIFILL					
PROJECT: Lava Cap Mine Monitoring Well Installation LOCATION: Grass Valley, CA					
ELEVATION: TE			EASTING: DRILLING CONTRAC	TOR: Diamond Well Drilling	
DRILLING METH	od and equipme	ENT USED: R	otodrill Schramm T450 WS		
WATER LEVELS:	: 61 ft bgs		START: END:	LOGGER: L. Elliott	
DEPTH BGS (ft)		STANDARD	CORE DESCRIPTION:	COMMENTS:	
INTERV	AL (ft)  RECOVERY  TYPE-# SS-Split Spoon ST-ShelbyTube	PENETRATION TEST RESULTS 6-6-6 (in) (N)	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.	
0 –	ST=ShelbyTube	(,			
1-			_		
2 –			_		
3 –			_		
4 –			_		
5 - 5.0-10.0			SILT with SAND (ML), dark reddish brown, dry, loose, cuttings have popcorn texture	14:06	
6 –			_		
7 –			_		
8-			_		
9 – 10.0-15.0			Brown sand clay with fine rounded gravel, medium moisture,	Rig chatter. Probably hitting gravel or boulders	
11 -			unsorted, loose, moderate plasticity	as we observe at surface. 14:11	
12 -					
13 -					
14 –					
15 - 15.0-20.0			Brown sandy clay with medium - coarse rounded gravel	So much chatter, bit temporarily halted	
16 –			clasts, moderate moisture and plasticity  —		
17 –			_		
18 🗕			_		
19 🗕			_		
20 - 20.0-25.0			Brown sandy clay with ~20% heterogeneous, very fine angular gravel, sand ~30%, very dry	Still significant chatter, probably indicative of gravel and boulders in unit. 14:27	
21 –			_		
22 -			_		
23 –			_		
			Prown sandy clay with rounded and angular clasts, years fine	14:40	
24 <b>–</b> 25 <b>–</b> 25.0-30.0			Brown sandy clay with rounded and angular clasts, very fine	14:40	



BORING ID: 5K-S

184646.FI.02

Sheet 2 of 5

## **SOIL BORING LOG**

**CH2MHILL** Lava Cap Mine Monitoring Well Installation LOCATION: PROJECT: Grass Valley, CA ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: TBD Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS WATER LEVELS: START: END: LOGGER: L. Elliott 61 ft bgs DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) to fine, moderate moisture and plasticity 26 -27. 28 -29 -30 - 30.0-35.0 Very moist brown sandy clay with ~30% rounded fine to 14:50 medium gravel clasts, moderate plasticity 31 -32 -33 -34 -35.0-40.0 Brown sandy clay with very fine angular gravel clasts and Very slow drilling between 35 and 40 ft - still rounded fine to medium clasts, unsorted intermittent chatter from rig 36 -37 38 -39 -GRAVELLY CLAY, brown, heterogeneous rounded fine clasts, 15:44 40.0-45.0 low moisture, also very fine angular clasts 41 -42 -43 -44 -45 - 45.0-50.0 Brown gravelly clay with large, coarse rounded ~20% clasts, 15:53 moderate moisture and plasticity, gravel is unordered and 46 heterogeneous 47 -16:30 Switch to button bit 48 -49 -50.0-55.0 Very moist reddish brown clay with gravel, gravel is rounded and very fine to medium, also very fine angular



PROJECT NUMBER

BORING ID:

5K-S

.02

Sheet 3 of 5

	<u> 5HZ</u>	IVI	<u>HILL</u>			
PROJE	CT: Lav	a Cap	Mine Monit	oring Well Installati	on LOCATION: Grass Va	alley, CA
ELEVA	TION: TB	D	NORT	HING:	EASTING: DRILLING CONTRAC	TOR: Diamond Well Drilling
DRILLII	NG METHO	D AN	D EQUIPMI	ENT USED: R	otodrill Schramm T450 WS	
WATER	R LEVELS:	61	ft bgs		START: END:	LOGGER: L. Elliott
DEPTH				STANDARD	CORE DESCRIPTION:	COMMENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,
			TYPE-#		OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.	
51 -			ST=ShelbyTube	(,	gravel ~10% gravel, also contains sand ~10%, cohesive	
52 <b>–</b>						
F0						
53 <b>–</b>					_	
54 <b>–</b>						
55 <b>–</b>						
56 <b>–</b>						
30 -					_	
57 <b>–</b>					_	
Ε0						
58 🗕					_	
59 <b>–</b>						
60 -	60.0-65.0				Reddish brown wet clay with gravel, gravel is very fine to	
61 <b>–</b>					fine and angular ~20% gravel, also ~10% coarse sand, low plasticity	
01-					piasitory	
62 <b>–</b>						
63 <b>–</b>						
64 <b>–</b>						
65 <b>–</b>	65.0-70.0				_	Driller reports a large void from 65/67 to 70 ft
66 <b>–</b>						bgs
00 -					_	
67 <b>–</b>						
68 –					_	
69 <b>–</b>						
70 <b>–</b>						
71 <b>–</b>						
/!-						
72 <b>–</b>						
73 <b>–</b>					<del>-</del>	
74 <b>–</b>					<u> </u>	
75 <b>–</b>	75.0-80.0				Wet reddish brown clay, ~15% angular gravel, very fine to	
76 <b>–</b>					medium, ~10% coarse sand, low plasticity, cohesive	
/0-			l		<del>-</del>	



PROJECT NUMBER
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BORING ID:

5K-S

Sheet 4 of 5

## **SOIL BORING LOG**

**CH2MHILL** Lava Cap Mine Monitoring Well Installation LOCATION: PROJECT: Grass Valley, CA ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: TBD Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS WATER LEVELS: START: END: LOGGER: L. Elliott 61 ft bgs DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 77 -78 -79 -80 - 80.0-85.0 Brown wet clay with gravel, ~30% heterogeneous (angular and 17:05 rounded, very fine to coarse) gravel, also contains medium to coarse sand ~10% 81 -82 -83 -84 -85 - 85.0-90.0 Yellowish brown wet clay with sand, ~40% medium to coarse sand, also rounded gravels up to medium, non-plastic, low cohesive 86 -87 -89 -Yellow brown sand clay with gravel, ~50% sand, ~20% gravel, 90.0-95.0 wet, non-plastic/noncohesive, coarse angular sand and very 91 fine to fine angular gravel 92 -93 -94 -95.0-100.0 CLAYEY GRAVEL and SAND, clay is yellow brown, sand and Jim indicates that he thinks we've hit bedrock gravel are dark blue gray and heterogeneous white/brown rounded clasts, wet, loose, no plasticity/cohesion, gravel 96 -~80%, sand ~15%, clay 5% 97 -98 -99 -100 - 100.0-105. Same as above, but with bigger angular clasts, also less heterogeneous white/brown rounded gravels, evidence of 101 fractured/conglomerated dark blue gray slate



PROJECT NUMBER
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BORING ID:

5K-S

Sheet 5 of 5

## **SOIL BORING LOG**

**CH2MHILL** PROJECT: Lava Cap Mine Monitoring Well Installation LOCATION: Grass Valley, CA ELEVATION: TBD NORTHING: EASTING: DRILLING CONTRACTOR: Diamond Well Drilling DRILLING METHOD AND EQUIPMENT USED: Rotodrill Schramm T450 WS START: WATER LEVELS: 61 ft bgs END: LOGGER: L. Elliott DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 102 -103 -104 -105 - 105.0-110. Same as above, more evidence of slatey fracture zone, coarse angular gravel and trace yellow brown clay, coarse 106 sand, few rounded heterogeneous gravel clasts (fine) 107 -108 -109 -110 - 110.0-115. Dark blue gray gravel, very fine to medium angular, few (<10%) rounded heterogeneous gravel clasts, also fine to 111 coarse sand of same lithology blue gray 112 -113 -114 -115 -116 -117 -118 -119 -120 - 120.0-120. Dark blue gray sandy gravel, angular very fine to fine 18:10 gravel, fine to coarse sand, angular dark blue gray. 121 -Few (<10%) rounded heterogeneous, fine gravel clasts, sample almost identical to 110 ft bgs; except average grain 122 sizes are smaller at 120 ft



BORING ID:

5L-D

Sheet 1 of 9

ELEVATION NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, Market Levist.; START: 274/0007 20000 PM END: LOGGER: D. Hodson DEVELOPMENT USED ARCH with 11-34 linch casing PM END: LOGGER: D. Hodson Test Test Test Test Test Test Test Test		_ava Cap Min				LOCATION: Grass V	alley, CA
ARCH-Width 11.34 inch casing		Lava Gap IVIII					
STANDARD   PENETATION   PENET		HOD AND E		D: AF			
INTERVAL (I)	VATER LEVEL	S:			START: 2/14/2007 2:00:00 PM	END:	LOGGER: D. Hodson
Solition   Solition					CORE DESCRIPTION	DN:	COMMENTS:
1		RECOVER	TE RY RES	ST ULTS 5 (in)	SOIL NAME (USCS GROUP SYMBOL), MOISTURE CONTENT, RELATIVE DEN OR CONSISTENCY, SOIL STRUCTURI	COLOR, ISITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,
10	1 – 2 – 3 – 4 – 5 – 5.0-10.0 6 – 7 –		nesty tube			emi moist,	casing.
16 – 17 – 17.0-20.0 GRAVELLY SAND (SP). Light olive brown (2.5Y 5/4), loose, <2% gravels (<2 mm), dry, subrounded.  18 – 19 – 20 – 20.0-25.0 Same as above.  21 – 22 – 23 – —	10 <b>-</b> 10.0-15. 11 <b>-</b> 12 <b>-</b> 13 <b>-</b>	0 NA					740
21 – Rig chatter. 22 – — — — — — — — — — — — — — — — — — —	16 <b>–</b> 17 <b>–</b> 17.0-20. 18 <b>–</b>				GRAVELLY SAND (SP). Light olive brown (2.5	_	-
	21 <b>-</b> 22 <b>-</b> 23 <b>-</b>	0			Same as above.	- - - -	
25 <b>–</b> 25.0-30.0 Same as above. <b>–</b> 810							



BORING ID:

5L-D

Sheet 2 of 9

## **SOIL BORING LOG**

CH2MHILI PROJECT: Lava Cap Mine LOCATION: Grass Valley, CA ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA ARCH with 11 3/4 iinch casing DRILLING METHOD AND EQUIPMENT USED: WATER LEVELS: START: 2/14/2007 2:00:00 PM END: LOGGER: D. Hodson DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26 -27 -28 -29 -30 - 30.0-35.0 820. Same as above. 31 -32 -33 -34 -35 - 35.0-40.0 BEDROCK. Light olive brown (2.5Y 5/4), semi angular, pieces 830. Drilling chatter. <5 mm. 36 -37 -38 -Cease advancement of 11 3/4 casing. Proceed with 9 5/8 open hole only. 39 -Same as above. Subangular pieces, <1 cm, dark bluish gray 900. Rig chatter, little progress. 40 - 40.0-45.0 (Gley 2 4/10B). 41 -915. Switch to 7 7/8 bit in open hole. 42 -43 -44 -45 - 45.0-50.0 Same as above. Semiangular pieces (<2 mm), dark grayish 1020. brown (10YR 4/2). 46 -47 -48 -49 -50.0-55.0 1030. Same as above.



<b>PROJECT</b>	NUMBER
FRUJECT	NUMBER

5L-D

Sheet 3 of 9

CH2MHILL				IL BOKING	<i></i>			
PROJE(	CT: Lav	a Cap	Mine	•		LOCATION: Grass	Valley, (	CA
ELEVAT			NORT		EASTING:	DRILLING CONTRA	ACTOR:	Water Development Corp., Woodland, CA
			D EQUIPME	ENT USED: A	ARCH with 11 3/4 iinch casing	5115		10055
	LEVELS:				START: 2/14/2007 2:00:00 PM	END:	-	LOGGER: D. Hodson
DEPTH E		\		STANDARD PENETRATION	CORE DESCRI			COMMENTS:
	INTERVA	RECO	VEDV	TEST RESULTS	SOIL NAME (USCS GROUP SYMB) MOISTURE CONTENT, RELATIVE	OL), COLOR, DENSITY	DEP	PTH OF CASING, DRILLING RATE, LLING FLUID LOSS,
		RECO	TYPE-#		OR CONSISTENCY, SOIL STRUCT	URE,	TES	TS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.			
51 -			31=3HelbyTube	, ,				
52 <b>–</b>								
52 -						•		
53 -							_	
54 <b>–</b>								
"								
55 -	55.0-60.0				Same as above. Greenish gray (Gley 2 5/5	BG).	1040	
56 -								
57 -								
58 🗕							_	
59 <b>–</b>								
37 -						•		
60 -	60.0-65.0				Same as above.		1100	
61 🗕								
62 -						•	_	
63 -						,	_	
64 –						•		
65 -	65.0-70.0				Same as above.		1135	
66 –								
67 -							_	
68 –							_	
69 –						•		
70 -	70.0-75.0				Same as above.		1140	
71 -								
/						•		
72 🗕							_	
73 🗕								
74 🗕							_	
75 -	75.0-80.0				Same as above.		1200	
76 <b>–</b>							_	



PRO	<b>IFCT</b>	NUMBER	
I IVO	ノレしょ	NUMBER	

5L-D

Sheet 4 of 9

	CHZIVIFILL						
PROJE	CT: Lav	а Сар	Mine		LOCATION: Grass Va	alley, CA	
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRAC	TOR: Water Development Corp., Woodland, CA	
DRILLII	NG METHO	D ANI	D EQUIPMI	ENT USED: A	RCH with 11 3/4 iinch casing		
WATER	R LEVELS:				START: 2/14/2007 2:00:00 PM END:	LOGGER: D. Hodson	
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:	
	INTERVA	I (ft)		PENETRATION			
		RECO	VEDV	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,	
		KECU			OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.	
			TYPE-#	6-6-6 (in)	MINERALOGY.		
			SS=Split Spoon ST=ShelbyTube	(N)			
77 <b>–</b>							
,, <u> </u>					_		
78 <b>–</b>					_		
79 <b>–</b>							
80 –	80.0-85.0				Same as above. Semiangular (<3 mm).	1215. Slightly larger, more angular fragments.	
81 <b>–</b>							
01-					_		
82 <b>–</b>					_		
	82.5-82.5					1225. Driller estimates water production 1 gpm.	
83 –					_		
0.4							
84 🗕					_		
85 -	85.0-90.0				Same as above. Very angular, thin pieces.	1300.	
	00.0 70.0					1000	
86 🗕					_		
87 <b>–</b>					_		
00							
88 –					_		
89 🗕							
90 –	90.0-95.0				Same as above.	1325	
91 <b>–</b>					_		
92 <b>–</b>							
/2							
93 🗕							
94 –					_		
ne.	95.0-100.0				Same as above.	1335	
95 -	70.0-100.0				Same as above.	1333	
96 🗕							
97 <b>–</b>							
98 <b>–</b>					_		
99 🗕							
// <del>-</del>					_		
100 -	100.0-105.				Same as above.	1350	
101 -					_		



<b>PROJECT</b>	NUMBER
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5L-D

Sheet 5 of 9

	PROJECT: Lava Cap Mine LOCATION: Grass Valley, CA									
	ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA									
DRILLING METHOD AND EQUIPMENT USED: ARCH with 11 3/4 iinch casing										
	WATER LEVELS: START: 2/14/2007 2:00:00 PM END: LOGGER: D. Hodson									
DEPTH				STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:				
	INTERVA	L (ft) RECO	VERY	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,				
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.				
102 -			31=SileabyTube		_	Downtime to refuel.				
103 -					_					
104 -					_					
105 🗕	105.0-110.				Same as above.	1505. Driller estimates water production ~7-8 gpm.				
106 -					_					
107 <b>–</b>					_					
108 🗕					_					
109 🗕					_					
110 -	110.0-115.				Same as above. Slightly smaller granules (<1 mm).	1530				
111 -					_					
112 -					_					
113 -					_					
114 -					_					
	115.0-120.				Same as above.	- 1550				
116 <b>–</b> 117 <b>–</b>					_					
117 -										
119 -										
	120.0-125.				Same as above.	1610				
121 🗕					_					
122 🗕					_					
123 🗕					_					
124 🗕					_					
125 🗕	125.0-130.				Same as above.	- 1640. Cease drilling on 2/14/07.				
126 <b>–</b>					<u> </u>					
127 <b>–</b>					_					



PRO	<b>IFCT</b>	NUMBER	

5L-D

Sheet 6 of 9

	<i>5</i> <b>HZ</b>					
PROJE	CT: Lav	a Cap	Mine		LOCATION: Grass Va	alley, CA
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRAC	TOR: Water Development Corp., Woodland, CA
DRILLII	NG METHO	D ANI	) EQUIPME	ENT USED: A	RCH with 11 3/4 iinch casing	
WATER	R LEVELS:				START: 2/14/2007 2:00:00 PM END:	LOGGER: D. Hodson
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:
	INTERVA	L (ft)		PENETRATION	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,
	RECOVERY		TEST RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,	
		i	TYPE-#		OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.	
			ST=ShelbyTube	(14)		
128 🗕						
129 🗕						
400	100 0 105				5,000	
130 -	130.0-135.				Same as above in appearance. Elliott's description: meta sedimentary bedrock seen elsewhere on site. No evidence of weathering. Angular,	
					well sorted clasts are pancake-like (preferred fracture surface?). Gley 2	
					5/5BG, no fines, largest clast size <3/4" diameter, wet.	
131 -					no fines, largest clast size <3/4 diameter, wet.	
132 -						
400						
133 🗕						
134 🗕						
135 🗕	135.0-140.				Same as above	1235
40,						
136 🗕						
137 🗕						
138 🗕						
120						
139 🗕					_	
140 -	140.0-145.				Same as above. With ~15% fine rounded brown (10YR 6/8)	The gravel may not be from this section? Doesn't
					gravel.	make sense. Gravel is same as gravel found on
141 –					_	ground. I suspect driller's helper laid sieve on
142						ground before bringing sample to me.
142 -					_	
143 -					_	
144 🗕					_	
1/15	145.0-150.					Begin drilling 2/27/07 at 1400.
143	143.0-130.				_	begin unling 2/27/07 at 1400.
146 🗕						
147 🗕					_	
148 🗕						
140					_	
149 🗕					_	
150 🗕	150.0-155.				Same as above.	1430.
151 -						
131						



BORING ID:

5L-D

Sheet 7 of 9

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Grass Valley, CA ELEVATION: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA NORTHING: DRILLING METHOD AND EQUIPMENT USED: ARCH with 11 3/4 iinch casing WATER LEVELS: START: 2/14/2007 2:00:00 PM END: LOGGER: D. Hodson DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY **RESULTS** DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 152 -153 -154 -155 -156 -157 -158 -159 -160 - 160.0-165. Same as above. Bedrock with no evidence of weathering. 1630 12/20/07 cont. 161 -162 -163 -165 - 165.0-170. Same as above. 2/21/2007 0720 Begin drilling. 166 167 -168 -169 -170 - 170.0-175. Same as above. 171 -172 -173 -174 -175 - 175.0-180. 0840 Same as above. 176 -



BORING ID:

5L-D

Sheet 8 of 9

PROJE	PROJECT: Lava Cap Mine LOCATION: Grass Valley, CA						
ELEVA	TION:		NORT	HING:	EASTING:	DRILLING CONTRAC	TOR: Water Development Corp., Woodland, CA
DRILLII	NG METHO	DD AN	D EQUIPMI	ENT USED: A	RCH with 11 3/4 iinch casing		
WATER	R LEVELS:				START: 2/14/2007 2:00:00 PM	END:	LOGGER: D. Hodson
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTIO	N:	COMMENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL),	COLOR.	DEPTH OF CASING, DRILLING RATE,
	RECOVERY			RESULTS	MOISTURE CONTENT, RELATIVE DEN	SITY,	DRILLING FLUID LOSS,
		ı	TYPE-#	/ / / /in	OR CONSISTENCY, SOIL STRUCTURE MINERALOGY.		TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	WIINERALOGT.		
177 –			,			_	
178 <b>–</b>						_	
179 🗕						_	
180 <b>–</b>	180.0-185.				Same as above.	_	0900
181 <b>–</b>							
101						_	
182 <b>–</b>						_	
183 🗕							
103 =						_	
184 🗕						<u> </u>	
185 🗕	185.0-190.				Same as above.	_	0925
186 🗕						<u> </u>	
187 <b>–</b>						_	
188 🗕							
100 =						<u> </u>	
189 <b>–</b>						_	
100	100 0 105				Company of the compan		0050
190 -	190.0-195.				Same as above.	_	0950
191 <b>–</b>						<u> </u>	
192 <b>–</b>						_	
193 <b>–</b>						_	
194 <b>–</b>						_	
195 <b>–</b>						_	
196 <b>–</b>						_	
197 <b>–</b>							
17/ =						_	
198 <b>–</b>						_	
40-							
199 <b>–</b>						_	
200 -	200.0-205.				Wet, loose bedrock. Ground by bit to ~80% coar	rse sand, ~20%	1015
					fine gravel. No fines, no evidence of weathering.		
201 <b>–</b>					homogenous, Gley 2 6/10B when dry	_	
202 -						<u>—</u>	



PROJECT NUMBER	
----------------	--

5L-D

Sheet 9 of 9

# **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Grass Valley, CA ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA DRILLING METHOD AND EQUIPMENT USED: ARCH with 11 3/4 iinch casing WATER LEVELS: START: 2/14/2007 2:00:00 PM END: LOGGER: D. Hodson DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 203 -204 -205 - 205.0-210. 1130 Same as above. 206 -207 -208 -209 -210 - 210.0-215. Same as above. 1050 211 -212 -213 -214 -1110 215 - 215.0-220. Same as above. 216 -217 -218 -219 -1200. End drilling 2/21/2007. 220 - 220.0-225. Same as above. 221 -222 -223 -224 -225 -226 -



BORING ID:

5L-S

Sheet 1 of 4

PROJE	CT: Lav	a Cap	Mine		LOCATION:			
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRACTOR:			
DRILLI	NG METHO	OD AN	D EQUIPMI	ENT USED:				
WATER	R LEVELS:				START: 2/22/2007	END:		LOGGER:
DEPTH	BGS (ft)			STANDARD	CORE DE	SCRIPTION:		COMMENTS:
	INTERVA	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP S			DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELA OR CONSISTENCY, SOIL STE			DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
			TYPE-#	6-6-6 (in)	MINERALOGY.	OCTOIL,		11313, AND INSTROMENTATION.
			SS=Split Spoon ST=ShelbyTube	(N)				
0-							_	
1-							_	
2-							_	
3 -							_	
4								
-							_	
5 -	5.0-10.0				SILT. 10R 4/8, moist, loose, no grav	el or sand.	_	
6-							_	
7 -							_	
8 -							_	
9-							_	
10 -	10.0-15.0				CLAYEY SILT. 5YR 5/8, wet, loose,	no gravel or sand,	_	1012.
					cohesive, high plasticity.			
11 -							_	
12 -							_	
13 -								
13-							_	
14 -							_	
15_	15.0-20.0				GRAVELLY SILT. ~30% gravel, silt i	c 5VD 5/9, graval ic	_	1033.
15-	13.0 20.0				rounded, heterogeneous in lithology		_	1000.
16 -					Also, ~10% medium sand, wet, loose	e.	_	
17 -								
18 -							_	
19 -							_	
20 -	20.0-25.0				SILTY GRAVEL with 10% sand. ~20 and up to 2.5" diameter, heterogene		_	1041.
21 -					and up to 2.5 diameter, heterogene	ous infloiogy.	_	
22 -							_	
23 -							_	
24 -							_	
25 -	25.0-30.0				SANDY SILT. ~30% fine to medium	sand, dry, loose, not		1120.



BORING ID:

5L-S

Sheet 2 of 4

PROJECT: Lava Cap Mine					LOCATION:			
ELEVA	LEVATION: NORTHING:				EASTING:	ACTOR:		
DRILLI	DRILLING METHOD AND EQUIPMENT USED:							
WATER	R LEVELS:				START: 2/22/2007	END:	LOGGER:	
DEPTH	BGS (ft)			STANDARD	CORE DE	SCRIPTION:	COMMENTS:	
	INTERVA	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP S		DEPTH OF CASING, DRILLING RATE,	
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELA	TIVE DENSITY,	DRILLING FLUID LOSS,	
			TYPE-#	( ( ( (:-)	<ul> <li>OR CONSISTENCY, SOIL STE MINERALOGY.</li> </ul>	RUCTURE,	TESTS, AND INSTRUMENTATION.	
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	WIINLKALOGT.			
			31-51cb)rabe		cohesive or plastic. 10YR 4/6.			
26 -						-	_	
27								
27 -						•	_	
28 -							_	
29 -						-	_	
30_	30.0-35.0				Same as above.		1125.	
30-	30.0-33.0				Same as above.	•	<b>—</b> 1123.	
31 -						-	_	
32 -	•					•	_	
33 -						-	_	
34 -						-	_	
25	35.0-40.0				Same as above.		1130.	
33-	35.0-40.0				Same as above.	•	1130.	
36 -						-	_	
37 -	•					-	_	
38 -						<u>-</u>	_	
39 -						-	_	
40	40.0.45.0				Carra and all and Mills formation of the	- d d.	1105	
40-	40.0-45.0				Same as above. With few chips of be	eurock.	<b>—</b> 1135.	
41 -							_	
42 -						•	-	
43 -							<u> </u>	
15						•		
44 -						-	_	
	45.050.0				CILTY CAMP 2007 - " C '	lum cond. dry !	1220 Stronge color	
45-	45.0-50.0				SILTY SAND. ~30% silt, fine to med 2.5Y 5/6.	ium sand, dry, loose,	1220. Strange color compacted to other samples.	
46 -					2.01 0/0.		_	
47 -						-	_	
48 -								
40 -						•	_	
49 -						-	_	
50 -	50.0-55.0				Bedrock. Dry.	-	1230.	
I	1	1	1	I	1			



BORING ID:

5L-S

Sheet 3 of 4

PROJECT: Lava Cap Mine					LOCATION:			
ELEVA	EVATION: NORTHING:			HING:	EASTING: DRILLING CONTRACTOR:			
DRILLI	DRILLING METHOD AND EQUIPMENT USED:							
WATE	R LEVELS:				START: 2/22/2007	END:	LOGGER:	
DEPTH	BGS (ft)			STANDARD	CORE DE	ESCRIPTION:	COMMENTS:	
	INTERVA	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP		DEPTH OF CASING, DRILLING RATE,	
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELA	ATIVE DENSITY,	DRILLING FLUID LOSS,	
			TYPE-#	( ( ( (:-)	<ul> <li>OR CONSISTENCY, SOIL ST MINERALOGY.</li> </ul>	TRUCTURE,	TESTS, AND INSTRUMENTATION.	
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	WIINERALOGT.			
51 -			51-5hdbyrdbc			_		
52 -	•					-	-	
53 -						_		
54 -	-					<del>-</del>	_	
	FF 0 /0 0						1005	
55-	55.0-60.0				Same as above. Dry.	_	<b>1</b> 235.	
56 -						_	_	
57 -	-					<del>-</del>	-	
58 -								
00-						_		
59 -	-					_	_	
	(00 (50						1045 Ct. 178	
60 -	60.0-65.0				Same as above. Dry, moist.	=	_ 1245. Stop drilling. 2/22/07 1530: Resume	
							drilling.	
61 -	-					_	-	
62 -								
02 -						<del>-</del>	_	
63 -						_	_	
64 =	1					_	-	
65 -	65.0-70.0				BEDROCK. Weathered medium sa	and, medium gravel.	<b>1</b> 540.	
						v		
66 -	-					-	-	
67 -								
07-						_	-	
68 -	-					<del>-</del>	_	
69 -	•					_	-	
70 -	70.0-75.0				BEDROCK. (Maybe not weathered	), homogeneous sand.	<b>1</b> 1600.	
					( ) ( ) ( ) ( ) ( )	. <b>.</b>		
71 -	-					_	-	
70								
72 -	]					_	-	
73 -						<del>-</del>	_	
74 -	1					-	-	
75 -	_							
""						_		
i .	1	1		i e	i		T. Control of the Con	



BORING ID:

5L-S

Sheet 4 of 4

PROJECT: Lava Cap Mine					LOCATION:			
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRACTOR:			
		D AN		ENT USED:				
WATER	LEVELS:				START: 2/22/2007	END:	LOGGER:	
DEPTH				STANDARD		SCRIPTION:	COMMENTS:	
	INTERVA	L (ft)		PENETRATION			DEPTH OF CASING, DRILLING RATE,	
		RECOVERY		TEST RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, DRILLING FLUID LOSS,			
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in)	OR CONSISTENCY, SOIL STE MINERALOGY.	RUCTURE,	TESTS, AND INSTRUMENTATION.	
76 <b>–</b>			ST=ShelbyTube	(N)				
70-						_		



PROJECT NUMBER
151319.FI.09

5TP1

Sheet 1 of 1

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Waste Rock Area ELEVATION: 2785' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: Case 580 Super L with 18" Bucket WATER LEVELS: START: 8/17/2001 END: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) Waste rock. 0 -1 -Stable-sides holding. 2 -3 -60% fines. 4 -SILTY SANDY GRAVEL (GW). Brown, slightly moist, angular, 5 cobbles (8"-). 6 -Sides caving below 6'. Increased moisture with 8 -10 -12 -Backfill with excavated material. 13 -15 -16 -17 -18 -19 -20 -



BORING ID:

5TP10

Sheet 1 of 1

PROJE		a Cap	Mine	4	LOCATION: Right Ab	utment of Log Dam
	TION: 27		NORT		EASTING: DRILLING CONTRAC	TOR: CASCADE DRILLING, INC., RANCHO COR
		)D AN	D EQUIPMI	ENT USED: C	ase 580 Super L with 18" Bucket	
	R LEVELS:				START: 8/17/2001 END:	LOGGER: K. Porter
DEPTH				STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:
	INTERVA			TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,
		RECO		RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.	
0 -			ST=ShelbyTube	(14)	SILTY SAND AND GRAVEL (GW). Dark brownish gray, moist, —	Waste rock (8").
					angular gravel/cobbles.	
1 -					<del>-</del>	•
2 <b>–</b>						
3 🗕						
					_	
4 –					_	
5 <b>–</b>					<del>-</del>	
6 –					_	
7 🗕						
8 <b>–</b>	8.0-8.0				SILTY CLAY (CL). Gray, very moist, very soft.	Tailings at 8 ft. bgs.
9 🗕						
					_	
10 -					_	
11 =					_	
12 -					_	. Backfilled excavated material.
13 –					<del>-</del>	
14 -					_	
15 🗕					_	
16 –					<u> </u>	
17 <b>–</b>					_	
18 <b>–</b>					_	
19 🗕					_	
20 <b>–</b>						
20 =					_	



PROJECT NUMBER
151319.FI.09

5TP2

Sheet 1 of 1

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Waste Rock Area ELEVATION: 2785' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: Case 580 Super L with 18" Bucket WATER LEVELS: START: 8/17/2001 END: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 0.0-0.0 Waste rock (8"). 1 -Walls relatively stable. 2 -3 -4 -SILTY SAND WITH GRAVEL (GW). Cobbles, angular, dry to 5 moist, gray-brown becoming dark brown with depth. 6 -8 -10 -12 -Backfill with excavated material. 13 -14 -15 -16 -17 -18 -19 -20 -



BORING ID:

5TP3

Sheet 1 of 1

## **SOIL BORING LOG**

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: Waste Rock Area ELEVATION: 2783' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: Case 580 Super L with 18" Bucket WATER LEVELS: START: 8/17/2001 END: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) Waste rock (8"). 0 -1 -Similar 5TP2. 2 -Noticeable layers ~12" thick likely representing 3 lifts during placement. 4 -SILTY SAND WITH GRAVEL (GW). Occasional cobbles, moist, 5 dense, angular gravels. 6 -8 -10 -Backfill with excavated material. Compact with bucket. 12 -13 -14 -15 -16 -17 -18 -19 -20 -



PROJECT NUMBER
151319.FI.09

5TP4

Sheet 1 of 1

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Waste Rock Area ELEVATION: 2772' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: Case 580 Super L with 18" Bucket WATER LEVELS: START: 8/17/2001 END: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS, OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) 0 -Waste rock (8"). 1 -Walls stable. 2 -3 -Less cobbles below ~4'. 4 -SILT SAND WITH GRAVEL (GW) and cobbles. Dark gray-brown, 5 - 5.0-5.0 Increase cobbles, less stable. moist, dense, angular. 6 -8 -10 -Backfill with excavated material. 13 -14 -15 -16 -17 -18 -19 -20 -



PROJECT NUMBER
151319.FI.09

BORING ID:

5TP5

Sheet 1 of 1

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Waste Rock Area ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: Case 580 Super L with 18" Bucket WATER LEVELS: START: 8/17/2001 END: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) SILTY SAND WITH GRAVEL AND COBBLES (GW). Brown to gray, Waste rock (8"). 0 moist, dense, angular. 1 -Organic debris, roots, slight change in color. 2 -3 -4 -5 -SILTY SAND (SM). Brown, moist, medium, fine sand. Tailings. Fine roots. 6 -8 -Becoming gray, very moist. Less stable, slight caving. 10 -Wet. Water at 10.5 ft.-hole unstable, caving. Backfill with excavated material. 12 -15 -16 -17 -18 -19 -20 -



PROJECT NUMBER
151319.FI.09

BORING ID:

5TP6

Sheet 1 of 1

## **SOIL BORING LOG**

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: Waste Rock Area ELEVATION: 2750' NORTHING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR EASTING: DRILLING METHOD AND EQUIPMENT USED: Case 580 Super L with 18" Bucket WATER LEVELS: START: 8/17/2001 END: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) SILTY SAND AND GRAVEL (GW). Some cobbles, gray-brown, Waste rock. 0 moist, dense, angular. 1 -2 -SILTY SAND (SM) with lenses of SILT (ML). Gray and brown, Roots in tailings to 6 ft. bgs. Slight organic 3 moist to wet, medium dense, fine sand. odor. 4 -Stable walls. 5 -Grab sample, bag + 5 gal bucket. 6 -8 -CLAYEY SAND AND GRAVEL (GC). Red-brown, very moist, dense, Native. angular gravel. 10 -12 -Backfill with excavated material. 15 -16 -17 -18 -19 -20 -



BORING ID:

5TP7

Sheet 1 of 1

## **SOIL BORING LOG**

**CH2MHILI** PROJECT: Lava Cap Mine LOCATION: Waste Rock Area ELEVATION: 2750' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: Case 580 Super L with 18" Bucket WATER LEVELS: START: 8/17/2001 END: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) SILTY SAND/GRAVEL (GW), cobbles. Brown-gray, moist, dense, Waste rock. 0 -1 -2 - 2.0-2.0 SILTY SAND WITH CLAY. Brown grading to gray, moist, loose Some organic (wood) debris. to medium. Tailings. Roots. 3 -No roots beyond 4 ft. bgs. 5 -6 -8 -Becoming wet. Grab sample: bucket and bag, wet. Walls becoming unstable, some caving. 10 -Grab sample: bucket. 12 -Backfill with excavated material. 15 -16 -17 -18 -19 -20 -



151319.FI.09

BORING ID:

5TP8

Sheet 1 of 1

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Tailings Area ELEVATION: 2755' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: Case 580 Super L with 18" Bucket WATER LEVELS: START: 8/17/2001 END: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) SILTY SAND/GRAVEL (GW). Gray-brown, moist, dense, angular. Waste rock. 0 -1 -SILTY SAND (SM). Tan, dry, loose, fine sand. Tailings. Becoming moist. 2 -3 -4 -Bucket sample. 5 -6 -8 -Becoming clayey, gray, wet. 10 -Bucket sample, wet. Bag sample. 12 -Backfilled with excavated material. 13 -15 -16 -17 -18 -19 -20 -



BORING ID:

5TP9

Sheet 1 of 1

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Near Left Abutment of Log Dam ELEVATION: 2746' NORTHING: EASTING: DRILLING CONTRACTOR: CASCADE DRILLING, INC., RANCHO COR DRILLING METHOD AND EQUIPMENT USED: Case 580 Super L with 18" Bucket WATER LEVELS: START: 8/17/2001 END: LOGGER: K. Porter DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) SILTY SAND/GRAVEL (GW). Gray-brown, moist, dense, angular, Waste rock (8"). 0 with cobbles. 1 -2 -Stable walls=5 3 -Tailings. 4 -5 - 5.0-5.0 SILT (ML). Gray-tan, moist, very stiff. 7.0-7.0 SILTY SAND (SM). Tan, moist, medium. Bucket sample. 8 -Bag sample. 10 -Becoming very moist, more gray. Old tree log (~8"). Walls caving some. 12 -Backfill with excavated material. 13 -15 -16 -17 -18 -19 -20 -



BORING ID:

LCM 1A

Sheet 1 of 5

CH2	MHILL	,	SOIL BURING LUG				
	va Cap Mine	•	LOCATION: ~150' S of electric gate				
ELEVATION:	NORT	HING:	EASTING: DRILLING CONTRAC	CTOR: Water Development Corp., Woodland, CA			
DRILLING METH	od and Equipm	ENT USED: (	CME 1050 Hollow Stem Auger				
WATER LEVELS	•		START: 11/2/1999 3:00:00 PM END: 11/3/1999 1:	30:00 PM LOGGER: Meier			
DEPTH BGS (ft)		STANDARD	CORE DESCRIPTION:	COMMENTS:			
INTERV	AL (ft)	PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,			
	RECOVERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.			
	TYPE-#	6-6-6 (in)	MINERALOGY.	12313, AND INSTROMENTATION.			
	SS=Split Spoon ST=ShelbyTube	(N)					
0.0-0.0			ORGANIC SOIL WITH SAND (OL/OH). Reddish brown (5YR 4/4), 75% silt, 25% fine to coarse sand, well rounded, soft.	MiniRam reading: 0.14. Surface soil sample 1450 0 to 0.25			
1 -			- 1070 Sill, 2070 line to course suria, well rounded, soil.	-			
2 - 2.0-3.5	1.5	6-8-7	SANDY LEAN CLAY (CL). Strong brown (7.5YR 5/6), 70% clay,	Roots present. Gravel: yellowish weathered			
3 –			25% fine to medium sand, 5% gravel, well rounded, dry, very stiff, crumbly.	sandstone and gray siliceous rock. Some white - clay material present in areas: caliche?			
3.5-5.0	1.5	6-7-9	Same as above.				
4 —			_	-			
5 - 5.0-6.5	1.5	6-9-9	Same as above.	6 to 6.5 ft. bgs. collected soil sample 1A1-2.			
3 – 3.0 0.3	1.5	077		o to 0.5 ft. bgs. concered son sample 1741 2.			
6 –			_	-			
6.5-8.5	2	6-8-10-10	Same as above.	MiniRam=0.0			
/-			_				
8 –			_				
8.5-10.0	1.5	6-9-10	Same as above.	Black spots: organic rich material. White spots:			
9 -			_	minerialization? Still some roots present.			
10 - 10.0-11.5	1.5	6-11-11	Same as above. With increasing content on white mineralized	_			
11			material, very soft, chalky, fine-grained material.				
11 –	2	6-8-10-11	Same as above. Pockets of white mineralization up to 1"	- Augers grinding on rocky material.			
12 -		001011	diameter. Hardness =1.	-			
13 -	1.5	6-9-10	Same as above. White mineralized material in 2" diameter	-   MiniRam=0.0			
14 -	1.5	0-9-10	rock firm.	WilliRalli=0.0			
15 - 15.0-15.5		7.40.40	No recovery.	-			
15.5-16.5 16 <b>–</b>	1	7-10-18	Same as above.				
16.5-18.5	2	8-10-12-12	SANDY LEAN CLAY (CL). Strong brown (7.5YR 4/6), 65% clay,	Increasing content with metasediments. Increasing			
17 -			20% fine to medium sand, 15% gravel (2 to 600 mm), well	moisture.			
18 _			rounded, moist, very stiff.				
18.5-20.0	1.5	15-12-8	LEAN CLAY WITH SAND (CL). Strong brown (7.5YR 4/6), 80%	-			
19 🗕			clay, 15% fine to medium sand, 5% gravel, well rounded,	-			
20 20 0 24 5	1.5	F F /	moist, very stiff, medium plasticity.	Degracing mineralization in the second			
20 - 20.0-21.5	1.5	5-5-6	LEAN CLAY WITH SAND (CL). Strong brown (7.5YR 4/6), 85% clay, 15% fine to very fine sand, well rounded, moist,	<ul> <li>Decreasing mineralization, increasing moisture, softness and plasticity.</li> </ul>			
21 -			soft, high plasticity.	-			
21.5-23.5	2	4-6-7-7	Same as above. Very stiff.				
22 -			_	-			
23 🗕			_	_			
23.5-24.5			No recovery.				
24 -		7.0.10	Come as above with large arcillage over 1-11	Completed 2 24 Fts 25 ft her-			
24.5-25.0		7-9-13	Same as above with large argillaceous/siliceous rock, dark gray matrix with high quartz content.	Sample IA1-3 24.5 to 25 ft. bgs.			
		L					



BORING ID:

LCM 1A

Sheet 2 of 5

LEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRA	CTOR: Water Development Corp., Woodland, C
		OD AN	ID EQUIPMI		CME 1050 Hollow Stem Auger	i santi i
	LEVELS:				START: 11/2/1999 3:00:00 PM END: 11/3/1999 1	:30:00 PM LOGGER: Meier
	3GS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:
[	INTERV	Al (ff)		PENETRATION		
	1141 LT\V <i>I</i>		VERY	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,
		KEU			OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.	
25 –	25.0-26.5		51-Sheldy Tube	7-10-11	LEAN CLAY WITH GRAVEL (CL). Strong brown (7.5YR 4/6), 75% clay, _	MiniRam: 0.0
					15% gravel, 10% fine to medium sand, subrounded to subangular, moist, medium stiff.	
26 🗕					_	_
	26.5-27.0			25-5"	Same as above. Increasing gravel/rock content. Color change: Brown	
27_	27.0-28.5				(7.5YR 4/4). No recovery.	28 ft. augers grinding, no progress, drilled
21 <b>-</b>	Z1.U-Z0.3				—	through rocky zone.
28 🗕					_	_
	28.5-30.0	1.5	No blow counts, hammer problem		Same as above. Color change: Dark yellowish brown (10YR	
29 🗕					4/4).	_
30 -	30.0-31.5	1.5		12-22-27	LEAN CLAY WITH SAND (CL). Brownish yellow (10YR 6/8), 85%	MiniRam: 0.0
31 -					clay, 15% fine to medium sand, well rounded, moist, very stiff, high plasticity.	
- 1	31.5-32.5	1		7-13-20-1"	SANDY LEAN CLAY WITH GRAVEL (CL). Pale olive (5Y 6/4), 65%	Lenses of dark gray metasedimentary,
32 -	J 1.U UZ.U	[		, 13 20-1	clay, 20% fine to medium sand, 15% gravel, subrounded, moist, very	arqillaceous/siliceous rock.
					stiff, medium plasticity.	
- 1	32.5-35.0				No recovery.	
33 🗕					_	-
34 🗕						
34 -					_	_
35 🗕	35.0-35.5				No recovery.	_
- 1	35.5-36.5	1		12-18-22	LEAN CLAY WITH SAND (CL). Pale olive (5Y 6/4), 85% clay,	
36 🗕					15% sand, subrounded, stiff, moist, high plasticity.	_
	36.5-38.5	2		10-10-16-35	LEAN CLAY WITH SAND AND GRAVEL (CL). Strong brown (7.5YR	Gravel metasedimentary.
37 🗕					5/6), 70% clay, 20% fine to coarse sand, 10% gravel (2 -600	-
20					mm), subrounded, very moist, stiff, medium to high	
38 –	38.5-40.0	1.5		8-10-12	plasticity LEAN CLAY WITH SAND (CL). Light brown (7.5YR 6/2), 75%	-
39 -	U.UF 0.00	1.5		0 10 12	clay, 20% fine to medium sand, 5% gravel, subrounded, very	_
					moist, medium stiff, high plasticity.	
40 -	40.0-41.5	1.5		6-6-7	GRAVELLY LEAN CLAY WITH SAND (CL). Pale olive (5Y 6/4), 65%	Zones with iron oxide staining gravel=black
					clay, 20% gravel, (2 to 400 mm), 15% fine to coarse sand,	metasedimentary rock. MiniRam:0.0.
41 –					subrounded, moist, very stiff.	-
- 1	41.5-43.5	2		6-12-18-7	Same as above.	Gravel=Black, massive argillaceous rock, gray
42 -					_	_ claystone. Red (2.5YR 4/4), claystone.
43 -					_	
- 1	43.5-44.0				No recovery.	
- 1	44.0-45.0			7-7-7	Same as above. Light olive brown (2.5Y 5/3).	_
	44.5-45.0	1.5			WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC). Light olive brown (2.5Y 5/3), 65% gravel, (2 to 600 mm), 25% fine to coarse sand, 10% clay, subrounded, moist, stiff, crumbly.	Weathered sandstone/claystone, breaks easily.
45 –	45.0-46.5	1.5		7-13-15	SANDY LEAN CLAY WITH GRAVEL (CL). Dark grayish brown (10YR 4/2), 70% clay, 15% fine to coarse sand, 15% gravel, (2 to 400 mm), subrounded, wet, medium soft, high plasticity.	Oxidized and reduced zones.



BORING ID:

LCM 1A

Sheet 3 of 5

	<u>CH2</u>	M	HILL		SOIL BORING LOG					
PROJE	CT: Lav	a Cap	Mine		LOCATION: ~150' S of electric gate					
ELEVATION: NORTHING:					EASTING:	DRILLING CONTRAC	TOR: Water Development Corp., Woodland, CA			
DRILLING METHOD AND EQUIPMENT U			D EQUIPM	ENT USED: (	CME 1050 Hollow Stem Auger					
	R LEVELS:				START: 11/2/1999 3:00:00 PM	END: 11/3/1999 1:3				
DEPTH E				STANDARD PENETRATION	CORE DESCRIPTION	DN:	COMMENTS:			
	INTERV	<u> </u>		TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), MOISTURE CONTENT, RELATIVE DEN		DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,			
		RECC	VERY	KESULIS	OR CONSISTENCY, SOIL STRUCTURI		TESTS, AND INSTRUMENTATION.			
			TYPE-# SS=Split Spoon	6-6-6 (in) (N)	MINERALOGY.					
46 -			ST=ShelbyTube	(11)						
47 –	46.5-47.5 47.5-48.5	1		9-50-5"	GRAVELLY LEAN CLAY WITH SAND. Light gr light greenish gray (10Y 7/1), 60% clay, 25% gr sand, subangular, moist, crumbly. No recovery.	• . •				
48 🗕	48.5-50.0			10-11-16	WELL GRADED SAND WITH CLAY AND GRA	VEL (SW-SC).				
40					Yellowish	fine to				
49 🗕					brown (10YR 5/6) and pale olive (5Y 6/4), 70% coarse sand, 25% gravel (2 - 500 mm), 15% cla crumbly to soft.					
50 <b>–</b>	50.0-51.5	1.5		50-6"	WELL GRADED GRAVEL WITH CLAY AND S olive (5Y 6/3), 70% gravel (2-700 mm), 20% fin clay, subrounded sand, angular, gravel, dry, loc	e to coarse sand, 10%	. Gravel=broken rock. Gray argillaceous metased			
51 🗕							TOOK.			
52 <b>–</b>	51.5-53.5	2		25-40-50-3"	LEAN CLAY WITH SAND (CL). Greenish gray 10% very fine sand, well rounded, dry, very stiff					
53 -										
	53.5-54.0 54.0-55.0	0.5		60-6"	LEAN CLAY WITH GRAVEL (CL). Greenish gr 15% gravel (2-400 mm), 5% fine to medium sar very stiff, crumbly. No recovery.		Gravel=same as above.			
55 <b>–</b>	55.0-56.0	1		28-50-4"	POORLY GRADED GRAVEL WITH CLAY (GP 5/1), 85% gravel (2-500 mm), 10% clay, 5% fin loose.	, , , ,	Gravel=broken dark gray argillaceous metasedimentary rock.			
56 <b>–</b>	56.0-57.0			60-6"	No recovery.	_				
57 <b>–</b>	57.0-58.5	1.5			Same as above.	_				
58 <b>–</b> 59 <b>–</b>	58.5-60.0	1.5		38-50-5"	Same as above.	_				
	60.0-61.0	1		35-50-3"	POORLY GRADED GRAVEL WITH CLAY (GP 5/1), 85% gravel, 10% clay, 5% fine sand, angu.		. MiniRam: 0.0			
- 1	61.0-61.5 61.5-62.5	1		60-6"	No recovery. Same as above.	_				
- 1	62.5-63.5				No recovery.	_				
64 🗕	63.5-65.0						63.5 ft. bgs. Drilling too hard with auger, switch to air rotary.			
65 🗕	65.0-66.0				Same as above.	_	Very dry, clay dust.			
66 –										
67 <b>–</b> 68 <b>–</b>	67.0-68.0				Same as above.	_	Bedrock=Dark gray argillaceous metasedimentary rock, very fine grained, massive, dries to light greenish gray color, similar to the dust color.			



BORING ID:

LCM 1A

Sheet 4 of 5

PROJE	PROJECT: Lava Cap Mine LOCATION: ~150' S of electric gate								
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA				
DRILLING METHOD AND EQUIPMENT USED: CME 1050 Hollow Stem Auger									
WATER	R LEVELS:				START: 11/2/1999 3:00:00 PM END: 11/3/1999 1	:30:00 PM LOGGER: Meier			
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:			
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,			
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,			
		ĺ	TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.			
			SS=Split Spoon ST=ShelbyTube	(N)	WINVERVICEOUT.				
69 🗕	69.0-70.0				Same as above	-			
70 <b>–</b>					<u>-</u>	-			
71 <b>–</b>					<u>-</u>	-			
72 <b>–</b>	72.0-73.0				Same as above.				
73 <b>–</b>					<u> </u>	_			
74 <b>–</b>									
	75.0-76.0				Same as above.				
76 <b>–</b>									
77 -					_				
					_	-			
78 <b>–</b>	70.0.00.0				_	=			
	79.0-80.0				Same as above.	-			
80 🗕					<del>-</del>	-			
81 <b>–</b>					<del>-</del>	-			
	82.0-83.0				Same as above.	-			
83 –					-	-			
84 –					<del>-</del>	-			
	85.0-86.0				Same as above.	<ul> <li>Discussed the possibility of water in bedrock fractures. May enter borehole slowly.</li> </ul>			
86 –					<del>-</del>	1			
87 🗕					<del>-</del>	1			
88 🗕					<del>-</del>	1			
	89.0-90.0				Same as above.	<ul> <li>Allowed 20 minutes and checked for water. Sample hardly even damp. Very small fracture.</li> </ul>			
	90.0-90.5				Same as above. Slightly moist.	1			
91 <b>–</b>					<del>-</del>	-			
92 <b>–</b>	92.0-92.5				<del>-</del>	-			
93 <b>–</b>					<del>-</del>	-			



	MBER

BORING ID:

LCM 1A

Sheet 5 of 5

PROJECT: Lava Cap Mine					LOCATION: ~150' S of electric gate			
ELEVATION: NORTHING:			NORT	HING:	EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA			
DRILLING METHOD AND EQUIPMENT USED: CME 1050 Hollow Stem Auger								
WATER	R LEVELS:				START: 11/2/1999 3:00:00 PM END: 11/3/19	99 1:30:00 PM LOGGER: Meier		
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:		
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,		
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,		
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.		
			SS=Split Spoon ST=ShelbyTube	(N)				
94 -						_		
95 -						_		
96 -	96.0-96.5				Same as above. Moist, no dust.	_		
97 -						_		
,,								
98 –						_		
99_	99.0-99.5				Same as above. Moist, no dust.	— 99 ft. bgs. Stopped drilling, waited 5 minutes.		
"-	77.0 77.3				Same as above. Moist, no dust.	77 it. bgs. Stopped drining, waited 5 minutes.		
100 -						_		
101 -								
101-								
102 -	102.0-103.				Same as above. Wet.	Soil sample 1AA-4 1310.		
102								
103 -								
104 -	104.0-105.				Same as above. Drier than previous. Damp only.	_		
105								
105 -						_		
106 -						_		
407	107.0.100							
107-	107.0-108.				LEAN CLAY (CL). Greenish gray (5G 5/1), 100% clay, moist, soft, medium plasticity.	_		
108 -					, , , , , , , , , , , , , , , , , , , ,	_		
4.00								
109 -	109.0-110.				POORLY GRADED GRAVEL WITH CLAY (CL). Greenish gray (5G 5/1), 85% gravel, 10% clay, 5% fine to coarse sand,	<ul> <li>Stopped, pulled hammer. Sounder: Water at 103 ft.</li> <li>bgs rising slowly. Gravel=greenish gray</li> </ul>		
110 -					angular, moist, loose.	argillaceous metasedimentary rock. High quartz,		
					Total depth=109 ft. bgs.	high iron.		
111_								



BORING ID:

LCM 1B

Sheet 1 of 7

PROJECT: Lava Cap Mine					LOCATION: At Y with Lava Cap Mine Road and Gravel Drive to the m				
ELEVATION: NORTHING:			NORT		EASTING: DRILLING CONTRA	CTOR: Water Development Corp., Woodland, CA			
DRILLING METHOD AND EQUIPMENT USED: CME1050 Hollow Stem Auger									
	LEVELS:				START: 11/4/1999 10:15:00 AM END: 11/4/1999 5				
DEPTH E		(61)		STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:			
	INTERV	<u> </u>	VERY	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,			
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.			
	0.0-0.0				-	MiniRam=0.0			
	0.5-1.0	.5			ORGANICE SOIL WITH SAND (OL/OH). Dark brown (10YR 3/3), 80% organic soil, 20% fine to very fine sand, well rounded, dry, stiff.	Gravel=dark gray igneous rock, hornblende olivine			
1-	1.0-4.0	3			GRAVELLY ORGANIC SOIL WITH SAND (OL/OH). Brown (10YR 4/3), _ 50% organic soil, 35% gravel, 15% fine to very fine sand, subrounded, dry, very stiff.	and quartz crystals. Diorite?? Doesn't look like			
2					a.y, 13.y 3	a breccias.			
2 -					_				
3 -					_	_			
4 🗕					<del>-</del>	At 4 ft. bgs. switching from augers to air rotary driller.			
5 🗕	5.0-5.5	0.5			WELL GRADED GRAVEL WITH SAND (GW). Grayish brown (10YR 5/2), 60% gravel (2 to 10 mm), 40% fine to coarse sand, angular, dry, very stiff.				
6 –	6.0-6.5	0.5			SANDY LEAN CLAY WITH GRAVEL (CL). Grayish brown (10YR 5/2), 60% clay, 25% fine to medium sand, 15% gravel, subrounded, dry, loose.	Lots of dusts generated, drilling breaks rock			
7 -	7.0-7.5	0.5			-	into dust.			
8 –	8.0-8.5	0.5			WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC). Darkgrayish	Gravel=Same igneous rock as above. MiniRam=0.8			
9 <b>–</b>					brown (10YR 4/2), 60% gravel, 20% clay, 20% fine to coarse sand, subangular, dry, loose.	-			
10 -	10.0-10.5	0.5			Same as above.	_			
11 –					<u>-</u>	_			
12 -					-	_			
13 –	13.0-13.5				SANDY LEAN CLAY WITH GRAVEL (CL). Same as above.	_			
14 -					_	_			
15 –	15.0-15.5				Same as above.	MiniRam=0.97			
16 –					_	-			
17 🗕					_	-			
18 –	18.0-18.5				WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC). Dark grayish	-			
19 🗕					brown (10YR 4/2), 60% gravel, 20% fine to coarse sand, 20% clay, subrounded, dry, loose.	_			
20 -					_	_			
21 –	21.0-21.5	0.5			Same as above.	_			
22 -					_				



151319.FI.03

BORING ID:

LCM 1B

Sheet 2 of 7

## **SOIL BORING LOG**

Lava Cap Mine LOCATION: At Y with Lava Cap Mine Road and Gravel Drive to the m PROJECT: **ELEVATION:** NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA DRILLING METHOD AND EQUIPMENT USED: CME1050 Hollow Stem Auger WATER LEVELS: START: 11/4/1999 10:15:00 AM END: 11/4/1999 5:00:00 PM LOGGER: Meier DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 23 - 23.0-23.5 0.5 Same as above. 24 -25 - 25.0-25.5 0.5 SANDY LEAN CLAY (CL). Dark grayish brown (10YR 4/2), 60% clay, 25% fine to coarse sand, 15% gravel, subrounded, dry, 26 loose. 27 - 27.0-27.5 0.5 Hammer broken again. MiniRam=0.35 28 -29 -30 -31 - 31.0-31.5 WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC). Dark Gravel=some dark gray igneous rock. brown (10YR 4/2), 50% gravel, 30% fine to coarse sand, 20% 32 clay, subrounded, dry, loose. 33 -34 - 34.0-34.5 Same as above. 35 -36 -37 -38 - 38.0-38.5 Same as above. 39 -40 -41 - 41.0-41.5 Same as above. 42 - 42.0-42.5 Same as above. Larger gravel (2 to 250 mm). 43 -44 - 44.0-44.5 WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC). Dark Gravel (2 to 300 mm diameter). brown (10YR 4/2), 50% gravel, 30% fine to medium sand, 20% clay, subrounded, dry, loose. 45 -46 -



151319.FI.03

BORING ID:

LCM 1B

Sheet 3 of 7

PROJE	PROJECT: Lava Cap Mine LOCATION: At Y with Lava Cap Mine Road and Gravel Drive to the						
ELEVATION: NORTHING:					EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA		
DRILLI	NG METHO	DD AN	D EQUIPMI	ENT USED: C	CME1050 Hollow Stem Auger		
WATER	R LEVELS:				START: 11/4/1999 10:15:00 AM END: 11/4/1999	5:00:00 PM LOGGER: Meier	
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:	
	INTERVA	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,	
		RECC	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,	
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.	
			SS=Split Spoon ST=ShelbyTube	(N)			
47 -						_	
48 -							
10-	48.5-49.0				   Same as above. With color change: Very dark grayish brown		
49 -					(10YR 3/2), moist.	_	
50 -						_	
51 -	51.0-51.5				Same as above.		
3	5 110						
52 <b>–</b>						_	
F2							
53 -							
54 -	54.0-54.5				Same as above.		
55 -						_	
56_	56.0-56.5				Same as above.		
00-	00.0 00.0				Sum as above.		
57 -						_	
58 -							
59 -	59.0-59.5				Same as above. Moist.	Seal around augers blow out.	
60 -						_	
61_	61.0-61.5				   WELL GRADED GRAVEL WITH SAND (GW). Dark gray (10YR 4/1),	Driller added water to hydrate bentonite and form	
01-	01.0-01.3				80% gravel (2 to 300 mm), 20% medium to coarse sand, subangular,	seal around augers. Sample 1B1-4 61 to 63 ft. bgs.	
					wet, loose.		
62 -	62.0-62.5				Same as above.	Very hard drilling.	
63 -							
64 -	64.0-64.5				Same as above.	Gravel=Dark gray, massive volcanic rock with some	
65 -						breccia present.	
05 =							
66 -	66.0-66.5				Same as above.	_	
67 -						_	
68-	68.0-68.5				Same as above.	Breccia content increasing. Dark gray igneous	
						rock content decreasing. Sample 1B1-5 68 to 71	
69 -						ft. bgs.	
	70 0 70 5				WITH CDADED CAND WITH CDAVEL (CNA C. )	Cond and group by the transfer	
/0-	70.0-70.5				WELL GRADED SAND WITH GRAVEL (SW). Dark grayish brown (10YR	Sand and gravel=broken up breccia.	
					4/2), 80% fine to very fine coarse sand, 20% gravel (2 to		
71 -					10 mm), subangular, wet, loose.	_	



151319.FI.03

BORING ID:

LCM 1B

Sheet 4 of 7

PROJE	CT: Lav	a Cap	Mine	•	LOCATION:	LOCATION: At Y with Lava Cap Mine Road and Gravel Drive to the m				
ELEVATION: NORTHING:					EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA					
DRILLII	DRILLING METHOD AND EQUIPMENT USED: CME1050 Hollow Stem Auger									
WATER	R LEVELS:				START: 11/4/1999 10:15:00 AM END: 11/4	4/1999 5:00:00 PM LOGGER: Meier				
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:				
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,				
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,				
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.				
			SS=Split Spoon ST=ShelbyTube	(N)						
72 🗕										
73 <b>–</b>						_				
74 <b>–</b>						_				
75 <b>–</b>	75.0-76.0				WELL GRADED GRAVEL WITH SAND. Very dark gray (5Y 3/1)	), — 0835: 11/18/199. Difficult drilling 76 to 80 ft.				
76 <b>–</b>					gravel 75%, sized 2 to 25 mm, sand 25% fine to coarse, subangular to subrounded.	bgs. Gravel pieces of igneous rock, no specific mineralization apparent.				
77 –						_				
78 <b>–</b>						_				
79 <b>–</b>						_				
80 🗕						_				
81 🗕						_				
82 <b>–</b>						_				
83 🗕						_				
84 🗕						_				
85 <b>–</b>					Color change back to grayish brown (10YR 5/2).	_				
86 –						_				
87 <b>–</b>						_				
88 –						_				
89 –	89.0-90.0				WELL GRADED SAND WITH GRAVEL. Grayish brown (10YR 5, 75%	5/2), — Some quartzite present in the gravel.				
90 <b>–</b>					fine to coarse sand, 25% gravel to 15 mm.	_				
91 🗕						_				
92 <b>–</b>						_				
93 –						_				
94 –	94.0-95.0				WELL GRADED GRAVEL WITH SAND. Very dark grayish brown (10YR	n — 0930 11/18/1999				
95 🗕					3/2), 75% gravel (2 to 15 mm), 25% medium to coarse sand, subrounded to subangular, moist.	_				



BORING ID:

LCM 1B

Sheet 5 of 7

PROJECT: Lava Cap Mine					LOCATION: At Y with Lava Cap Mine Road and Gravel Drive to the m			
ELEVATION: NORTHING:			NORT	HING:	EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA			
DRILLING METHOD AND EQUIPMENT USED: CME1050 Hollow Stem Auger								
WATE	R LEVELS:				START: 11/4/1999 10:15:00 AM	END: 11/4/1999 5	:00:00 PM LOGGER: Meier	
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	:	COMMENTS:	
	INTERVA	AL (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), CO	OLOR,	DEPTH OF CASING, DRILLING RATE,	
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSI		DRILLING FLUID LOSS,	
			TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.		TESTS, AND INSTRUMENTATION.	
			SS=Split Spoon ST=ShelbyTube	(N)	WINTER CESS 1.			
96 -	-					-	_	
07								
97 -						_	_	
98 -	_					<del>-</del>		
99 -	-					-	_	
100 -	100.0-101.				   WELL GRADED GRAVEL WITH SAND. Dark gray	yish brown (10YR 👤		
					4/2), 75% gravel (2 to 20 mm), 25% medium to coa	•		
101 -	-				subrounded to subangular, moist.	-	_	
102 -								
102						_		
103 -	-					_	_	
104								
104 -	-					<del>-</del>	_	
105 -	105.0-106.				WELL GRADED SAND WITH CLAY AND GRAVE	L. Grayish brown	Gravel pieces mixture of volcanic and metamorphic	
					(10YR		and Colleged and Laborated AD (	
106 -					5/2), 60% sand, 30% gravel, 10% clay, moist, subr subangular.	rounded to	rocks. Collected sample 1B-6.	
					- Sazanganan			
107 -	-					-	_	
108 -								
100-						_		
109 -	_					_	_	
110-					Increasing clay, transition zone from "Lava Cap" to underlying conglomerate.	· _	_	
111-	_				underlying conglomerate.	_		
112 -	-					-	_	
113 -								
"						<u>-</u>		
114 -	-					-	-	
110	115 0 11/				Same as 105 ft. bgs. 70% sand, 20% gravel.		1015 11/10/1000	
115-	115.0-116.				Same as 100 it. bys. 70% Samu, 20% gravei.	_	<u> </u>	
116 -	-					_	_	
117 -	1					-	-	
118 -	_					_	_	
119 -	-					-	-	
120 -								
120						_		
I	1	1	1	l .	1		I .	



BORING ID:

LCM 1B

Sheet 6 of 7

PROJE	CT: Lav	a Cap	Mine		LOCATION: At Y	vith Lava Cap Mine Road and Gravel Drive to the m
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTR	ACTOR: Water Development Corp., Woodland, CA
DRILLI	NG METH	OD AN	D EQUIPMI	ENT USED: C	ME1050 Hollow Stem Auger	
WATER	R LEVELS:				START: 11/4/1999 10:15:00 AM END: 11/4/1999	5:00:00 PM LOGGER: Meier
DEPTH I	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:
	INTERV		VERY	PENETRATION TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,
		KLOO	TYPE-#		OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.	
121 -			S1=SneibyTube	. ,		_
122 -						_
123 -						_
124 -						_
125 -						_
126 -						
127 -						
128 -						
	129.0-130.				WELL CRAPED CAND WITH CRAVEL AND WOOD (see sisters of	_
	129.0-130.				WELL GRADED SAND WITH GRAVEL AND WOOD (consistency of railroad ties). Maybe fines present but washed by added	_
130 -					water. Dark gray (10YR 4/1), 80% sand, 20% gravel, subangular to subrounded, wet.	_
131 -						_
132 -						_
133 -						_
134 -	134.0-135.				WELL GRADED SAND. With some cobbles to 1/2" fine to coarse sand, wet, subangular, very dark gray (7.5YR N/3). Non	1215
135 -					volcanic.	_
136 -						_
137 -						Transitions at 137 ft. bgs. to solid
138 -						claystone/slatey rock.
139 _						_
140 -					Massive, dark gray claystone (broken into 1/8 to 1/4"	Argillite, slightly metamorphosed. Dries to a
141 -					pieces), metasedimentary bedrock, does not appear to contain much quartz.	light olive gray.
142 -						_
143 -						
144 -						
145 -						
146 -						-



PROJECT NUMBER
151319.FI.03

BORING ID:

LCM 1B

Sheet 7 of 7

ELEVATION: NORTHING: EASTING   DRILLING CONTRACTOR: Water Development Corp., Weodeland, CA	PROJE	CT: Lav	a Cap	Mine	•	LOCATION: At Y with	Lava Cap Mine Road and Gravel Drive to the m
START: 11/4/1999 10:15:00 AM	ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRAC	TOR: Water Development Corp., Woodland, CA
DEPTH BGS (ft)	DRILLII	NG METHO	D AN	D EQUIPMI	ENT USED: C	ME1050 Hollow Stem Auger	
INTERVAL (ft)	WATER	R LEVELS:				START: 11/4/1999 10:15:00 AM END: 11/4/1999 5:0	00:00 PM LOGGER: Meier
RECOVERY   RESULTS   SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.   DEPTH OF CASING, DRILLING FATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.    147 -	DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:
RECOVERY   RESULTS   MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.   DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.	i		L (ft)		PENETRATION TEST		
TYPE-#   6-6-6 (in)   MINERALOGY.   TESTS, AND INSTRUMENTATION.				VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,
147 -			ı		( ( ( ( ) )	OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.
147 –  148 –  149 –  150 – 150.0-152.  Same as 140 ft. bgs.  — Collected sample 1B-8  — Total depth=152 ft. bgs.  — 1515 11/18/1999					6-6-6 (IN) (N)	WIINERALUGY.	
148 –  149 –  150 – 150.0-152.  Same as 140 ft. bgs.  — Collected sample 1B-8  — Total depth=152 ft. bgs.  — 1515 11/18/1999				S1=ShelbyTube	( )		
149 –  150 – 150.0-152.  Same as 140 ft. bgs.  — Collected sample 1B-8  — 151 –  152 – 152.0-152.  Total depth=152 ft. bgs.  — 1515 11/18/1999	147 🗕						
149 –  150 – 150.0-152.  Same as 140 ft. bgs.  — Collected sample 1B-8  — 151 –  152 – 152.0-152.  Total depth=152 ft. bgs.  — 1515 11/18/1999							
150 – 150.0-152.  Same as 140 ft. bgs.  — Collected sample 1B-8  — 151 –  152 – 152.0-152.  Total depth=152 ft. bgs.  — 1515 11/18/1999	148 🗕						
150 – 150.0-152.  Same as 140 ft. bgs.  — Collected sample 1B-8  — 151 –  152 – 152.0-152.  Total depth=152 ft. bgs.  — 1515 11/18/1999	149 🗕						
151 – 152 – 152.0-152. Total depth=152 ft. bgs. — 1515 11/18/1999							
152 – 152.0-152. Total depth=152 ft. bgs. — 1515 11/18/1999	150 <b>–</b>	150.0-152.				Same as 140 ft. bgs.	Collected sample 1B-8
152 – 152.0-152. Total depth=152 ft. bgs. — 1515 11/18/1999							
	151 <b>–</b>					<del>-</del>	
	152 -	152 0-152				Total depth=152 ft_bas	1515 11/18/1999
	153 🗕						



BORING ID:

LCM 5A

Sheet 1 of 2

PROJECT: Lava Cap Mine Road				•	LOCATION: Caved in Adit			
ELEVATION: NORTHING:		HING:	EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA					
DRILLIN	DRILLING METHOD AND EQUIPMENT USED: Hollow Stem Auger CME 1050							
WATER	LEVELS:	10	ft. bgs.		START: 10/25/1999 4:30:00 PM END: 10/26/1999 4	:00:00 PM LOGGER: Meier		
DEPTH E	BGS (ft)			STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:		
	INTERVA	AL (ft)		TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,		
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.		
			TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.	TESTS, AND INSTRUMENTATION.		
0 –	0.0-1.0		51-5hebyrabe		POORLY GRADED GRAVEL WITH CLAY (GP-GC). Gray (5Y 5/1), dry,—	Mini Ram Aerosol Monitor Model PDM-3 Nazco 3564		
					loose, 60% gravel, 40% clay.	Rdg=0.18. Continuous core.		
1-					_			
2 -					<u> </u>	_		
3 -	3.0-4.0				Same as above. Olive brown (2.5YR 4/3), slightly moist.	•		
4 -					_			
5 –					_	-		
6_	6.0-8.0				POORLY GRADED GARVEL WITH SILT AND CLAY (GP-GC). Light	Gravel=1 to 8 cm diameter. Semilithified		
	0 0.0				brownish gray (2.5Y 6/2), dry, loose, 50% gravel, 20% silt,	sandstone and siltstone, light gray and white.		
7 –					30% clay			
	0.0.0				Came as shows Dark vallouted brown (10VD 4//) vary majet	Water may be comi perahad layer from pand at adit		
8-	8.0-9.0				Same as above. Dark yellowish brown (10YR 4/6), very moist, soft clay, 50% gravel, 40% clay, 10% silt.	Water may be semi-perched layer from pond at adit.		
9 🗕	9.0-10.0				Same as above. Dark brown (10YR 3/3), wet.			
10 -					_	•		
11 _					_			
12 -	12.0-13.0				POORLY GRADED GRAVEL WITH CLAY (GP-GC). Dark yellowish	Gravel (2 mm to 10 cm), semilithified to		
13 -					brown (10YR 2/6) to black (10YR 2/1), wet, loose, 85% gravel, 15% clay, subangular.	lithified sandstone/siltstone.		
	13.5-14.0				SILTSTONE. Very dark gray (10YR 3/1), wet, 85% rock/gravel,	Switch to drive sampling.		
14 -					15% clay, angular.			
15	15 0 15 5					15.5 ft. has: Augor may power, no progress		
15 -	15.0-15.5				_	15.5 ft. bgs: Auger-max power, no progress,     water, fine sand and clay comes up on augers.		
16 -	16.0-17.0				Bedrock. Dark gray (5Y 4/1), 100% gravel (2 mm to 3 cm).	•		
17 -					_	•		
18 🗕					_	_		
19 🗕					_	•		
20_	20.0-21.0				Same as above.	Miniram (1.6). Water color varies from gray to		
						grayish brown (2.5Y 5/2).		
21 🗕					_	-		
,,	22.0-23.0				Same as above.	Miniram (1.0).		
22-	∠∠.U-Z3.U				Same as above.	wintan (1.0).		
23 🗕					_			
	04007=				WELL ODADED ODAVEL NUTTU OAND (OVA			
24 -	24.0-24.5				WELL GRADED GRAVEL WITH SAND (GW). Wet, finer grained gravel (2 mm to 4 mm), 65% gravel, 35% fine to coarse	- May be more compentent (less fractured) bedrock.		
25 -					grained sand, angular.			
25 -					grameu sanu, angular.	•		



BORING ID:

LCM 5A

Sheet 2 of 2

PROJE	CT: Lav	a Cap	Mine Road		LOCATION: Caved in	n Adit
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRAC	CTOR: Water Development Corp., Woodland, CA
DRILLII	NG METHO	DD AN	D EQUIPME	ENT USED: H	ollow Stem Auger CME 1050	
WATER	R LEVELS:	10	ft. bgs.		START: 10/25/1999 4:30:00 PM END: 10/26/1999 4	1:00:00 PM LOGGER: Meier
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,
		ı	TYPE-#	( ( ( ( ) )	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	WIINERALOGT.	
			31=3HelbyTube			
26 <b>–</b>	26.0-26.5				<del>-</del>	Miniram (0.4).
27 <b>–</b>					<del>-</del>	-
28 🗕	28.0-29.0				Same as above.	
29 🗕					<del>-</del>	-
30 <b>–</b>					Same as above.  Total depth=30 ft. bgs.	-
31 -					<del>-</del>	-



151319.FI.03

BORING ID:

LCM 5B

# **SOIL BORING LOG**

Sheet 1 of 2

PROJECT: Lava Cap Mine Road LOCATION: ~500 ft. NW of Log Dam

ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA

DRILLING METHOD AND EQUIPMENT USED: Hollow Stem Auger CME 1050

WATER LEVELS:		START: 10/29/2007 10:45:00 AM END: 10/29/2007	7 12:15:00 PM LOGGER: Meier
DEPTH BGS (ft)	STANDARD	CORE DESCRIPTION:	COMMENTS:
INTERVAL (ft)  RECOVERY  TYPE-#  SS-Spill Spoon ST-ShelbyTube	PENETRATION TEST RESULTS 6-6-6 (in) (N)	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0 - ST-ShelbyTube 1 - 1.5-3.5 2 - 3 -	10-14-11-8	POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM). Dark grayish brown (2.5Y 4/2), dry, soft, 50% fine to very fine sand, 30% gravel (2 to 250 mm), 20% silt.  SILTY SAND (SM). Dark grayish brown (2.5Y 4/2), slightly moist, soft, 60% fine to very fine sand, subrounded.	Mini Ram reading=0.06. Soil sample SB1-1 0 to 0.25.
3.5-5.0	3-4-5	FAT CLAY (CH). Gray (Gley 1 5/N), moist, medium stiff, high plasticity, 100% clay.	_
5 <b>-</b> 5.0-6.5	3-3-4	SILTY SAND (SM). Dark grayish brown (2.5Y 4/2). Same as above.  FAT CLAY (CH). Same as above.	_
6.5-8.5 7 <b>–</b> 8 <b>–</b>	2-2-1-2	SILTY SAND (SM). Same as above. Very moist. FAT CLAY (CH). Gray (Gley 1 5/N), wet, very soft, high plasticity, 100% clay.	Clay saturated, holds water in pores.
9 - 9.0-10.0	2-1-2	SILTY SAND (SM). Dark gray (2.5Y 4/1), very moist, soft, 75% fine to very fine sand, 25% silt, subrounded.	_
10 - 10.0-12.0	2-1-1-2	CLAYEY SAND (SC). Gray (Gley 1 5/N), wet, soft, 60% fine to very fine sand, 40% clay, subrounded, high plasticity clay.	Tailings mixed with silt. Mini Ram reading=0.0.
12 - 12.0-13.0		No recovery.	_
13 - 13.0-14.5	2-2-3	Same as above.	_
14 – 14.5-16.0	1-2-3	Same as above.	Water level indicator inside augers: WT ~14.5 ft. bgs. Mini Ram reading=0.0.
16 –	1-2-2-3	Same as above.	
18 –	3-3-3	Same as above.	Sample 5B1-2 10/29 12:00 pm.
19 – 19.5-21.0 20 –	1-1-2	FAT CLAY (CH). Gray (Gley 1 5/N), wet, soft, high plasticity, 100% clay.	_ _
21 - 21.0-22.5	2-2-1	CLAY WITH SILT (CH). Gray (Gley 1 5/N), wet, soft, high plasticity clay, 60% clay, 40% silt.	22 ft has interface with native material roots
22 – 22.5-23.5	1-1	SANDY LEAN CLAY WITH GRAVEL (CL). Very dark brown (10YR 2/2), wet, soft, 50% clay, 25% fine to medium sand, 25% gravel (2 to 50 mm), subrounded.	<ul> <li>22 ft. bgs. interface with native material, roots present. Sample 5B1-3.</li> </ul>
23.5-25.0	1-1-2	Same as above. With color change to dark brown (10YR 3/3).	



BORING ID:

LCM 5B

Sheet 2 of 2

	JNZ	IVI				
PROJE	CT: Lav	а Сар	Mine Road		LOCATION: ~500 ft. N	NW of Log Dam
ELEVA	TION:		NORTI	HING:	EASTING: DRILLING CONTRACT	TOR: Water Development Corp., Woodland, CA
		D ANI			ollow Stem Auger CME 1050	
	R LEVELS:				START: 10/29/2007 10:45:00 AM END: 10/29/2007 12:	2:15:00 PM LOGGER: Meier
DEPTH E			<del></del> 1	STANDARD	CORE DESCRIPTION:	COMMENTS:
DEFIIII	INTERVA	I (ft)		PENETRATION		
				TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,
		RECO		RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
			TYPE-#	6-6-6 (in)	MINERALOGY.	TESTS, THE INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	(N)		
24 🗕					Same as above. With color change to very dark brown (10YR	Sample 5B1-4.
					2/2).	
25 🗕					Total depth=25 ft. bgs.	
26 -						
20-						
			( J	i '		1



BORING ID:

LCM 5C

Sheet 1 of 4

CH2MHILL			SOIL BORING LOG					
PROJE(		a Cap Mine		LOCATION: Between tailings piles				
ELEVATION: NORTHING:				EASTING: DRILLING CO	NTRACTOR: Water Development Corp., Woodland, CA			
		OD AND EQUIPM	ENT USED: (	CME1050 Hollow Stem Auger	Upon T and an DM			
	LEVELS:		I	_	/2007 5:00:00 PM			
EPTH E	BGS (ft)		STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:			
	INTERV		TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,			
		RECOVERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.			
		TYPE-#	6-6-6 (in)	MINERALOGY.				
0 -		SS=Split Spoon ST=ShelbyTube	(N)		MiniRam reading=0.0			
0-					-   Millikalii leauliig=0.0			
1 –					_			
	1.5-3.0		8-11-9	WELL GRADED SAND WITH GRAVEL (SW). Very dark gray (10Y				
2 -				3/1), 60% fine to coarse grained sand, 40% gravel (2 mm to	smaller pieces (gravel). Mini Ram reading=0.1.			
3 -	3.0-5.0		3-5-5-5	5 cm), subangular, dry, loose. Same as above. Very dark grayish brown (10YR 3/2).	— Mini Ram reading=0.2.			
-								
4 –					_			
5 –								
	5.5-6.5		3-4-5	Same as above. Very dark grayish brown (10YR 3/2).	Waste rock-metasedimentary, appears to be			
6 –					argillite containing pyrite crystal slate, iron			
	6.5-8.5		5-4-4-4	Same as above.	oxide staining, chert and quartz.			
7 -					_			
8 _					_			
	8.5-10.0		3-4-5	Same as above.	Some metamorphosed volcanics, hornblende crystals			
9 🗕					visible.			
10	10.0-11.5		3-4-4	Same as above. Black (10YR 2/1).				
10-	10.0-11.5		3-4-4	Sallie as above. black (TOTK 21).	<u> </u>			
11 –					_			
	11.5-13.5		4-45-6	Same as above. Black (Gley 1 2.5/N), Some dark yellowish				
12 -				brown sand (10YR 3/6), slightly moist.	_			
13 -					_			
14 -	445450		7.7.0	(40)(5.0(0)	-			
	14.5-15.0 15.0-16.5		7-7-8 4-6-6	Same as above. Very dark grayish brown (10YR 3/2). Same as above.	Drilling sounds like bit hit bedrock Mini Ram  reading=0.10.			
	10.0 10.0		100	Sum as above.	Todding-0.10.			
16 –					_			
	16.5-18.5		5-4-4-5	Same as above. Slightly moist.	Mini Ram reading=0.12.			
17 –					_			
18 🗕					_			
	18.5-20.0		2-3-3	Same as above.				
19 🗕					-			
20 🗕					<u>_</u>			
21 –	21.0-21.5		4-8-8	Same as above.	— Mini Ram reading=0.18.			
22	22.0-23.5		4-5-5-5	Color change to brown (10YR 4/3).	More iron oxidation visible.			
22 <b>-</b>	ZZ.U-ZJ.J		4-0-0-0	Color change to brown (1011 4/3).	— Wore non oxidation visible.			
23 🗕					_			
	23.5-25.0		5-4-3	Back to very dark grayish brown (10YR 3/2).	Mini Ram reading=0.10.			
24 -					-			
25 -	25.0-26.5		5-4-4	Same as above.	Waste rock: massive sulfides, argillite quartz.			



BORING ID:

LCM 5C

Sheet 2 of 4

#### **SOIL BORING LOG**

CH2MHILI PROJECT: Lava Cap Mine LOCATION: Between tailings piles **ELEVATION:** NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA DRILLING METHOD AND EQUIPMENT USED: CME1050 Hollow Stem Auger WATER LEVELS: START: 10/27/1999 10:15:00 AM END: 10/27/2007 5:00:00 PM LOGGER: Meier DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 26. 27 27 5-28 5 4-5-6-6 WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM). Dark gray Mini Ram reading=0.95. (2.5Y 3/1), 60% fine to medium sand, 40% gravel, 10% clay, 28 subangular, moist. 28.5-30.0 9-8-9 WELL GRADED GRAVEL WITH SILT AND SAND (GW-GM). Brown Mini Ram reading=0.51. (10YR 4/3), 50% gravel (2 mm to 500 mm), 30% fine to very fine sand, 20% silt, subangular, slightly moist. 29 -9-12-14 WELL GRADED GRAVEL WITH SILT (GW-GM). Brown (10YR 4/3), 30 - 30.0-31.5 Gravel, chert and argillite. More felsic material. gravel, (2 mm to 500 mm), 30% fine to very fine sand, 20% 31 31.5-33.5 9-7-9-10 WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GC). Dark Water. Sample and sampler wet at 32 ft. bgs. brown (10YR 4/2), 60% gravel, 30% fine to coarse sand, 10% 32. clay, subangular, wet. 33.5-35.0 Metasedimentary rock (Gley 1 6/N). 34 POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM). Olive 35 - 35.0-36.5 12-14-15 Black waste rock, massive sulfides. brown (2.5Y 4/4), 50% gravel (100 to 500 mm), 30% fine to 36 very fine sand, 20% silt, subangular, wet. 36.5-38.5 8-7-6 Same as above. Driller says hardly any pressure necessary to drill. 37 -38 -38.5-40.0 Same as above. Gray (Gley 1 5/N), 50% gravel, 30% silt, 20% very fine May be tailings, washed downward to bedrock 5-6-9-10 sand, subangular, wet. Same as above. 50% gravel, 40% silt, 10% very fine sand. interface. Color not natural. 39 4-2-2 40 - 40.0-41.5 7-6-6 Same as above. Dark gray (Gley 1 4/N). Mini Ram reading=0.10. SILTY SAND (SM). Very dark gray (Gley 1 3/N), 60% fine to very fine 41. sand, 40% silt, wet, loose. 41.5-43.5 4-10-12-14 Same as above. 42 43 WELL GRADED SAND WITH GRAVEL AND SILT (SW-SM). Very dark 43.5-45.0 8-8-10 gray (Gley 1 3/N), 60% fine to coarse sand, 30% gravel (2 to 100 mm), 10% silt, subangular, wet. 45 - 45.0-46.0 7-30-6" SILTY SAND (SM). Very dark grayish brown (10YR 3/2). May be bedrock. 46 -47 - 47.0-70.0 Drilling very difficult, could not drive sampler, No recovery. no sample possible.



151319.FI.03

BORING ID:

LCM 5C

Sheet 3 of 4

## **SOIL BORING LOG**

PROJECT: Lava Cap Mine LOCATION: Between tailings piles ELEVATION: NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA DRILLING METHOD AND EQUIPMENT USED: CME1050 Hollow Stem Auger WATER LEVELS: START: 10/27/1999 10:15:00 AM END: 10/27/2007 5:00:00 PM LOGGER: Meier DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST MOISTURE CONTENT, RELATIVE DENSITY, RESULTS RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 48 -No sense in switching to air rotary drilling if 49 bedrock within a few feet. Raining hard. Mini Ram reading=0.08. 50 -51 -52 -53 -54 -55 -56 -57 -58 -59 -60 -61 -10 feet of sluff in borehole. 62 -Mini Ram reading=0.0. 63 -64 -More clay and silt. Evidence of woody material in 65 -66 -Mini Ram reading=0.0. 67 -68 -69 -70 -71 -72 - 72.0-72.5 70-6" SANDY LEAN CLAY WITH GRAVEL (CL). Gray (Gley 1 5/N), 40% Used sampler to remove sluff. Very hard material.



BORING ID:

LCM 5C

Sheet 4 of 4

PROJE	CT: Lav	a Cap	Mine		LOCATION: Between	tailings piles
ELEVA	TION:		NORT	HING:	EASTING: DRILLING CONTRACT	TOR: Water Development Corp., Woodland, CA
DRILLII	NG METHO	D AN	D EQUIPMI	ENT USED: C	ME1050 Hollow Stem Auger	
WATER	R LEVELS:				START: 10/27/1999 10:15:00 AM END: 10/27/2007 5:	:00:00 PM LOGGER: Meier
DEPTH	BGS (ft)			STANDARD	CORE DESCRIPTION:	COMMENTS:
	INTERVA	L (ft)		PENETRATION TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE,
		RECO	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY,	DRILLING FLUID LOSS,
		1	TYPE-#	6-6-6 (in)	OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	TESTS, AND INSTRUMENTATION.
			SS=Split Spoon ST=ShelbyTube	(N)	WIINERALOGT.	
			,		clay, 30% very fine to medium sand, 20% gravel, 10% silt,	
73 <b>–</b>					subangular, very moist.	
74 <b>–</b>						Very hard material.
/4-					_	very fraitu filateriai.
75 <b>–</b>					_	
76 <b>–</b>	76.0-76.5			60-6"	WELL GRADED GRAVEL IN CLAY (GW-GC). Gray (Gley 1 5/N), 50% — gravel (2 to 200 mm), 30% clay, 20% very fine sand, subangular, wet,	Refusal at max power. Weathered bedrock.
					dense.	
	76.5-76.5				Total depth=76.5 ft. bgs.	Borehole abandoned.
77 <b>–</b>					<del>-</del>	



25 - 25.0-26.5

2-2-3-5

PROJECT NUMBER

BORING ID:

LCM 5D

Sheet 1 of 2

#### SOIL BORING LOG

CH2	MHILL		SOIL BORING LOG						
	a Cap Mine	•	LOCATION: 17	5' NW of Log Dam					
LEVATION:	NORT	HING:	EASTING: DRILLING CON	TRACTOR: Water Development Corp., Woodland, CA					
RILLING METHO	D AND EQUIPME	ENT USED: (	CME 1050 Hollow Stem Auger						
/ATER LEVELS:			START: 10/28/1999 11:00:00 AM END: 10/28/1	1999 3:00:00 PM LOGGER: Meier					
EPTH BGS (ft)		STANDARD	CORE DESCRIPTION:	COMMENTS:					
INTERVA	RECOVERY	PENETRATION TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.					
	TYPE-# SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.						
0 - 0.0-0.0			Waste rock.	— MiniRam=0.0. Sample 5D-1 0.0 to0.25 ft. bgs.					
1.5-3.0		4-3-4	SILTY SAND (SM). Dark grayish brown (2.5Y 4/2), 80% fine to very fine sand, 20% silt, subrounded, moist, loose.	— High quartz content. —					
3 - 3.0-4.5		2-2-2	Same as above. Gray (2.5Y 5/1).	-					
4 <b>–</b> 4.5-6.5 5 <b>–</b>		2-1-2-2	SILT WITH CLAY (ML). Dark gray (Gley 1 4/1), 60% silt, 40% clay, wet, loose.	Tailings, saturated.					
6.5-8.0		1-1-1	FAT CLAY (CH). Gray (Gley1 5/1), 100% clay, wet, very soft, high plasticity.	Glue-like consistency.					
8 - 8.0-9.5		1-1-1	CLAY WITH SILT (CH). Gray (Gley1 5/1), 75% clay, 25% silt, wet, very soft, high plasticity.	MiniRam=0.0.					
9 <b>–</b> 9.5-11.5		1-1-1-2	FAT CLAY (CH). Gray (Gley1 5/1), 95% clay, 5% silt, wet, very soft, high plasticity.						
11 - 11.5-13.0		1-3-2	SILT WITH CLAY (CL). Dark gray (Gley1 4/1), 70% silt, 30% clay, wet, loose.	_					
13 - 13.0-14.5		2-1-1	FAT CLAY (CH). Same as above.	_					
14 <b>–</b> 14.5-16.5 15 <b>–</b>		1-1-1	SILT WITH CLAY (ML). Same as above.	3 blows-24".					
16 <b>–</b> 16.5-18.0		1-1	FAT CLAY (CH). Same as above.	MiniRam=0.0.					
18 - 18.0-19.5		3-3-3		2 blows-18".					
19 <b>–</b> 19.5-21.0			No recovery.	19.5 ft. bgs. driller added water. Tailings     sticking to augers.					
21 <b>–</b> 21.0-21.5 21.5-23.0 22 <b>–</b>		2-2-2-1	SILT WITH CLAY (ML). Same as above. FAT CLAY (CH). Same as above.						
23 – 23.0-24.5		3-3-4	SILTY SAND (SM). Very dark gray (Gley1 3/N), 60% fine to very fine sand, 40% silt, wet, loose.	_					
24 -		2-2-1	FAT CLAY (CH). Same as above.	-					

SILT WITH CLAY (ML). Very dark gray (Gley 1 3/N), 80% silt,



**BORING ID:** 

LCM 5D

Sheet 2 of 2

## **SOIL BORING LOG**

Lava Cap Mine LOCATION: PROJECT: 175' NW of Log Dam **ELEVATION:** NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA DRILLING METHOD AND EQUIPMENT USED: CME 1050 Hollow Stem Auger WATER LEVELS: START: 10/28/1999 11:00:00 AM END: 10/28/1999 3:00:00 PM LOGGER: Meier DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 20% clay, wet, loose. 26 -27 - 27.0-28.0 2-4-7 WELL GRADED SAND WITH CLAY AND GRAVEL (SW-SC). Dark Sample 5D1-3. Interface with underlying native brown (10YR 4/2), 60% fine to coarse sand, 20% gravel (2 to material, roots present. 28 -100 mm), 20% clay, subrounded, wet, soft. 29 -30 - 30.0-31.5 7-18-25 MiniRam=0.0 Same as above. With weathered sandstone. 31 -32.5-33.0 3-10-15 Same as above. 33 - 33.0-34.5 7-25-38 WELL GRADED SAND WITH GRAVEL AND SAND (SW-SC). Dark Sample 5D-4. yellowish brown (10YR 4/4), 50% fine to coarse sand, 35% gravel, 15% clay, wet, medium stiff. 34.5-36.0 20-44-53 WELL GRADED GRAVEL WITH SAND AND CLAY (GW-GC). 35 brown (10YR 5/6). 36 -36.5-37.5 15-50-5" POORLY GRADED GRAVEL WITH SAND AND CLAY (GP-GC). Yellowish brown (10YR 5/6) with black rock (10YR 2/1), 70% gravel (2 37 to 600 mm), 20% sand, fine to coarse, 10% clay, wet, very dense. 38 - 38.0-38.5 50-3" No recovery. 39. 39.5-41.0 28-20-18 No recovery. 40 -41. 42 Total depth=42 ft. bgs. 43 -



BORING ID:

LCM 5E

Sheet 1 of 2

CH2	2M	HILL		SOIL BURIN	G LUG		
	ava Cap			LOCATION: 150' N to NE of Log Dam			
ELEVATION:		NORT		EASTING: DRILLING CONTR	RACTOR: Water Development Corp., Woodland, CA		
DRILLING METH		D EQUIPM	ENT USED: (	CME 1050 Hollow Stem Auger			
WATER LEVELS	S:			START: 11/1/1999 9:00:00 AM END: 11/1/1999			
DEPTH BGS (ft)			STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:		
INTER			TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS.		
	RECC	VERY	RESULTS	MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.		
		TYPE-# SS=Split Spoon	6-6-6 (in)	MINERALOGY.			
0 –		ST=ShelbyTube	(N)				
0.25-0.25 1 <b>–</b> 2 <b>–</b> 2.0-3.5	1.5		1-1-1	WELL GRADED GRAVEL WITH SAND (GW). Very dark grayish brown (2.5Y 3/2), 60% gravel, 35% fine to coarse sand, 5% clay, subrounded, wet.  FAT CLAY (CH). Gray (Gley 1 5/N), 100% clay, wet, very	MiniRam reading=0.0. Sample: 5E1-1 0.25 ft. bgs.		
				soft, high plasticity.			
3 - 3.5-5.0	0		1-1	No recovery.			
5 - 5.0-6.5	1.5		1-1	Same as above.			
6.5-8.5	2		1-1-3-2	SILTY SAND (SM). Dark gray (Gley 1 4/N), very moist, soft, 60% fine to very fine sand, 40% silt, subrounded.	_		
8 <b>–</b> 8.5-10.0	1.5		1-1-2	Same as above.	_		
10 - 10.0-11.5	1.5		1-2-2	Same as above.	10 ft. bgs. Driller added water, tailings too sticky.		
11 <b>–</b> 11.5-12.0 12 <b>–</b> 12.0-13.5			1-1-1-1	No recovery. Same as above.	_		
13 <b>–</b> 13.5-15.0	1.5		1-1-1	CLAY WITH SILT (CH). Gray (Gley 1 5/N) 85% clay, 15% silt, wet, high plasticity, soft.	_		
15 - 15.0-16.5	1.5		1-1-1	FAT CLAY (CH). Gray (Gley 1 6/N), 100% clay, wet, very soft, high plasticity.	MiniRam reading 0.00. 15 to 16 ft. bgs: Sample 5E1-2, 5E1-5.		
16 <b>–</b> 16.5-18.5 17 <b>–</b>	2		1-1-1-2	Same as above.	_		
18 <b>–</b> 18.5-20.0	1.5		1-1-2	Same as above.	_		
20 - 20.0-21.5	1.5		1-2-3	CLAY WITH SILT (CH). Gray (Gley 1 5/N), 85% clay, 15% silt, wet, medium stiff, high plasticity.	Driller added more water.		
21 <b>–</b> 21.5-23.5 22 <b>–</b>	2		2-3-3-3	FAT CLAY (CH). Gray (Gley 6/N), 100% clay, wet, increasingly stiff with depth, high plasticity.			
23 <b>–</b> 23.5-25.0	1.5			CLAY WITH SILT (CH). Same as above.			



**BORING ID:** 

LCM 5E

Sheet 2 of 2

#### **SOIL BORING LOG**

LOCATION: PROJECT: Lava Cap Mine 150' N to NE of Log Dam **ELEVATION:** NORTHING: EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA DRILLING METHOD AND EQUIPMENT USED: CME 1050 Hollow Stem Auger WATER LEVELS: START: 11/1/1999 9:00:00 AM END: 11/1/1999 12:00:00 PM LOGGER: Meier DEPTH BGS (ft) STANDARD CORE DESCRIPTION: COMMENTS: PENETRATION INTERVAL (ft) SOIL NAME (USCS GROUP SYMBOL), COLOR, DEPTH OF CASING, DRILLING RATE, TEST RESULTS MOISTURE CONTENT, RELATIVE DENSITY, RECOVERY DRILLING FLUID LOSS OR CONSISTENCY, SOIL STRUCTURE, TESTS, AND INSTRUMENTATION. TYPE-# MINERALOGY. 6-6-6 (in) (N) 25 - 25.0-25.5 2-3-4 LEAN CLAY WITH SAND (CH). Dark yellowish brown (10YR 4/6), 70% clay, 30% fine to medium sand, subrounded, wet, medium stiff. 25 5-26 0 FAT CLAY (CH). Same as above. Sample: 5E1-3, 25.5 to 26.5 ft. bgs. 26. WELL GRADED GRAVEL WITH SAND AND CLAY (GW-GC). Very 26.5-28.5 2 3-5-6 MiniRam reading=0.0. grayish brown (2.5Y 2/2), 50% gravel (2 to 100 mm), 40% 27 very fine to medium sand, 10% clay, subangular, wet, soft. 9-9-6-6 Same as above. Color change to dark grayish brown (10YR 28 -29 - 29.0-30.0 13-23-25 Same as above. 30 -30.5-31.5 0.5 25-35-40 WELL GRADED GRAVEL WITH SAND AND CLAY (GW-GC). Dark Some large pieces (2" diameter), medasedimentary brown (2.5Y 4/2), 60% gravel, (2m to 500 mm), 30% fine to rock. coarse sand, 10% clay, subangular, wet. 32 - 32.0-32.5 0.7 11-32-2" Same as above. 32.5-33.5 33.5-34.0 No recovery. 34.0-35.0 3-3-6 Same as above. With 45% gravel, 45% fine to coarse sand, 10% clay, subrounded, wet, soft. 35 - 35.0-36.0 38-50-5" Same as above. With increasing content black igneous rock. 36 - 36.0-37.0 No recovery. 37 - 37.0-38.5 5-25-50 SANDY LEAN CLAY (CL). Dark yellowish brown (10YR 4/6), 65% MiniRam=0.0. Sample: 5E1-4, 37.5 to 38.5 ft. bgs. clay, 35% fine to very fine sand, subrounded, moist, soft. 38. 38 5-40 0 39. 40 - 40.0-41.5 5-7-8 Same as above 41. Total depth=42.0 ft. bgs. 42 43 -



17.5-18.5

19 - 19.0-20.0 1

20.5-21.5 1

23.5-25.0

1.5

20 -

21 -

22 -

23 -

24 -

3-3-4-4

6-6-5

4-8-6

4-6-6-3

3-2-2

Same as above. Moist.

Same as above. Moist.

Same as above. Moist.

to coarse sand, rounded.

subangular.

FAT CLAY WITH SAND (CH). Dark brown (10YR 3/3), wet, soft,

LEAN CLAY WITH SAND (CL). Strong brown (7.5YR 5/6), moist,

medium stiff, medium to high plasticity, 75% clay, 25% fine

high plasticity, 75% clay, 25% fine to coarse sand,

PROJECT NUMBER 151319.FI.03

BORING ID:

LCM 5H

Sheet 1 of 2

Waste rock: massive, argillaceous, sulfide

occasionally and some quartz veins. MiniRam=0.0.

21 ft. bgs. Sample 5H-2 1245. Waste rock softer,

Native material interface at 22.5 ft. bgs. Sample

Root zone, weathered sandstone, high iron content.

more fissils slatey material, black and dark

5H-3 1255.

bearing rock with iron oxide staining

PROJE	CT: La	va Ca	p Mine	•	LOCATION: 150 ft	W of Cyanide Bldg.		
ELEVATION: NORTHING:					EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA			
DRILLII	NG METH	IOD A	nd Equipm	ENT USED: (	CME 1050 Hollow Stem Auger			
WATER	RLEVELS	<b>:</b>			START: 11/2/1999 11:45:00 AM END: 11/2/1999	1:10:00 PM LOGGER: A. Evans		
DEPTH	BGS (ft)			STANDARD PENETRATION	CORE DESCRIPTION:	COMMENTS:		
	INTERV		OVERY	TEST RESULTS	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY,	DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS,		
		REC	TYPE-#	RESOLIS	OR CONSISTENCY, SOIL STRUCTURE,	TESTS, AND INSTRUMENTATION.		
			SS=Split Spoon ST=ShelbyTube	6-6-6 (in) (N)	MINERALOGY.			
0 –						MiniRam reading=0.0. Sample 5H-1 collected.		
1 –								
2 <b>–</b>	2.0-3.5	1.5		15-12-10	WELL GRADED GRAVEL WITH CLAY AND SAND (GW-GM). Very	Gravel=Waste rock. Massive argillaceous rock with		
					dark			
3 🗕					brown (10YR 2/2), dry, loose/soft, 40% gravel, (2 to 500 mm), 40% fine to coarse sand, 10% clay, subrounded.	sulfide minerals, mostly pyrite.		
					, ,			
4 🗕	4.0-5.0			5-9-10	Same as above.	_		
5 <b>–</b>						_		
6 <b>–</b>	6.0-6.5	1		4-3-2	Same as above. Damp.	Some quartz, some slatelike rock.		
7 <b>–</b>								
	7.5-8.5	0.5		1-3-4-3	Same as above. Damp.			
8 –						_		
9 🗕	9.0-10.0	1		3-3-4	Same as above. Moist.	_		
10 -								
	10.5-11.5	1		3-3-3	Same as above. Moist.	MiniRam=0.06		
11 -						_		
12 -								
40	12.5-13.5	1		3-3-3-3	Same as above. Moist.	Waste rock, softer more fissile slate-y material,		
13 🗕						very dark brown to black.		
14 🗕				_		_		
15 🗕	14.5-15.0	0.3		3-4-4	Same as above. Moist.			
10 =								
16 <b>–</b>		0.2		2-2-1	Same as above. Moist.	_		
17 🗕								



BORING ID:

LCM 5H

Sheet 2 of 2

PROJECT: Lava Cap Mine LOCATION: 150 ft. W of Cyanide Bldg.					
ELEVATION: NORTHING:					EASTING: DRILLING CONTRACTOR: Water Development Corp., Woodland, CA
DRILLING METHOD AND EQUIPMENT USED: CME 1050 Hollow Stem Auger					
WATER LEVELS: START: 11/2/1999 11:45:00 AM END: 11/2/1999 1:10:00 PM LOGGER: A. Evans					
DEPIH	DENETDATION			STANDARD PENETRATION	CORE DESCRIPTION: COMMENTS:
	IIVIERVAL (II)			TEST	SOIL NAME (USCS GROUP SYMBOL), COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE,  DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
	RECOVERY TYPE-#		RESULTS		
				6-6-6 (in)	MINERALOGY.
			SS=Split Spoon ST=ShelbyTube	(N)	
25 -	25.0-26.0	1.5		2-3-5	— 26 ft. bgs. Sample 5H-4 1310.
26 <b>–</b>					<u>_</u>
					Total depth=26.5 ft. bgs.
27 <b>–</b>					<u> </u>