GEOLOGY OF THE SODA LAKE GEOTHERMAL AREA

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ABSTRACT

The Soda Lake geothermal area is located in the Carson Desert, west-central Nevada. Hot springs activity has occurred in the Soda Lake area in the past, resulting in surface deposits which have motivated present geothermal exploration. The geothermal anomaly is in Quaternary clastic sediments which are as much as 4600 feet thick. The sediments consist of interbedded deltaic, lacustrine, and alluvial sediments.

Quaternary basaltic igneous activity has produced cinder cones, phreatic explosions that formed the maar occupied by Soda Lake, and possible dikes.

Opal deposition and soil alteration are restricted to a small area two miles north of Soda Lake. The location of hot springs activity and the surface thermal anomaly may be partially controlled by north-northeast-trending faults.

INTRODUCTION

The Soda Lake geothermal area is located in the Carson Desert, in western Churchill County, west-central Nevada (Figure 1).

Thermal waters were first discovered in the Carson Desert in 1903 when a well drilled at the site of an extinct hot spring northeast of Soda Lake hit hot water at a depth of 60 feet (Garside and Schilling, 1979, p. 9). The mixture of steam and water produced by the well was used to furnish steam to a bathhouse until sometime after 1950. The U. S. Bureau of Reclamation and the U. S. Geological Survey drilled several temperature gradient holes over the Soda Lake anomaly during 1972 and 1973. These holes were drilled to a depth of about 33 m and temperature and thermal gradients were measured. Olmsted and others (1975) reported the results of this program. Chevron Resources Company became interested in the area in the early 1970s and has drilled several exploration holes in the Soda Lake area (Hill and others, 1979). Chevron encountered temperatures in excess of 3650F in exploratory holes (Hill and others, 1979).

The present study was undertaken as part of the Industry Coupled Case Studies Program of the Department of Energy, Division of Geothermal Energy. The objectives of this study are to present the geologic setting of the KGRA and the subsurface information available from the Chevron well cuttings.

GEOLOGIC SETTING

The rocks exposed within the Carson Desert consist of Quaternary to Recent, poorly consolidated sediments and minor basaltic volcanic rocks.

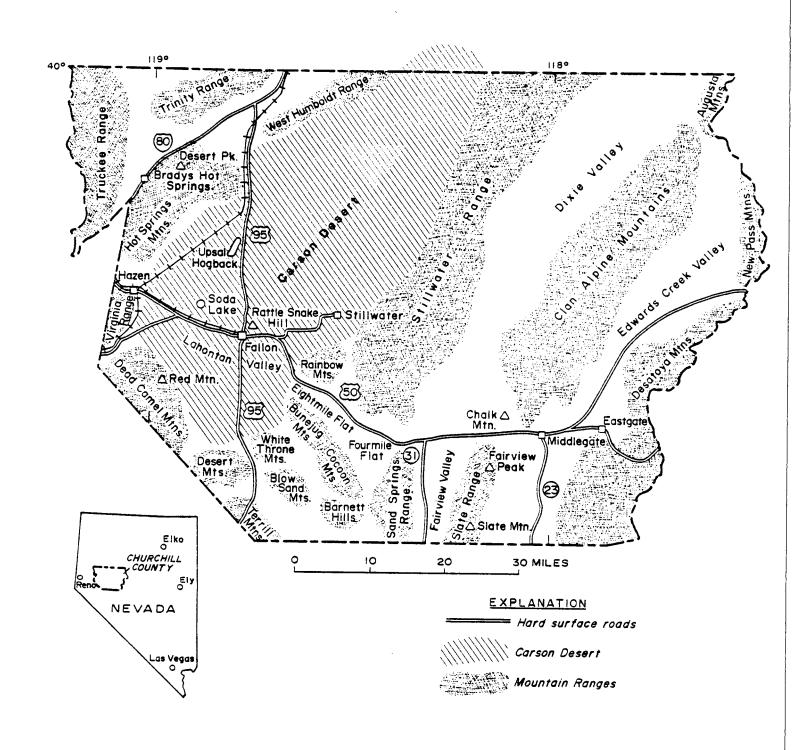


Figure 1. Index map of Churchill County, Nevada.

During the Quarternary the Carson Desert was filled with lacustrine sediments, alluvium, wind-blown sand, and in the southwest part by deltaic and fluvial deposits related to the Carson River. Morrison (1964) reported on the surficial deposits. The current study emphasizes the subsurface deposits within the basin.

Lake Lahontan and younger lake sediments cover most of the basin. Recent sand dunes, playa, and fluvial sediments have covered or reworked the lacustrine deposits in some areas. Morrison (1964) divided the Lake Lahontan deposits into several formations. The Sehoo and Wyemaha formation consists of lacustrine sand, silt and clay, and the Fallon formations consist of alluvial sand and silt (Figure 2). These formations could not be distinguished in drill cuttings from older Quaternary rocks penetrated in the drill holes.

Bouguer gravity studies (Wahl, 1965; Erwin and Berg, 1977) indicate that the depth of alluvial fill varies considerably across the Carson Desert. Wahl (1965) interpreted lows of 30 milligals amplitude within the Carson Sink (compared to gravity values along the western front of the Stillwater Range) to indicate about 10,000 feet of alluvium. A low of the same amplitude is located south of Fallon in the Carson Lake area. Between these two lows, gravity and geologic data indicate a bedrock ridge under thinner alluvial cover.

Soda Lake 44-5 and Carson Sink #1 (Figure 2), located in the southwest part of the Carson Desert, penetrated Quaternary sediments to a depth of 4600 feet.

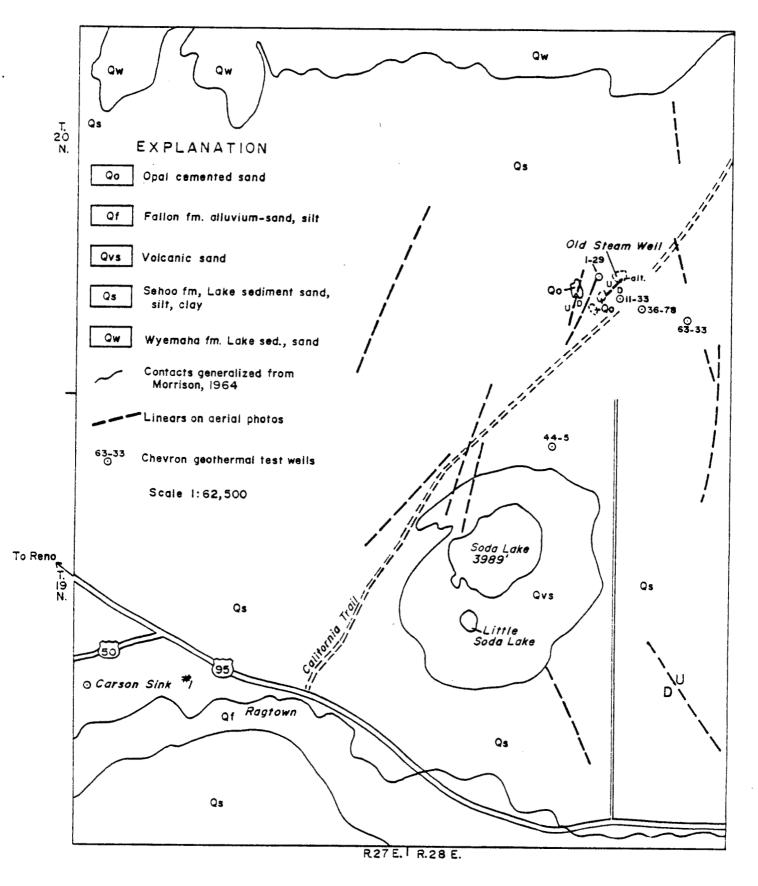


Figure 2. Geology of the Soda Lake area, Churchill Co., Nevada.

Subsurface information in the Soda Lake area comes from six holes, Chevron's Soda Lake 44-5, 1-29, 63-33, 11-33, 36-78 and the Carson Sink #1 uranium exploration hole (Figure 2). Logs for the Chevron holes are in the Appendix. The sediments in the drill holes are poorly sorted lithic and arkosic sand, silt, tuffaceous mudstone, clay, and gravel. The coarser sediments are probably deltaic and alluvial fan deposits of the Carson River, whereas silt, mudstone, and clay interbeds are probably lacustrine and playa sediments.

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IGNEOUS ACTIVITY

Igneous rocks in the Soda Lake area consist of basaltic cinder cones and dikes or flows.

Upsal Hogback, seven miles northeast of Soda Lake, is composed of overlapping basaltic tuff cones. Morrison (1964, p. 38) suggested that the cones were of Wyemaha age (30,000 to 45,000 years old). The basaltic tuff is olivine-rich, mostly sand to pebble-size, and was deposited subaerially (Morrison, 1964, p. 38).

Soda and Little Soda Lakes occupy craters formed by multiple phreatic explosions and volcanic eruptions. The crater rim consists of volcanic sand, lapilli, and lacustrine deposits (Morrison, 1964, p. 71). The last eruption was subaerial and post-dated the last lake rise to that level.

A sample of basalt from Rattle Snake Hill, north of Fallon (Figure 1), yielded a whole-rock potassium-argon age of 1.05 \pm 0.05 m.y. (Stan Evans, personal communication, 1979).

Subsurface basaltic rocks within the Quaternary alluvium were penetrated in Soda Lake 1-29, 11-33, and 63-33. The igneous rocks consist of non-porphyritic pyroxene basalt with trachytic texture. No evidence of vesicles or amygdaloids in the basalt was found in the cuttings, and the sediments in contact with the thick basalt intercept in Soda Lake 1-29 are altered above and below the basalt. This suggests that the basalt occurs as dikes rather than flows. The basalts in Soda Lake 63-33 and 11-33 are petrologically identical to the basalts in Soda Lake 1-29 and different from the basalt of the Pleistocene basalt flows penetrated in Soda Lake 44-5.

SUBSURFACE INFORMATION

Subsurface stratigraphic information in the Soda Lake area is based on interpretation of drill cuttings from six holes: Soda Lake 44-5, 1-29, 11-33, 56-33, and 36-78, drilled by Chevron (Earth Science Laboratory, 1979), and Carson Sink #1 (Horton, 1978). Lithology logs for Soda Lake 44-5, 1-29, 11-33, and 66-33 are included in the Appendix and a log summary is presented on Plate 1.

Soda Lake 44-5 and Carson Sink #1 each penetrated 4,600 feet of Quaternary sediments (Plate 1). Below these sediments is a sequence of thick, vesicular, olivine and augite basalt flows. These flows are interpreted to be the Pliocene to early Pleistocene Bunejug formation (Morrison, 1964, p. 14). The Carson Sink #1 hole penetrated over 3000 feet of basalt and andesite flows (Horton, 1978). Below the basalt flows is an altered, welded ash-flow tuff. Soda Lake 1-29 encountered a pyroxene gabbro below the sediments at a depth of 3940 feet.

Tuffs and tuffaceous sand and mudstone are predominant below a depth of 2400 feet. The basal eight hundred feet of Quaternary sediments are poorly sorted mudstone, sand, silt, and tuff. These are overlain by organic-rich, laminated mudstone which may represent the first lake event or a deltaic swamp. A channel gravel has replaced most of the mudstone unit in Soda Lake 44-5 (Plate 1). Above the organic-rich mudstone is 250 feet of sand and mudstone, which may also be lacustrine, overlain by 230 feet of mudstone, siltstone, and shale with organic carbon. In the next 2000 feet, between a depth of 3000 feet and 1000 feet, individual beds cannot be correlated. In general, sand and gravel predominate in the Carson Sink #1 hole and finer-grained sand to clay are present in the holes north of Soda Lake.

The basalt intercepts between 1300 and 2000 feet in Soda Lake 1-29, 11-33, and 63-33 are petrographically identical. These basalts are thought to be dikes and were discussed in the Igneous Activity section of this report. The basaltic crystal ash at 1520 feet in Soda Lake 44-5 has tabular plagioclase phenocryst and is distinct from basalt dikes.

A unit consisting of shale, mudstone, and fine sand occurs between a depth of 700 and 1000 feet in the four drill holes in which cuttings are available for this interval (Plate 1). These rocks probably formed in a deep lake environment. The Lake Lahontan formations probably account for only the upper 400 feet of sediments (Morrison, 1964).

SURFACE ALTERATION AND SINTER DEPOSITS

Hot springs deposits and alteration are restricted to several small areas

two miles north of Soda Lake (Figure 2). Here the soil has been altered to kaolinite, iron oxides, and hydroxides (Olmsted and others, 1975, p. 103). The alteration extends about two hundred feet to the section line road west of an abandoned steam well and approximately one hundred feet to the east where it is covered by a sand dune. Shallow hand-dug pits have exposed brightly colored alteration a few inches below the surface in the low area around the steam well.

The hot springs deposits consist of small areas of opal-cemented sand in the SE 1/4 of section 29 and the NE 1/4 of section 32 (Figure 2). Opal replaced grass stems are abundant locally and opallized brush stems are also present, while opal-filled fractures were found at one location. The opal-cemented sand is deeply eroded and sand dunes have partly covered some outcrops. Alteration coloration was not evident in the sinter-cemented outcrops.

STRUCTURE

The dominant fault trend around the Carson Desert is northeast. Linears on aerial photographs of the Soda Lake area have a north-northeast trend (Figure 2), and several short linears were found near Soda Lake 1-29 and 11-33. One linear extends from opal-cemented sand to the altered area of the old steam well (Figure 2). This photo linear coincides with the thermal plume and a NE-SW-trending fault, defined from seismic reflection (Hill and others, 1979). The surface expression indicates relative movement down to the SE (Figure 2). Hill and others (1979) concluded that the fault dipped SE and formed the boundary of a NE-trending graben. Offset on the photo linears

appears to be a few feet at most. Some evidence for faulting was found in the cuttings in the form of gouge and slickenside surfaces on chips; locations of the possible fault intercepts are shown on Plate 1. There are no marker beds which could be used to demonstrate offset between holes. The sedimentary facies correlated between holes could be offset a few tens of feet.

HEAT FLOW AND TEMPERATURE

Olmsted and others (1975, p. 115) estimated a conductive heat discharge of 3.2 x 10^6 cal/sec as a minimum from the Soda Lake thermal anomaly enclosed by the 200C isotherm at a depth of 30 m. Chemical analyses were made of several water samples from two intervals in Chevron's Soda Lake 1-29 test hole (Earth Science Laboratory, 1979). Calculated reservoir temperatures using the silica geothermometer averaged 183° C for both test intervals with a range of 176° to 192° C for 6 samples. The measured temperature in the lower interval, 1008-1531 feet deep, averaged 174° C. Hill and others (1979) estimated a reservoir temperature in excess of 400° F (190° C).

CONCLUSIONS

The Soda Lake thermal anomaly is located in thick Quaternary clastic sediments. In general the sediments are coarser to the southwest and finer to the north and northeast. The gravels found in Soda Lake 44-5 and Carson Sink #1 are probably channel deposits while the few clean sand zones may be beach deposits. There is a greater similarity between Carson Sink #1 and Soda Lake 44-5, which are five miles apart, than between Soda Lake 44-5 and Soda Lake 1-29, which are only 2 miles apart. This is probably because Carson Sink #1

and Soda Lake 44-5 are both in the delta-alluvial fan facies, but Soda Lake 1-29, 11-33, and 63-33 are in the lake-playa facies of deposition. The area of deltaic or lacustrine deposition shifted at times due to rise and fall of the basin lake, but the delta-alluvial fan generally extended from the southwest to just north of Soda Lake.

Soda Lake 1-29, 63-33, and 11-33 are in finer sediments than Soda Lake 44-5 and Carson Sink #1 to the south. Most of the cuttings from Soda Lake 1-29 are of silty and sandy mudstone derived from tuffaceous material. All of the tuffs intercepted have undergone fluvial transport.

The Quaternary sediments are 4600 feet thick and overlay basalt flow under Soda Lake and to the west. Two miles north of Soda Lake gabbro is overlain by the sediments.

ACKNOWLEDGEMENTS

I wish to credit Ed C. Bingler for the lithologic log of the Carson Sink #1 Borehole which was published in the Bendix report (Horton, 1978) and was used in this report. Helpful consultation on cuttings interpretation was provided by Jeff Hulen. Valuable guidance in the preparation of this report was given by Joe Moore, and the critical reviews of the manuscript by Joe Moore and Howard Ross are appreciated. The drafting was done by Dawnetta Bolaris and Connie Pixton and typing by Lucy Stout.

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APPENDIX

LITHOLOGIC LOGS

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CHEVRON RESOURCES COMPANY WELLS

Soda Lake 44-5 Soda Lake 1-29 Soda Lake 11-33 Soda Lake 63-33

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100-		Ш	₩	H	Н	H	Н	+	Н	+	#	Н	Н	Ш	₩		Н	Щ	₩	₩	F		Ť	+		Dobbles - L
-	1	##	Н	Ħ	Η.	۲	Н	Н	Н	t	+	Н	₩	Н	₩	H	Н	Н	₩	₩	ŀ	0.		╌		Pebbles are volcanic rock, quartzite, and siltstone
•			Ħ	Ħ	Ħ	T	11	Ħ	П	t	T	Ħ	₩	Ш	₩	t	Ш	Ш	₩	Ħ	١	o i	Ö	1		und saisione.
-			\coprod	I	\coprod					Τ	Ι		$\ $		\blacksquare	I			$\ $].	-	٠			
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_		Ш	Н	#	Н	Ц	Щ	H	4	H	4	Щ	Щ	Щ	Щ	ļ	Щ	Щ	Щ	Щ	l	-ر		ŀ		
-		$\parallel \parallel \parallel$	₩	╫	#	Н	#	H	+	H	+	#	#	₩	₩	#	Ш	₩	₩	#	Į.		-	+		
-				#	H	Н	₩	H	╢	H	+	#	₩	₩	₩	H	Ш	₩	#	Ш	ľ	o.	٠	1		
- -200		1111	1	1	Ш	H	1	Ħ	$\dagger \dagger$	Ħ	t	₩	Ш	₩	Ш	t	₩	₩	#	Ħ	1		٠٠	\vdash		
			\prod	I	Ш			I	T	T	Ι	Ī		Ш	Ш	I	III	Ш		li	ŀ		<u>ه</u> د	T		· · · · · · · · · · · · · · · · · · ·
	Ш	Ш	Щ	Ц	\Box	П	Щ	\prod	\blacksquare	П	$ lab{1}$			$\ $							Ė		Ξ	Έ		
-	$\parallel \parallel \parallel$	Ш	#	4	Ш	Ц	Щ	Щ	4	Ц	Ц	Щ	Щ	Щ	Ш	Щ	Щ	Щ	Щ	Щ	ŀ	٠.7		Ŀ		
-	+++		₩	#	Н	+	#	╢	#	H	Н	Ш	Щ	Щ	Щ	Н	Щ	Щ	Щ	Щ	ŀ	o	∵•	<u>'</u> -		Thin section (1555')
00-	Ш	+++	H	H	Н	H	₩	₩	₩	H	₩	₩	Ш	Н	₩	Н	Ж	Н	Н	III m	ŀ	بن	2	╀		Basalt lapilli, alt. vitric-basaltic
-		###	+	H	++	H	Ħ	H	Ħ	H	Н	₩	Н	Н		ii	₩	₩	Ж	ï	ŀ	≐	=	╊		tuff, lava flow fragments, mud- stone B/or tuffaceous siltstone.
1		Ш	#	T		Ħ	Ħ	Ħ	Ħ	Ħ	H	Ħ	Ш	Н	Ш	ij	₩	Ш	Ш	ï	ľ	_	• • •	┢	i	Sione Wyor Turraceous Siristone.
1			\coprod	T	П	T	\prod	Ħ	Ħ	Ħ	П	I	Ш	Ш	Ш	I	Ш		iii	Ï	ŀ			r		
100			П		Ш	П	П	${ m I\hspace{1em}I}$	П	\prod	П	M	III	W			Ш	III	111	III	Ŀ		<u> </u>	I		Epidote-could be detrital
4	Ш	Щ	Щ		Ц	Ц	Щ	Ц	Ц	Ц	Ц	Ш	Ш	Ш	Щ	Ш	Щ	Ш	Ш	II	Ŀ			L		
- 1			#	Н	Ш	₩	#	H	$\!$	H	Н	Щ	Щ	Щ	Щ	Н	Щ	Ш	Щ		:	0	•	H		Ash, basaltic, with phenocryst of euh.
- 1		╫	╫		Н	H	$^{+}$	H	₩	H	Н	₩	Н		₩	H	₩	Н	Н	i	!	2	•	╌		labradorite & amygdules. Also detrital grains of quartz, quartzite,
1		₩	#	Ī	Ш	Ħ	Ħ	Ħ	H	H	H	₩	₩	iii	₩	H	Н	Н	1	Ü	:	وي نو	4	┢		& andesite - basalt lavas, Sand
500-		††† †	$\dagger \dagger$	i.	Ш	Ħ		Ħ	Ħ	H	H	Ħ	Ħ	ï	₩	Ħ	Ħ	П	III		Ė	Ĭ		1		increases below 1580' epidote
]		Ш	Π	П	\blacksquare	Π	\prod	I	I	Ħ		II	Ш	iii	III	III		Ш	Ш		'n	÷	.			may be detrital.
4	Щ	Ш	\prod	П	Щ	Ц	Щ	Ц	\parallel	Ц	Ц				Ш	Ш	Ш		$\ $		ш	70	=	L		Sand-very coarse & aranules, & clay
4	 	HH	₩	Щ	Щ	H	Щ,	#	#	4	μ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Ш	Ė	Ŧ	÷	1		zones tuffaceous, most grains are
00	+++	₩	#	Ш	4	H	#	#	#	H	H	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	٤	÷	፰	L		vol., some quartz grains are alassy
-	 	 	#	H	+	₩	+	₩	#	H	H	H	₩	#	₩	₩	Ш	₩	₩	H	2			-		Tuffaceous clay dominant over sand
	<u> </u>	<u> </u>	\dagger	Ħ	#	Ħ	Ш	Ħ	Ħ	H	Ħ	Ħ	Ш	₩	#	Ħ	Ш	₩	Ħ	Ħ		<u>۔</u> د	ک	┢		(well setters log calls this clay, the clay fraction could be washed
1		\coprod	\prod	Ι	$ lap{1}$	Π					\prod							I	I		-		4			out)
00	Щ	Ш	Щ	\prod	\prod	Ц	Щ	П	Д	Д	П	Ш	Ш	$\ $	Щ	\parallel	Щ	Щ	$\ $		2	<u>. </u>	£	Г		Poorly sorted &/or interbedded tuffa-
4	Щ	₩	Щ	4	#	$\!$	Щ	μ	Щ	μ	+	m	ш	₩	Щ	#	##	Щ	Щ	Ш		Ξ.		L		ceous clay or mud, sand, gravel,
4	 	 	Ш	#	#	₩	Щ	4	Ш	#	H									м		:	<u>ବ</u> .	⊩		
1	 	₩	₩	₩	++	₩	Н	H	+	H	H	Ш	₩	₩		H	₩	₩	₩	H	٥		=	⊢		
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00	Ш	<u> </u>		j	Ħ	Ħ	Ħ	ľ	Ħ	Ħ	Ħ	Ħ	Ш	₩	Ш	Ħ	Ħ	Ħ	Ħ	Ħ	:			t		
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1	Щ	Ш	Ш	#	#	1	Щ	\downarrow	Ш	Ц	Ц	Щ	Ш	Щ	Ш	Щ	Щ	Щ	Щ	Ш	:	Σ.	1:1:			
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+	 	₩	Н	#	₩	H	Н	Н	Н	۰	+	Ш	Ш	Ш	Ш	Ш	#	Ш	#	н				} —		

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000		Щ	П	Щ	I	T	I	ľ	Ш	I		Ш		Щ	Ш		Ш		331		Mudstone & sand, tuffaceous
-	Ш	Щ	\parallel	Щ	#	Щ	Щ	4	Щ	Щ		Щ	Ш	Щ	Щ	Щ	Щ				
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100-	!	†	Ħ	₩	Ħ	Н	Ħ	Ħ	₩	#	Ħ	#	Ш	H	Ж	₩	₩	۳	•	- 2172	Sand is dominant with minor
-			ľ	Ш	1		#	ľ	 	#				Ħ	Ш	Ħ	Ш		<u> </u>		mudstone.
-	Ш	\prod	\prod	Ш	\prod			\prod	Ш	\prod											
_	Ш	Ш	\parallel	Щ	1	Щ	\prod	\prod	Щ	Щ	Щ	Щ	Щ	Ш	Щ	Щ	Щ	II:	<u>: </u>		
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-	₩	HH	H	₩	#	Н	#	₩	₩	H	#	#	Ш	₩	₩	₩	₩	#:	- - 4 6	- 2236	Tuffaaaanalan masa shiri dad
-	₩	† †††	₩		#	H	#	H	╫	#	₩	₩		₩	Ш	#	₩	#:		1 == -0	Tuffaceousclay more abundant Fossil claim shells
		 	Ħ		#		#	Ħ		#	۳	Ħ		Ш		Ш	₩	۴	-		Gravel, pebbles-granules, Pebbles
300-	Ш	Ш	I	Ш	\prod		Π	\prod	Ш	\prod								١.	00		are quartzite, vol. intrusive, tuff.
-	Щ	Щ	\prod	Щ	\prod	Щ	\prod	\prod	Щ	Щ	Щ	Щ	Щ	\mathbf{I}	Ш	Ш	Щ		۰.۰		fairly clean & sorted.
_	₩	HH	#	Щ	#	Щ	#	μ	Щ	44	Щ	Щ	Щ	Щ	Щ	Щ	Щ	ŀ	Α Δ .	 	7.7
-	₩	╂┼┼	₩	₩	#	₩	#	₩	H	#	#	#	Ш	Н		Ж	₩	ŀ	A.	2237-	Tuff or ash-basaltic with sand or
-	₩	[₩	₩	H	H	H	╫	₩	H	#	₩	₩	₩	₩	Ж	₩	1	4.4	2473	Organic carbon grains - wood.
400-		† †††	Ħ		H	1	#	t		₩		₩	Ш	Ħ	Ш	H	Ш	۲	. خبت		Of Game Car Don Groins - Wood.
_		Ш	\prod	Ш	\blacksquare				Ш	\coprod								1	<u>. ه</u> .		
-	\coprod	Ш	\prod	Щ	Щ		\prod	\prod	Ш	Щ			Ш	I	Ш		\blacksquare	ŀ	٠.		
-		$\parallel \parallel$	#	Щ	44	1	Щ	\parallel	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Ŀ	<u>cià:</u>	2473	
500-		₩	₩	Н	#	+	₩	#	₩	₩	Щ	Щ	₩	4	Щ	Щ	₩	¥	4-	 	Tuffaceous clay-rhyolitic?
-		╫╫	+	₩	₩	H	#	+	₩	₩		₩	₩	₩	₩	Ш	₩	Ŀ	4 4 4 4	 	
-		!	\dagger	H	$\dagger \dagger \dagger$	1	#	Ħ	Η	$\dagger \dagger \dagger$	₩	Ш	₩	H	₩	Ш	₩	Ŀ		 	Sand, medium to coarse, 1/2 quartz-
		Ш	\prod	Ш	Ш		\prod	T	Ш	Ш			Ші						ప్ప		1/2 vol., well sorted
600 -		Ш	\prod	Ш	\prod	Ш	\prod	\mathbb{I}	Ш	Ш			Ш		Ш			ľ	. 0 0		Gravel, pebbles of vol., sand matrix.
	$\parallel \parallel$	₩	\parallel	Щ	Щ	Щ	Щ	Щ	Щ	Ш	Щ	Щ	Щ	Щ	Щ	Щ	Щ	ŀ			
4	₩	₩	#	#	#	1	Щ	Ш	Щ	Ш	Щ	Ш	₩	4	₩	Щ	Ш	1	0	}	Sand, medium to fine. Some pebbles
4	₩	╂┼┼┼	#	₩	Н	#	#	Н	₩	₩	Ш	₩	₩	₩	₩	₩	Ш	 :	ο. Δ Δ Δ.	 	& tuff, quartz rich & vol. grains.
	##	!	Ħ		Ħ	H	Ħ	H	Ш	Ш	##	Ħ	₩	H	₩	₩	Ш		A	 	
700-	1	1	Ħ	Ш	Ш	#	$\dagger \dagger$	H	$\parallel \parallel$	Ш	Ш	₩	₩	Ħ	₩	₩	Ш	Ė	•		
1	Щ	Ш	П	Щ	Щ	П	Ш	Ш	Щ	Щ	Щ	Щ	Ш	Ш	Щ	Щ	Ш	1	0.0		Sand, coarse to medium, some
4	₩	₩	#	4	Ш	#	Щ	Ш	4	₩	Щ	Щ	Щ	Щ	Щ	Щ	Щ	۴			pebbles, carbon-lignite.
4	₩	₩₩	₩	4	₩	#	Щ	Щ	#	₩	₩	₩	Щ	#	Щ	#	Щ	1	4		Sand with interbedded & mixed
900-	₩	₩	H	₩	Н	H	H	Н	+	₩	₩	₩	Ш	#	₩	₩	Ш	۲) A		tuffaceous clay, pebbles, carbon
1	H	₩	H	+	╫	#	H	H	#	₩	₩	₩		۳	Ш	₩	₩	п.			present as grains.
1		[[]]	Ħ	#	Ш	Ħ	Ħ	Ħ	#	\prod	₩	#		Ħ	Ш			ľ	O		
]		Ш	Ш	\prod	Ш	П		Ш	$ lap{1}$	Ш	Ш					Ш		Ŀ			
900-	Щ	Ш	Щ	4	Щ	#	Щ	Щ	4	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Ľ	Ö		
	₩	₩	Ш	#	Щ	#	Щ	Щ	#	Ш	₩	Щ	Ш	Щ	Щ	Щ	Щ	Ŀ	ا: ن		
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1	+	╫╫	H	╫	₩	H	Н	Н	╫	₩	₩	₩	Ш	₩	H	₩	₩	ŀ	40		Zone-20% carbon, more clay
<u></u> 1			Ħ	#	₩	#	H	Ħ	#		₩	#		Ħ		Ħ	₩	Ç	45.0		2970 - 2985
				$ lab{1}$	Ш	\mathbf{I}			\coprod	Ш	Ш							۲			
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000	Ш	Ш	Щ	I		Щ	Í	Í	ĬÍ	li				İ	Ш			Ē	-		Sand with clay (tuffaceous) 8
_	Щ	Ш	Щ	Ц	Щ	Щ	\blacksquare	Щ	Ц	Щ		Щ	Ш		Ш	Ш		ě	- ≛		carbon continued
-	$\blacksquare \Box$	Ш	Щ	Ш	Щ	Щ	4	Ш	#	4	Ш	Щ	Щ	Щ	Ш	Щ	Щ	10			
-	₩		₩	Ш	#	Ш	#	Ш	#	#	Ш	Щ	Щ	Щ	Щ	Ш	Щ	20		L	No sample
100-		Ш	₩	Н	Н	Н	₩	Н	₩	H	Ж	Ж	₩	н	Ж	Ш	Ж	-	^	 	Mudatana (1. 46 man 1. 20 ml 1
-		 	₩	Ш	H	₩	╫	H	Ħ	Ħ	***	₩	Ш	Н	₩	₩	+	<u>.</u>	- <u>∡</u>		Mudstone (tuffaceous) & shale, minor quartz sand.
-			•	П		Ħ	Ħ	Ш	Ħ	Ħ		#	#	Ħ	Ш	#	Ш	4-	=		mmor quartz sana.
_			П	Ш		Ш	Ħ	Ш	Ħ	T	Ш	Ш	Ш	Ħ	Ш	Ш	iii	ټ.	-3	3177 -	10-20% lignite
200-	\coprod	\coprod	Ш	П		\prod	Π		Π	\coprod					Ш			į	4	3205	
		Щ	Щ	Ш	Ш	Щ	Ц	Ш	Ц	Щ		Ш	Щ	Ш	Ш		Ш	1		3205-	10% lianite
-		Щ	Щ	Ш	Щ,	Щ	4	Щ	₩	#	Щ	Щ	Ш	Щ	Щ	Ш	Ш	<u>4-</u>	<u>-</u>	3236	
-	##	Ш	₩	Н	#	Н	Н	-	₩	#	Щ	Ш	Ш	Щ	Щ	Ш	Щ	<u> </u>			
-	₩	+++	₩	╫	₩	₩	#	Ш	₩	H	##	Щ		₩	#	Ш	Щ		- 4	 	
3 00	 	+++	₩	+	+	₩	Н	H	H	H	#	\mathbb{H}	ж	₩	₩	-	₩	= ;	100	Ay vein	
-		+++	₩	Н	##	H	H	Н	Ħ	Ħ	#	Ш		Ш	ж		ш	<u> </u>	=	Ap vein	Sand 2/3, medium to coarse,
7		Ш	Ħ	Ħ	$\dagger \dagger$	H	Н	1	Ħ	#	#	Ш		Ш	Ш	Ш		-	-		quartz rich, Mudstone -
			III	П	П	Ш	П	П	П	П		Ш		Ш		III	I	$\pm i$	Œ		clay 1/3, tuffaceous.
400			\coprod	П	\prod		П	Ш	\coprod	П		Ш			Ш		III	1	1,1		
_		\exists	Щ	Ш	Ш	\coprod	Ш	Щ	Ц	Ш				Ш	Ш	Ш			[:]		
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4		Щ	Щ	Ш	Щ	Щ	Ш	Щ	Н	Щ	Ш	Щ	Щ	Щ	Щ	Ш	Щ	=	=		
4			₩	Н	Щ	Щ	Ш	#	#	Ш	Щ	Ш	Щ	Щ	Щ	Щ	Щ	3	<u>-</u>		Tuffaceous mudstone & shale with
500-	++	+++	₩	Н	Н	#	Н	H	₩	Н			Н.	Ш	Ш	Ш	Ш	. <u></u>	=		minor sand.
-			H	H	₩	₩	Н	+	₩	Н		Ш	₩	Ш	Ш	₩	Н		Ξ.		
1		++	$\parallel \parallel$	+	##	++	Н	+	H	Н		₩	₩	Ш	₩	₩	Ш	죠_	_		
]				Ħ	Ш		П	11	Ħ	Ш		Ш		Ш	Ш	₩	Ш	<u>~</u>	3		
600			Π	Т	\prod		П		П	П		Ш		Ш	Ш	Ш	Ш	0.0	0		Gravel, aranule to pepbles - pebbles
			\mathbb{I}					\prod	Π						Ш	\mathbb{I}		0	0		of lava, tuff, obsidian & quartzite.
- 1	Ш	Ш	Щ	Ш	Ш			\prod	Ш			Ш		${ m III}$	Ш	\mathbb{I}		O	0		
- 4	Ш	Щ	Щ	Щ	Щ	Щ	Щ	4	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Ш		ം		
- 4		НН	#	1	Щ	Ш	Ш	#	Н	Ш	Щ	Щ	Щ	Ж	Ш	Щ	Щ	000	2		
200-	Ш	+ + +	#	₩	#	Щ	Щ	#	Щ	Щ	Щ	##	Щ	#	Щ	Щ	Щ	_ C			
+	-	+++	₩	₩	╫	H	H	₩	Н	Н	₩	₩	₩	₩	₩	₩	₩,	စ္	0		Tuffaceous mudstone & clay, minor
1		$\dagger \dagger \dagger$	#	1			Ħ	11	Н	Н	₩	Ħ	Ш	#	₩	Ш	H	Ξ	-		sand.
1		Ш	\prod	T	Ш	Ш	T	\prod	Ш	П				Ħ			Ħ		- 1		Sand, medium to coarse, quartz &
00	Ш	Ш	\blacksquare	П	Ш		I	\prod	Ш		Ш							<u>:-</u> ુ	\vdots		lithic minor mudstone & pebbles
	Ш	Ш	Ш	Щ	Ш	Ш	\prod	Ш	Ш	Ш	Ш	Ш		$\ $	Ш	Ш		o.			
4	Щ	Щ	Щ	1	Щ	Щ	\prod	Щ	Щ	Щ	Ш	Ш		Щ	Щ	Ш	Ш		اخِ'		
4	Ш	Ш	Щ	#	Щ	Щ	#	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ.	Щ	Щ		-,-		Claystone zone
4	Ш	₩	Ш	#	₩	₩	#	₩	Щ	4	₩	Щ	Щ	#	#	Ш	#	<u>-</u> :	-1		Antonio
200-	++	₩	#	₩	₩	₩	₩	₩	₩	H	₩	Щ	Ш	Щ	Ж	Ш	#	عب	H		Arkosic zone
1	 	╫	HH	₩	₩	₩	₩	+	Н	╫	₩	Ш	Ш	Н	₩	Ш	H	٠.	٠:I		
1		††† !	Ш	#	₩	₩	H	₩	H	₩	Ш	₩	+	₩	₩	Ш	#	_ :	<u>-</u> -		
1	111	††† 1	Ш	#		#	#	Ħ	H	#	Ш	Ш	Ш	Ш	Ш	Ш	Ħ		[-		
<u>~1</u>		\prod		T	Ш	Ш	Ħ	Ш	m	#	†	Ш		Ш	Ш	Ш	Ħ				
$^{\infty}$	Ш	Ш	\blacksquare	I			Ï	\prod]		Ш					Ħ		Ť		
1	Ш	Ш	Ш	Π	Ш	\prod	Π	Ш		\prod						\prod			Ì		
	Ш	Ш	Ш		Ш	Ш	Π	[.]	Ш	\coprod		Π		Ш	Ш	Ш			[

DRILL HOLE Soda Lake 44-5
LOCATION

					Ç	PAI	24	170	~	Z	2	75	_					Pg. 5	
ž			_	Z	70	W	í	1	1	Γ			Γ				1/2	77 78468 4 miles 2 miles	DESCRIPTIONS
QEPTA	Sun	00000		101	£0/00/0	Mentalin.	97	2110	Speum									# strang	
4000	Ш	Ш	П	П	П	Ш	П	П	Щ	Ш		Ш	Ш	Ш	Ш	1	o.		Arkose & tuffaceous mudstone.
-		Ш	Н	#	Ш	! !!!	Ш	Ш	##	Щ	Щ	Щ	Ш	Щ	Щ	#			few pebbles, poorly sorted.
-		##	Н	╫	Н		₩	Н	₩	Ш	Ш	##	Ш	Щ	Щ	#		·}	
-		HH	Н	₩	₩	╫	₩	₩	╫	₩	₩		Н	₩		₩.			
4100-		Ш	Н	#	Ш	***	Ħ	Ш	##	Ш	₩							4/10 -	
				$ lap{1}$			П		Ш		Ш				Ш	1		4/60	Sand, medium, arkosic & lithic.
	Ш	Ш	Ш	$ lap{I}$	\coprod	Ш	Π	\prod	${ m III}$						Ш				
_	Ш	Щ	Ш	Щ	Щ	Ш	Щ	Щ	Щ	Ш	Ш	Ш	Ш	Ш	Ш		— - -		Arkose, & mudstone or clay inter-
4200-	Ш	##	Ш	4	4		Ш	Щ	Ш	Щ	Щ	Ш	Ш	Щ	Ш	Ų.	-:=		bedded, gray to very light gray
. 4		+++	Н	╫	++	+++	Н	Н	₩	₩	₩	Ш	Щ	Ш	Ш	∦-	ΞΞ	 	mudstone, tuffaceous grades to
-	##	##	H	╫	++	₩	₩	╫	₩	₩	₩	Ш	Ш	₩	₩	₩.	<u></u> -	 	mudstone at 4260'.
-			H	#	\parallel	!	╫	1	₩	₩	₩	$\parallel \parallel$	₩	##	#	#	==	1	Mudstone, tuffaceous, medium gray
4300-			Ш	#		Ш	Ħ		∭		∭	$\parallel \parallel$	₩	Ш	₩	-			& light olive gray interbedded. The
,,,,				$ lab{\Pi}$	\coprod		\prod	\blacksquare	\prod					Ш					medium gray has light & dark gray
	Ш	Щ	Щ	Щ	Ш		Ш	$ lap{1}$	Ш		Ш] -	-= -		laming O. I mm thick. Araillaceous
4	Ш	Щ	Щ	Щ	4	Щ	Щ	Щ	Ш	Щ	Ш	Ш	Щ	Щ	Щ	13			siltstone in minor amounts is also
-	Ш	Ш	Ш	4	Щ	Ш	Ш	Щ	111	Щ	Щ		Щ	Щ	Щ	IJ <u>-</u>	=		present. Mudstone contains calcite.
1400			Ш	₩	+	₩	₩	+	₩	₩	Щ	Щ.	#	Ш	₩	∦ =		Fault ?	
4		Ш	Н	Н	H	₩	₩	+4		₩	Ш		₩	₩	₩	∦-	- <u>-</u> -	 	
1	. +++	+++	₩	₩	+	╫	₩	+	•	₩	Ш		₩	₩	₩	1	=	 	
1	Ш	$\dagger\dagger\dagger$	Ш	Ш	#	***	₩	н	H	₩	Ш	Ш	Ш	##	111	1 -	<u> </u>	 	
1990		111	Ħ	Ш	11	Ш	1	1	П	Ħ					Ш	1	=_		
			Π	Ш]].		\prod			${ m III}$			Ш				Δ		Coarse sand, tuff & mudstone.
]	Ш	Ш		Ш	\prod	\Box		U	\coprod	Ш					Ш	12		py veinlet	(thin sec. 4534)
4	Ш	Ш	Н	Щ	Щ	Щ		Щ		Щ	Ш	Ш	Щ	Щ	Ш	1:	4. 4		grades into pure tuff, basalt
4		###	H	₩	₩	Ш	4	Н	Щ	Щ	Щ	Ш	Щ.	Щ			٥٥	 	flow frag. & tuff, calcite amydules.
1600-	Н	+++	Н	Н	₩	Ш	H	Н	++	Ш	Ш		##	Щ		F			(thin sec. 4568)
1		+++1	Н	H	₩	₩	H	Н	₩	ж	Ш		#		Ш	L		Fault	Lava flow, alt. basalt & basalt.
1	+++	+++1	H	╫	₩	₩		H	++		Ж		Ш	ж	Н	1	44	 	
- 1	111	$\dagger\dagger\dagger$	1	Ħ	Ш	Ш		1	Ш	Ш			Ш	Н	H	1,,	مثبه م	 	
-m	$\Pi\Pi$	Ш	П	П	П								Ш		Ш	1	4	Foult	
]	Ш	Ш	П	Ш	Ш	Ш			Ш		Ш		Ш			1	Ψ.		
- 1		###	H	Ш	Щ	111	H	Щ	Щ	Щ	Ш	Щ	Ш	Щ	Щ	۱.	عنهر	\Box	
- 1	₩	₩	H	₩	Щ	\mathbf{H}	+	₩	\mathbb{H}	Ш	Щ		Ш	Ш	Ш	-		Fault	
4	╫	₩	H	₩	₩	+++	H	₩	$\parallel \parallel$	\blacksquare	₩	₩	Ш	₩	Ш	1	14	 	
1 000-		###	H	₩	₩	+++	+	╫	\mathbb{H}	Ш	Ш	#	₩	₩	₩	Ħ	3/5		Pagalt lava flow of Alivina marieta
- 1	 		H	₩	₩	+++		₩	H	Ш	₩	₩	₩	₩	₩	۲	**	 	Basalt lava flow, alt. olivine, vesicles
		111	H	Ħ	##	###	H	1	#	Ш	₩	##	₩	₩	₩	۱:۱	44	 	(See core description). Lava flow, ash flows & sand interbedded.
1	Ш	Ш	T	Ħ	ijĦ	##	1	Ħ	#		Ш	****	₩	₩	#	1	200		TONS A SUM MET DEGGEO.
[موروا	\coprod			Ш	\coprod			$ lab{I}$	\prod		Ш					Ľ	4 A #		
	Щ	Ш	Ц	Щ	Ш	Щ	Ш	Ш	Ш	Ш	Ш	Ш	Ш	Ш	Ш	E	44	На	Trace cinnabar ? (thin sec. 4905)
4	Щ	Ш	4	Щ	Щ	Щ	\downarrow	ų,	Ш	Щ	Щ	Ш	Щ	Щ	Щ	7	4		Basalt to andesite - upper Andesine
- 4	Ш	Ш	4	#	##	Щ	1	1	Щ	Щ	Щ	Щ	Щ	Щ	Щ	•			Augite, alt. to bio. (thin sec. 4936)
-	₩	Ш	4	#	111	###	+	H	Щ	₩	Щ	Щ	##	Щ	Щ	1~	- 44	<u> </u>	Porphyritic, plag. hornblende - alt.
10000	₩	##	+	+	₩	₩	+	₩	₩	₩	Ш	Ш	Щ	Ш	Ш	17	4 A	 	palagonite, celladonite, chlorite.
ı	₩		H	₩	₩	##	+	╫	╫	₩	Ш	₩	₩	₩	Ш	7	4	Fault	Lava & tuff only
t			۲	#	₩	###		╫	₩	₩	₩	₩	₩	₩	₩	#	-Te-		Lava & tuff only T.D. 5069'
	Ш		U	Ш	Ш	Ш	d	Ш					Ш			Z	A 44		T.D. 5069'

DRILL HOLE Soda Lake 44-5
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	Т				G	P	1 E	72	7/	~	1			27	_	-		-			_	
	<u> </u>			-	_	_				-	7		9.	<i>-</i>	_					7		p. 1
3	L	272	Z.C	47	770	21		3	574	2									\$2	A MEAR 2. MOD.	,	DESCRIPTIONS
8	17.	1.4		2	, V	1	5,5	3	,										82	3. STRO	*	
9	à	7	12		وم	9	1	مرم	وا									ı	3.3	VEINLE 3 Tx	73	
1,000	17			1		H	1	H	1	ff					Ш		Ш	111	30	* / y	28	
1,025					100			П	1				Ш	Ħ		Ш	$\dagger \dagger \dagger$	II	XX 1.			(no cuttings above 1025') 1025-1120 Secondary Calcite, vugy,
1						8.	\prod	\coprod	$ lab{I}$										終ま			Same lar calcite xls, pyrite anhydrite
			Ш		į, X		Щ	Щ	\parallel	Щ	Ш	Щ	Ш	Ш	Щ	Ш	Щ		$\bigotimes_{i \in \mathcal{I}}$	3		Some matic pumice grains with gypsum
1,100-			₩				$\!$	Щ	#	Ш	\parallel	Ш	Ш	Щ	Щ	Щ	Щ	Щ				in ves. (poss. calcite real. quas.)
-	HH	HH	╂┼┼	╫	₩	╂	Н	₩	₩	Н	Ш	Ш		Щ	₩	Щ	Ш		₩		_	drilling cement also present
-	╂┼┼┼		H	\dagger	₩	╫	₩	₩	H	Н	₩			₩	₩	₩					-	
-			Ħ	1	Π	Ħ	H		Ħ	Ш	╫	Ш		Ш	$\parallel \parallel$	₩	Ш	iii	Lost circ.			
			\coprod			\prod	\prod				#			Ш		\parallel	Ш				_	
_	Ш	Ш	Ш	\prod	Щ	П	Щ	Щ	\prod	Ш		Ш				$ lap{1}{1}$	Ш					
1240-			₩		Щ	$\!$	Ш	Щ	4	Ш	Щ	Ш	Щ	Ш	Щ	Щ	Ш	Щ	,-,-			
1 -		╂┼┼┼	₩		+	₩	₩	#	#	Щ	₩	Ш	Щ	Щ	$\parallel \parallel$	₩	Щ	Щ			_	1240-1330 Sand, otz rich, tuffaceous,
-		╂┼┼	╂┼┼		╀	H	╢	#	#	\mathbb{H}	₩	₩	₩	\parallel	#	₩	\mathbf{H}	₩	00	Tr. 9	۶.	coloita como de la Estada de la Colora de la
1300 —		 	#		+	#	₩	H	\dagger	Н	₩	$\parallel\parallel$	₩	₩	Ж	₩	Ш	₩	4 5			1290-1330 her white tutt comparent
				P		1		11		$\parallel \parallel$	\parallel		₩	Ш	$\parallel \parallel$	\parallel		Ħ		fault	-	1290-1330 has white tuff component. Slicken sides and fault gouge
		Ш	\coprod		\prod	\prod	Ш	\coprod					Ш			\blacksquare		∭				1330-1400 Basaltic dike or flow, dk-gy
		Ш	Щ	Ц	Щ	Щ	Ш	Щ		Щ	Ш	Щ	Ш		Ш	\parallel	Ш			Tr. 91	4	bk, aphanitic, in the sec. plagpyrox.
1400-	+	+++	\mathbb{H}	Щ	Щ	\coprod		#	4	Ш	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ			_	glass, opaques, hyp, trachytic text.
-			H		\mathbb{H}	H	H	₩	#	H	₩	Ш	Ш	Ш	Ш	Щ	Щ	₩	4.4			1400-1480 Sand, tuffaceous, atz
-	++		H +		H	H	Н	₩	H	\mathbb{H}	₩	₩	₩	#	Ш	Ш	₩	H	4.4	7	72	med-f., mod. sort.
-						H		$\dagger \dagger$		+	₩	₩	₩		Ш	Ш	₩	H	ه ۵	Cal 8		detrital ep.? large rounded grains
1500 -				7				$\dagger \dagger$	П	$\dagger \dagger$	₩	$\parallel \parallel$	₩	Ш	Ш	Ш	₩	#				1480-1680 Basaltic dike or flow
-			\prod	7	-	\prod	\prod	\prod		\prod		\prod										aphanitie, dk-gy-bk, no pheno.
		Ш	Щ	1	4	Ш	Ш	\coprod	Ш	\coprod	Ш	Щ	Щ	Ш	Щ	Ш	Ш			1-2 9		Thinsec: trachytic text. ave. od nom
			H	1	r]	Н		₩	Ш	\mathbb{H}	Ш	Ш	Ш	Щ	Щ	Ш	₩	Щ		& c'a	(e.	xls., few 0.3 mm plag. laths, glass
	+++	+++	H		+		╫	╫	Н	╫	₩	₩	Ж	#	₩	Ш	₩	H				matrix, anh. hypersthene, opaques
1600-					\forall		+	$\dagger \dagger$		╁	Ш	₩	Ш	₩	Ш	Н	₩				\dashv	~ 0.02 mm, a patite rade, basalt comp
			$\parallel \parallel$		T-		1	#		$\dagger\dagger$	Ш	₩					₩	Ж			1	some calcite alt.
										\prod							$\parallel \parallel$		学			
		Щ	\prod	Щ	Щ	Щ	\prod	\prod	Щ	\prod	\prod	\prod	Щ		Щ	Щ	Ш				\Box	contact picked from drilling rate
1700-			#	Щ	#	Щ	4	H	4	#	Щ	Щ	Щ	Щ	Щ	Щ	Щ	4	4.4	1. py	4	1680-1910 Tuff, siliceous . V. li av.
-	+++	+++	#	Ш	╫	₩	#	H	H	╫	₩	\mathbb{H}	\mathbb{H}	₩	₩	₩	$\parallel \parallel$		440	Tr 1	-	to pinkish gy, pumice, bio speck
			#	1	$\dagger \dagger \dagger$	H	#	Н	+	$\dagger \dagger$	₩	$\parallel\parallel$	Ж	#	₩	₩	HH	╢-	444	17. 7.	\dashv	glass shards, variable text.
			\prod	1	$\dagger \dagger \dagger$	$\dagger\dagger$	#	Ш	#	$\dagger \dagger$	₩	$\parallel\parallel$		Ш	$\parallel \parallel$	$\parallel \parallel$	$\parallel \parallel$	1	, A		+	NUN: WEIGED.
1800-	Ш			1	\coprod		1		I							$\ $		Į.	4 4		_	
	Ш	Щ	Щ		Щ	Щ	\prod	Ш	\prod	\prod						\prod		ŀ	4.4.	Tr. qtz-	ارم	color changes to linguagen &
	\coprod	+++	Щ	1	\coprod	Щ	#	Щ	\parallel	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Į.	9 9	,7	1	color changes to li. gy-grn & li. gy. pk at 1815'
	+ + + +	+++	\mathbb{H}	-	++	Ш	#	Щ	#	#	₩	Ш	Щ	Щ	Щ	Щ	Щ	∦.	PO		4	
	+++	+++	HH	1	$+\!\!+\!\!\!+\!\!\!\!+$	H	╫	HH	₩	H	₩	Ш	₩	₩	##	₩	\blacksquare	H.	00		-	
1900-		†##	HH	1	#	H	$\dagger \dagger$	H	$\dagger \dagger$	$\dagger \dagger$	₩	$\parallel\parallel$	₩	₩	₩	Ш	₩	+	1	Tr. 91	_ 	F. 14 and a +1010
					\prod				#	\dagger	₩		∭	Ħ	Ш	##	$\parallel \parallel$	*	40	Tr. cal		fault gouge at 1910 1910-1990 Dacite tuff (pass, flow)
			Ш	I	\prod	\coprod	\prod	Ш		\prod			$ lap{\parallel}$									grn-gy, irregular vugs with
		Щ	Щ	\prod	\prod	Щ	Щ	Ш	\prod	Щ	\prod	Ш	\prod		\prod	\prod	Ш		00		\Box	chlor. , possible lithic frage
2000-	 	!	\coprod	\parallel	#	Щ	4	Щ	#	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	E	4 9.		\bot	
	┼┼┼┫	+++-	+++	#	 	\mathbb{H}	#	H	₩	Щ	#	Щ	₩	Щ	Щ	Щ	Щ	-	1		4	
1	┼┼┼┫	+++	+++	╫	╫	H	╫	Н	╫	H	#	\blacksquare	₩	₩	₩	\mathbb{H}	₩	H	}		+	
	шЦ		111	1!	Ш	Ш	Ц	Ш	Ш	Ш	Ш	Ш	Ш	Ш	Ш	Ш	Ш	L			_	

DRILL HOLE Soda Lake 1-29

LOCATION SE'4 Sec. 29. T. 20 N., R. 28E., Nevada

	T					Ģ	R/	1.	H	70	~	Z	C	G	5	_			_				P. 2
3		12	72	R	42	70	2/1	7	1. 2.	ME	20.	I				I		-		1/2	7	TH TRACE I. WEAR 2. MOD.	DESCRIPTIONS
FPTA	XXX	,			T	وكهوك	1	18	12	Ţ										32		3. STRONG	22363111 11633,2
9	٩		Chlor	hom		1	016		5/2											83	1	VEINLETS Ture	
2000		\prod	Ш	\prod										Ш	Щ				Щ	00			1990-2100' lithic tuff or tuffacent
		╫	₩	-	H	\mathbb{H}	H	H	\mathbb{H}	\parallel	-	\blacksquare	Ш	₩	₩	₩	\blacksquare	Щ	Щ	0.0	1	Tr1 972-py	sand, with lithic & ata grains
		#					H	\dagger	H	+	+	#	₩	₩	₩			$\parallel \parallel$	Ш	P		, - /-/	med - fine grained.
2100-		Ц	\prod	\prod	Į,		\prod		Щ		\prod	\blacksquare	Щ	Щ	Щ				Щ	400	2	1 py	
	100		${\mathbb H}$	₩			H	Н	+	#	H	₩	Ш	$\parallel \parallel$	\prod	Ш	Ш	Щ		4440	:	1 py	2100-2545' witrie tuff, non-welded
	and a		\parallel					\parallel		1	H	₩	Ш	₩	₩		Ш	\parallel		4		1 py 2 py	li. gy. bis. specks Same alt. To clay variable text. & color
	1		Щ	\prod	180						П		Щ		Щ	Ш	Щ	Ш	Ш	300	٠t	— <i>PY</i>	variable text, & color
2200			Ш	₩	7	+	Ш		\mathbb{H}	H	H	\parallel	Щ	#	Щ	Щ	Ш	Щ		460	4		
						+			\dagger	Н	Ш	\parallel	$\parallel \parallel$	#	$\parallel \parallel$	₩	₩	₩	#	2 20	:		,
		\prod				\prod	Ш					\blacksquare					Ш	Ш		440	Ĺ		
		H	\mathbb{H}	-		+	H	Ц	\parallel	Ш	Щ	\blacksquare	Щ		Ш	$\parallel \parallel$	Щ	\prod		240	-		
2300-		H				$\dagger \dagger$	H		H		H	Ħ				H	$\parallel \parallel$	₩		40 4	+		
	Ш					\prod								Ш				Ш		4 4 4			
		#				$\!$	H		\vdash		\coprod	Щ	Щ	Ш	Щ	\parallel	Щ	Щ		× - 4			
2400-	╫	+				#	H	+			+	Н		Ш	Н	\parallel	₩	₩	H	404	ŀ		
2700-			Щ	Щ		\parallel								Ш	Ш			Ш		4 4 4	1		
	₩	4	\prod	Ш		#	Ш	$\!$	\coprod	Щ	\coprod	Ш	Щ	Ш	Щ	Щ	Щ	Щ	Ш	4 0	L		
•	$\parallel \parallel$		+			$\dag \dag$	₩	₩	+	H	H	Н	Ш	₩	Н	Н	₩	\mathbb{H}	₩	4 9 9	╁		lignite grains - 2440
2500-					1			1		\parallel		Ш	Ш	Ш	\parallel		Ш		$\parallel \parallel$	040	1		Color change to more white tuff
-			$\!$			\parallel	\coprod	$\!$	Щ		$\!$	Ш	Ш	Ш		Щ	Щ	Щ	Щ	400	L		with sand grains at 2480'
-	#	4	++	+++				H	H	+	H	₩	₩	₩			₩	++	Н	22	╀		2545 - 2/40 T co
_			Щ		1	\parallel					\parallel	Ш	Ш	Ш			Ш	Ш	Ш	440	t	1 gta-py	2545-2600 Tuffaceous mudstone
2600-			#	$+\!\!+\!\!\!+\!\!\!\!+$		#			Ш	\parallel	$\!$	Щ		Щ	Щ	Щ	Щ	Щ	Щ	Δ 4 Δ	-	7	greenish gray
-			H	+++	-	H	H		H	╫	${}_{H}$	₩	₩	₩	Ш	H	Ш	#	Н	A 40	ŀ	Tr.	2600-3060 vitric tuff, alt. to clay
			\parallel	Ш	1		Щ			I	\parallel		$\parallel \parallel$	Ш		Ш				مر. مرح م	t		calcite and chlor. Chlorite grains, with a few lithis.
-			H	+ + +	1	\prod	Щ			\prod	\prod	\mathbf{H}	\prod	\prod		\prod	\prod	Щ	Щ	444	F		frag.
2700-			╫	₩	1	H	H			H	${\dagger}$	₩	₩	$\parallel \parallel$	#	₩	₩	$\parallel \parallel$	#	<i>P</i> ≪ 9	+		abundant clay mont. & Kaolinite
· -			Щ	Щ	I	Ш	Щ			I	\parallel	Щ	Щ	Щ		Щ	$\parallel \parallel$	Ш		: :	L		may have other carbonates in
-		-	H	H	1	Ш	Щ			₩	#	Щ	Щ	\parallel	\parallel	Щ	Щ	Щ	Щ	400	H	4 4 5	addition to calcite.
2 800 -			╫	##		H	H	H		H	H	#	₩	\mathbf{H}	H	₩	₩	₩	#	ه م م ح ض ه	H	1 to 2 2	py + gyp. veins py + atz veins & ca/cite
-			Ш	Ш			\coprod			П						Ш		Ш		ه ۵	L	2 cal+0	THE VENTS & CONTR
-			\coprod	\coprod		Щ	Щ			\coprod	\coprod	Щ	Щ	Щ	Щ	Щ	$\parallel \parallel$	\prod	Щ	440	L		
-	H	1	╫	+++	1	Н	#			╫	H	₩	#	+	+	₩	₩	$\parallel \parallel$	₩	444	H	I	
2900-		1	Ш	Щ						I									₩	0-0		7	Tr. chalcopy rite at 2900'
		1	₩	\prod	1.6	Щ	Щ			\prod	\prod	Щ	\parallel	Щ	Щ	Щ	\prod	Щ	\prod	4-2	Ŀ	7	
-			╫	+++	6 41 22	H	#		8 • 1	H	H	$\parallel \parallel$	#		#	#	+	₩	#	4.46	1	7	
		1	Ш	Ш		Ш				I			\parallel						∭.	D 94	f		
3000-			\coprod	Щ		Щ	\prod	1	¥	\prod	Д	Щ	\prod	\prod		Щ	\prod		\prod	20	Ţ.	1 gtz+py	
-		╫	H	₩	H	\mathbb{H}	#	+	H	╫	H	\mathbb{H}	#	$\parallel \parallel$	\blacksquare	\mathbb{H}	#	#	#		H		
		\parallel	Ш	Ш			\parallel			ľ	\prod		\parallel					₩	\parallel		H		
		_							_					-			-					أبيسستي	

DRILL HOLE Soda Lake 1-29 LOCATION SE'4 Sec. 29, T. 20N., R. 28E., Nevada

	Γ					G	R	41	75	170		- 4	50	26	75	~			_				3 م
3		Z	TE	R	A)		~		_		_	_,			·	T	-		-	14		TR TRACE]
	_		-	Γ,	_	3	4	J. N.	Ź	7. 57	ma	*				l				33	- 1	3. MOD. 3. STATOMS	DESCRIPTIONS
8	11.13	1	10/6	hen	1	7/0		8	1	4		l								120	١,	EINLETS	
3000		7	27	4	4	ř	1	23		4	Í	4	1111		Ш		Ш	Ш		90	+	type	*
					1				10 m	H		\parallel			₩	I		Ш		000	+	_	2600-3060' (cont.) alt vitrie tuff non-valelded, poss. water lain
_	Ш		Ш	Ш			1	Ш	K						\blacksquare		Ш			4 4 4			or airfall
-		H	Н	\mathbb{H}	∦	#	Í	\mathcal{H}		Щ	Щ	4		Ш	\prod		Ш	Щ			-		3060-3300 Sand, tuffaceous,
3100-		H	Н	Н	╫	H		\forall	ı	Н	H	+		₩	₩	Н		Н	Ш		+		vitrie, lithic grains, lignite,
					1			\parallel				1			$\parallel \parallel$		Ш		Ш				Kaplinite, lingy, to vilingy. Zone 3/20-3/60' vitrie Tuff, alt. gy-grn
! -			Щ	Щ	1	Щ		\coprod		Ш	Щ	\prod	Щ	Щ	Щ		Ш		Щ		2	Fault gou	ge 99 700
-	₩	╫	\mathbb{H}	#	╫	Н	+	₩	H	H	H	+		₩	₩	#	Щ	Щ	Ш	D	╌┞		Sand grains are sub-well round
3200-	$\parallel \parallel$	Ш	$\dagger \dagger$	$\dagger \dagger$	╫	H	H	╫	\dagger	Н	+	H	Ш	₩	₩		₩	₩	Ш		+		
	\coprod		Ш	\prod				$ lap{1}$											Ш	. م			detrital
-	\coprod	 	Ш	\coprod	4	Ш	4	\coprod	Щ	Ш	\coprod	$\downarrow \downarrow$	Щ	Щ	Щ	Щ	Щ	Ш	Щ				
-	H		H	+	╫	Н	\mathbb{H}	╫	Н	Н	H	H	₩	₩	₩		₩	Ш	₩	. 0	ŀ		
3300		ė	Ш	$\dagger \dagger$			#	$\dagger \dagger$		\parallel	$\dagger \dagger$		₩	₩		#	#	₩	$\parallel \parallel$	00	+		3300-3450 Vitric tuff, alt
		*	Ш	\prod	100			\prod		Ш	\prod	\prod	Ш	Ш			Ш	\blacksquare	\prod	APA			li ay with some arn- ay grains
			\mathbb{H}	#	100	Н	\parallel	#		Щ	$\!$	\parallel	₩	Щ	Щ		Щ	Ш	Щ	40	L		li. gy. with some grn-gy grains Slight to non-welded.
71144	H		Н	H	1	Н	H	$\dagger \dagger$		+	H	╢	₩	-	Н	#	₩	₩	Ш	000	1	r. cal+	0.0000000000000000000000000000000000000
- 0076			\coprod								11		Ш			Ü				d A	t		peppered with sulfide grains
	Щ.		Ш	#	1	Щ	\coprod	\coprod		Щ	\prod	Щ	Щ	Щ			Щ	Щ	Ш	00	L		
-		-	H	₩		\mathbb{H}	╁	₩	\mathbb{H}	+	₩	╢	₩			\blacksquare	#	$\parallel \parallel$		+ +	۱.	- /	3450-3500 Basalt, similar to 1480-
3500 -			H	$\dagger \dagger$	1		2	$\dagger \dagger$	$\parallel \parallel$	\forall	H	\parallel	₩		Н	₩	₩	₩		+ +	H	r. Cal+p	1620', dike or flow, dk. gy, aphaniti minior alt Thin sec.: trachytic text
2,00				\prod			1	\prod			\coprod			III			Ш			400	Ī		3500-3540 vitrie-crystal tuff
	\perp	-	\coprod	$\!$			The Control	\Vdash		\parallel	\prod	\coprod	\prod	Ш			Щ	Щ		000	4		4 Imm feld phen alt to cal + mic + class
-			╫	${\sf H}$			T			+	H	╫	Ш				Ш	+		.δ:	\vdash		3540-3590 Sand, tuffaceous,
3600			П				\parallel			1		I											grn-gy med. grain, sub-well round. Sand grains of tuff, pumice, x/s,
		1	Ш	\coprod		Щ	U	\coprod		\parallel	\prod	Щ					Ш	\coprod		.6.	L		lithic with a Tuff matrix.
-		+	H	₩	ł	Н	1	$\!$		#	H	╢		Ш	\parallel	Ш	₩	Щ			F		montm. and poss. other clays
							\dagger			\dagger	$\dagger \dagger$	$\dagger \dagger$			Ш		Ш	\parallel		۵.	H		
3700-			Щ	\prod			\prod	\prod		\parallel	\prod	\prod			\blacksquare		Ш						3690-3840 Mudstone even text.
-	Ш	₩	\mathbb{H}	₩		H	H	Н	H	#	₩	H		Щ	\blacksquare	Щ	Щ	Ш	Щ		Ļ		3690-3840 Mudstone, even text. med. gy 3690-3780 dk-gy 3780-3840 & fine carbon
	Ш	#	$\ $	#		H	\dagger	H	$\parallel \parallel$	\dagger	#	#		₩	₩	₩	₩	₩	#		1		4K-gy 3780-3840 & fine Carbon
	Ш	\parallel	\prod	\parallel		\parallel		Ш	\parallel	\parallel	\parallel		Ш	Ш			Ш						Thin laminae of med & dk-au in
3 800-		#	Щ	#	\parallel	+	#	Щ	\coprod	#	#		Щ	₩	\parallel	Щ	Щ	₩	\prod		1		Thin laminae of med & dk-gy in 3780-3840' part.
	$\parallel \parallel \parallel$	#	╫	₩	\mathbb{H}	+	╫	H	H	╫	╫	╫	\mathbb{H}	₩	#	₩	₩	₩	₩		1		
1		\dagger	H	#		$\dagger \dagger$	\dagger	H	#	$\dagger \dagger$	#	Ħ	$\parallel \parallel$	₩	₩	$\parallel \parallel$	₩	₩	₩	0.04	+		3840-3865 Crystal tuff & vitric tuff
]	Щ	\prod	\prod	\prod		\prod	П	Ш	П	\prod	\prod	Щ		Щ	Ш	\prod	Ш	$\parallel \parallel$		7 2.			possibly detrital, gy-grn
3900-	H	#	\coprod	#	\parallel	H	\parallel	Щ	\coprod	#	\parallel	#	\blacksquare	₩	Щ	#	Щ	₩	#	ح	Ļ		3865-3940 silicified tuff & mudst.
	╫	#	+	+	\dagger	$\dagger \dagger$	+	H	\dagger	+	#	H	₩	₩		₩	₩	₩	₩	7 7	1		detrital grains? lingy
								Ш						∭		\parallel		₩		-	7	9/2.py	with bio. specks, few dk-gy frag. 3940-3950 transition zone
	\prod		\prod	\prod	\prod	\prod	\prod	Щ	\prod	\prod	\prod	Щ	Щ	Щ		\prod	\prod	Щ		+ +	Ľ		3950-4306 pyroxene gabbro.
4000-	₩		#	H	₩	#	+	H	H	#	#	Н	#	₩	Ш	#	\parallel	$\parallel \parallel$	₩	+ #	┡		alt. dk-arnish-ay x/s of
1	<u> </u>	$\dagger \dagger$	\parallel	$\parallel \parallel$	#	\parallel	1	\parallel	\parallel	#	#			₩	Ш	$\parallel \parallel$	₩	##	H		H		labradorite, augite, opaques magnetite
			$ lap{1}$			\prod																	way neme
	_		-								-			_					Į.				

DRILL HOLE Soda Lake 1-29 LOCATION SEL Sec. 29, T. 20N., R. 28E., Nevada

GRAPHIC LOGS P. 4 ALTERATION 2 Mass. TH TRACE

1. WEAR

2. MOD.

3. STRONG DESCRIPTIONS VEINLETS + + slickens fine phaneritic text. Mod. alt. (thin section made) sphene, epidate 4/00 -+ + F. gouge secondary albite? 4200-Fault gouge 4300-**i i 1111 i 1710 i 1880 i 1880 i 188**0 i 1881 i 188

LOCATION SEL Sec. 29, T.20N. R. 28E. Nevada

							(Gl	94	1/	25	170		•	Z	20	55	5	_						P. I	
×	ľ	A	22	Z	7	- 2/	7	70	20	V	;	/. A	120					_	Γ	_			T	44	TH TRACE	DESCRIPTION
ZEPTA	t		į,	_	_	-	Т	_	Т	_	ľ	7. 53	and a	44									١	38	2. 400. 3. STROMS	DESCRIPTIONS
B.		4118 123	G	to,	Š	ol C-		23	14	8F	Ç	,	6	9										SEQ.	VEINLETS	0-400 no cutting
400	-	Щ	Ц	Ц	\downarrow	Ц		Щ	П	Ц	\prod	П	\prod			Ш				\prod			Ī	+	Tr. qtzpy.	Arkose, med. to fine gr. calcite & clay matrix,
	1	Щ	$\!$	Ц	\parallel	\coprod	Ц	\coprod	\coprod	\coprod		Ш	Ш	Щ	Щ	Щ	Щ	Щ	Ш	Щ	Щ	Ш	ľ	_ + 	400-480	V.II. grayish-green; grains angsubround, mod. sort.
	1	Щ	$\downarrow \downarrow$	Щ	Ц	Ц	\parallel	11	Ц	Щ	\downarrow	Щ	Щ	Щ	Ш	Ш	Щ	Щ	Ш	Ш	Ш	Ш		† A	<u> </u>	~ 40% tuff, rhy. ? bio. phen. opaques minor
	+	Щ	Ц	Ц	$\!$	$\!$	\coprod	Н	$\!$	\coprod	$\!$	Щ	Ш	Щ	Ш	Щ	Щ	Щ	Ш	Щ	Щ	Ш	∥.	7	<u> </u>	silica cementing, of arkose
500 ·	4	#	-	H	$\!$	H	H	H	₩	Н	\vdash	Щ	Щ	Щ	Ш	Ш	Щ	Щ		Щ	Щ	Щ	1	1111	480-660	Arkose, lithic medcoarse, to fine kacilnite
	+	₩	ŀ	Н	$\!$	H	₩	₩	₩	Н	\vdash		Ш	\parallel	Ш	Ш	Щ	Щ	Щ	Щ	Щ	Щ	∦.	+ + :		matrix, white with bio.
	+	H	ŀ	Н	${\mathbb H}$	H	H	₩	₩	Н	+	Н	Н	+	Ш	₩	#	Щ	Н	₩	Щ	Щ	Ų:	+ + :		~ 25% tuff, light gray non-weld.
	+	H	ŀ	Н	╫	Н	╂	${}_{H}$	₩	Н	${\mathbb H}$	Н	H	+	Ш	₩	#	Н	Н	₩	Н	Ш	-	ナナ ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・		
ł	+	++	H	+	H	H	H	₩	H	Н	H	Н		+	Ш	Ш	₩	Н	Н	₩	Н	Ж	ŀ	· · · · · · · · · · · · · · · · · · ·		Sand grains are mod. rounded qtz.,
600 ·	1	╫		Н	+	Н	H	╫	H	Н	╫	Н	Н	+		₩	₩	Н	Н	₩	Н	Ш	H	1.1.1	Tour ede - au	chalcedony, feldspar, lavas & mudstone grains.
1	1	+		+		H	H	╁	H	Ш	Н	Н	Н	+	Ш	Ш	₩	Н	₩	₩	Н	₩	H.	ΔΔΔ	Trqtzpy.	
	+	++		+	1	+	H	+	+	H	Н	H	H	H	₩	₩	₩	\mathbb{H}	₩	₩	₩	₩	1	+ ++	 	620 - 660 ~ 70% mas 2 mais
	#	+	r	H	\dagger	\dagger	H	$\dagger \dagger$	1	H		Н	Н	\forall	₩	₩	#	H	₩	#	H	₩	۲	<u> 4 </u>	660 - 740	620-660 ~ 30% tuff & lithic clast
	#	#	H	\dagger	+	1	H	Ħ	H	Н		Ш	Ш	\dagger	₩	₩	₩	H	₩	₩	Ш	₩	1:	$\Upsilon + \overline{\Upsilon}$	350 - 740	Graywacke, f. gr., clay & cal. matrix 680-VC-M, clay matrix, 30% tuff sub-ang. to mod-round.
700 -	1			Ħ	T	Ħ	Ħ	$\dagger \dagger$	T	H		H	\forall	\dagger	₩	₩	#	H	₩		H	₩	+	Lost		and the state of t
	1	\prod	Ī	T	ľ	Ħ	Ħ	$\dagger \dagger$		Ш		Ш	Н	1	Ш	Ш	Ш	ij	Ш	Ш	I			۰. ۰	740-780	Granules, & graywacke, white kaoline matrix,
	7			T	ľ	IT	Ħ	$\dagger \dagger$		П	П	Н	Н	†	$\dagger \dagger \dagger \dagger$		Ш	Ï	₩	$\dagger \dagger \dagger$	iii	Ш	1	- - -		minor chlor, 1/4 tuff., 1/4 C.Ss tuff is V.II. gray
	7			T		П	П	Π		П			П	1	Ш	Ш	Ш	Ï	Ш	Ш	II	$\parallel \parallel$		- +		
<i>800</i> -					T			\prod			Т	П	Π	1	Ш	m	Ш	IÏ	Ш	Ш	İ	\parallel	E	4-4-	780 - 800	Mudstone, tuffaceous & siltstone
<i>800</i> -					Ι	П	П	П	П			П	П	1	Ш	Ш	Ш			П	П	П	!		800-1180	Graywacke, med. to fine, kaoline matrix few
						\prod	П	\prod						П		Ш				III	П	Ш		- -		granules & mudstone clast lithic sand grains of
	floor							\prod						\prod		Ш						П	Ē	====		tuff, lava, qtzt, 840-860 tuffaceous
	1	\coprod					\prod	\prod						\prod			Ш				III	Ш		<u>⊼</u> _ŏ		mudstone unit. Tuff is 1/2 of sample 860-880
900 -	\coprod	\coprod			I								\coprod	\prod	\mathbf{III}	\prod				Ш				Lost		About 30% mudst. 920-980
		Ш												\prod	${ m I\hspace{1em}I\hspace{1em}I}$					Ш			Γ	<u> </u>		V.li. gy, with bio. specks.
	1	Щ		Ц	\perp	Ш	Ц	Ц	Щ	Ш		Ш	Ш	Ш	Ш	Ш	Ш	Ш	$\ $					+ —		
	-	Щ		Ц	\downarrow	Щ	$\!$	Щ	Щ	Щ	Щ	Щ	Ц	Ц	Щ	Щ	Ш	Щ	Щ	Ш	Щ	Щ		+ -		
	1	Ш		\downarrow	Ц	Щ	\parallel	Ш	Щ	Ц	Ш	Щ	4	4	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Ш			Tr. py.	py, fine grain, some in Ss & tuff also Ss.
1000 -		Щ	L	Н	4	Щ	\parallel	Ш	Ш	Щ	Ш	\coprod	4	4	Щ	Щ	Ш	Щ	Щ	Щ	Щ	Ш	Ŀ			frag. with py. matrix.
	4	$+\!+\!4$	H	H	μ	Щ	$\!$	Щ	Ш	Ш		4	44	4	Щ	Щ	Ш	Щ	Щ	Щ	Щ	Ш		- +	Tr calc.	
ł	4	##	H	\parallel	$^{+}$	Н	$\!$	Н	Н	Н		#	#	$\!$	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Ш		+ _		Some calcite matrix cement. Most the sand
	-	H	H	\parallel	H	4	$\!$	Н	\mathbb{H}	\parallel	H	#	#	#	#	Щ	Щ	#	Щ	#	Щ	Щ		<u>.</u> ::		grains are tuff & lava, now alt/weathered to
	-	╫	H	H	+	+	${\sf H}$	H	₩	H	++	╫	#	╢	Ш	₩	₩	₩	₩	₩	₩	₩			-	clay + mica V. pale grn color in part of the
1100 -	-	##	H	H	H	+	${}^{\!\!\!+}$	H	Н	H	H	₩	H	╫	Ж	₩	₩	₩	Ш	₩	₩	₩	۲			grains & matrix is probably sericite & clays
	1	╫	H	H	H	+	#	H	Н	H	+	#	††	╫	$\parallel \parallel$	₩	₩	₩	₩	₩	₩	₩	ľ	_ +		epidote grain, probably detrital.
•	Ħ		H	╁	H	\dagger		Ш	H	$\dagger \dagger$	H	#	H	Ħ	Ш	#	₩	H	₩	₩	₩	₩	ŀ	T		
•	#	Ш	H	Ħ	Ħ	+	\dagger	Н		$\dagger \dagger$	$\dagger \dagger$	$\dagger \dagger$	$\dagger \dagger$	Ħ	Ш	₩	₩	#	$\parallel \parallel$	₩	₩	₩	Ŀ			II80'-Trace organic carbon.
	Ħ	╫	Ħ	Ħ	Ħ	\dagger	\dagger	Ш	H	$\dagger \dagger$	$\dagger \dagger$		H	Ħ	Ш	₩	₩	H	₩	₩	₩	₩	ŀ	+	1180 - 1220	Lithic Arkose, fine-m., li. gray, angular,
1200 -			Ħ	Ħ	Ħ	1	Т	П		11	#	1	T	Ħ	Ш	#	$\parallel \parallel$	T	Ш	#	₩	Ħ	۲	<u>. </u>	HOY - IEEU	few graywacke & tuffaceous clasts.
•	1		П	Ħ	Ħ	Ħ		П		\dagger	$\dagger \dagger$	$\dagger \dagger$	\parallel	Ħ	Ш	$\parallel \parallel$	$\parallel \parallel$	Ħ		₩	#	$\parallel \parallel$	ŀ	.: +:	1220 - 1280	Lithic, qtz. sand, med. to coarse, cleaner
•	T	\prod	T	Ħ	T	T	П	П	П	\parallel	Ħ	1	\parallel	Ħ	Ш	Ш		ı	Ш	$\parallel \parallel$	#		Ė	Lost		& more atz. than above, angular to
		\prod		I						\prod	\prod]	\prod	T						$\ $						subangular. 1260-1280 1/2 graywacke
1300 -	J	\coprod		\prod		floor				\prod	\prod	\prod	\prod	\prod									:	<u>- ::: </u>	1280-1560	Graywacke, med. clay matrix abundant tuff
,500 -	\prod	\prod		\prod						\prod		\prod	\prod	\prod			\blacksquare							Lost		or alt feldspar? grains.
	1	\prod				\coprod			\prod	\prod	\prod	\prod	\prod	\prod						$\llbracket \rrbracket$			Ŀ	 -		
	\prod	Ш	Ц	Ц	Ц	Щ	Щ	Ш	Ш	\coprod	\prod	\coprod	Щ	\coprod	Ш	\prod	\prod		Ш	\prod			4	.051		
	1	Ш	Ц	Ц	Ц	\coprod	Ш	Ш	Ш			\coprod	\prod	\prod					$\parallel \parallel$					1		Calcite cemented lithic grains, round grain
1400 -	1	Ш	Ц	Ц	Ц	Щ	Ш	Щ	Щ	\coprod	\coprod	\coprod	\prod	\coprod	Ш	Ш	\prod		\mathbf{M}	$\ $						mostly tuffaceous - clay matrix.
l .	#	Ш	Ц	Ц	\coprod	$\downarrow \downarrow$	Ш	Щ	Ш	Щ	Ц	Ц	Ц	Щ	Щ	Щ	Щ	Ш	Щ	Щ	Щ	Щ				
	#	Щ	Ц	Ц	Ц	Ц	Щ	Щ	Щ	Ц	\coprod	4	1	Щ	Щ	Щ	Щ	Ш	Щ	Щ	Ш	Щ				
<u></u>	11	\coprod		Ц			Ш	Щ	Ш	Ш	Ц	\coprod	Ц						Ш		Ш		L			

ALTERATION 1 Notes 1 Street 2			_	-	-	-	-	-	~	2	12	フエ	77.	,,,	<u> </u>	7	~	,,,,	-	_	_	_	_			
Section Sect		-	_		_	-	_		_	_	_	-	70				70	7~	? 	-		_	_	Tix	P. 2	4
Net Net	3		12	72	€.	72	1	Z.	70	7/1	_	3	. A.	700	, Mag									3%	2. MOD.	DESCRIPTIONS
Last Gray wacke - continuing from 1280	9	ز ا	٠	do.	Ĺ	,	6	l		l,	ell.	، ا			76	Ì								33	3. STRONG	
Lost Nem. stain due to drilling steel.	2	61,		' '		3			e = 1	1	-=	5		9	,									33	VEINLET	5
Lost Tr. py Organic carbon, bivalve shells.	1400		\prod					Í			Í	Í	ĺ	Í	Í							Ш		Lost		Gray wacke - continuing from 1280
1500 Lost Sericite and kaolin, minor cal. cem.				\parallel	4	\coprod	Ц	\downarrow	Ц		Щ	Ш		Ц	Ш	Ш	Щ	Щ	Ш	Ш	Щ		\parallel			
Lest Sericite and kaolin, minar cal. cem.	1	Щ	Ц	\parallel		H	4	\parallel	\coprod	$\!$	Щ	Ш	Щ		Щ	Ш	Ш	Щ	Ш	Щ	Щ	Щ	Щ	Lost	<u> </u>	
Sericite and kaolin, minar cal. cem. Lost	1 -		H	\parallel	H	H	H	$\!$	Н	+	Н			Η,	Н	Н	Ш	Ш	Щ	##	₩	Щ	Ж		Tr. py	Organic carbon, bivalve shells.
Lost Tuff content increased - Tuff content increased - Tuffaceous sed. sand? Tuffaceous sed. sand sed. Tuffaceous sed. sand sed. Tuffaceous sed. sand. Tuffaceous sed. sand. Tuffaceous sed. sand. Tuffaceous, cal. in mathematical sed. Tuffaceous, cal. in mathematical se	1500 -			\dagger	1	H	H	H	H	\dag	Н		Н	Н			Ш	Ш	Н	Н	\parallel	₩	₩	LOST		Sericite and kentin miner cal cem
1600 1600	1]				1	Ħ		Ť	П	H	П			Н		Ш	₩	Ш	Ħ	Ш	#	₩	Ħ	Lost		Seriene and kaonin, immor car. cem.
Paraller Paraller						\prod											\blacksquare				Ш	\parallel			Tr. cal.	Tuff content increased -
Table Tabl	1 4	$\downarrow \downarrow$		Щ	1	Ц	$\downarrow \downarrow$	4	Щ	Ц	Щ	Щ	3			Щ	Ш	Ш	Щ	Ш	Щ	\prod	Ш	-4-4-	1560 -1660	Tuffaceous sed. sand ?
1700 Higher Hig	1600 —	\parallel	-	Н	+	H	+	4	Щ	Н	Щ	Щ	Щ	Н	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	444		
1700 1700 1700 1880-1820 Gray wacke, tuffaceous, med-fine 1880-1820 Gray wacke, tuffaceous, cal. in math 1720-1740 fine ground zone? 2 half of matrix is calcite, 2 half of matrix is calcite, 2 half of matrix is calcite, 3 half of matrix is calcite, 4 half of matrix is calci		+	Н	Н	ł	H	H	+	H	+	\mathbb{H}	\mathbb{H}	+	H	\mathbb{H}	₩	₩	₩	₩	₩	$\parallel \parallel$	₩	\mathbb{H}	-4-4-	 	
1800 - 1820 Gray wacke, tuffaceous, cal. in main fault Fault	1	+		Н	t	#	$\dagger \dagger$	+	H	Н	\parallel	H	+	H	+	₩	₩	#	₩	₩	₩	#	#		-	mairix, tine-med. grains.
1800 - 1820 Gray wacke, tuffaceous, cal. in main fault Fault					Ţ		\prod			Щ	Ш		\dagger	\dagger	1	∭	$\parallel \parallel$	$\parallel \parallel$			₩	#	$\parallel \parallel$	4	1660-1680	Lithic arkose, tuffaceous, med -fine and
Foul!	1700				I	\prod		Ι								\prod					Ш		III	-		Gray wacke, tuffaceous, cal. in matrix.
1800 1800		\downarrow		Щ	1	Ц	Ц	\downarrow	Щ	Щ	Ц	, ,			\coprod	\prod	Щ	Щ		\prod	Щ	\prod		1	Fault	
1800 1800	1 -	+	J	Щ	+	4	4	4	Щ	Щ			4	\parallel	4	Щ	\parallel	Щ	Щ	Щ	Щ	Ш	Щ	ΔΔ		
1900 1900	-	+		Н	╁	H	H	+		Н	\perp		╫	₩	+	₩		#	Ш	$\parallel \parallel$	Ш			Δ Δ		
1900 1900 1940 1	1 1			Н	t	H	H	t		Н	Н		╫	H	+	₩	#	#	Н	#	Ж	Н		ΔΔ		qrz sana grains % 20% below 1760.
1900 A-A 1860-1880 fine ground zone. 1860-1880 fine ground zone from 1860-1880 fine ground zone fine ground zone in larger xis. 1860-1880 fine ground zone in larger xis. 1860-1880 fine ground zone in larger xis. 1860-1880 fine ground zone in larger xis. 1860-1880 fine ground zone in larger xis. 1860-1880 fine ground zone. 1860-1880 fine ground z	1800 —				t	H	H	H		H	H		$\dagger \dagger$	\parallel	$\dagger \dagger$	Ш	Ш	H	Н	Ħ						
1900 A-A 1860-1880 fine ground zone. 1860-1880 fine ground zone from 1860-1880 fine ground zone fine ground zone in larger xis. 1860-1880 fine ground zone in larger xis. 1860-1880 fine ground zone in larger xis. 1860-1880 fine ground zone in larger xis. 1860-1880 fine ground zone in larger xis. 1860-1880 fine ground zone. 1860-1880 fine ground z			1		I								\parallel	I	\parallel	\prod							İ	+ +	1820 - 1840	Lithic-arkose, med. to fine, tuffaceous
1900 — 1900 — 1940 increased at a sand grant 1900 — 1940 increased at a sand grant 1940 — 1980 Basaltic — andesite, plag - taths. Matrix bio. 8 chlor, calcite, clay? Matrix bio. 8 chlor, calcite, clay? 1980 — 2000 Basaltic — andesite, plag. laths are long — few 1/2 mm in Trachytic, II. gray to II. bluish gray, even colo. Thinsection 2000' est. 30% plag. laths, euh normal zone in larger xls. 20% bio. alt to chlor. 10 % hem. 5 - 7 % obaques. A few pyroxene grains	1 4	Щ		Щ	L	Ц	Ц	Ц	Ц	Щ	Ц		\prod	\prod	\coprod	Щ	Щ	Щ		\blacksquare	Ш			<u>A</u> - <u>A</u>	1840-1940	
1940-1980 Basaltic - andesite, plag-taths. Matrix bio. B chlor, calcite, clay? 1980-2000 Basaltic-andesite, plag. laths are long-few '/2 mm in Trachytic, II. gray to II. bluish gray, even colo. Thinsection 2000' est. 30% plag. laths, euh normal zone in larger xls. 20% bio. alt to chlor. 10% hem. 5-7% obaques. A few pyroxene grains	-	\sqcup	1	\parallel	H	4	4	Ц	Ц	Щ	4	\sqcup	$\!$	\coprod	4	Щ	Щ	Щ	Ш	Щ	Щ	Щ	Ш	4-4-		1860-1880 fine ground zone.
1940-1980 Basaltic - andesite, plag-taths. Matrix bio. A chlor, calcite, clay? 1980-2000 Basaltic-andesite, plag. laths are long-few 1/2 mm in Trachytic, II. gray to II. bluish gray, even color. Thinsection 2000' est. 30% plag. laths, euh normal zone in larger xis. 20% bio. alt to chlor. 10% hem. 5-7% obaques. A few pyroxene grains	1900 -	H	1	$^{\rm H}$	V	+	H	H	+	H		H	#	H	#	Щ	Ж	Щ		Щ	Щ	Щ	Щ			
Matrix bio. 8 chlor, calcite, clay? 1980-2000 Basaltic-andesite, plag. laths are long-few 1/2 mm in Trachytic, II. gray to II. bluish gray, even colo. Thinsection 2000' est. 30% plag. laths, euh normal zone in larger xls. 20% bio. alt to chlor. 10 % hem. 5-7% obaques. A few pyroxene grains	1	Н		╫	2	+	H	H	+	\mathbb{H}	+	H	+	∦	╢	Н	Ш	₩		Щ	$\parallel \parallel$	Ш	+	<u>-</u> 4€		1900-1940 increased qtz sand grains.
Matrix bio. 8 chlor, calcite, clay? 1980-2000 Basaltic-andesite, plag. laths are long-few ½mm in Trachytic, II. gray to II. bluish gray, even colo. Thinsection 2000' est. 30% plag. laths, euh normal zone in larger xls. 20% bio. alt to chlor. 10 % hem. 5-7% obaques. A few pyroxene grains				$\dagger \dagger$		+	1	Ħ	\parallel	\dagger	Ħ	1	Ħ	1	\dagger	#	Н	Ш		Ш	#	₩	H		1940-1980	Basaltic - andesite, plan-taths
2000 T.O. 1980-2000 Basaltic-andesite, plag. laths are long - few 1/2 mm in Trachytic, II. gray to II. bluish gray, even colonomic Thinsection 2000' est. 30% plag. laths, euh normal zone in larger xls. 20% bio. alt to chlor. 10 % hem. 5-7% obaques. A few pyroxene grains			1							\prod								\blacksquare		Ш	\parallel	\parallel	Ш			
Iong - few 1/2 mm in Trachytic, II. gray to II. bluish gray, even color Thinsection 2000' est. 30% plag. laths, euh normal zone in larger xls. 20% bio. alt to chior. 10 % hem. 5-7% obaques. A few pyroxene grains	2000-			Щ	Ä	1	4	\coprod	Щ	Щ	Ц	Ц	Ц	Ц	Ц		Ш	Ш				\parallel			1980-2000	Basaltic-andesite, plag. laths are 0.2mm
Thinsection 2000' est. 30% plag. laths, eun normal zone in larger xls. 20% bio. alt to chlor. 10% hem. 5-7% obaques. A few pyroxene grains		\coprod	\parallel	\coprod	H	+	4	H	4	#	4	#	4	#	1	Щ	Ш	Щ	Ш	Щ	Ш	Щ	Щ			
est. 30% plag. laths, euh normal zone in larger xls. 20% bio. alt to chlor. 10% hem. 5-7% obaques. A few pyroxene grains	1 +	H	╫	╫	H	+	H	H	+	$\!$	+	#	∦	₩	4	Щ	Ш	Ш	#	Ш	Щ	₩	Ш			
normal zone in larger xls. 20% bio. alt to chior. 10 % hem. 5-7% obaques. A few pyroxene grains	1 +	$\dagger \dagger \dagger$	Ħ	\dagger	H	+	H	H	$\dagger \dagger$	$\dagger \dagger$	H	H	$\dagger \dagger$	$\dagger \dagger$	H		₩	Ш	╫	Ш	Н	₩	H			
20% bio. alt to chior. 10 % hem. 5-7% obaques. A few pyroxene grains			T	\prod		1	1	\prod]	\parallel	\parallel	\prod	\parallel			$\parallel \parallel$	$\parallel \parallel$		۱		$\parallel \parallel$	$\ $	Ħ			
5-7% obaques. A few pyroxene grains	I	Ш	\prod	\prod	П	projection	I	П	\prod	\prod	\prod	\prod	I				$\parallel \parallel$			Ш	Ш					
A few pyroxene grains	1	\coprod	#	#	H	Щ	1	\coprod	$\!$	\parallel	#	#	4	4	\parallel	Щ	Щ	Щ		Щ	Щ	Щ	Щ			
	+	₩	#	#	H	H	+	H	╫	#	#	#	#	#	H	Щ	Щ	Щ	#	Щ	Щ	Щ	$\ $			
	+	₩	╫	${}^{\dag}$	H	H	+	H	╫	╫	╫	H	+	H	₩	₩	₩	₩	H	₩	₩	$\parallel \parallel$	H			
	+	$\dagger\dagger$	Ħ	$\dagger \dagger$	H	\dagger	1	\dagger	#	$\dagger \dagger$	$\dagger \dagger$	#	+	\dagger	Ħ	₩	$\parallel \parallel$	₩	Ħ	₩	₩	$\parallel \parallel$	#			manor stay.
		\prod]	\prod	T	Ħ	T	Ħ		\parallel	\prod		T	1			Ш	$\parallel \parallel$								
		Ш	\prod	\prod			I	П	\prod	\prod	\prod	\prod												İ		
	1	\coprod	#	#	Ц	\coprod	1	Ц	4	\coprod	4	\prod	1	ĮĮ.	Щ	Щ	Щ	Щ	Ш	Щ	Щ	Щ				
	-	H	₩	#	H	$\!$	+	H	#	#	#	Щ	-	#		$\parallel \parallel$	Щ	Щ		Щ	Щ	Щ	4			
	+	₩	╫	╫	H	H	+	H	#	#	#	Н	H	#	₩	₩	Ш	#		₩	₩	#	4	- 1		
	1		\dagger	$\dagger \dagger$	H	\forall	+	+	#	#	\dagger	Н	H	#	╫	₩	Ш	Ш	Ш	\parallel	₩	#	Ħ			
			I		H	\prod	1	l		$\dagger \dagger$				+		₩	Ш			$\parallel \parallel$	##	H				
	J	Ш	\prod						\prod																	
	П	Щ	\prod	\prod	\prod	\prod	\prod	\prod	\prod	\prod	\prod	Щ			\prod	Щ	\prod			\coprod	\coprod		I			
		\mathbb{H}	#	#	${\sf H}$	H	H	4	#	#	#	Ш	\blacksquare	4	$\ $	Щ	Ш	Щ	\parallel	Щ	Щ	Щ	4			
		Ш	Ц	Ш	Ц	П	Ш	1	1	Ш	Ц		Ш	Ц	Ш	Ш	Ш	Ш		Ш	Ш	Ш				

DRILL HOLE Soda Lake 11-33

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7	A	Z	72	7	2	17	7	0	V	<u> </u>	/. H	12		Г			_	Τ				44	TH TRAC		D 000000000000000000000000000000000000
EPTA	H	J	ò	T		T	_	T		Ī	7. 57	200	***									38	2. MOD. 3. STAC		DESCRIPTIONS
K	3,5	٩	6	1	6	1	100	1	٧.	L	ş.		6.									33	ı		T. S Thin section for indicated interval, 20 ft. sample interval
7	ره حر	1	(g) (22)	ķ		.[3 123	1	7 188	6	25	9	æ									23			0-400' no cuttings
400		\prod	Щ		Ц	Į	Щ	\prod	\prod	Ц	Щ	\prod	Ц	Щ	Ш	Ш	\parallel		Ш	Ш			400-4	20	Sand, lithic-qtzose, med c grain sub. round-
-		4	Щ		\parallel	\downarrow	Ш	\prod	4	$\!$	Ш	Ц	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ				few lithic pebbles
-	4	4	H	H	\dashv	4	Ш	1	+	\parallel	Щ	Ц	Щ	Щ	Ш	Щ	Щ	Щ	Щ	Щ	Щ		420-4		
-	+	+	H	¥	#	\mathbb{H}	Н	+	#	₩	₩	Ц	Щ	Щ	Щ	Ш	Ш	Щ	Ш	Щ	Щ		440-4	180	
500-	+	+	+	ñ	╫	H	Н	╫	+	₩	┼┤┫	+	Н	Н	Ш	Ш	Щ	\parallel	₩	Н	Щ				in 460-480'.
	$\parallel \parallel$	H	+	H	H	Н	Н	H	+	+	₩	+		₩	#	₩	₩	H	₩	₩	#		480-4		
1 1	$\parallel \uparrow \parallel$		$\dagger \dagger$	H	$\dagger \dagger$	H	H	H	#	H	Н	+	Н	₩	₩	₩	Н	₩	₩	Ш	Ж		430-6	00	Sand, v.f. with few lithic granules some med. grains in 520-540 & 560-580'.
		t	$\dagger \dagger$	Ħ	$\dagger \dagger$	Ħ	$\dagger \dagger$	Ħ	111	H	П	Н	H	₩	₩	₩	Ш	H	₩	Ш	Н				some med. grams in 320-340 & 360-380.
<u>600-</u>					\prod			1]		Ш	Н	Ħ	$\ $	$\parallel \parallel$			$\parallel \parallel$	₩		#				
7.S.—	\prod		\prod	\prod	\prod		\prod	\prod	\prod														600-6	40	Lithic Arkose, c., 1/2 lithic 1/3 fine grains.
	Щ	Ш	\coprod	Ц	\coprod	\prod	\coprod	\prod	Щ	\prod	\coprod			\coprod	${ m I\hspace{1em}I}$	\mathbf{II}		$\ $					640-7	_	Lithic Sand, v.f. to m., 1/2 coarse grains in
-	Щ	4	#	1	\coprod	\parallel	\coprod	\coprod	Щ	Щ	Щ	\coprod	$\downarrow \downarrow$	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ				660-680', few c. grains 680-700
-	Щ	4	$\!$	\parallel	H	H	#	\parallel	Щ	Щ	Щ	Щ	$\downarrow \downarrow$	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ				arkosic, subangular.
700-	HH	+	₩	4	H	H	#	H	H	Щ	\coprod	#	4	Щ	Щ	Щ	Щ	Щ	$\parallel \parallel$	Щ	Щ		<u> </u>		
] -{	HH	H	╫	H	╫	₩	++	H	H	\mathbb{H}	+	\parallel	╢	Ш	₩	#	Щ	#	$\parallel \parallel$	\mathbb{H}	#		700-7	_	Lithic Arkose, v.c. to granules, ~40% lithic
1 -	Н	H	H	H	H	H	╫	H	++	Н	\mathbf{H}	H	H	Н	₩	Ш	Н	₩	₩	\mathbb{H}	Ш		720-7		Lithic Arkose, v.f., with \$\sim 15\% c.v.c. lithic grains
1	+++	Ħ	$\dagger\dagger$	H	H	H	$\dagger \dagger$	H	H	Н	+	$\dagger \dagger$	╫	Ш	₩	Ш		₩	H	₩	Н		740-76	<u> </u>	Tuff, bio-opaque specks few lithic sand grains, tuff prob. waterlain.
		1	$\dagger \dagger$	H	Ħ	H	Ħ	H	Н	Н	\mathbf{H}	H	1		₩		Н	Н	₩	#	Н		780-8	20	Sand, v.f. atzose, few lithic granules and
800-		T	\prod		П	Ħ	\prod	T	Ш	Ш	$\forall t$	Ħ	11	Ш	Ħ			Ш	Ш	₩			-		c. sand grains, few bio. grains.
]			\prod				\prod						\prod		Ш					$\parallel \parallel$	Ш	謹	820-8	40	Silt & clay, mont., few lithic grains.
	Ш	Ц	Ц	Ц	Ц		П				$ lab{1}$	\prod							\prod	$\ $			840-9	20	
	Щ	Ц	Щ	\parallel	Ц	Ц	Щ	Ц	Щ	Щ	4	Ц	Ц	Ш	Ш	Ш		Ш							tuff granules 880 - 920'
900	\coprod	\parallel	#	$\!$	$\!$	$\!$	Щ	\coprod	Ш	Щ	#	Ц	4	Щ	Ш	Щ	Щ	Ш	Щ	Щ	Щ	4			
-	\coprod	₩	H	$\!$	$\!$	H	#	\dashv	Ш	Щ	#	\coprod	\coprod	Щ	Ш	Щ	Щ	Щ	Щ	Щ	Щ				
		₩	₩	$\!$	H	H	H	${\mathbb H}$	H	Н	₩	H	\mathbf{H}	Щ	Ш	Щ	Щ	Щ	Щ	Щ.	Щ		920-9	40	Sand, v.c. to granules, lithic, rounded,
	Н	Ħ	H	H	╁	H	+	H	₩	Н	╫	╫	Н	Н	Н	₩	₩	HH	Ш	₩	Н	7.342	940-10	,,	euh-py. cubes partially cementing.
-		Ħ	#	\dagger	\dagger	H	#	\dagger	H	H	₩	H	H	Ш	Ш	Ш	H	Ш	₩	Ш	#		340-10	"	Graywacke, v.f., lithic with \$\sigmu /3 v.c. grains with some py cement.
1000-		Ħ	\dagger	IT	\dagger	Ħ	11	H		Н	#	Ħ	Ħ	Ш	Ш	₩	Ħ	Ш	Ш	Ш	Н	<i>સારકા હવે.</i> પ્રાપ્તિએક			960-980' qtz sand zone
		Ħ		IT		Ħ	\prod		11		$\dagger \dagger$	Ħ	Ħ	Ш	Ш	₩	Ш	₩	Ш	Ш	H		1010-10	60	Lithic Arkose, v.f., few tuff & lava granules
		II									\prod	Ħ	П	\parallel		Ш	Ш		Ш	Ш	Ħ	°0 ,			py. cubes & massive cementing.
	Щ	\prod	\prod		\prod	\prod	\prod	\prod	\prod	\prod	\prod	\prod	Ш	\prod	\prod	\parallel		\prod	Щ	Ш			1060-12	20	Graywacke, fine, tuff & lava granules, qtzose,
1100-	Ш	\parallel	Щ	μ	\coprod	μ	Щ	$\!$	Ш	Ц	4	\coprod	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ			_	∽15% lithic.
-	\mathbb{H}	#	Ш	4	\mathbb{H}	$\!$	Щ	\vdash	₩	#	#	\parallel	₩	Щ	\parallel	Щ	Щ	Щ	Щ	Щ	Щ.			_	
-	H	₩	H	#	Н	${\mathbb H}$	₩	+	╫	#	#	#	₩	Ш	#	₩	Щ	\mathbb{H}	₩	\mathbb{H}	₩			_	1120-1220., v.f. to f. with lithic granular.
1	H	╫	Н	+	Н	\dag	H	+	H	╫	#	╫	₩	₩	₩	₩	\mathbb{H}	₩	₩	₩	₩,				
1200	H	#	Н	H	Н	H	H	H	H	H	+	H	╫	#	₩	##	\parallel	₩	₩	₩	#				
1200_	\parallel	Ħ	Ш	Ī		\dagger	Ш	H	Η	$\dagger \dagger$	#	#	₩	₩	$\parallel \parallel$	#	H	$\parallel \parallel$	#	#	Ħ,	200		┥	1200-1220, ½ pebbles of tuff & lava.
ľ		T	Ш	T	П	T	Ш	П		$\dagger \dagger$	T	\dagger	Ħ		$\parallel \parallel$		۱	$\parallel \parallel$	$\parallel \parallel$	₩	#		1220-12	60	Sand, arkosic, v.f., few c. lithig. frg.
										\parallel					$\ $			$\parallel \parallel$	Ш	$\ $	Ħ			7	few grains contain celadonite.
	\coprod	\prod	Ш			\mathbb{I}	\prod	\prod	\coprod	\prod					$\ $			\prod	\prod				1260-128	30	Sand, arkosic, f., few lithic granuals.
T.S 1300	Щ	μ	Щ	Ц	Щ	\parallel	Щ	Щ	Щ	\coprod	\coprod	\prod		Щ	Щ	Щ		Ш	Ш	\coprod			1280-13		Lithic Arkose, fine to med. grains
100	\downarrow	$\!$	Щ	Щ	Щ	μ	Ш	Щ	Щ	#	Щ	\parallel	\parallel	Щ	Щ	Ш	Щ	Щ	Щ	Щ	∭.			\Box	few tuff granules 1300-1320'.
-		#	Щ	Щ	4	$\!$	\mathbb{H}	Щ	Щ	\parallel	#	1	$\ \ $	Щ	Щ	Щ		Щ	Щ	Щ	Щ			\dashv	
-	H	H	4	H	\dashv	4	\mathbb{H}	Щ	\sqcup	\dashv	#	4	$ \parallel$	Щ	Щ,	Щ	#	Ш	#	Щ	Щ:		1340-130	_	Sand, lithic, v. c. to granular
-	#	+	+	H	+	H	H	Щ	+	H	+	#	#	\mathbb{H}	Ш	Ш	#	$\parallel \parallel$	₩	Щ	#	5.6:	1360-138	30	Arkose, mf., & v. coarse bival. shell at 1370'
1400-	++	H	+	H	+	-	Н			+	H	+	1	H	Ш	\mathbb{H}	₩	₩	₩	₩	H	300000 300000	1300 15		lithic-tuff grains.
†	#		H	$\dagger \dagger$	\dagger	H	Н	Н	+	#	H	H	╫	H	₩	Ш	₩	₩	₩	₩	#		1380-15·	40	Graywacke, fine-med. grained, chal.
#		H	$\dagger \dagger$	Ħ	\dagger	Н	H	H	#	$\dagger \dagger$	$ \mathbf{f} $	\dagger	1	₩	Ш	₩	₩	$\parallel \parallel$	₩	₩	#			\dashv	cement with chlorite in final interst. pores.
	-	نك	-1.1	Н	1		_1.		1	-		ч.	Ш	Ш	Ш	1111	111	ш	Ш	Lil	ЦŚ	1 10 7 10 10 10 10 10 10 10 10 10 10 10 10 10			

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-		4	ı	Ц	Ц	Ц		Ц		\downarrow	Ц	Щ	Щ	Ц	Ц	Щ	Ш	Ш				$ lap{\parallel}$	$\ $					
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1500-	f	╫	₽	H	H	Н	8	H	H	\vdash	╫	H	+	$\!$	H	Щ	Щ	₩	Щ	Ш	Ш	Щ	Щ	Щ		\$		1480-1560 small bival. shells
-	H	╫	ŀ	H	H	Н		\dagger	H	\dagger	╫	H	+	+	H	Н	Ш	₩	Н	+	₩	₩	Н	Щ				1500-1520 secondary qtz., calcite cement.
	ı	Ħ	ı	H	H	H	1	1		+	H	Ħ	H	\dagger	H	Н	₩	╫	Н	Н	₩	₩	Н			-	1540-158	Sile of Burd Co. A
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V600-	\prod	\prod				Ц											$\parallel \parallel$	Ш		ı	Ш	П	Ш	1		ं	1580-1820	Graywacke, fine grd. tuffaceous
-	\parallel	\prod	\parallel	4	μ	\coprod		\downarrow		\prod	4	\coprod	\coprod	\prod	Ц	\prod	\prod	\prod	\prod		\prod			\prod				Trace cinnabar 1580-1600
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-	H	H	Н	\parallel	$\!$	H	ı	4	$oldsymbol{\parallel}$	#	#	H	#	#	\parallel	Щ	Щ	Щ	Щ		Щ	Щ	Щ	Щ				Celadonite? in matrix 1580-1620
1	\dag	H	Н	#	${\sf H}$	H		+	+	H	#	₩	╢	H	#	₩	Щ	\mathbb{H}	₩	#	$\parallel \parallel$	Щ	Щ	₩	多数			~/3 c. grain zones-1660-1720
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1 1		П		H		H		П		Н	H	\parallel		Н	Ħ	Ш	Н	Ш	₩	H	Ш	₩	₩	#			 	1700- celadonite in matrix 1720-1740 coarse drill chips
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		Ш				Ц		\prod						\prod	\prod			\parallel			П	$\parallel \parallel$	Ш	П	-/60	4	1760-1800	1/2 basaltic-andesite, trachytic text.
1800-	Щ	Щ	Ц	Ц	L	Ц	1	Ц		Щ	$oldsymbol{\perp}$			Ц	\prod	Ш		${ m I\hspace{1em}I}$			$ lap{\parallel}$	\mathbb{I}	III	III		`		Olive black color, 1/2 mm plag laths.
76-	Ш	Н	H	Н	Ļ	4		\coprod	P	$\downarrow \downarrow$	4	\parallel	4	Ц	4	Ш	Щ	Щ	Ш	Щ	Щ	Щ	Щ			10		1800-1820 fine ground graywacke?
7. S.→		H	₩	H	+	+	ļ	H	H	H	\mathbb{H}	$\!$	1	H	$\!$	Щ	Щ	Ш		Ш	Щ	Щ		Щ	深刻		1820-1840	
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1900-	П	$\forall I$	Ħ	Ħ	Ħ	†	Ī	Ħ	Ħ	Ħ	П		IT	$\dagger \dagger$	Ħ	#	₩	††		╫	Ħ		₩	Ш			1000-1300	alt & fresh basait, xi tuff frag. & micrite.
		$ lab{1}$	\prod					П			1	1	T	H	1	\parallel	$\parallel \parallel$	Ш	\parallel	Ħ	Ш	П	₩	H	4	4	1900-1920	
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2000	H	₩	╫	H	H	$^{\!+\!$	+	H	H	₩	₩	\parallel	+	$\!$	Н	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Щ	Ц			<u>1960-2000</u>	Basalt, olive-black, ~/3 tuff. grains
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1	\prod	1		1	I	\parallel	I					$\dagger \dagger$	T			اال	\parallel	╫	H	H	₩	\parallel	Ш	H		ŀ		weathering, chill, vesicles or oxida tion which might indicate
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