

Drill Hole NC-EWDP-19IM1A (NC-EWDP-19IM1)

Location= Latitude: 36° 40' 14.615", Longitude: 116° 26' 56.397"

Compiled and interpreted by Richard W. Spengler, 9/04/02

Elevation=2687.3 feet (ground)

Nomenclature of lower volcanic units and Tertiary sedimentary strata, for the most part, follows that found in Wahl and others (1997).

Geophysical log observations based on raw counts of geophysical logs. Geophysical measurements from Nye County drill holes are currently (9/2002) considered unqualified data.

<u>Stratigraphy</u>	<u>Lithologic Description</u>	<u>Petrographic and Trace Element Characteristics</u>	<u>Geophysical Signature</u>	<u>Confidence Assessment</u>	<u>Unit Top (feet)</u>	<u>Unit Base (Feet)</u>	<u>Thickness (Feet)</u>	<u>Elevation of Base of Unit (Feet)</u>		
Qal	Quaternary Alluvium		No diagnostic geophysical signature could be identified.		0	5	5	2682		
QTu	Quaternary and Tertiary Alluvium		Gravels and sands, volcanic, commonly light brownish gray (5YR6/1), medium light gray (N6), very pale orange (10YR 8/2), pale brown (5YR 5/2) composed of a mixture of tuff fragments of variable characteristics, dominantly non- to densely welded, some zeolitic and silicified. Sand size fraction of processed samples comprises between 30 and 70 percent of sample. Sand fraction is grayish orange pink (5YR 7/2), is medium to coarse grained, and dominantly composed of sanidine and quartz phenocrysts. Significant mixing of samples		The temperature log indicates an abrupt decrease at a depth of 348 feet. Moisture log indicates an abrupt decrease at 344 feet. Density log abruptly increases at 354 feet. All logs appear to be responding to the proximity of the water table. Geophysical logs remain relatively constant to a depth of about 716 feet. The temperature log indicates several subtle changes in slope that occur at 463, 546, and 571 feet.	Some workers believe that Quaternary alluvial deposits rarely exceed 50 meters in thickness; therefore these deposits are labeled as undivided Quaternary and Tertiary alluvium.	5	605	600	2082

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	<p>probably occurs within the alluvial section, which makes it a challenge to segment the vertical section into alluvial subunits. Interval from 390-392.5 is composed almost exclusively of densely welded tuff fragments of the Topopah Spring Tuff. Interval from 520-522.5 contains an abundance of coarse sand. A conspicuous concentration of vitrophyric and basaltic fragments was identified at a depth of 82.5 to 85.0 feet and 395 to 397.5 feet. Refer to "geophysical signature" for possible subdivisions.</p>							

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QTu	Quaternary and Tertiary Alluvium	Sand, some gravel-size fragments, tuffaceous, pale yellowish brown (10YR 6/2), light brown (5YR 6/4), and pale brown (5YR 5/2), contains abundant phenocrysts of sanidine, some quartz. The relative abundance of sand size particles is significantly more than the interval described above.		The moisture log indicates a notable decrease at about 713 feet and the density log shows an abrupt increase at a depth of about 696 feet. Other geophysical logs remain relatively constant to a depth of about 716 feet. The temperature log indicates a subtle change in slope that occurs at 658 feet. Two more conspicuous changes in slope of the temperature profile occur at a depth of 720 and 780 feet, where, respectively, an abrupt decrease and increase in slope can be observed.	Changes in the geophysical log response near the middle of the unit do not appear to be correlative with any variations identified in the bit-cutting samples. The lack of correlation may be due to changes in size of particles that cannot be detected in processed bit-cutting samples.	605	813	208	1874
Tpt	Topopah Spring Tuff	Pyroclastic flow deposit, very pale orange (10YR8/2) and yellowish gray (5Y 8/1), nonwelded, highly vesiculated, zeolitic, pumice-rich, very pale orange, zeolitic and slightly argillic, sparse light olive gray (5Y6/1) volcanic lithic fragments. Porosity is estimated to vary between 10 and 25 percent. Microcrystalline quartz and (or) zeolites commonly line	Thin section analysis of an unqualified ("grab") sample from 905 to 910 feet corroborates previous samples from nearby NC-EWDP-19D1, indicating a total phenocryst content of 0.5 percent. Of the phenocrysts, 33 percent are alkali	Top of tuff is marked by an abrupt increase on the density log at 812 feet. Moisture log indicates an abrupt decrease in counts per second at a depth of 813 feet.	High confidence is given that the tuff is part of the Paintbrush Group, based on very low phenocryst content and the essential mineral assemblage. High confidence is given that the tuff represents the nonwelded basal part of the Topopah Spring Tuff on the basis of similar petrographic and trace element characteristics from NC-	813	Could not be determined, greater than 1012.	Could not be determined. Based on nearby NC-EWDP-19D1, unit thickness is significantly greater than 200.	Elevation at total depth of the drill hole was not deep enough to determine elevation of base of unit. However, it is greater than 1675.

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	<p>cavities, which rarely exceed 1 mm in size. Samples indicate only minor mixing throughout interval. Rare fragments of very pale orange (10YR 8/2) pyroclastic flow first appears within the sample interval of 810 to 815 feet. Samples from 820 to 900 feet contain 80 to 90 percent very pale orange (10YR 8/2) pyroclastic flow deposit.</p>	<p>feldspar, 58 percent are plagioclase, and 9 percent are hornblende.</p> <p>These petrographic features appear to match those found in samples of the crystal poor member of the Topopah Spring Tuff. However, the nonwelded basal part of the Topopah Spring Tuff rarely exceeds a few tens of feet in thickness at outcrops in the vicinity of the drill hole.</p> <p>Relatively immobile trace elements such as Ti, Zr, and Ba are tightly clustered and fall within the clustered domain between the Topopah Spring Tuff and the Calico Hills Formation. Based on samples from NC-EWDP-19D1, the mean</p>		<p>EWDP-19D1. However, the possibility that the tuff is part of the Calico Hills Formation cannot be completely ruled out, as the trace element and petrographic characteristic of the Topopah Spring and Calico Hills are, in some cases, quite similar. Abrupt variations occur in most geophysical logs near the top of unit.</p>				

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		concentrations for Ti, Zr, and Ba are 725 ppm, 112 ppm, and 176 ppm, respectively. Ti, Zr, and Ba values range from 660-852 ppm, 101-118 ppm, and 64-701 ppm, respectively.						
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Total depth of hole was 1012.5 feet. Hole was initially drilled using the reverse circulation method to a depth of 900 feet. And is referred to as borehole NC-EWDP-19IM1A. It was later drilled to a total depth of 1012.5 ft using mud and referred to as NC-EWDP-19IM1. Samples below 900 feet were not collected at specific sample intervals, were not processed, and therefore, are not currently considered qualified samples. Samples collected below 900 feet were used only to corroborate previous samples collected from drill hole NC-EWDP-19D1, which is located on the same drill pad, approximately 66 feet to the south. Processing of all qualified samples by the Sample Management Facility includes the discarding of sample material larger than 4.75 mm (in bedrock) and 8 mm (in alluvium) and smaller than .045 mm. Therefore, all processed samples will not include any very fine nor large sample fragments. Reference: Wahl, Ronald R., Sawyer, David A., Minor, Scott A., Carr, Michael D., Cole, James C., Swadley, WC, Laczniak, Randell J., Warren, Richard G., Green, Katryn S., and Engle Colin M., 1997, Digital Geologic Map Database of the Nevada Test Site area, Nevada, U.S Geological Survey Open-File Report 97-140, 47 p. (TIC#247201).