Drill Hole Data USW G-3/GU-3[1]

Depth in Meters

Ground Surface Elev. 1480.2 m A.S.L.

Surface Casing 9.5 m

22.23 m

12.07 m Static Water Level 804.7 m

10.80 m

Total Depth 1533.39 (uncorrected)

Stratigraphic Unit / Lithologic Description – Distinguishing Features

Stratigraphic Unit	Lithologic Description – Distinguishing Features
Tiva Canyon Member	Tuff, ash-flow, biotite rich, moderately welded, devitrified, silicic volcanic lithic fragments as large as 1cm
	Tuff, ash-flow, lt. gray, devitrified, mod. to densely welded, sparse to abundant pumice and lithophysal cavities
	Tuff, ash-flow, lt. gray, grading downhole to lt. brownish-gray, devitrified, moderately to densely welded, pumice common, lithophysal cavities near absent, fractures contain calcite, smectite, and breccia, < 1% silicic volcanic lithic fragments up to 0.4 cm
	Tuff, ash-flow, lt. brownish-gray, devitrified, mod. to densely welded, elongate pumice, lithophysal cavities form 2–12 % of the rock, as large as core diameter (6 cm), fractures contain calcite, clay, palygorskite, and breccia
	Tuff, ash-flow, lt. brownish-gray, grading downhole to pale-red, devitrified, mod. to densely welded, pumice common, lithophysal cavities absent, fract contain calcite, clay, no silica; Basal vitrophyre, 104–107 m, moderately to nonwelded basal zone, 107–119 m. (Basal vitrophyre)
Bedded Tuff	Tuff, bedded, pyroclastic fall, poorly indurated, in part nonwelded ash-flow and minor reworked tuff
Topopah Spring Member	Tuff, ash-flow, non-welded to mod. welded, pumice common 130.4–131.6 m vitrophyric
	Tuff, ash-flow, devitrified, moderately welded, pumice common and locally very large,
	Tuff, ash-flow devitrified moderately welded, pumice sparse to common, lithophysal cavities common to abundant (5–20 % of rock)
	Tuff, ash-flow, moderately to densely welded, devitrified, pumice sparse to common, (gradation from sparse to rare lithophysal cavities downhole
	Tuff, ash-flow, highly mottled w/ lt. brownish gray, devitrified, moderately to densely welded, pumice common
	Tuff, ash-flow, vitrophyre, densely welded, pumice common
Bedded Tuff?	Tuff, ash-flow, vitric, mod. to nonwelded downhole, pumice common in mod. welded portion, bottom of zone extremely friable.
Tuffaceous Beds of Calico Hills	Tuff, ash-flow, vitric, nonwelded, pumice common to abundant, abundant lithic fragments of nonwelded rhyolite tuff, obsidian lithic frags. in tuff portion, desiccation cracks
Bedded Tuff	Tuff, bedded, mod to poorly indurated, lithic and pumic rich layers up to 1 m thick
Prow Pass Member	Tuff, ash-flow, vitric, lower 70 m locally devitrified to partially vitric, non-welded to partially welded, pumice common, mudstone lithic fragments.
Bedded Tuff?	
Bullfrog Member	Tuff, ash-flow, partially devitrified to vitric, partially welded to nonwelded, lithic fragments, pumice common
	Tuff, ash-flow, devitrified, moderately welded, welding increases downhole, pumice common, below 666 m mod. to densely welded.
	Tuff, ash-flow, mod. to densely welded, devitrified to partially devitrified, pumice common, lithic fragments., partially to non welded downhole
Bedded Tuff?	
Tram Member	Tuff, ash-flow, mod. to nonwelded, upper 25 m mottled, devitrified, locally quartz rich, pumice common,
	Tuff, ash-flow, moderately to densely welded, partially to mod. welded below 984 m, devitrified, vitrophyric 982–984 m, pumice common, lithic fragments sparse to abundant locally quartz rich, cooling alteration of lithic fragments below 1083 increasing downhole,
Bedded Tuff?	
Lithic Ridge Tuff	Tuff, ash-flow, nonwelded to moderately welded, devitrified, pumice common, lithic fragments (5–20%) to abundant
Bedded Tuff	Tuff, bedded, reworked, mainly pyroclastic fall, poorly to well indurated carbonized wood fragments @ 1435.47 m.
Older Tuffs	Tuff, ash-flow, devitrified, partially to densely welded, degree of welding increasing downhole, pumice common, lithic fragment poor

Fracture Density[2]

Fractures / unit cubic meter

Interval	Fractures / unit cubic meter
	22
	8.5
	0.7
	8
	42
	10
	3
	16
	26
	8
	12
	23
	2.3
	0.5
	3.5
	0.3
	0.7

WWL # 20

Porosity[3]

Percent (plotted as a function of depth of origin)

59% @ 114 m

No data points through this interval 121 m – 345 m

18 data points projected into this interval 345 m – 365 m

From WWL # 22 Table 1

Saturated Hydraulic Conductivity

of samples from well GU-3 plotted vs depth of origin

m/s

No data points through this interval 121 m – 345 m

From WWL # 56 Table A.2

Hydrologic Units[4]

Hydrologic Unit	Description
Tiva Canyon Welded Unit	Moderately to densely welded, devitrified, lithic-rich tuff of the Tiva Canyon member of the Paintbrush tuff
Paintbrush Welded Unit	Partially to nonwelded, vitric and secondarily devitrified tuffs of the Tiva Canyon, Yucca Mtn, Pah Canyon and Topopah Spring members
Topopah Spring Welded Unit	Moderately to densely welded, devitrified zone of the Topopah Spring member of the Paintbrush tuff which contains more than approx 10 % vugs by volume
Topopah Spring Welded Unit	Moderately to densely welded, devitrified zone of the Topopah Spring member of the Paintbrush tuff which contains less than approx 10 % vugs by volume This is the potential repository unit
Basal Vitrophyre of the Topopah Spring Welded Unit	Basal vitrophyre of the Topopah Spring member of the Paintbrush tuff
Vitric Calico Hills Nonwelded Unit	Nonwelded ash flows, bedded and reworked tuff, vitric and devitrified in places, Topopah Spring member and the Calico Hills
Vitric Calico Hills Nonwelded Unit	Basal, bedded, reworked zone of the vitric tuffs and tuffaceous sandstones of the Calico Hills
Vitric Calico Hills Nonwelded Unit	Upper vitric zone of the Prow Pass member of the Crater Flat tuff
Prow Pass Welded Unit	Moderately welded devitrified zone of the Prow Pass member of the Crater Flat tuff
Crater Flat Nonwelded Unit	Zeolitized portions of the lower Prow Pass member and the upper Bullfrog member of the Crater Flat tuff
Bullfrog Welded Unit	Welded devitrified zone of the Bullfrog member of the Crater Flat tuff

WWL # 56

Notes on Test Holes USW G-3/GU-3

1) USW G-3/GU-3 is actually two boreholes; G-3 being displaced approximately 20 meters N-NE of the GU-3 location; USW GU-3 was cored in the unsaturated zone from 415 m to 805.63 m depth, and was drilled to a total depth of 806 m. USW G-3 was cored largely in the saturated zone from 735 m to total depth at 1523.30 m because of the low density, data and samples are treated as originating from a single, continuous drillhole.
   - Drilling fluid consisted of polymer and bentonite mud for GU-3; air/soap and polymer mud for G-3.
   - Ground surface elevation for both holes is 1480.2 m above sea level.
   - Static water level 804.9 m depth
2) These fractures include only mineralized cracks, cracks with altered walls, or cracks showing evidence of shear. Such as breccia, gouge or slickensides, fracture density is calculated per unit cubic meter.
3) Solid line connects data points from WWL # 22 Table 1, dashed line connects data points from WWL # 56 Table A.2. (No values given for interval 121 m – 345 m depth) Lines connecting data points are for visual comparison, and may not be valid for interpolation of porosity values between data points.
4) This table presents a summary of functional stratigraphies found in the two drill holes, developed by Ortiz (1996).

D-01.