

Nye County Early Warning Drilling Program

Summary Lithologic Log

BOREHOLE ID: NC-EWDP-24P

Depth	LITHOLOGY	DESCRIPTION
0		(0 to 60 feet [ft]) INTERBEDDED WELL-GRADED SAND WITH SILT, CLAY AND GRAVEL (SW-SM/SC) AND SILTY, CLAYEY SAND WITH GRAVEL (SM/SC): The interval consists of layers of well-graded sand with silt, clay and gravel (SW-SM/SC) up to 12.5 feet thick interbedded with thinner layers of silty, clayey sand with gravel (SM/SC). Fines in the SW-SM/SC layers typically display no plasticity, and fines in the SM/SC layers typically display no to low plasticity. Gravel clasts are volcanic in origin and subangular. Sediment colors range from predominantly yellowish brown (10YR 5/4) to brown (7.5YR 4/4, 5/2), gray (5YR 5/1) and light reddish brown (5YR 6/3). Cementation is observed to be moderate from 0 to 17.5 ft. No cementation is observed from 17.5 to 60 ft. Sediments reacted strongly to 10 percent (%) hydrochloric acid (HCl). All samples are dry.
100		(60 to 245 ft) WELL-GRADED SAND WITH SILT, CLAY AND GRAVEL (SW-SM/SC): The interval consists primarily of layers of well-graded sand with silt, clay and gravel (SW-SM/SC) up to 17.5 ft thick. Lesser layers of well-graded sand with gravel (SW) and silty, clayey sand with gravel (SM/SC) are present, with the proportion of the latter increasing toward the base of the interval. Fines typically display no to low plasticity, with a zone of moderate plasticity from 200 to 210 ft. Gravel clasts are volcanic in origin and subrounded to subangular. Sediment colors range from predominantly reddish brown (5YR 4/3, 5/4) to light reddish brown (5YR 6/3), dark reddish brown (5YR 4/2), yellowish brown (10YR 5/6, 5/4), yellowish red (5YR 5/6), dark yellowish brown (10YR 4/4), brown (10YR 4/3), and grayish brown (10YR 5/2). No cementation is observed. Typically, sediments do not react to 10% HCl from 60 to 170 ft, and react strongly from 170 to 245 ft. Samples of drill cuttings are dry. Moisture is observed in drive core samples from 80, 120, 160, 200 and 240 ft.
200		(245 to 400 ft) SILTY, CLAYEY SAND WITH GRAVEL (SM/SC): The interval consists primarily of layers of silty, clayey sand with gravel (SM/SC). Fines typically display low plasticity from 245 to 272.5 feet, and moderate to high plasticity from 272.5 to 400 ft. Gravel clasts are volcanic in origin and typically subangular to angular. Sediment colors range from predominantly light brown (7.5YR 6/4) to grayish brown (10YR 5/2), reddish brown (5YR 5/3, 5/4), and brown (7.5YR 5/4). Weak cementation is observed. Sediments react strongly to 10% HCl. Samples of drill cuttings are dry. Moisture is observed in drive core samples from 280, 320, and 360 ft.
300		(400 to 890 ft) ASH-FLOW TUFF (BULLFROG TUFF): The tuff is moderate brown (5YR 3/4) to light brown (5YR 5/6), devitrified, and variably welded, with moderate welding from 400 to 505 ft, dense welding from 505 to 560 ft, moderate welding from 560 to 690 ft and 825 to 890 ft, and dense welding from 690 to 825 ft. A weak zone of spherulitic development occurs from 535 to 540 ft. The tuff matrix is open and porous from 400 to 440 ft and dense/nonporous from 440 to 890 ft. The tuff contains 10-20% very pale orange (10YR 8/2) pumice clasts up to 5 millimeters (mm) in diameter from 695 to 730 ft, and 1% pale yellowish orange (10YR 8/6) pumice clasts from 870 to 885 ft, 1 to 5% grayish brown (5YR 3/2) to black (N1) lithic clasts from 2 to 10 mm in diameter from 400 to 545 ft. Locally, from 545 to 890 ft, the tuff contains 2 to 10% light grey (N3-N8) lithic clasts from 3 to 15 mm in diameter. The tuff also contains 1 to 3% colorless feldspars up to 2 mm long, 2 to 5% light grey (N7) to colorless quartz phenocrysts up to 2 mm in diameter from 400 to 830 ft, 1% light grey (N7) to colorless quartz phenocrysts from 830 to 890 ft, and 1 to 5% greenish black (5GY 2/1) and black (N1) biotite up to 3 mm long and trace hornblende from 480 to 890 ft. Reaction with 10% HCl is observed where white calcite fills open fractures in samples from 525 to 530, 555 to 560, 580 to 585, 605 to 615, 655 to 665, 680 to 685, and 705 to 710 ft. The lower contact is sharp with the underlying sedimentary rock.
400		
500		
600		
700		
800		
890		(890 to 933 ft) SANDSTONE (PRE-BULLFROG TUFF SEDIMENTARY ROCKS): The interval consists of dark reddish brown (5YR 3/2 to 5YR 5/6) conglomeratic sandstone from 890 to 915 ft, grading into light brown (10YR 5/4) fine volcanoclastic sandstone from 915 to 933 ft. The conglomeratic section contains 15 to 85% gray (N4) and reddish brown (5YR 3/2) rounded volcanic pebbles and rare reddish brown (5YR 3/4) siltstone fragments. The sandstone is argillitic, or zeolitic, and weathered. The lower contact is gradational with the underlying ash-flow tuff.
933		(933 to 1,356 ft) ASH-FLOW TUFF (TRAM TUFF): The tuff is variable in color and ranges from pale orange (10YR 8/2) from 933 to 1,035 ft, reddish brown (10R 6/4) from 1,035 to 1,135 ft, light brown (5YR 5/6) from 1,135 to 1,200 ft, and grayish orange (5YR 7/2) from 1,200 to 1,356 ft. The tuff is devitrified, has an open/porous matrix, and is generally nonwelded, except for zones of weak welding at 1,005 to 1,010 ft, 1,030 to 1,040 ft and 1,100 to 1,115 ft. From 933 to 985 ft, the tuff is locally weakly to moderately weathered. From 985 to 1,356 ft, the tuff is unweathered. The tuff contains 10 to 20% moderate orange pink (5YR 8/4) to greenish grey (5GY 6/4) pumice clasts from 5 to 8 mm in diameter from 940 to 1,190 ft, 1 to 2% orange pink (5YR 8/4) to light brown (5YR 8/2) pumice clasts from 1 to 5 mm in diameter from 1,190 to 1,356 ft, 2 to 20% reddish brown (5YR 3/4) to gray (N5) lithic clasts from 2 to 10 mm in diameter from 933 to 1,190 ft, and 2 to 25% reddish brown (10R 4/6) to black (N1) lithic clasts from 2 to 10 mm in diameter from 1,190 to 1,356 ft. From 940 to 955, 1,120 to 1,190, and 1,220 to 1,240 ft, lithic clasts can comprise up to 25% of the tuff. The tuff also contains 1 to 2% colorless feldspars up to 2 mm long from 935 to 1,065 ft and 1,190 to 1,355 ft, 1 to 2% light gray (N5 to N8) to colorless quartz phenocrysts up to 3 mm in diameter, 1 to 3% greenish black (5GY 2/1) to black (N1) biotite up to 2 mm long from 933 to 1,140 ft, and 1% black (N1) biotite up to 1 mm long from 1,140 to 1,356 ft. No reaction to 10% HCl is observed. The lower contact is sharp with the underlying sedimentary rocks.
1000		
1100		
1200		
1300		
1356		(1,356 to 1,400 ft) VOLCANICLASTIC SEDIMENTARY ROCK (PRE-TRAM TUFF SEDIMENTARY ROCKS): The interval consists of variably colored calcareous volcanoclastic siltstone, claystone, and fine sandstones. The colors range from red (10R 4/6) from 1,356 to 1,366 ft to pale olive (10Y 6/2 to 5/4) from 1,366 to 1,400 ft. The sequence consists of an upper section of red siltstones and claystones from 1,356 to 1,359 ft overlying olive-colored, fine sandstones with siltstone beds from 1,366 to 1,400 ft. Typically, the sequence reacts strongly to 10% HCl.
1400		
1400		(1,400 to 1,480 ft) REWORKED TUFF (LITHIC RIDGE TUFF): The tuff is light olive (10Y 5/4) to olive gray (5T 3/2) from 1,400 to 1,425 ft, greenish yellow (10Y 7/4) from 1,425 to 1,430 ft, olive brown (5Y 4/4) from 1,430 to 1,455 ft, and dark yellowish orange (10YR 6/6) from 1,455 to 1,480 ft. The tuff is devitrified, nonwelded, has an open/porous matrix, and is moderately weathered from 1,400 to 1,430 ft. The tuff contains 1 to 3% yellowish green (10Y 6/6) pumice clasts up to 3 mm in diameter from 1,400 to 1,420 ft, 8 to 10% greenish yellow (5Y 8/4) pumice clasts up to 3 mm in diameter from 1,450 to 1,480 ft, 2 to 10% pale brown (5YR 5/2) to gray (N5) lithic clasts from 2 to 20 mm in diameter from 1,400 to 1,455 ft, and 10 to 50% gray (N5) to brownish black (5YR 2/1) lithic clasts from 6 to 20 mm in diameter from 1,455 to 1,480 ft. The tuff also contains up to 1% colorless feldspar phenocrysts up to 2 mm long from 1,400 to 1,455 ft, up to 10% light gray (N8) quartz phenocrysts up to 2 mm in diameter from 1,400 to 1,420 ft, and 1 to 2% black (N1) mafic minerals up to 1 mm long from 1,400 to 1,480 ft. The rock has no reaction to 10% HCl. The lower contact is gradational with the underlying ash-flow tuff, suggesting that the unit is a reworked tuff derived from the underlying unit.
1500		
1480		(1,480 to 1,722 ft) ASH-FLOW TUFF (LITHIC RIDGE TUFF): The tuff is highly variable in color, from dark yellowish orange (10YR 6/6) from 1,480 to 1,540 ft, moderate red (5R 5/4) from 1,540 to 1,600 ft, greyish orange (10YR 7/4) to moderate red (5R 5/4) from 1,600 to 1,655 ft, and moderate orange pink (10YR 7/4) from 1,655 to 1,722 ft. The tuff is devitrified, nonwelded, with an open/porous matrix. The tuff is moderately weathered from 1,480 to 1,500 ft, slightly weathered from 1,480 to 1,505 ft, and fresh from 1,505 to 1,722 ft. The tuff contains 10 to 20% pale brown (5Y 3/4) to pale orange (10Y 8/2) pumice clasts from 2 to 5 mm in diameter from 1,480 to 1,540 ft, 1 to 5% greenish yellow (10Y 8/2-7/4) pumice clasts to 4 mm in diameter from 1,540 to 1,722 ft decreasing in size and content with depth; and 5 to 10% moderate brown (5YR 4/4) to gray (N4, N5) lithic clasts up to 10 mm in diameter throughout the interval, with concentrations of 10 to 20% from 1,520 to 1,550 ft and 20 to 50% from 1,600 to 1,722 ft. The tuff also contains 1% and, locally, up to 5% light gray (N7) to colorless quartz phenocrysts up to 2 mm in diameter; 1% colorless feldspar phenocrysts from 1,510 to 1,710 ft; and 1 to 4% black (N1) mafic minerals up to 2 mm long from 1,480 to 1,722 ft. No reaction to 10% HCl is observed. The lower contact is gradational with the underlying weathered, clayey, sedimentary rocks.
1600		
1700		
1722		(1,722 to 1,860 ft Total Depth) CLAYSTONE, SILTSTONE, AND SANDSTONE (PRE-LITHIC RIDGE TUFF SEDIMENTARY ROCKS) The interval consists of a variably colored sequence of claystone, siltstone, and sandstone. The rocks are brown (5YR 6/4, 3/2 and 10YR 5/4, 3/4) from 1,722 to 1,795 ft and moderate brown (5YR 3/4) from 1,795 to 1,860 ft. From 1,722 to 1,760 ft, the interval consists predominantly of fine-grained volcanoclastic sandstone and layers of claystone, grading downward into predominantly finely laminated siltstones at 1,760 ft. Reaction to 10% HCl is variable with no reaction from 1,722 to 1,730 ft, weak reaction from 1,730 to 1,735 ft, strong reaction from 1,735 to 1,750 ft, weak reaction from 1,750 to 1,810 ft and strong reaction from 1,810 to 1,860 ft at the total depth. Trace amounts of gypsum are observed with the cuttings from 1,800 to 1,805 ft and 1,830 to 1,835 ft.
1800		