NYE County NWRPO -Technical Data Report

RID No.	Transmitter	Org.	Receiver	Org.	Key word1	Title/Description
7683.00	Walker	NWRPO	QARC	Nye	4PD	Summary Lithologic Log for NC-EWDP-4PD

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Title of Data Summary Lithologic Log for NC-EWDP-4PD

Description of Data Geologic summary of alluvium and non-alluvium described during drilling of borehole.

Data Collection Method Summary of existing data.

Data Location(s) Borehole drilled in southern Jackass Flat, north of Highway 95.

Data Collection Period(s) 7/14/08 to 8/07/08

Data Source(s) 1) Alluvium Logging Form for 4PB, 4PC and 4PD; 2) Non-Alluvium Logging Form for 4PD; 3) Nye County NWRPO laboratory testing data for 4PB and 4PD that includes particle size distribution (PSD or sieve data) and hydrometer data (silt/clay measurement); and 4) Geophysical Log Data for 4PD (used primarily for determining textural properties of lithologic layers and verification of stratigraphic contacts).

Data Censoring None

Data Processing Data Processing: Observed grain size distribution for alluvium from lab data and assigned USCS designations where possible and assigned contacts. Summarized description of alluvial units including: interlayering, thickness of layers, color, lithology, moisture, grading, gravel/sand shape, sediment cementation, and sediment reaction to 10% HCL acid. Summarized description of non-alluvial units including: color; welding of volcanic rocks; alteration and devitrification (volcanic units); weathering (if present); structure (if observed); matrix porosity (volcanic units); pumice clast color, content and size, lithic clast color, content and size, phenocryst color, content and size; HCl reaction, contact relationships and probable formation or unit name. Graphic log added to description using WellCAD® software.

Data Limitations Due to the fact that NC-EWDP-4PD was drilled with conventional mud-rotary methods the unconsolidated formation drill cuttings (alluvial and valley-fill) collected are not representative of in situ sediments (TP-8.0). The samples are biased toward the coarse fraction and considered disturbed from in situ conditions. For this reason the alluvium from this borehole, including the particle size distribution and USCS group symbol recorded on the Alluvium Drill Cuttings Logging Form were censored. However, two nearby boreholes drilled on the same site using reverse circulation hammer (Becker Method) drilling methods. Cuttings samples produced from these nearby boreholes are considered reasonably representative of in situ conditions than are the mud rotary samples from 4PD. Borehole 4PB is approximately 40 ft east of 4PD and was drilled and sampled to 850 ft in January 2000. Archived samples from 4PB were tested (PSD and hydrometer data) in the NWRPO laboratory in August 2008. Borehole 4PC is approximately 20 ft west of 4PD and was drilled and sampled to 460 ft in June and July of 2008. Samples from 4PC were tested (PSD and hydrometer data) in October 2008. Because of the close proximity of all three boreholes, a close agreement of textural properties would be expected. The alluvial sediments encountered in 4PB and 4PC are reasonably consistent. Between both boreholes exhibiting similar fine and coarse textured layers and by extrapolation they are assumed to be consistent with sediments underlying 4PD which is situated between the two boreholes. Some textural differences in the alluvial deposits due to lateral facies changes probably exists and there are likely slight differences in the depth to the stratigraphic contacts due to dip of the depositional units. From ground surface to 850 ft, wet sieve and hydrometer data for 4PB and 4PC was relied upon to determine particle size distribution (relative percentages of gravel, sand, silt and clay) and sediment layering. Reliable sieve data was not available for sediments below 850 ft. Visual comparison of PSD data curves from 4PB and 4PD above 850 ft indicate large sample bias resulting from drilling and sampling of mud-rotary cuttings. The comparison illustrated that 4PD mud-rotary samples are not representative of in situ conditions, as recognized in

previous EWDP investigations, rotary drilling pulverizes coarser components into finer particles and the in situ fines (silt and clay) are carried away in the drilling mud. For these reasons 4PD PSD data was not used for sediment texture and layering analysis. The Alluvium Drill Cuttings Logging Form however was used for determining properties of the sediment that are not affected by mud-rotary drilling methods such as color, grain shape, cementation, sediment reaction to HCL, major rock type represented in the gravel clasts, and plasticity where available. Plasticity is not always reliable because of the plasticity introduced into the samples as a result of bentonitic drilling fluids. Therefore, plasticity estimates are only reliable when natural formation clays are preserved. Drilling rate, as recorded on the Alluvium Drill Cuttings Logging Form, was also used to help distinguish soft clayey units that drill slowly because of bit plugging with clay from loose and non-cohesive granular units that drill much faster. Below 850 ft, geophysical logs were relied upon for identifying bulk textural differences in the sediments and layering thicknesses. No attempt was made on the Summary Lithologic log to assign USCS Group Symbols to sediments below 850 ft where particle size data is not available from the lab; therefore, below 850 ft only general descriptions of sediments are shown on the Summary Log. Gamma, resistivity, density, and sonic logs all show recognizable signatures and have spatial trends that allow the assignment of depth intervals to fine and coarse textures within the alluvial deposits and to break out the basalt and tuff contacts. The log signatures were also used for delineating fining and coarsening-downward sequences within the individual units where they exist, and provide supplementary information on cemented zones, thinly bedded and laminated zones, breccias, weathered zones, and provenance changes.

Governing QA Docs.	TP-8.0, section 5.8, Rev. 6
Frequency of Transmittal	Once per borehole
Direct Questions About Data To-	NWRPO QA Records Center