

NYE County NWRPO -Technical Data Report

RID No.	Transmitter	Org.	Receiver	Org.	Key word1	Title/Description
7263.01	Kryder	NWRPO	QARC	Nye	24PA	NC-EWDP-24PA Alluvium Drill Cuttings Logging Form

Doc. Date 1/27/2006 General Doc. Type QA Program Doc Keyword2 geologic

Entry Date 12/19/2008 Detailed Doc. Type Alluvium/Non-Alluvium Logging Keyword3 log

Data Originator Preparer Contract Geologic Staff

Title of Data NC-EWDP-24PA Alluvium Drill Cuttings Logging Form

Description of Data Drill cuttings logging report exported from drilling database (NC Drilling v3.6.mdb) in .pdf format (Alluvium Drill Cuttings Logging Form from 1/25/06 to 1/27/06).

Data Collection Method Alluvium drill cuttings samples described on the geologic field logging forms during drilling of borehole.

Data Location(s) NC-EWDP-24PA

Data Collection Period(s) 1/25/06 to 1/27/06

Data Source(s) Geologic logging of drill cuttings.

Supporting Data: Field Scientific Notebook # 171, Pages 4 to 11 (RID 7099) describing general drilling conditions; field drill cuttings logging form (RID 7263); and archived drilling database (RID 7561).

Data Censoring Density data recorded on the Alluvium Drill Cuttings Logging Forms.

Data Processing Data from field logging forms were entered into the drilling database, reviewed, and database reports were transmitted to the QARC.

Data Limitations Data Censoring and Data Limitations have changed from the original field forms (RID 7263).

The borehole was drilled with the Symmetrix Casing Advance System in which 10 3/4 in. steel casing string is coupled to a 6 3/4 in. hammer bit at the casing shoe. The hammer bit and the casing advance together and thereby the stability of the borehole is maintained above the bit. The borehole was scheduled to drill to a depth of approximately 1,400 ft. At a depth of 151.8 ft and with 9 casing joints in the borehole, the casing separated between Joint # 2 and Joint # 3. All but 27.7 feet of casing string was removed from the borehole leaving the casing shoe and Joints # 1 and #2 in the hole. The hole was abandoned with bentonite and another collar location was established for a new borehole designated NC-EWDP-24PB.

Samples collected from alluvium at NC-EWDP-24PA are not entirely representative of in situ conditions due to several drilling related factors. The alluvial drill cuttings samples from 0 to 57.5 ft and from 87.5 to 151.8 ft are impacted as a result of winnowing of fines at the air cyclone separator that occurred during dry drilling of the unsaturated alluvium and could account for as much as a 50% loss of fines. The ideal sample volume for a 6 3/4-inch borehole is 4.3 gallons and sample yield was as low as 0.5 gallon in the unsaturated sediments. Samples were moist from 57.5 to 60 ft as a result of injection water used during the 16-inch casing installation. From 60 to 87.5 ft samples were moist due to injection water used for dust control at the air cyclone separator.

Evidence from other boreholes in alluvial sediments indicate that the mechanical action of the drill bit results in sample degradation and particle size distribution bias (see discussion in Report for the Early Warning Drilling Program Phase III Boreholes, Section 2.1.2, RID 5579). In general, the mechanical action of the bit reduces large-size particles to smaller-size particles effectively decreasing the gravel-size component and effectively increasing the sand and "fines"-size component. However, this is a relatively minor problem in unsaturated alluvium.

The Alluvium Drill Cuttings Logging Form includes preliminary field estimates of grain size distribution for the 151.8 ft of alluvium penetrated. The estimates are made on every 2.5 foot sample interval and used for preliminary layering information and general planning of wells prior to receipt of

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laboratory data. These field estimates of grain size distribution as well as USCS group symbol data should be considered reasonably representative of geologic samples and have not been censored. Grain size distribution data determined by laboratory analysis on every second 2.5 foot sample interval are considered representative of the geologic samples.

In addition, some sample handling disturbance may have been introduced into samples by: 1) material accumulating on moist drill pipe and rotating splitter in the interval from 57.5 to 87.5 ft due to injection water used during drilling; 2) unsaturated zone sample homogenization process and sample splitting.

Sample weights in sample density data do not include material that is lost to winnowing of unsaturated fines (dust). Therefore sample weight data is not representative of the volume of the borehole drilled, should not be used in density calculations, and has been censored.

Evaluations of cementation and structure as recorded on the logging forms are difficult to accurately determine because intact pieces of in-situ material are not available in cuttings.

In summary, laboratory measurements of grain size distribution of alluvium drill cuttings in this borehole are considered to be modified to some extent from in situ conditions due to a number of drilling related factors. However, for the most part these factors were unavoidable. Disturbance from sample handling related factors is considered minimal. Except for censored data mentioned above, geologic drill cutting samples from NC-EWDP-24PA are considered approximately representative of in situ conditions.

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**Governing
QA Docs.** TP-8.0 Rev. 5

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**Frequency
of
Transmittal** Once per borehole/well

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**Direct Questions
About Data
To-** NWRPO QA Records Center