

# NYE County NWRPO -Technical Data Report

RID No.	Transmitter	Org.	Receiver	Org.	Key word1	Title/Description
7413	Gilmore	Nye County NWRPO	QARC	Nye	27P	NC-EWDP-27P Alluvium Logging Forms and Non-Alluvium Drill Cuttings Logging Forms
<b>Doc. Date</b>	1/31/2008	<b>General Doc. Type</b>	QA Program Doc	<b>Keyword2</b>	cuttings	
<b>Entry Date</b>	1/31/2008	<b>Detailed Doc. Type</b>	Alluvium/Non-Alluvium Logging	<b>Keyword3</b>	geology	
<b>Data Originator Preparer</b>	Kathy Gilmore					
<b>Title of Data</b>	NC-EWDP-27P Alluvium Logging Forms and Non-Alluvium Drill Cuttings Logging Forms					
<b>Description of Data</b>	Drill cuttings logging reports exported from drilling database (NC Drilling v3.6.mdb and v4.mdb) in .pdf format. (Alluvium and Non-Alluvium Drill Cuttings Logging Forms from 11/22/02 to 12/7/02.)					
<b>Data Collection Method</b>	Borehole drilling and sampling, and borehole depth control procedures. Logs were reviewed for accuracy of field data.					
<b>Data Location(s)</b>	NC-EWDP-27P					
<b>Data Collection Period(s)</b>	11/22/02 to 12/7/02					
<b>Data Source(s)</b>	Geologic logging of drill cuttings. Scientific Notebook #152 (RID 5524), pages 7-56, describes general drilling conditions.  Supporting Data: RIDs 5524, 6413, 6756.					
<b>Data Censoring</b>	Particle Size Distribution data (field estimates), USCS Group Symbols, and Density data recorded on Alluvium Logging Forms.					
<b>Data Processing</b>	Data from field logging forms were entered into the drilling database, reviewed, and transmitted to the QARC.					
<b>Data Limitations</b>	<p>Samples collected from alluvium by reverse circulation air drilling methods are not entirely representative of in situ conditions due to several drilling related factors. The near surface (0 to 60 ft) alluvial drill cuttings samples are impacted as a result of hole erosion and related sample contamination resulting from the drilling of loose unconsolidated sediments in the near surface. Small amounts of injection water was necessary to stabilize these unconsolidated sediments and repeated clean-out was required to advance the borehole. Installation of a 58 ft surface casing eliminated these hole erosion problems. Below a depth of 60 ft, winnowing of fines at the air cyclone separator 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 1/2 inch borehole is 4.3 gallons and sample yield was as low as 1 gallon in the unsaturated sediments. Evidence from other boreholes in alluvial sediments indicates that the mechanical action of the rotary bit results in sample degradation and particle size distribution bias (see discussion in the 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. This is a relatively minor problem in unsaturated alluvium and in the upper part of saturated alluvium where water production is low. In underlying saturated alluvium, this drilling impact renders particle size distribution data useless. Since this borehole penetrates unsaturated alluvium only, particle sizes in drill cuttings are impacted to some extent but are considered to provide a reasonable approximation of in situ conditions.</p> <p>The Alluvium Logging Form includes preliminary field estimates of grain size distribution for the 182.5 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 laboratory data. These field estimates of grain size distribution as well as USCS group symbol data should not be considered representative of geologic samples and have been censored. However, grain size distribution data determined by laboratory analysis on every second 2.5 foot sample interval are considered representative of the geologic samples (RID 5476).</p>					

In addition, some sample handling disturbance may have been introduced into samples by: 1) material accumulating on rotating splitter during wet

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drilling; and 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) or material that was "cleaned out" of the borehole after each 20 foot drill run. Therefore, unsaturated zone sample weight data is not representative of the volume of the borehole drilled and should not be used in density calculations and has been censored.

In the upper section of the saturated zone from 600 to 720 ft, the water production data was estimated. Injection water was required to lift the sample and maintain a clean drill string. Beginning at 720 ft, timed volume water tests were conducted generally at 40 to 60 ft intervals to measure the production of water.

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-27P are considered approximately representative of in situ conditions. The geologic data recorded in these geologic logs are used to produce a Summary Lithologic Log.

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**Governing  
QA Docs.** TP-7.0 Rev. 3, TP-8.0 Rev. 4

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**Frequency  
of  
Transmittal** once per borehole

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