NYE COUNTY NUCLEAR WASTE REPOSITORY PROJECT OFFICE

TEST PLAN

TITLE:	REVISION: 0
Data Collection at the Amargosa Valley Science and Technology Park Production Well	DATE: **11-20-03**
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TEST PLAN NUMBER:	SUPERSEDES:
TPN-5.2	**New Document**

APPROVAL	CONCURRENCE
11-26-03 Project Manager Date	11/20/03 On-Site Geotechnical Representative Date
	11/20/03 Principal Investigator Date
	11/20/03 Quality Assurance Officer Date

1.0 INTRODUCTION

This test plan (TPN) describes the construction by Nye County of a production well in Lathrop Wells, approximately 0.5 miles northeast of the junction of State Highway 372 and U.S. Highway 95. Construction of this well is funded by a grant from the U.S. Economic Development Corporation for the purpose of supplying water to future occupants of the Amargosa Valley Science and Technology Park.

The well will be constructed in two phases: 1) a pilot borehole will be drilled to identify different lithologies and suitable screen locations for a production well and 2) a larger diameter production well will be drilled and constructed over the pilot borehole or at a nearby location.

The Nye County Independent Scientific Investigation Program (ISIP) believes that this well has the potential to fill hydrogeologic data gaps in its Early Warning Drilling Program (EWDP) regarding potential flow pathways from Yucca Mountain to residents in Amargosa Valley, including those in Lathrop Wells. For this reason, the ISIP, with funding from the U.S. Department of Energy (DOE), will conduct the following data-collection tasks during well construction:

- Collect, log, and process drill cuttings samples from a 1,250-foot pilot borehole.
- Maintain depth control and collect drilling parameter data on this pilot borehole.
- Maintain depth control during completion of the production well, track the use of completion materials, and assist in aquifer testing of the well.

This TPN references applicable quality assurance (QA) technical procedures (TPs) that provide more detailed instructions to NWRPO personnel for routine data collection and applies solely to the Science and Technology Park pilot borehole and production well.

2.0 PURPOSE AND JUSTIFICATION

Lathrop Wells is the populated area closest to Yucca Mountain. Very few, if any, hydrogeologic data are available from the existing private wells located within and near Lathrop Wells. Detailed hydrogeologic data are available from existing EWDP Wells NC-EWDP-4PA and –4PB; however, these wells are approximately 1.5 miles northwest of the proposed well. The proposed production well has the potential to provide much-needed hydrogeologic data in the immediate vicinity of Lathrop Wells.

3.0 SCOPE OF WORK FOR SAMPLING, LOGGING, AND WELL COMPLETION

3.1 Responsibilities

The Nye County NWRPO On-Site Geotechnical Representative will be the Principal Investigator (PI) responsible for supervising all technical data collection described in this TPN. The NWRPO-designated field representative (NDFR), in most cases the contract managing geologist, will supervise the contract geologist and technicians, collectively referred to as NWRPO field personnel herein. NWRPO field personnel are responsible for conducting the data collection activities described in this TPN.

Nye County personnel and/or contractors other than NWRPO field personnel are responsible for all other well construction tasks described in the drilling contract specifications (Nye County, 2003). These tasks are outside the scope of this TPN and will not be discussed herein. However, NWRPO field personnel will be required to cooperate with these contractors in order to complete their data collection activities successfully. These contractors and their responsibilities are as follows:

- AMEC Infrastructure Inc. of Las Vegas, Nevada, which is the engineer for the development of the Science and Technology Park, including the construction of the pilot borehole and the production well.

- Rafael Construction Co. of Henderson, Nevada, which is the general contractor for well drilling and construction.
- Thompson Drilling Co. of Las Vegas, Nevada, which has been subcontracted by Rafael to drill, complete, and test the well.

3.2 Pilot Borehole Tasks

One or more NWRPO field personnel will be present during the construction of the pilot borehole to assist the drilling contractor in the following tasks:

1. Maintaining depth control during borehole advancement through the measurement of drill pipe and collars.
2. Collecting, splitting, geologic logging, and labeling of drill cuttings samples from 5-foot depth intervals.
3. Monitoring water levels in the borehole below the water table.
4. Recording drilling rates, drilling fluid injection rates, drilling fluid composition and consistency, and quantities of drilling fluids and additives lost to the formation.
5. Overseeing the running of borehole geophysical logs and reviewing them to help determine well screen placement.
6. Conducting a 5-minute tailgate safety meeting at the start of each work shift.

Depth control will be maintained in accordance with TP-7.0, *Drill Site Management.* Collecting, logging, and processing of drill cuttings will be conducted in accordance with TP-8.0, *Field Collection, Logging, and Processing of Borehole Samples.* Groundwater levels will be measured prior to the start of drilling each day in accordance with TP-9.9, *Measurement of Groundwater Levels Using Electric Well Sounders.* NWRPO field personnel will ensure that borehole geophysical logs meet the requirements specified in TP-11, *Borehole Geophysical Logging Data Identification and Acceptance.*

3.3 Production Well Completion Tasks

One or more NWRPO field personnel will be present during the following activities: 1) removal of the drill pipe from the well after total depth is reached, 2) running the well casing and well screen into the well, 3) emplacement and development of the gravel pack, and 4) emplacement of the grout seal. These personnel will assist the drilling contractor in the following tasks:

1. Maintaining depth control to accurately determine the total depth of the borehole and the depths of screens, gravel packs, and grout seals.
2. Calculating annulus volume from caliper logs.
3. Recording types and volumes of completion materials added to the borehole.
4. Conducting a 5-minute tailgate safety meeting at the start of each work shift.

As stated, depth control will be maintained in accordance with TP-7.0. In addition to annulus volumes, well completion material types, depths, and volumes will be recorded in the field scientific notebook assigned to this program.

3.4 Aquifer Testing Tasks

One or more NWRPO field personnel will be present during well production tests to perform the following tasks:

1. Assisting the drilling contractor in the installation of a Nye County pressure transducer above the pump.
2. Programming, monitoring, and downloading pressure data from a Nye County data logger during and after well production testing according to instructions from the drilling contractor.
3. Assisting in collecting pump rate data and standardizing rate measurement devices.
4. Participating in a 5-minute tailgate safety meeting at the start of each work shift.

Pressure transducers will be installed and monitored with aboveground data loggers during aquifer tests in the production well and EWDP Wells NC-EWDP-4PA and –4PB in accordance with TP-9.2, *Procedures for Operating Westbay® Mosdax® Groundwater Monitoring Equipment in Nye County Wells.* If permission is obtained, pressure transducers may also be installed and monitored in one or more nearby private wells in Lathrop Wells.

3.5 Drill Cuttings Sample Collection and Management Tasks

The drilling contractor will drill the unsaturated zone and the upper part of the saturated zone using air-foam methods. Drill cuttings will be diverted to a cyclone separator where representative samples from 5-foot depth intervals will be collected in 5-gallon buckets. If feasible, a defoaming agent will be added to the cyclone separator to facilitate the collection and geologic logging of these samples.

At deeper depths in the saturated zone, the drilling contractor will switch to flooded mud rotary methods. The mud system will be controlled in a manner to obtain representative lithologic samples and minimize the sealing of the well with mudcake or mud invasion into the formation. Representative mud rotary samples from 5-foot depth intervals will be collected from a shaker screen.

NWRPO field personnel will split drill cuttings samples from each depth interval into two subsamples: one for geologic logging and the other for archival at the DOE Sample Management Facility (SMF). Field personnel will split, bag, and label samples according to methods described in TP-8.0. It is estimated that approximately 250 drill cuttings samples will be collected and archived at the SMF.

The transfer of drill cuttings to the SMF will be controlled and documented with the NWRPO Transfer of Custody Form (Form TP-8.0-3). Drill cuttings samples will be maintained under chain of custody at all times, either in view of the current holder or secured in locked storage.

Unless drill cuttings samples are judged to be representative of in situ conditions, NWRPO field personnel will not make numerical estimates of particle size distribution in samples from depths producing significant amounts of water during drilling. Rather, they will make qualitative estimates of changes in relative size fractions. In cases where sample quality permits numerical estimates of particle size distribution, a brief justification will be recorded in the comments section of the Alluvium Drill Cuttings Logging Form (Form TP-8.0-5). In addition, because drilling methods preclude obtaining meaningful data for sample recovery, sample density, and moisture content, these parameters will be left blank for each depth interval on the form. Other logging parameters will be entered to the extent reasonably possible given the quality of the drill cuttings sample.

Samples will not be sent directly from the drill site to a NWRPO testing laboratory for measurement of hydraulic properties as described in other EWDP work plans and TPNs. Instead, drill cuttings samples and geologic logs will be reviewed and evaluated following the completion of this program to determine whether they are sufficiently representative of in situ conditions to justify laboratory testing. If so, a separate laboratory TPN will be written to cover this testing.

All data recorded on QA forms and in the field scientific notebook will be reviewed by NWRPO personnel not directly involved in recording the data and submitted to the NWRO Quality Assurance Records Center with all supporting documentation and metadata.

4.0 HEALTH AND SAFETY

NWRPO field personnel will be trained in the EWDP Health and Safety Plan (NWRPO, 2002). As stated, these personnel will hold a brief tailgate safety meeting before each shift.

In the event of injury or medical need, NWRPO field personnel will notify one of the following emergency response organizations.

Pahrump Emergency Services 911

Beatty Emergency Services 775-553-2345

Amargosa Emergency Services 775-372-5345

5.0 MANAGEMENT

Before conducting work, NWRPO field personnel performing the tasks described in this TPN will be trained in the procedures specifically applicable to the equipment and methods used herein. Personnel will document that they have read and understand this TPN and other applicable QA documents.

The Quality Assurance Officer is responsible for ensuring that this TPN meets QA requirements and that NWRPO field personnel are trained in and comply with the requirements of this TPN. The PI is responsible for the preparation, technical review, and revision of this TPN, as well as oversight of its performance. NWRPO field personnel are responsible for conducting field sampling and testing.

6.0 REFERENCES

NWRPO (Nuclear Waste Repository Project Office), 2002. *EWDP Health and Safety Plan*, Nye County Department of Natural Resources and Federal Facilities, Pahrump, Nevada.

Nye County, 2003. *Nye County Amargosa Valley Science and Technology Park Project, Bid Specifications, June 3, 2003. Section 02733, Water Well Drilling, Casing and Gravel Installation, Development, and Testing.* Nye County Department of Natural Resources and Federal Facilities. Pahrump, Nevada.

TP-7.0, *Drill Site Management.*

TP-8.0, *Field Collection, Logging, and Processing of Borehole Samples.*

TP-9.2, *Procedures for Operating Westbay® Mosdax® Groundwater Monitoring Equipment in Nye County Wells.*

TP-9.9, *Measurement of Groundwater Levels Using Electric Well Sounders.*

TP-11, *Borehole Geophysical Logging Data Identification and Acceptance.*