



United States Department of the Interior

BUREAU OF MINES  
2401 E. STREET, NW.  
WASHINGTON, D.C. 20241

October 26, 1982

U.S. Nuclear Regulatory Commission  
Division of Contracts  
Washington, D.C. 20555

ATTN: Cindy Fleenor  
Technical Assistance Contracts Branch

SUBJECT: Monthly Progress Report - September 1983 Interagency Agreement  
Number NRC-02-80-075, "State-of-the-Art Assessment for Large  
Diameter Horizontal Nuclear Waste Emplacement Holes"

Dear Mrs. Fleenor:

Enclosed is our first monthly progress report on the subject interagency  
agreement for September 1983. This is in accordance with Article 1, Number  
3.1 - Reporting Requirements.

Earle Amey  
Staff Engineer  
Division of Health and Safety  
Technology

Enclosure

B409120423 821026  
PDR WMRES EUSDOIMI  
B-6934 PDR

September 1983 Monthly  
STATE-OF-THE-ART ASSESSMENT  
OF  
LARGE DIAMETER HORIZONTAL  
NUCLEAR WASTE EMPLACEMENT HOLES

1.0 Drilling of Emplacement Holes

Principal Investigator - Gerald L. Finfinger

Computer implemented literature searches were conducted on directional drilling, tunnel boring, horizontal drilling, vertical drilling and auger mining technologies. Also several leading equipment manufacturers were contacted for obtaining product specifications.

An investigation into borehole surveying systems was initiated for the purpose of determining if borehole deviations of 6 inches per 100 feet of drilling can be accurately measured. Since a variety of algorithms can be used to calculate borehole location based on survey data the accuracy of the survey sensors must first be evaluated.

Physical properties data of Basalt and Tuff are being collected to determine equipment specifications, life expectancies and penetration rates for the drilling or tunnel boring techniques since the different technologies may not have application under differing characteristics.

2.0 Maintaining Integrity of Emplacement Holes

Principal Investigator - Daniel R. Babich

Computer literature searches were conducted to obtain information and references concerning maintaining the integrity of emplacement holes. The searches are under review and appropriate references are being obtained. Currently, emphasis is on information gathering and establishing detailed sub-sections for clarification of research direction.

A computer literature search was conducted to obtain information and references concerning hole casing. Current emphasis is on information gathering. A review of the DOE reports has begun.

3.0 Backfilling of Emplacement Holes

Principal Investigator - Robert Evans

A program schedule for "Backfilling of Emplacement Holes" was prepared. A computer literature search of the topic "Backfilling of Nuclear Waste" was requested and conducted by the Pittsburgh Research Center Bureau of Mines Library.

Fifteen (15) articles describing material properties required for backfilling of boreholes were reviewed. The primary factors evaluated for the candidate materials were thermal and hydraulic conductivity and radionuclide sorption. Three (3) DOE reports describing some conceptual designs and program criteria for mined geologic disposal of nuclear waste were examined.

During the next month review of literature obtained will continue. Factors affecting backfill material performance will be discussed with Dr. D.M. Roy at the Materials Research Laboratory, Pennsylvania State University.

4.0 Retrieving Waste Canisters for Emplacement Holes

Principal Investigator - Gerald L. Finfinger

No significant progress to report.

Edward D. Thimons  
Supervisory Physical Scientist  
Dust Control and Ventilation  
FTS 723-6683

Man-Effort

<u>Task</u>	<u>Man-Hours This Period</u>	<u>Total Man-Hrs. to Date</u>	<u>Percent of Available Hrs.</u>
1.0	22	22	2 %
2.0	48	48	4 %
3.0	60	60	9.5 %
4.0	0	0	0 %

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