

SUPPORTING ANALYSIS FOR EMPLOYEE COI REVIEW

1. PURPOSE OF PROCUREMENT

Name: Dr. Rodney Read

Rate (Dollars/hr): US \$

Period of Performance: June 15, 2003 to June 14, 2004

Statement of Work: To assist CNWRA staff to conduct numerical analyses using geomechanical computer codes, including validation of these codes; review and assessment of DOE reports, including monitoring and maintenance plan for the stability of openings; and preparation of reports, including potential monitoring techniques reports.

Estimated Utilization: 400 hours per year

2. CONFLICT OF INTEREST EVALUATION (AP-001, 5.1)

Past: Dr. Reed's past works include activities for three conflicted clients: (i) the DOE, (ii) Golder Associates, Vancouver, Canada, and (iii) COGEMA.

Dr. Reed reviewed, on behalf of DOE, two DOE subcontractor reports: (i) Thermal-Hydrological Analysis of Large-Scale Thermal Tests in the Exploratory Studies Facility at Yucca Mountain, UCRL-ID-121791, Lawrence Livermore National Laboratory, October 30, 1995 and (ii) ESF Thermal Test Design Analysis Status, SLTR95-0013, Sandia National Laboratories. This DOE work included working for about 40 hours to review these two reports. These were followed by a meeting at Las Vegas in 1995 to discuss the review comments with the DOE. These review comments were used by the DOE to prepare the Drift-Scale Heater Test Plan for Yucca Mountain. Since the completion of this small amount of review work more than 7 years ago, Dr. Reed did not work on any other projects funded by the DOE. Dr. Reed may have potential for conflict of interest to review Drift-Scale Heater Test results and associated reports.

At Golder Associates, Vancouver, Dr. Reed worked (1985-1987) on several projects as a junior level geotechnical engineer: (i) site characterization of Oldman River Dam, for Alberta Government; (ii) test tunnel investigation of Oldman River Dam, for Alberta Government; (iii) Roger Pass tunnel investigation, British Columbia, for Canadian Pacific Railway; (iv) site characterization, Pinawa, Manitoba, for Atomic Energy of Canada, Ltd.; (v) construction inspection of Squamish Highway; Vancouver, for British Columbia Ministry of Highways; (vi) pile inspection at Capilano Mall Expansion project, North Vancouver; (vii) water well drilling at Harrison Bay, British Columbia; (viii) water well drilling at Balfour, British Columbia; (ix) water well drilling at McLeod Lake, British Columbia;

Initial Statement of Work for CNWRA Consultant Dr. R.S. Read

1. Introduction

The Center for Nuclear Waste Regulatory Analyses (CNWRA) has a responsibility under a contract with the U.S. Nuclear Regulatory Commission (NRC) to assess the adequacy of an anticipated design for underground openings at the proposed Yucca Mountain nuclear waste repository. The license application for the repository is expected to include a design for stable underground openings to support the repository operations during an anticipated operational period of approximately 100 yr. The underground openings are needed to perform the following repository operations: (i) waste emplacement; (ii) ventilation; (iii) monitoring, maintenance, and performance confirmation; (iv) waste retrieval, if necessary; and (v) closure operations, such as the emplacement of drip shields or backfill. The emplacement drifts (i.e., the tunnels that would contain nuclear waste), in addition to providing for these operations, would also provide a function of protecting the waste packages against rockfall impact during the preclosure period.

Any design of the underground openings is expected to include a monitoring and maintenance program to help assure the stability of the openings during the operational period. An assessment of the design, therefore, would include an evaluation of the technical adequacy of any monitoring and maintenance plan included in the design. The anticipated conditions at the proposed repository that may entail special considerations include (i) high temperatures, up to approximately 96°C at the emplacement-drift walls and approximately 70–80°C in the middle of the pillars between the emplacement drifts; and (ii) high radiation levels within the emplacement drifts.

The consultant, Dr. R.S. Reed, will be provided with documents developed by the U.S. Department of Energy (DOE) describing a proposed monitoring and maintenance plan to support the stability of the openings. The consultant will be tasked to (i) review specific documents as necessary and provide review comments following a specified format; (ii) discuss the review with CNWRA and NRC staff; and (iii) participate in meetings between NRC and DOE, in which the consultant will be expected to provide technical leadership during any discussion of the monitoring and maintenance plan.

2.0 Task Description for Task Number 1

The consultant is needed under Task Number 1 to (i) perform a literature review of geotechnical monitoring techniques for underground openings, including techniques that may not have been fully developed but are likely to be well suited for the repository application; (ii) identify the techniques applicable to the repository conditions, including radiation environment and elevated temperature; and (iii) provide a report on the review. The report should include a description of what quantities are measured in each monitoring technique, how the measurements are made, and potential interpretations of the measurements to locate and characterize any damage to the underground openings. The potential for using such interpretations to develop a contingency plan for maintenance of the openings should also be discussed.

The report should be submitted at the end of ten weeks following the start date (to be determined) for the task.