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High Level Waste Technical Development Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
7915 Eastern Avenue
Mail Stop 623-SS
Silver Spring, MD 20910

Attention: Mr. Trueman Seamans

Subject: Quality Assurance Chapter of the DSCA

Dear Mr. Seamans:

Enclosed is one (1) copy of our input for the quality assurance chapter of the DSCA, as requested by Jay Rhoderick of your office. If you have any questions, please call me.

Sincerely,

ENGINEERS INTERNATIONAL, INC.

V. Rajaram
Project Manager

VR/ja

Enclosure

cc Jay Rhoderick, WMRT

QAP
1085D

10 QUALITY ASSURANCE PROGRAM

10.1 Introduction

10 CFR 60.11(a) identifies Quality Assurance (QA) as a key element of site characterization activities for a nuclear waste repository. An adequate QA program is necessary to assure confidence in the geologic and geotechnical data obtained during site characterization and to assure licensability of the BWIP site.

10.2 Description and Evaluation of the Quality Assurance Program

Chapter 18 of the SCR addresses the eighteen criteria of 10 CFR 50 Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," as required by 10 CFR 60 Subpart G. The administrative procedures are based on the 18 criteria of 10 CFR 50 Appendix B. Beyond this, however, it is necessary that detailed technical (i.e., implementing) procedures are developed for each technical area following the requirements spelled out in the administrative quality assurance procedures. These implementing procedures should contain instructions for actual performance of testing and investigations. In addition to providing a framework for an adequate QA program, DOE should also provide evidence of proper implementation of the program. In the description of site screening and site characterization activities in the SCR, a detailed description of the QA procedures in each program area is lacking (e.g., detailed QA procedures for the exploratory shaft are not provided). This is a major concern that will need attention. It is discussed in more detail in the following narrative. Additional comments on the administrative aspects of the QA program are discussed in Chapter 12.

The Standard Format and Content Guide (Regulatory Guide 4.17) maintains that "QA methods should be presented in sufficient detail to allow NRC to make an independent evaluation of the precision, accuracy, reproducibility, analytic sensitivity, and limitations of data acquisition and analysis methods that was used during site exploration and will be used during site characterization." Such a detailed presentation is not found in the SCR. For example, calculated solubility limits are discussed in the geochemistry chapter. However, a discussion of the limitations of the solubility estimations is not given in enough detail for the staff to adequately evaluate it. Without significant details of the QA methods including test plans, test procedures, and acceptance criteria used for each technical area, the quality of the data presented cannot be assessed.

Other concerns involving the implementation of the QA program include the following:

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Other concerns involving the implementation of the QA program include the following:

1. Documentation of Data Gathering Procedures. Many documents are referred to in the discussion of the QA program. These include: implementing functional-procedures manuals, BWIP procedures manual, Rockwell data package manual, and Rockwell functional manual. However, these are not listed as references at the end of the chapter. In fact, no BWIP document is referenced at the end of the QA chapter. In order to evaluate whether the QA program described in Chapter 18 is being implemented properly, all of these documents should be identified as references in the QA chapter. Those that contain the technical test procedures to be used during site characterization activities should also be made available for review.

2. Plans for Major Test Programs. Section 18.11 of the SCR states that test plans are prepared for each major test program. However, few detailed test plans are referenced in the SCR for any of the major test programs mentioned. For example, the discussion of the exploratory shaft in Chapter 17 does not reference any detailed test plan. Since this activity is being conducted in the very near future, a detailed quality assurance program and test plan should be available now for the exploratory shaft. Further, few of the planned individual tests listed in the SCR provide any reference to test plans. Also, Regulatory Guide 4.17 maintains that a description of the quality assurance program to be applied to each planned test and a discussion of the limitations and uncertainty in the data be provided. The plans identified in Chapters 13 through 16 do not have a designated level of quality assurance to be applied or discuss the limitations and uncertainty involved.

3. Reliability Analyses in Design Control. Section 18.3 should address the methods to be used to quantitatively define the degree to which analytic processes are verified. Methods for reliability analyses, as well as requirements for establishing reliability design goals for components and systems, should be identified.

4. Identification and Control of Samples. Several comments made in other chapters of the SCR suggest that Section 18.8 of the QA program was not properly implemented. Statements such as "Sample identification, preparation, and testing techniques contributed significantly to this scatter" (Page 4.1-7, Section 4.1.3, Paragraph 1, Sentence 6) indicates a lack of adequate QA control of samples, as required by criteria VIII of 10 CFR 50 Appendix B. These type of statements should be explained.

5. Hydrofracturing Calculations. There are apparent discrepancies in the data presentation related to in-situ stresses in Table 4-11. For example, if values of shut-in pressures obtained from

Figures 4-17 and 4-18 are used in the equations presented on page 4.6-2 to compute minimum horizontal stresses, one can arrive at inappropriate results. This confusion is apparently a result of improper identification of shut-in pressure in the figures, or inadequate explanation in the text. This lack of clarity in the data presentation raises questions about the QA procedures for this test.

10.3 Summary, Conclusions and Recommendations

10.3.1 Summary

This chapter of the DSCA discusses the quality assurance aspects of the SCR and NRC staff concerns on the implementation of the quality assurance program during site characterization.

10.3.2 Conclusions

Chapter 18 of the SCR lacks detail on the quality assurance implementation program, especially for geotechnical investigations, and does not refer to the operating manuals being utilized by Rockwell Hanford Operations for QA at the present time.

10.3.3 Recommendations

The following recommendations are made for inclusion in SCR updates:

- A complete QA reference list should be assembled and the documents which take precedence should be clearly identified
- State-of-the-art geotechnical tests should be clearly documented, approved by a peer review panel of independent experts, and the procedures implemented by a qualified engineer, with regular QA audits by a qualified QA engineer
- The limitations and uncertainty associated with each test plan should be clearly stated
- Computer codes should be bench marked and modeling results should be verified independently.
- The effectiveness of the QA program should be addressed in detail. Revisions to the program which were implemented to increase effectiveness should be discussed.