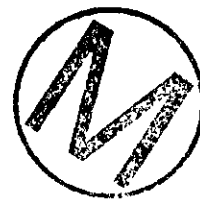


# **PEER 1 - Conceptual Models Peer Review**





CAO PLAN  
Carlsbad Area Office

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Revision 0

Title: CONCEPTUAL MODELS PEER REVIEW PLAN

  
(Assistant Manager, Office of Regulatory Compliance, Carlsbad Area Office)

3/28/96  
Date:

## 1. INTRODUCTION

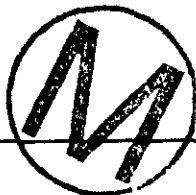
This Conceptual Model Peer Review (CMPR) Plan describes the peer review and documentation the WIPP Project will use to ensure that the conceptual models used in performance assessment (PA) reasonably represent possible future states of the disposal system.

### 1.1 BACKGROUND

In accordance with the regulatory requirements, as specified in 40 CFR Part 191, and the criteria for the implementation of those requirements, as specified in 40 CFR Part 194, the Department of Energy (DOE) will conduct a peer review (PR) of the conceptual models used in the compliance certification application for the WIPP Project. Specifically, a PR will be conducted to determine whether the conceptual models developed and selected by DOE reasonably represent future states of the disposal system. Sandia National Laboratories (SNL) is responsible for the WIPP PA. SNL has determined which processes are significant and have developed conceptual models which represent possible future states of the disposal system and subsystems. To facilitate review of the conceptual models, they have been divided into the following three associated subsystems:

- Natural barriers (Salado and non-Salado flow and transport);
- Engineered barriers (rock mechanics and shaft/borehole seals); and
- Waste form and the disposal room.

SNL has developed a description of the conceptual models, the associated parameters, and parameter values, and is developing and implementing a process for the selection and assembly of data and other information which will be utilized to support PR of the conceptual models.





## 1.2 PURPOSE

The purpose of the WIPP PR process for conceptual models is to ensure that the conceptual models used in PA reasonably represent possible future states of the disposal system.

The requirement for conducting peer reviews is specified in sections 27 (a)(1) and 22 (b) of 40 CFR Part 194. Specifically, a PR is a documented, critical review performed by peers who possess qualifications at least equal to those of the individuals who conducted the original work. The PR shall be independent of the work being reviewed; independence from the work being reviewed means that the peer: a) was not involved as a participant, supervisor, technical reviewer, or advisor in the work being reviewed, and b) to the extent practical, has sufficient freedom from funding considerations to assure the work is impartially reviewed.

## 1.3 SCOPE

This CMPR Plan describes the peer review process that the DOE Carlsbad Area Office (CAO) will use for review of conceptual models. A PR is an in-depth critique of assumptions, calculations, extrapolations, alternate interpretations, methodology, and acceptance criteria employed, and of the conclusions drawn in the original work. This Plan defines the management approach, resources, schedule, and technical requirements for using peer reviews to confirm the adequacy of the conceptual models.

## 2. PEER REVIEW PLANNING AND IMPLEMENTATION

### 2.1 APPROACH

The DOE-CAO has prepared this Conceptual Model Peer Review (CMPR) Plan to document the approach to conducting the PR process. The CMPR will be conducted using a rigorous proceduralized approach in accordance with NUREG-1297. The DOE-CAO has prepared a procedure for conducting peer reviews in accordance with sections 27 (a)(1) and 22 (b) of 40 CFR Part 194. The DOE-CAO procedure ensures that each PR will be a documented, critical review performed by qualified peers who are independent of the work being reviewed. SNL has prepared a procedure to provide the information necessary to support peer review of the conceptual models.

#### 2.1.1 DESCRIPTION OF CONCEPTUAL MODELS TO BE REVIEWED

Section 23(a)(3)(v) of 40 CFR Part 194 requires that any compliance certification application shall include documentation that the conceptual models have undergone PR according to 40 CFR Part 194 section 27. SNL will provide a description of the conceptual models and other supporting information to the PR Manager for peer review. The following listed conceptual models have been identified to be reviewed:

CONTAINMENT SUB-SYSTEM

CONCEPTUAL MODELS

Natural Barriers (Flow & Transport)

Disposal System Geometry

Culebra

Repository Fluid Flow

Salado

Impure Halite

Salado Interbeds

Disturbed Rock Zone

Actinide Transport (Salado)

Units Above the Salado

Dissolved Actinides (Culebra)

Colloidal Actinides (Culebra)

Exploration Boreholes

Cutting/Cavings

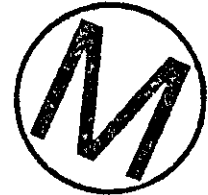
Spallings

Blowout

Castile & Brine Reservoir

Multiple Intrusions

Climate Change



Engineered Systems (Shaft Seals & Rock  
Mechanics)

Disposal Room Geometry

Creep Closure

Repository Fluid Flow

Shafts & Shaft Seals

Disturbed Rock Zone

Waste Form & Disposal Room (Disposal  
Room Closure & Chemistry)

Gas Generation

Chemical Conditions

Dissolved Actinide Source Term

Colloidal Actinides Source Term

**2.1.2 COMPOSITION OF PEER REVIEW PANEL**

The CMPR Panel will be composed of a minimum of three individuals who possess the subject matter technical expertise to a degree at least equivalent to that needed for the original work. It is currently planned to have panel members who are experts in Natural Barrier System (flow and transport), Engineered Barriers (shaft seals and rock mechanics) and Waste Form and Disposal Room Chemistry.

Through a formal orientation process, each panel member will be made familiar with the WIPP containment system and the basis of the conceptual models which describe the containment system. In addition they will be provided a basic description of how

the conceptual models are represented in numerical models, algorithms, and codes. The peer reviewers will be made familiar with the parameter inputs to the PA codes and the results of prior PAs, sensitivity analyses, and critical comments from previous reviews. Each peer reviewer will be selected, oriented, and trained in accordance with approved procedures.

### 2.1.3 LOGISTICS AND MANAGEMENT

Not all information necessary to support peer review of conceptual models is currently available. Therefore, it is necessary to conduct the CMPR in a phased manner. The phasing depends on information availability. The PR Manager, working closely with SNL, has developed a preliminary schedule that provides the necessary information on an "as available" basis. Flexibility is required by all supporting organizations (i.e., DOE-CAO, SNL, and the PR manager, staff and panel members) to accommodate schedule changes due to uncertainty in the timing of information availability.

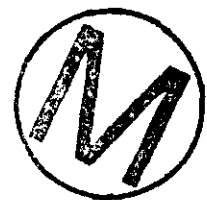
## 2.2 SUGGESTED METHODS

The method to be used by the CMPR Panel for the adequacy and reasonableness of the conceptual models will be developed based on SNL requirements for the process of conducting PR. The methods the PR Panel uses to evaluate the subject matter shall include, as applicable, the adequacy criteria identified in section 2.3 below.

## 2.3 ADEQUACY CRITERIA

Conceptual models which have been selected and developed by the DOE must meet commonly accepted technical and scientific standards based on in-depth evaluation. The peer review panel will evaluate and report on, as applicable:

- Adequacy of requirements and criteria;
- Validity of assumptions;
- Alternate interpretations as appropriate;
- Uncertainty of results and consequences if wrong;
- Appropriateness and limitations of methodology and procedures;
- Adequacy of application;
- Accuracy of calculations; and
- Validity of conclusions.



Adequacy of the conceptual models will be determined based on whether or not they reasonably represent possible future states of the disposal system.

## **2.4 SCHEDULE**

Based on the concept described in section 2.1.3, Attachment A presents a schedule of CMPR activities and milestones. This schedule will serve as the baseline schedule from which requested schedule deviations will be evaluated and approved if appropriate. Revisions to the baseline schedule will not require revision to this Plan, but will be attached to the plan by reference.

## **2.5 DELIVERABLES**

Monthly status reports addressing CMPR progress against schedule and expenditures against budget will be submitted by the CTAC Project Manager and will be incorporated in the CTAC monthly report to the DOE-CAO. Significant variances in progress or spend rates will be explained and will include the cause of the variance, impact to the overall CMPR schedule and recommended corrective actions. A draft and final report of this PR will be submitted to DOE-CAO.

## **2.6 RESOURCE REQUIREMENTS**

To meet the CMPR schedule as outlined in section 2.4 an estimate of the resources which may be required and the allowed manpower support levels are specified in Attachment C.

## **3. QUALITY ASSURANCE**

The CMPR process will be conducted in a controlled manner and in compliance with the CAO Quality Assurance Program Description, CAO-94-1012, and other applicable QA procedures.

## **4. RECORDS MANAGEMENT**

Records generated as a result of PR activities defined in this peer review plan and designated as QA records will be identified in the PR Procedure. Conceptual Models PR records will be assembled and maintained in accordance with the PR Management Procedure and the PR Desk Instruction(s). Ultimately, PR records will be dispositioned in accordance with DOE-CAO records management requirements. SNL records will be managed in accordance with SNL Records Management Procedure, SNL QAP 17-1.

## **5. DOCUMENT CONTROL**

All plans, procedures, and other Documents which require document control will be handled in accordance with applicable DOE-CAO controlled document procedures.



ATTACHMENT A

CONCEPTUAL MODEL PEER REVIEW (CMPR) SCHEDULE

<u>ACTIVITY</u>	<u>DRAFT</u>	<u>FINAL</u>
CMPR Plan	3/8	3/29
PR Panel Assigned	NA	3/29
Information Package to PR Manager	3/15	4/2
Initiate CMPR	NA	4/2
Complete CMPR	NA	6/28
Submit CMPR Report	6/21	7/1



**ATTACHMENT B**

**ESTIMATED PEER REVIEW RESOURCE REQUIREMENTS**

<b>Support</b>	<b>Hours</b>
Subject matter experts	1800
Technical Coordinator	300
Clerical Support	300

