that meets the requirements of ASME NQA-1-1989 edition, ASME NQA-2a-1990 addenda (part 2.7) to ASME NQA-2-1989 edition, and ASME NQA-3-1989 edition (excluding Section 2.1 (b) and (c)).

(2) Any application for certification of compliance shall include information which demonstrates that the quality assurance program implemented under paragraph (a)(1) of this section has been established and executed for:

(i) Waste characterization activities and assumptions;

(ii) Environmental monitoring, monitoring the performance of the disposal system, sampling, and analysis activities;

(iii) Field measurements of geological factors, ground water, meteorology, and topography;

(iv) Computations, codes, models and methods used to demonstrate compliance with the disposal regulations;

(v) Expert judgment elicitation used to support applications for certification or determination of compliance;

(vi) Design of the disposal system and actions taken to ensure compliance with design specifications;

(vii) The collection of data and information used to support compliance application(s); and

(viii) Other systems, structures, components, and activities important to the containment of waste in the disposal system.

(b) Any application for certification of compliance shall include information which demonstrates that data and information collected prior to implementation of the quality assurance program under paragraph (a) of this section has been qualified in accordance with:

(1) A quality assurance program equivalent in scope and implementation to ASME NQA-1-1989 edition, ASME NQA-2a-1990 addenda (part 2.7) to ASME NQA-2-1989 edition, and ASME NQA 3-1989 edition (excluding Section 2.1 (b) and (c)); or

(2) An alternative method approved by the Administrator for use at the WIPP.

(c) Any application for certification of compliance shall provide information which addresses how the following quality indicators for the collection of data and information used to support a compliance application have been and will continue to be achieved:

(1) Data accuracy, i.e., the degree to which data agree with an accepted reference or true value;

(2) Data precision, i.e., a measure of the mutual agreement between comparable data gathered or developed under similar conditions expressed in terms of a standard deviation;

(3) Data representativeness, i.e., the degree to which data accurately and precisely represent a characteristic of a population, a parameter, variations at a sampling point, or environmental conditions;

(4) Data completeness, i.e., a measure of the amount of valid data obtained compared to the amount that was expected;

(5) Data comparability, i.e., a measure of the confidence with which one data set can be compared to another;

(6) Data reproducibility, i.e., a measure of the variability among measurements of the same sample at different laboratories;

(7) Data validation, i.e., a systematic process for reviewing a body of data against a set of criteria to provide assurance that the data are adequate for their intended use; and

(8) Data verification, i.e., a systematic process for reviewing a body of data generated by one source against a body of data generated by another source.

(d) The Administrator will verify appropriate execution of quality assurance programs through inspections which include surveillances, audits, and management systems reviews.

§194.23 Models and computer codes.

(a) Any application for certification of compliance shall include:

(1) A complete listing and description of the models used to support such application. The description shall be sufficiently complete to permit technical review of the purpose of modeling, the modeling approach, method of analysis and the assumptions underlying such analyses.

(2) A complete listing of conceptual model(s) considered but not used to support such application, a description of such model(s), and an explanation of the reason(s) why such model(s) was/ were not used to support such application.

(3) Information which demonstrates that:

(i) Conceptual models reasonably represent the disposal system;

(ii) Mathematical models incorporate equations and boundary conditions which reasonably represent the mathematical formulation of the conceptual models;

(iii) Numerical models provide numerical schemes which enable the mathematical models to obtain stable solutions;

(iv) Computer models accurately implement the numerical models; i.e., computer codes are free of coding errors and produce stable and accurate solutions; and (v) Models, computer codes, and observed and measured data used to confirm models and computer codes have undergone peer review according to § 194.27.

(b) Models and computer codes used to support any application for certification of compliance shall be fully and clearly documented in a manner that complies with the requirements of ASME NQA-2a-1990 addenda (part 2.7) to ASME NQA-2-1989 edition.

(c) Documentation for models and computer codes shall include:

(1) A description of the theoretical backgrounds of each model, the method of analysis or assessment, scenario construction, and data collection procedures;

(2) Detailed descriptions of the structure of computer codes and complete listings of the source codes;

(3) Users' manuals that include general descriptions of the models, discussions of the limits of applicability of each model, detailed instructions for running the computer codes including hardware and software requirements, input and output formats with detailed explanations of each input and output variable and parameter, listings of input and output files from a sample computer run, and reports on code verification, benchmarking, validation and quality assurance procedures;

(4) Programmers' manuals;

(5) Any necessary licenses; and

(6) An explanation of how models and computer codes handle covariance.

(d) The Administrator or the Administrator's authorized representative may verify the results of computer simulations used to support any application for certification of compliance by performing independent simulations. Data files, source codes, executable versions of computer software for each model, other material or information needed to permit the Administrator or the Administrator's authorized representative to perform independent simulations, and access to necessary hardware to perform such simulations, shall be provided within 30 calendar days of a request by the Administrator or the Administrator's authorized representative.

§194.24 Waste characterization.

(a)(1) Any application for certification of compliance shall identify, in detail, the chemical, radiological and physical characteristics of all waste proposed for disposal in the disposal system. Such identification shall provide information about waste characteristics as they exist or, in the case of to-be-generated waste, as they are expected to exist upon emplacement in the disposal system.