NVO-196-17

NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS

QUALITY ASSURANCE PLAN

AUGUST 1980

UNITED STATES
DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE
LAS VEGAS, NV

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INTRODUCTION

The Nevada Nuclear Waste Storage Investigations (NNWSI) were established by DOE/NV to evaluate the geohydrologic setting and underground rock masses of the Nevada Test Site (NTS) and contiguous areas to determine whether a suitable site exists for constructing a repository for isolating highly radioactive solid wastes. Since the results of these evaluations will impact possible risks to public health and safety, a quality assurance program which conforms to the criteria given in the Code of Federal Regulations, Title 10, Part 50, Appendix B (10CFR50 Appendix B) is needed to control the quality aspects of the work. The Quality Assurance Plan (QAP) embodied in this document describes, in general terms, how the criteria of 10CFR50 Appendix B are being applied to the NNWSI as a whole. A detailed treatment of the criteria application to each separate investigative phase of the project is contained in individual Quality Assurance Program Plans (QAPP's) prepared by the organizations directing and/or conducting that investigation or experiment.

The DOE/NV NNWSI Project Office, hereafter called simply the Project Office, directs the overall NNWSI by acting primarily as the administrators and coordinators of the project. The Project Office has required each Participating Organization and the NTS Support Contractors (through the Nevada Test Site Support Office) to prepare and submit a QAPP which is based upon the criteria of 10CFR50 Appendix B. Essentially, a compendium of these plans could be considered to be the NNWSI/QAP but it would be difficult to use and interpret due to the many-faceted aspects of the project. Therefore, this QAP brings together the essential parts of the criteria elements into one

document to be applied on a selective basis dependent upon the nature of the investigation being conducted. It is intended that all QAPP's on the NNWSI fit within the framework of this plan.

Participant Organizations contributing the majority of effort on NNWSI include the following:

NNWSI Project Office
Sandia National Laboratories (SNL)
Lawrence Livermore National Laboratory (LLNL)
Los Alamos Scientific Laboratory (LASL)
United States Geological Survey (USGS)

NTS Contractors are also used for site activities and are also expected to develop QAPP's or apply existing generic quality assurance program requirements for their operations. They are as follows:

Fenix & Scisson, Inc. (F&S)
Holmes & Narver, Inc. (H&N)
Reynolds Electrical and Engineering Company, Inc. (REECo)
Westinghouse Electric Corporation (W/AESD)

POLICY

Nevada Nuclear Waste Storage Investigations (NNWSI) project management considers quality assurance (QA) an essential element of all project activities. The NNWSI quality assurance program has been established which is applicable to all activities affecting functions that prevent or mitigate the consequences of events that could cause unreasonable risk to the health and safety of the public or that could compromise project success. It is the policy of NNWSI as described in this Quality Assurance Plan and implemented by appropriate procedures to satisfy the quality assurance criteria of 10CFR50 Appendix B.

Quality assurance programs for the NNWSI are based upon 10CFR50 Appendix B and the ANSI/ASME NQA-1-1979 standard. With the exception of the references to Regulatory Guides and ANSI N45.2 Standards, which have been replaced by ANSI/ASME NQA-1-1979, the NUREG-75/087, Section 17.1 Standard Review Plan is used by the Project Office/QA Overview to evaluate the QAPP's of the Participating Organizations and the Support Contractors. It is recognized that not all elements of these documents are applicable in every case, and this is taken into account in the review process.

It is also NNWSI policy to apply a graded approach to quality assurance which acknowledges that public health and safety is not always affected and that an adequate level of quality is also needed for such things as operational reliability and maintainability. Applicable portions of 10CFR50 Appendix B are utilized to the maximum degree for quality-related functions which are identified as safety-related and a less stringent but still viable quality level is utilized for other activities on the project.

Since this project involves research, development, and investigative activities, it is necessary to adapt the criteria elements to fit the context of this work environment. Such adaptation is the responsibility of each organization preparing a QAPP for NNWSI with the principal thrust being the assurance that their activities are properly validated, documented, and available for use as a basis for task-related decision making.

Robert M. Nelson Jr.

R. M. Nelson, Jr.
NNWSI Project Manager

Frank C. Hood

F. C. Hood
DOE/NV Quality Assurance

PURPOSE AND SCOPE

This Quality Assurance Plan (QAP) describes the general quality assurance program for the overall NNWSI project under which the quality assurance programs of the individual Participating Organizations and Support Contractors are to operate. The details of how each of these groups will meet the criteria will differ among Participating Organizations and Support Contractors, and those details are given in the QAPP's listed in Appendix A. It is the purpose of this plan to show the commonality of quality assurance programs in effect within the project and to define how each element fits into the entire picture to give total quality assurance coverage for the NNWSI Project.

1. ORGANIZATION

1.1 The Project Office operates as a part of the DOE Nevada Operations Office (DOE/NV) under the overall direction of DOE Headquarters Office of Nuclear Waste Management. In matters of National Policy, DOE/NV interfaces with the Office of Nuclear Waste Management (ONWM) and cooperates with them in the establishment of a consistent quality assurance approach to the general problems of nuclear waste management. An organization chart indicating interface relationships is shown in Figure 1.

1.2 Responsibilities on the NNWSI project are outlined below. More definitive descriptions of the responsibilities are contained in the QAPP's of the individual organizations which are listed in Appendix A.

1.2.1 DOE/NV

1.2.1.1 DOE/NV has the ultimate responsibility for the NNWSI, including the quality assurance program. The Project Office has been established within the DOE/NV organization for management of the project. The Project Office discharges its quality assurance responsibilities, with the assistance and concurrence of the DOE/NV QA

ORGANIZATION CHART
NEVADA NUCLEAR WASTE STORAGE INVESTIGATIONS

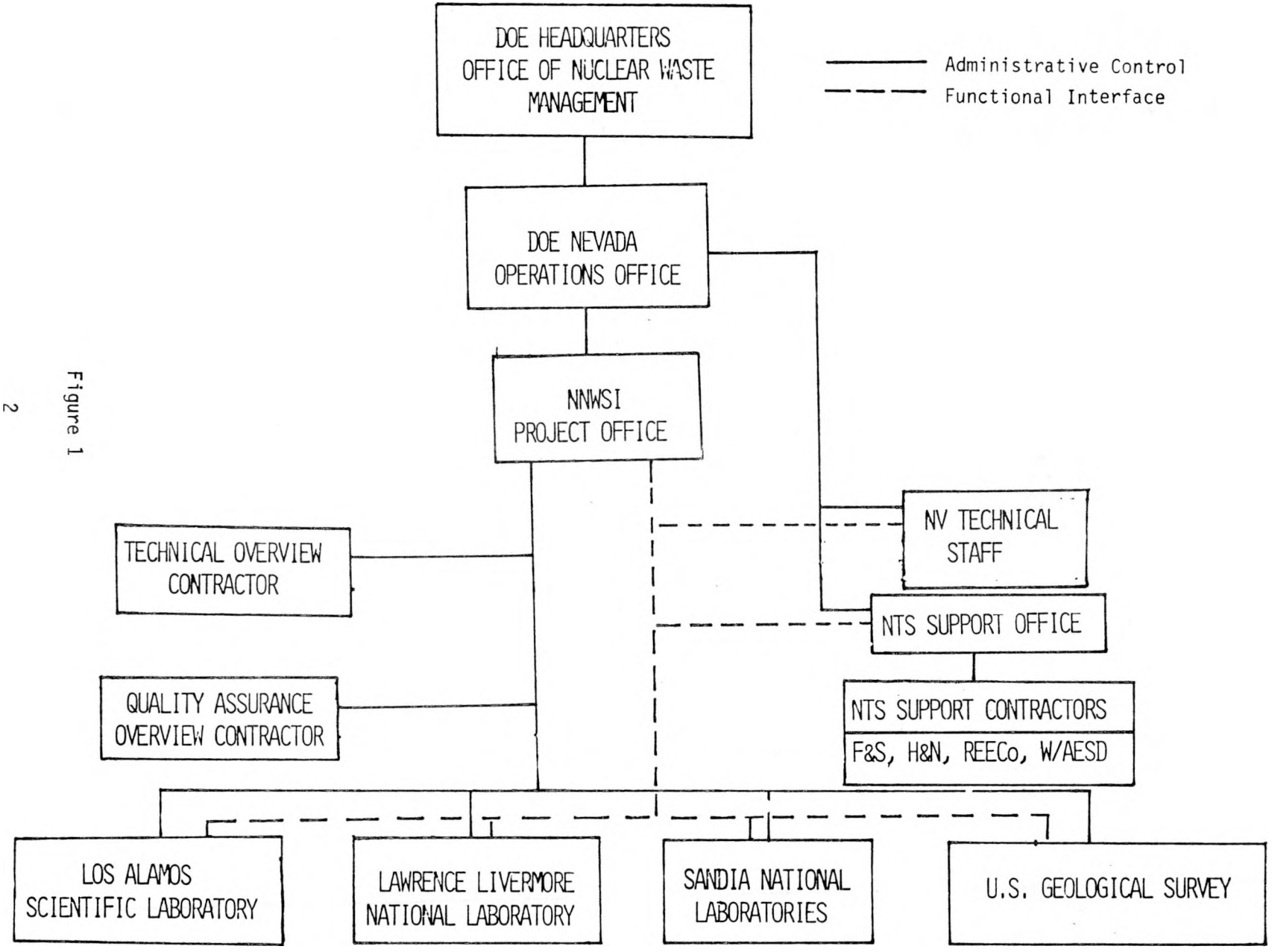

Figure 1

manager, by such activities as participation in design reviews and QA audits, review and approval of test plans and QA procedures, provision of QA surveillance and policy guidance and review and approval of the Quality Assurance Program Plans (QAPP's) prepared by organizations participating in the project. The extent of involvement in these activities is shown elsewhere in this QAPP. Project management encompasses planning activities and goals, and assessing progress toward those goals; planning budgets; and delegating responsibilities to participant organizations for completion of the various project tasks.

1.2.1.2 The NNWSI Project Manager is the management officer responsible for administering the NNWSI. The Project Coordinators are part of the Project Office staff and assist the Project Manager in administering the NNWSI.

1.2.1.3 NV Staff assists the Project Manager by providing reviews, recommendations, and expertise on the various aspects of the NNWSI in terms of their respective responsibilities. The Project Manager is responsible for coordinating NV staff support.

1.2.1.4 The DOE/NV QA Manager is a policy guidance, surveillance, and audit position within DOE/NV management and is included as part of NV staff for the purposes of this document.

1.2.1.5 The Nevada Test Site Support Office (NTSSO) is responsible for field direction of work performed at NTS by the Support Contractors. These contractors and their responsibilities are as follows:

1.2.1.5.1 Fenix and Scisson, Inc. (F&S) - F&S is the architect-engineer (A-E) for drilling and mining for the NNWSI. Responsibilities also include field surveillance and inspection of drilling and mining activities.

1.2.1.5.2 Holmes and Narver, Inc. (H&N) - H&N is the architect-engineer (A-E) for aboveground facilities; they provide material test laboratory support and administer the Project Record Center for the NNWSI. Responsibilities also include field surveillance and inspection of facility construction.

1.2.1.5.3 Reynolds Electrical and Engineering Company, (REECo) - REECo is the support contractor performing construction, drilling, and mining for the NNWSI. Responsibilities also include handling procurements for NTS.

1.2.2 Sandia National Laboratories, NTS Waste Management Overview Division, is the Technical Overview Contractor for the NNWSI and reports to the Project Manager. Responsibilities include coordination and documentation of overall technical activities; interfacing with ONWI, NWTS, etc. on technical issues; reviewing NNWSI technical activities and reports; and long-term in-depth technical studies which cut across the project. The Technical Overview Contractor is an advisor and consultant to the Project Office in these areas.

1.2.3 The Quality Assurance Overview Contractor organization for the NNWSI is Sandia National Laboratories, Quality Assurance Advanced Planning Division. The Quality Assurance Overview Contractor is identified as QA Overview throughout the remainder of this Quality Assurance Plan. QA Overview is responsible directly to the Project Manager. QA

Overview responsibilities include development of the Quality Assurance Plan for the NNWSI and the specific QAPP for Management and Overview activities; providing guidance for the preparation of the QAPP's of all Participating Organizations and Support Contractors; reviewing these QAPP's for the Project Office; conducting and participating in QA audits and surveillance of all programs on the project; and providing advice, consultation, and support for the Project Manager and his staff on quality assurance matters.

1.2.4 Participating Organizations

1.2.4.1 Los Alamos Scientific Laboratory (LASL) - LASL provides sorption measurement capability, tuff geologic media investigations, and geologic investigation support for NNWSI.

1.2.4.2 Lawrence Livermore National Laboratory (LLNL) - LLNL is responsible for granitic media studies including the Spent Fuel Test-Climax.

1.2.4.3 Sandia National Laboratories (SNL) - SNL Geologic Projects Division is responsible for argillite and tuff geophysical media investigations and ground motion studies for NNWSI.

1.2.4.4 United States Geological Survey (USGS) - USGS performs regional and localized geologic and hydrologic investigations necessary to support repository site evaluation and selection.

1.2.5 DOE/NV Support Contractor (Hereafter referred to as a Support Contractor)

1.2.5.1 Westinghouse Electric Corporation-Advanced Energy Systems Division (W/AESD) - W/AESD provides spent fuel handling and packaging capabilities for NNWSI.

1.3 Interfaces between the Project Office, the Participating Organizations and the Support Contractors are described in the QAPP's of these respective organizations. From the

overall NNWSI standpoint, these interfaces are exchanges of technical requirements of work to be performed and liaison until completion of work. Participating Organization and Support Contractor QAPP's describe the methods of conducting inter-organizational interfaces. Programmatic quality assurance requirements are imposed on the Participating Organizations and Support Contractors by the Project Office and QA audits of each organization are conducted by the Project Office or QA Overview under the cognizance of the DOE/NV QA Manager. Project participants are not authorized to audit one another.

1.4 Quality assurance personnel across the entire project report to management levels such that they have sufficient authority and organizational freedom to identify quality problems; initiate, recommend, or provide solutions; and to verify implementation of solutions. The organizational structure for executing the quality assurance programs varies from organization to organization and each one is described in their individual QAPP.

1.5 The establishment and execution of quality assurance programs for the NNWSI have been delegated to the various organizations working on the project, but the responsibility for quality assurance is retained by DOE/NV. This responsibility is carried out by QA Overview with QAPP reviews, surveillance and monitoring activities, and QA audits under the direction and with the awareness of the DOE/NV QA Manager.

2. QUALITY ASSURANCE PROGRAM

2.1 The quality assurance program for the NNWSI project as a whole consists of the QAPP's of NNWSI Project Management and Overview, the Participating Organizations, and the Support Contractors. All elements of the 10CFR50 Appendix B criteria which are applicable are addressed in the QAPP for

each organization. Written procedures are used to implement the plans. Matrices of procedures referenced to the applicable criteria elements are also included in each QAPP.

2.2 The requirement for determination of and QA coverage for the applicable elements of 10CFR50 Appendix B is delegated to the Participating Organizations (see 1.2.4) and the NTS Support Contractors (see 1.2.1.5.1 through 1.2.1.5.3 and 1.2.5.1). Assurance that the elements have been adequately addressed and implemented is provided by QA Overview during the review of their QAPP's, monitoring and surveillance operations on site, and regularly scheduled periodic audits of the activities.

3. DESIGN CONTROL

3.1 Design control on the NNWSI project applies to any information which defines or describes how and by what means (equipment, etc.) an investigation or test is to be conducted. Requirements are translated into such documents as drawings, criteria letters, specifications, test plans, instructions, procedures, etc. All such documentation is subject to the design control methodology of the organization responsible for that phase of the work to which it is applied. In every case, design reviews (or peer reviews) are conducted to verify the design; quality requirements are specified; the documentation is identified and controlled; changes are controlled and approved by the originating organizations; and applicable regulations and standards are incorporated. Variations in methodology across organizations are common but these basic control elements are always present.

3.2 For work done at the NTS, criteria letters which stipulate requirements are prepared by the organizations in charge of the activity. After appropriate reviews and approvals, the letter is forwarded to NTSSO with a copy to the Project Office. If the Project Office has any inputs to the criteria, the Project Coordinators will coordinate them with both the originating organization and the Support Contractor through

NTSSO. The A-E Support Contractors use the criteria letter and these additional inputs, if any, to formulate a test program, drilling program, or other documentation as necessary to govern the work. These formulated documents then become the "design" documents from which the other Support Contractors will work in the performance of the activity. The procedures and controls for accomplishing this work are described in detail in the Standard Operating Procedure NTSO-SOP-6001, Part I.

3.3 Design reviews are conducted at appropriate times by all groups involved in the NNWSI project. The Project Office will participate in these reviews as the coordinating agency for the overall project. Methods for accomplishing Project Office involvement will be developed in the future and incorporated in this QAP.

4. PROCUREMENT DOCUMENT CONTROL

4.1 Procurement activities by Participating Organizations and Support Contractors in support of their investigative work are accomplished per their own written procedures and by their internal groups dedicated to that work. The Project Office requires Participating Organizations to assure that these groups include applicable regulatory requirements, design bases and other requirements in their procurement documents to assure that adequate quality assurance requirements are included or referenced. The procurement activities are subject to audit by QA Overview as a representative of the Project Office.

4.2 Participating Organizations and Support Contractors have been instructed by the Project Office to meet applicable portions of 10CFR50 Appendix B and ANSI/ASME NQA-1-1979 in their quality assurance programs and to pass this requirement on to their subcontractors in their procurement documentation. Documents which do not adequately define quality assurance requirements as judged by the QA representative of the participant are corrected prior to the issuance of a purchase order or contract.

4.3 Procurement documents for the NTS are controlled by REECo under NTSSO direction and per the REECo QAPP.

5. INSTRUCTIONS, PROCEDURES, & DRAWINGS

5.1 All activities affecting quality on the the NNWSI project are defined by instructions, procedures, and drawings. Work done on the project is accomplished per these documents and they include appropriate acceptance criteria. Each Participating Organization and Support Contractor is responsible to see that their documentation meets these requirements and QA Overview, acting on behalf of the Project Office, assures compliance through monitoring, surveillance, and auditing techniques.

6. DOCUMENT CONTROL

6.1 Each of the Participating Organizations and Support Contractors on the NNWSI project have existing written procedures which describe how they control their own quality-related documents. It is not the intent of the overall project to interfere with these normal methods of doing business but they must be fully defined in the QAPP's written by these groups for this project and in the procedures referenced therein. All of these document control methods shall include the basic elements of issuance and distribution control, change control which assures review and approval by the originating organization, and control of content to assure adequate quality assurance coverage. The Project Office determines the adequacy of the control methods by means of document reviews and audits of individual quality assurance program procedures.

6.2 Documents developed and issued by the Project Office are reviewed for adequacy by authorized personnel and approved for release by the Project Manager or his designated alternate. Changes to these documents undergo the same review and approval procedure as the originals. A controlled distribution for each document is established by

the Project Office dependent upon its content to assure that quality-related information is disseminated to all affected parties.

7. CONTROL OF PURCHASED MATERIALS, EQUIPMENT, AND SERVICES

7.1 All materials, equipment, or services purchased on behalf of the NNWSI project become the property of the DOE/NV. However, the Project Office has delegated the procurement of these items and services to the Participating Organizations and Support Contractors as needed to properly conduct their investigations. The QAPP's of these groups define and reference written procedures for the methods of contractor evaluation, verification of supplier's conformance to specifications, and periodic surveillance of contractors. These activities are controlled and verified by the Project Office through QA program reviews and periodic audits.

7.2 Material, equipment, and service purchases for use at NTS are controlled by REECo per their procurement procedures.

8. IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

8.1 Materials, parts, and components purchased for use in the NNWSI project are identified and controlled by the using organization or contractor. These items are the property of DOE/NV. Their identification and method of control is documented and this information is available to the Project Office. A procedure, as applicable, for control and identification of material is part of every individual QAPP which is reviewed and concurred with by the Project Office.

9. CONTROL OF SPECIAL PROCESSES

9.1 When special processes are required, the use of qualified personnel and procedures is necessary. The criteria for qualification and the maintenance of qualification records are as specified in Participating Organization and Support

Contractor QAPP's and these records become part of the overall project record system. Verification methods and criteria are also documented and retained.

9.2 Some special processes are reviewed and approved by DOE/NV. Reviewers of such procedures are selected on the basis of their expertise in the particular field involved with the intent that they be peers to the personnel who developed the procedure.

10. INSPECTION

10.1 The NNWSI project is essentially a research project in which data are the primary products. Sometimes, in the conduct of a test or in some other data-gathering activity, it is necessary to develop and build a "one-of-a-kind" piece of hardware or equipment to perform a particular task. In these instances, inspection, either source or receiving, is needed to establish the design conformance of the item(s). The extent of the inspection, the inspection procedures, the designation of inspection personnel or organizations, and provisions for indirect monitoring are all considered when inspection is necessary. Provisions are made by written procedures referenced in the individual QAPP's to assure that the inspection is performed by qualified personnel who did not perform the actual work. Qualified personnel include experienced personnel from independent inspection organizations as well as personnel from the design group if they were not responsible for the actual work being evaluated. It is the function of the QA person assigned to an activity to assure that individuals are selected who are qualified to perform inspections.

11. TEST CONTROL

11.1 Test plans are submitted to the Project Office for review and approval. These plans define the test and plans for its execution; provide a means for assuring that test

prerequisites are met; specify adequate instrumentation and suitable environmental conditions; provide for documentation, evaluation, and retention of test results; and delineate necessary quality assurance provisions. A test in an investigation project such as the NNWSI is conducted to provide data upon which to base a decision and is thoroughly reviewed and discussed prior to approval by the Project Manager. The implementation of test plans is subject to audit by the Project Office/QA Overview.

12. CONTROL OF MEASURING AND TEST EQUIPMENT

12.1 Calibration of measuring and test equipment being used in the investigative effort is a requirement addressed in all NNWSI QAPP's. The basic controls include a recall system, periodic maintenance, records of calibration, identification noting status of calibration, and traceability of standards to the National Bureau of Standards. Calibration programs of the Participating Organizations and Support Contractors are subject to periodic audits by the Project Office to assure conformance to these requirements.

12.2 Measuring and test equipment which is of special design for a particular investigative activity is designed, developed, and manufactured under the control of the Participating Organization involved. Before using such equipment in an NNWSI test, a complete check-out is conducted per written procedures to assure conformance to specifications and the equipment is calibrated in accordance with 12.1 above.

13. HANDLING, STORAGE, AND SHIPPING

13.1 Written procedures are prepared by the responsible Participating Organizations and Support Contractors to delineate the identification, packing, handling, shipping, and storage of materials, including special nuclear

materials, involved in their investigative activity. The appropriateness of these procedures is established by the Project Office through design and program reviews and adequate implementation is verified by monitoring, surveillance and auditing techniques.

14. INSPECTION, TEST, AND OPERATING STATUS

14.1 Identification of inspection, test, and operating status is a requirement addressed, as applicable, in all NNWSI QAPP's. Implementing methods include systems assuring that activities are completed in the planned sequence. Status will be identified during the conduct of activities. Control of application of status indicators will be provided. This criterion applies to research and development activities for operations that include a planned sequence of activities that are to be verified. The criterion is especially applicable to test or data generation hardware that is fabricated, performance tested, or verified in the progress of work. Status (and status history) is verified through Project Office surveillance and audits.

15. NONCONFORMANCES

15.1 Nonconformances are controlled in accordance with requirements of the individual QAPP's. When items or components are involved, they are segregated, insofar as possible, from acceptable items until adequate disposition can be made. If services or data appear as nonconforming, the nonconformances will be documented and appropriate actions taken. Project management will decide whether activities are to be suspended until corrective action is taken or whether the data are to be re-run. All nonconformances are documented by the appropriate Participating Organization and Support Contractor to fully define the condition and the disposition of the nonconformance. This documentation is retained on file and is subject to Project Office audits.

15.2 Nonconformances include not only those things which are contradictory to the specified requirements but also unusual occurrences, incidents, etc. discovered by Participating Organizations and Support Contractors in the course of their work. Nonconformances are dispositioned by these organizations in accordance with their QAPP's. The Project Office will have the prerogative to be represented on all nonconformance committees dealing with safety-related items or services and will decide upon the extent of their participation based upon the seriousness of the nonconformance.

16. CORRECTIVE ACTION

16.1 Corrective action programs are defined in the approved QAPP of each Participating Organization or Support Contractor. They serve both to identify the cause of a nonconforming condition and to specify the corrective action taken. The corrective action specified for any nonconformance not only corrects current conditions but also is designed to preclude recurrence. The Project Office reviews the corrective action programs and verifies their implementation by monitoring, surveillance, and audit activities.

17. QUALITY ASSURANCE RECORDS

17.1 NNWSI maintains sufficient records to support conclusions reached from investigations or tests, or to support any facility construction done under the auspices of NNWSI. The Project Record Center is established at the NTS Engineering Records Library (ERL) for the receipt and permanent storage of records generated during the course of the NNWSI.

17.2 QA Overview has defined requirements for the operation of the Project Record Center. Included are requirements for submittal of records to the Project Record Center, review of incoming records, methods of filing records, access control, and reproduction of records upon request. Once accepted

into Project Record Center storage, records never leave the Project Record Center; copies are made as required. Holmes and Narver, Inc. (H&N) has been assigned responsibility for operation of the Project Record Center. Procedures utilized by H&N to administer the Project Record Center are controlled by the H&N QAPP.

17.3 The ERL provides necessary precautions against destruction due to fire or natural causes. Fire and security protection is provided by NTS systems. Access to the records storage areas is procedurally controlled.

17.4 The Project Office will identify the record types that should be contained in the Project Record Center by means of a Record Management Plan. Each Participating Organization and Support Contractor will develop a list of records planned for forwarding the Project Record Center. These lists of records are used by the Project Record Center for development and maintenance of an overall record index. DOE/NV approves Participating Organization and Support Contractor records lists to assure that adequate records are planned for retention in the Project Record Center.

17.5 The record index includes retention times for all records stored in the Project Record Center. Retention times are in the lifetime and nonpermanent categories.

17.5.1 Lifetime records are held in storage until the conclusion of the NNWSI project. At this time, records will be reviewed to determine if they will be archived by DOE or discarded. DOE/NV and the organization generating the record will make this determination on a record-by-record basis. The record index will be updated to show the final disposition of each record, and the record index will then be archived.

17.5.2 Nonpermanent Records show evidence that an activity was performed in accordance with applicable

requirements but need not be retained until conclusion of the NNWSI project. Nonpermanent records are kept for three (3) years and then reviewed to determine if continued retention is necessary. DOE/NV and the organization generating the record perform the review and make the determination to keep or discard the record. The record index will be updated to show the records that are discarded.

17.6 Participating Organizations and Support Contractors have defined their individual record management systems in their QAPP's. Planned records are defined. Requirements for record identification, contents, and necessary approvals are defined. Methods and facilities for storing records are described.

17.7 Participating Organizations and Support Contractors will forward all pertinent records to the Project Record Center at the conclusion of their involvement in NNWSI activities. The contents of this record transfer will be mutually agreed to by the Project Office and the Participating Organization or Support Contractor, and may include records that are in addition to records initially planned for transfer to the Project Record Center.

18. AUDITS

18.1 Scope of NNWSI Audit Program

18.1.1 NNWSI activities will be subject to audit on the basis of impact to the project and will not be included in audit schedules on a set frequency. An activity may be audited several times in one year or at longer intervals depending on activity importance or current levels of effort.

18.1.2 The NNWSI audit program will be executed at the overview level by the Project Office and at the activity level by individual Participating Organizations and Support Contractors.

18.2 Project Office Audits

18.2.1 The Project Office will conduct audits of activities throughout the project.

18.2.2 QA Overview will develop a schedule defining all Project Office audits planned for each fiscal year. This schedule will be approved and issued by the Project Office as an annual planning document. Additional audits will be conducted if a unique need arises or if requested by a Participating Organization or Support Contractor.

18.2.3 Audit teams will consist of representatives of the Project Office, NV staff, QA Overview or selected consultants, as appropriate. Representatives from the Technical Overview Contractor will also be audit team members when appropriate. Representatives of Participating Organizations or Support Contractors will be members of audit teams during audits of their contractors by NNWSI, or during audits of activities that are of mutual interest to them and the Project Office.

18.2.4 Sandia National Laboratories auditors will be qualified in accordance with the project requirements that specify attendance at auditor training courses, knowledge of the NNWSI quality assurance program, and QA principles. Previous audit experience will be required to qualify as a Sandia National Laboratories lead auditor. QA Overview will maintain a list of their lead auditors and qualified auditors. The lead auditor will select (subject to Project Office approval) audit team members from the list of qualified auditors.

18.2.5 Each audit will be performed to an audit plan developed by the lead auditor with concurrence by audit team members and approved by the Project

Office. Project procedures will define the actions required to plan, conduct, and report an audit.

18.2.6 Audit findings will be reviewed in a closeout meeting with the audited organization. An audit report will be issued to the Project Manager, referencing the audit number. The Project Manager will review the audit findings and issue the audit report to the audited organization with requests for appropriate corrective action. QA Overview will, at the request of the Project Office, review the corrective action proposed by the audited organization to assure that audit findings will be adequately corrected. A re-audit may also be required if extensive corrective action is necessary to correct audit findings.

18.3 Participating Organization and Support Contractor Audits

18.3.1 Each Participating Organization and Support Contractor shall conduct audits of activities under their direct control. They also shall audit their direct contractors but they will not audit each other.

18.3.2 Participating Organization and Support Contractors audits will be scheduled, planned, conducted, and reported as described in their respective QAPP's.

18.3.3 Results of these audits will be reported to appropriate levels of management. The Participating Organization or Support Contractor management, as applicable, will review audit findings and approve actions correcting audit findings. Follow-up action, or re-audit, will be done as necessary. Project Office audits will verify the adequacy of the organization audit process.

18.3.4 Participating Organization and Support Contractor auditors will be qualified as required by their respective QAPP's.

Appendix A

PARTICIPATING ORGANIZATION AND SUPPORT CONTRACTOR QAPP'S

Participating Organizations

1. NNWSI Project Office	M&O-QAPP; NNWSI Management and Overview Quality Assurance Program Plan
2. Los Alamos Scientific Laboratory (LASL)	TWS-CMB QA-QP-01, R1; Quality Assurance Program Plan for NTS Terminal Waste Storage
3. Lawrence Livermore National Laboratory (LLNL)	1. M-078-08, Rev 1; Quality Assurance Plan, Spent Fuel Test - Climax 2. M-078-16; Quality Assurance Plan, Waste Isolation Projects, Laboratory Testing
4. Sandia National Laboratories (SNL)	Revision 06, Quality Program Plan for the Nevada Nuclear Waste Storage Investigations
5. United States Geological Survey (USGS)	WS-USGS-QPP-01, R0; USGS Quality Program Plan

Support Contractors (NTSSO)

1. Fenix and Scisson, Inc. (F&S)	F&S Quality Program Plan
2. Holmes and Narver, Inc. (H&N)	H&N Quality Program Plan
3. Reynolds Electrical and Engineering Co, Inc.	REECo Quality Program Plan

Direct DOE/NV Contractor

1. Westinghouse Electric Corporation - Advanced Energy Systems Division (W/AESD)	NVO-199; Quality Assurance Program Plan for Spent Fuel Handling and Packaging Tests

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