

U.S. GEOLOGICAL SURVEY
QUALITY ASSURANCE PROGRAM PLAN
FOR
YUCCA MOUNTAIN PROJECT

Effective Date _____

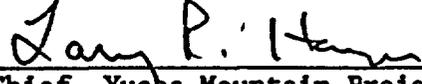
Revision 5 of this QAPP has been in effect since 5-3-89.

This signature page has been revised to reflect an organizational change.



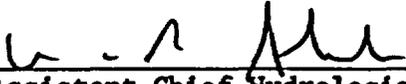
YMP-USGS QA Manager

10/11/91
Date



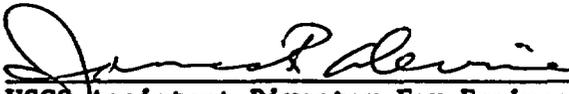
Chief, Yucca Mountain Project Branch

10/01/91
Date



Assistant Chief Hydrologist for Program
Coordination and Technical Support

10/07/91
Date



USGS Assistant Director For Engineering
Geology:

10/04/91
Date



Director, Yucca Mountain Quality Assurance
Division

10/14/91
Date

QUALITY ASSURANCE PROGRAM PLAN

**YMP-USGS QUALITY ASSURANCE PROGRAM PLAN
INTRODUCTION**

The U.S. Geological Survey (USGS) has lead responsibility for conducting earth science investigations in the Yucca Mountain Project (YMP). The USGS is responsible for site characterization activities including climatology, geology, hydrology, and paleohydrology. The USGS acts as the lead technical participant for the site characterization drilling activities and provides assistance to other YMP participants for areas of specialized USGS expertise. The USGS has no repository design responsibilities, although some technical data collected by the USGS and its sub-contractors will be used by other participants as design input.

This Quality Assurance Program Plan (QAPP) describes how the USGS will satisfy the quality assurance requirements of the YMP. This QAPP specifies an assemblage of quality assurance controls that are in compliance with ANSI/ASME NQA-1 and its supplements, applicable YMP-USGS QA and management requirements, and appropriate parts of the Office of Civilian Radioactive Waste Management Quality Assurance Requirements Document (QARD).

This QAPP delineates the YMP-USGS organization as it relates to the fulfillment of its YMP Quality Assurance responsibilities. The QAPP is organized in a manner similar to ANSI/ASME NQA-1 with 18 sections and, as appropriate, supplements. Each section is comparable to the corresponding NQA-1 section.

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1.0 ORGANIZATION

1.1 General

This section describes organizational responsibilities of the USGS for the YMP and identifies organizational interfaces for YMP-USGS work that support a quality assurance and technical program that meets the requirements of NQA-1 for achievement of quality in all activities. The QAPP is based on an important quality principle that each person is responsible for the achievement of quality in the work the person performs. The Quality Assurance (QA) Program provides for such achievement of quality as well as verification of that achievement. The line organization has responsibility for the achievement of quality. The QA organization has the responsibility to provide assurance to senior line management of the line organization's achievement through verification of quality. This is accomplished through the conduct of overview activities such as audits, surveillances, reviews, and assessments.

1.2 YMP-USGS Responsibilities

The YMP-USGS is a participating organization in the Yucca Mountain Site Characterization Project, including the environmental monitoring program. The YMP Branch of the USGS Water Resources Division (WRD) provides administrative and budget management support and oversight for all YMP activities within the YMP-USGS scope of work. The technical program is conducted within the Hydrologic Investigation Program (HIP) and the Geologic Studies Program (GSP), and through written agreements with other organizations including the USGS Geologic Division; the U.S. Bureau of Reclamation; Lawrence Berkeley Laboratories (LBL); University of Nevada, Reno; and others. These written agreements specify how the YMP-USGS QA Program will be addressed by those organizations. Specific activities performed by the YMP-USGS are derived from the YMP Work Breakdown Structure (WBS).

It is the responsibility of the Chief, YMP Branch, to ensure that appropriate QA requirements and procedural controls are implemented for the YMP-USGS scope of work in order to provide confidence that the YMP will not cause undue risk to either the health and safety of the public or of the workers associated with the geologic repository facilities.

1.3 YMP-USGS Organization

The Water Resources Division (WRD), USGS, has been assigned the responsibility for the overall management and implementation of the USGS earth sciences support to the YMP. This responsibility is housed in the YMP Branch under the Assistant Chief Hydrologist for Program Coordination and Technical Support (ACH/PC&TS). The YMP Branch will also provide for support from other organizational units of the USGS or outside organizations through the use of written agreements.

The YMP-USGS QA organization ultimately reports to the Assistant Director of Engineering Geology, independent of the WRD line organizations. This functional relationship has been established to ensure the QA organization reports to a management level that provides the appropriate authority and organizational freedom,

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including sufficient independence from cost and schedule considerations, to fulfill its responsibilities. The responsibilities of these various organizations are as described in Section 1.4 below.

The YMP-USGS QA Office functions are those of assuring that an appropriate QA program is established and executed effectively, and of verifying that requirements have been performed correctly by checking, auditing, conducting surveillances, and otherwise monitoring activities that affect quality. The USGS may delegate to others, such as contractors, agents, or consultants, the work of establishing and executing the QA Program, or any part thereof, but the USGS shall retain the responsibility for the QA Program.

1.4 Organizational Duties and Responsibilities

The organizational structure, program responsibilities, levels of authority, and lines of communication of the USGS staff performing work on the YMP are described below. All organization and authority presented herein is YMP-USGS Project-specific and represents program relationships established to implement YMP activities. Where there are conflicts or disputes involving differences of opinion among YMP-USGS personnel, they will, as necessary, be elevated through the organizational hierarchy described in this section. The organization of the USGS with respect to the YMP-USGS and QA is shown in Figure 1.

1.4.1 Director, USGS: The Director is responsible for the overall direction of the USGS activities. The Director has delegated YMP-USGS QA program responsibilities to the Assistant Director for Engineering Geology. This management function includes responsibility for the YMP-USGS QA Program, including final USGS resolution of conflicts and disputes involving quality arising from differences of opinion between YMP-USGS QA Office personnel and technical/administrative personnel.

1.4.2 Quality Assurance (QA) Manager, YMP-USGS: The QA Manager directs the development and verification of the YMP-USGS QA Program, and in this regard reports to the Assistant Director for Engineering Geology. The QA Manager interfaces with the Chief, YMPB and technical personnel on QA matters, as necessary. The basic responsibilities of the overall QA organization are development of the QA Program, verification that YMP-USGS activities are conducted in accordance with governing documents, and implementation of specific QA Office requirements. In this capacity, the QA Manager has the responsibility to:

- a) Develop, review, and approve the YMP-USGS QA Program Plan and the YMP-USGS implementing procedures;
- b) Maintain liaison with DOE Yucca Mountain Site Characterization Project Office (YMPO) management to assure adequate compliance with the YMP QA Program;
- c) Provide and direct QA support for the YMP-USGS;
- d) Identify quality problems, provide or review solutions to those problems, and verify implementation of solutions.

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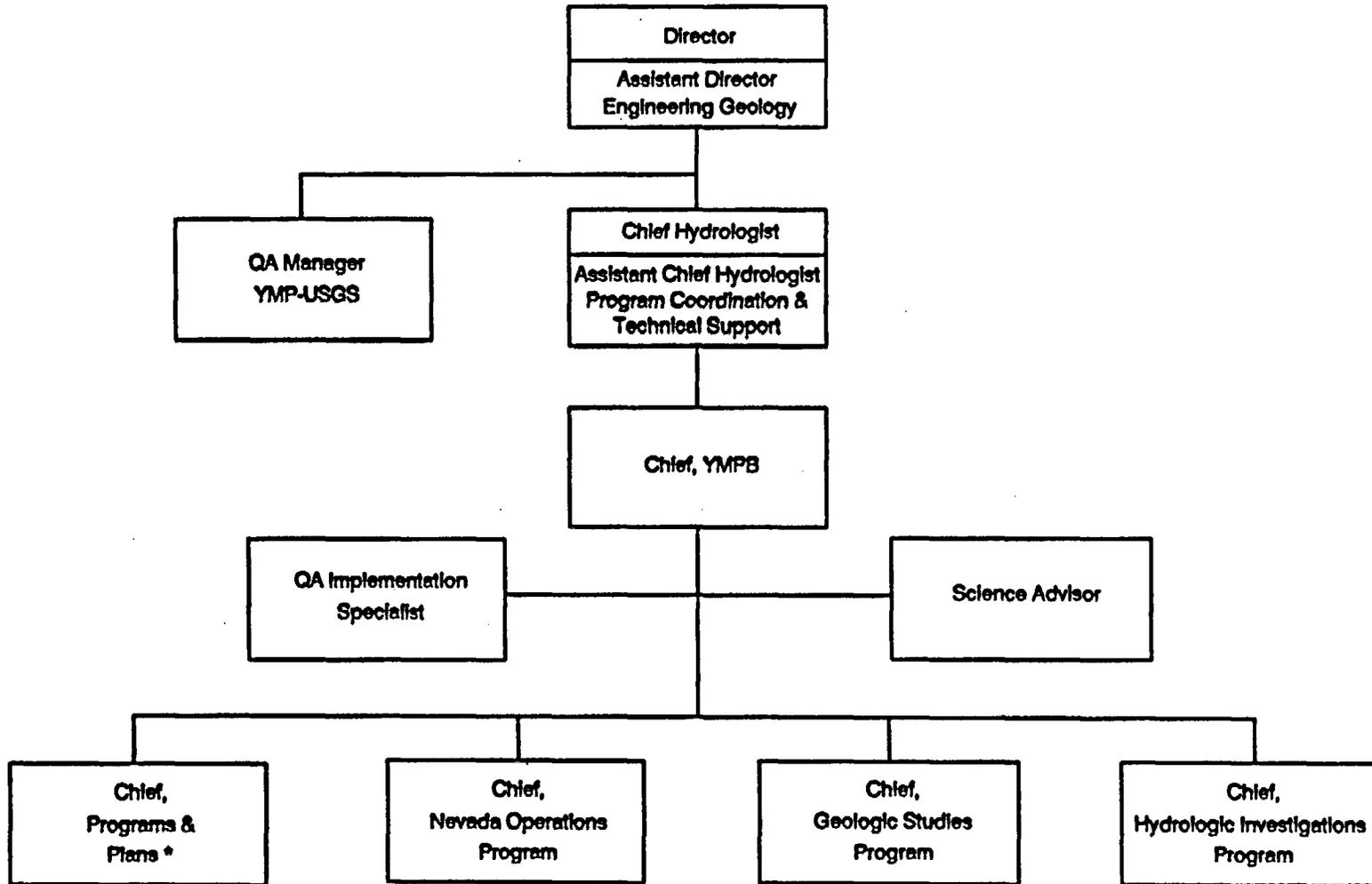
- e) Assure unsatisfactory conditions are properly controlled and, if necessary, stop work that does not meet QA standards;
- f) Verify the adequacy and effectiveness of quality assurance implementation through the conduct of audits, surveillances, reviews, and trend analysis; and
- g) Resolve conflicts and disputes between QA personnel and others.

1.4.3 Chief, Hydrologist, Water Resource Division (WRD): The Chief Hydrologist has overall responsibility for managing the WRD technical program. The YMP-USGS responsibilities have been delegated to the Assistant Chief Hydrologist for Program Coordination and Technical Support (ACH/PC&TS). The ACH/PC&TS provides management oversight for the YMPB activities.

1.4.4 Chief, YMP Branch (YMPB): This position is also referenced as the Technical Project Officer (TPO). The Chief, YMPB reports to the ACH/PC&TS, WRD and has been delegated direct management responsibility for the YMP-USGS technical program. The Chief, YMPB responsibilities include YMP-USGS line management, programmatic, and budgetary responsibility for technical and administrative USGS and contractor personnel assigned to the YMP, including responsibility for the implementation of the YMP-USGS QA Program. The Chief, YMPB responsibilities include but are not limited to the following:

- a) Planning and directing work activities;
- b) Complying with quality requirements imposed by quality program documents;
- c) Satisfying staff resource needs, cost, and schedule objectives, and deliverable requirements;
- d) Approving and implementing the YMP-USGS QAPP and the YMP-USGS QA program implementing procedures;
- e) Implementing the YMP procedures as they apply to the YMP-USGS scope of work;
- f) Implementing corrective actions for deficiencies identified within YMP-USGS quality program;
- g) Providing periodic assessment regarding the adequacy and effectiveness of the YMP-USGS quality program;
- h) Approving and implementing Stop Work Order; and
- i) Planning and directing the YMP-USGS training program.

**Organizational Structure
Yucca Mountain Project Branch**



* Also Serves as Associate Branch Chief

Figure 1. Organizational Chart

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1.4.5 QA Implementation Specialist, YMPB: This position reports to the Chief, YMPB and interprets QA requirements of the USGS and directs and provides guidance to ensure the effective and appropriate implementation of the quality assurance program, as developed by the YMP-USGS QA Manager's Office. The QA Implementation Specialist also provides liaison with the YMPB, the QA Office, the GSP and HIP Chiefs and the DOE regarding quality assurance implementation.

1.4.6 Science Advisor (SA): The SA reports to the Chief, YMPB, and advises the Chief, and YMP-USGS personnel on the technical quality and future direction of geologic and hydrologic activities of YMP-USGS. The SA provides liaison for the Chief, YMPB with scientists in the YMP and elsewhere, who are involved in geologic and hydrologic aspects of high-level nuclear-waste disposal.

1.4.7 Chief, Program and Plans (PAP): The Chief, PAP reports to the Chief, YMPB, and maintains responsibility for the oversight of project planning and control activities, and the management of records, data, and reports/publication activities. The Chief, PAP also serves as Associate Branch Chief, YMPB and acts for the Chief, YMPB in his absence.

1.4.8 Chief, Nevada Operations Program (NOP): The Chief, NOP reports to the Chief, YMPB and provides day-to-day YMPB representation in Nevada to DOE officials and other participants and interested parties on behalf of the Chief, YMPB. The Chief, NOP provides liaison with the DOE Yucca Mountain Site Characterization Project Site Office and the on-site support contractors for operational and logistical support of YMP-USGS field activities. The Chief, NOP also coordinates the environmental/regulatory readiness of planned on-site activities and directs the YMP-USGS functions related to Systems Engineering.

1.4.9 Chief, Geologic Studies Program (GSP): Chief, GSP directs the geologic activities performed by Geologic Studies Program Principal Investigators and staff. The Chief, GSP reports to the Chief, YMPB. The Chief, GSP has responsibility for achieving the performance of assigned YMP-USGS tasks, including satisfying all technical, QA, or other requirements specified in USGS plans, procedures, contracts, purchase documents, or management directives.

1.4.10 Chief, Hydrologic Studies Program (HIP): Chief, HIP directs the hydrologic activities performed by Hydrologic Studies Program Principal Investigators and staff. The Chief, HIP reports to the Chief, YMPB. The Chief, HIP has responsibility for achieving the performance of assigned YMP-USGS tasks, including satisfying all technical, QA, or other requirements specified in USGS plans, procedures, contracts, purchase documents, or management directives.