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STATE OF NEVADA
AGENCY FOR NUCLEAR PROJECTS/
NUCLEAR WASTE PROJECT OFFICE

NARRATIVE REPORT

JANUARY 1, 1991 - ~~MARCH 31~~, 1991

June 30

*(per Freddie Breyer
typoon date)*

The Agency for Nuclear Projects/Nuclear Waste Project Office (NWPO) is the State of Nevada agency designated by State law to monitor and oversee U.S. Department of Energy (DOE) activities relative to the possible siting, construction, operation and closure of a high-level nuclear waste repository at Yucca Mountain and to carry out the State of Nevada's responsibilities under the Nuclear Waste Policy Act of 1982.

Initially created by Executive Order of the Governor in 1983, the NWPO, together with a seven-member Commission on Nuclear Projects, was formally established in statute by the 1985 Nevada State Legislature. The Office is supported by Nuclear Waste Fund money channeled through DOE, Office of Civilian Radioactive Waste Management.

During the reporting period the NWPO continued to work toward the five objectives designed to implement the Agency's oversight responsibilities.

1. Assure that the health and safety of Nevada's citizens are adequately protected with regard to any federal high-level radioactive waste program within the State.
2. Take the responsibilities and perform the duties of the State of Nevada as described in the Nuclear Waste Policy Act of 1982 (Public Law 97-425) and the Nuclear Waste Policy Amendments Act of 1987.
3. Advise the Governor, the State Commission on Nuclear Projects and the Nevada State Legislature on matters concerning the potential disposal of high-level radioactive waste in the State.
4. Work closely and consult with affected local governments and State agencies.
5. Monitor and evaluate federal planning and activities regarding high-level radioactive waste disposal. Plan and conduct independent State studies regarding the proposed repository.

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A. PROGRESS IN MEETING OBJECTIVES

OBJECTIVE 1

Assure that the health and safety of Nevada's citizens are adequately protected with regard to any federal high-level radioactive waste program within the State.

Status

To meet this objective, the NWPO works with the Governor's office, the Nevada State Legislature, the Nevada Commission on Nuclear Projects and statewide and local government coordinating and advisory committees to assure open and direct communication and an integrated State approach to the repository program.

Because the proposed Yucca Mountain repository project has the potential to affect the health and safety of Nevada's citizens in a variety of ways and over an extended period of time, all of the NWPO's efforts during the reporting period were designed to assure adequate protection of Nevada's citizens with regard to any federal HLW program in the State. This is an overriding objective that is encompassed by every other objective and by every activity engaged in by the NWPO.

OBJECTIVE 2

Take the responsibilities and perform the duties of the State of Nevada as described in the Nuclear Waste Policy Act of 1982 (Public Law 97-425) and the Nuclear Waste Policy Amendments Act of 1987.

Status

Because of funding reductions for State activities resulting from congressional FY 1989, FY 1990, and FY 1991 budget actions, the ability of the NWPO to carry out roles and responsibilities as prescribed in the NWPA and NWPAA is being adversely affected. Technical, environmental, socioeconomic and transportation efforts - all related to assuring public health and safety - have had to be reduced or, in some cases, eliminated or postponed.

State responsibilities and duties under the Nuclear Waste Policy Act of 1982 and the Nuclear Waste Policy Amendments Act of 1987 include the monitoring, review and involvement in the policies and activities of the Department of Energy and the Office of Civilian Radioactive Waste Management (DOE/OCRWM) in the site selection process for a high-level radioactive waste repository. Further, the State of Nevada is conducting independent studies and reviews in the technical,

environmental, socioeconomic and transportation aspects of the repository siting and planning process. The NWPO continues its cooperation with local governments and Indian tribes within the State and has made provisions for public information and involvement in its activities.

During the reporting period, NWPO technical and planning staff participated in and/or made presentations at the following meetings:

PLANNING DIVISION MEETINGS

- Clark County Steering Committee
(April 19, 1991 in Las Vegas)
- Clark County Community College Panel on Yucca Mountain
(April 22, 1991 in North Las Vegas)
- Meeting with DOE and Local Governments on DOE Socioeconomic Plan
(April 23, 1991 in Las Vegas)
- International HLW Conference
(April 29 - May 2, 1991 in Las Vegas)
- Meeting with Socioeconomic Risk and Sociocultural Researchers
(May 1, 1991 in Las Vegas)
- Clark County Peer Review Committee Yucca Mountain Tour
(May 6, 1991 in Las Vegas/Nye County)
- Clark County Peer Review Committee Meeting
(May 7 - 8, 1991 in Las Vegas)
- Western Interstate Energy Board HLW Committee Meeting
(May 13 - 14, 1991 in Denver)
- DOE Project Update Meeting
(May 20, 1991 in Pahrump)
- DOE Project Update Meeting
(May 21, 1991 in Las Vegas)
- DOE Project Update Meeting
(May 23, 1991 in Reno)
- Commission on Nuclear Projects Meeting
(May 23, 1991 in Las Vegas)

- Council of Energy Resource Tribes Workshop on Hazardous and Nuclear Materials Transportation
(June 4, 1991 in Reno)
- University of Nevada Reno Center for Infrastructure Studies Meeting
(June 12, 1991)
- Clark County Steering Committee
(June 18, 1991 in Las Vegas)

TECHNICAL DIVISION MEETINGS

- NWTRB Meeting on Natural Analogs
(April 16-17, 1991 in Reno, NV)
- NRC-ACNW Working Group Meeting on Integration of Geophysics
(April 22, 1991 in Washington, DC)
- NRC-ACNW Field Trip to Lunar Craters, Central Nevada
(April 27-28, 1991)
- NWTRB Meeting on Performance Assessment
(May 20-21, 1991 in Arlington, VA)
- DOE Engineered Barrier System Workshop
(June 18-20, 1991 in Denver)
- NWTRB Meeting on Testing
(June 25-27, 1991 in Denver)

During the reporting period, the Office participated in Quality Assurance audits/surveillances of U.S. Geological Survey, Lawrence Livermore National Laboratory, and Science Applications International Corporation. The Office also attended NRC/DOE Quality Assurance meetings and DOE Technical Project Office meetings.

OBJECTIVE 3

Advise the Governor, the State Commission on Nuclear Projects and Nevada State Legislature on matters concerning the potential disposal of high-level radioactive waste materials in the State.

Status

During the reporting period, NWPO staff continued to work with the Governor's Office, the State Commission on Nuclear

Projects and the State Legislature's Study Committee on High-Level Radioactive Waste to keep each apprised of developments relative to DOE's high-level waste (HLW) disposal program.

The NWPO Director worked closely with the Governor's Office to assure that the Governor and his staff were adequately informed on the HLW issues.

NWPO staff kept the Commission on Nuclear Projects advised as to the status of the program and the technical, socioeconomic and transportation findings of ongoing State studies. During the period, the NWPO continued to provide financial assistance and informational materials to the Legislature's Committee on High-Level Radioactive Waste. The NWPO funded a legislative analyst to keep committee members informed on key issues and also provided resources for nuclear waste-related committee activities.

OBJECTIVE 4

Work closely and consult with affected local governments and State agencies.

Status

During the period, the NWPO continued to work closely and cooperatively with affected local governments and Indian tribes in Nevada, those that have been formally awarded affected unit of local government status as well as others in the State that stand to be affected by the repository or related activities. Regular meetings of the State/Local Government Planning Group (SLPG) were held to review socioeconomic and transportation efforts and to coordinate State and local government nuclear waste activities.

The NWPO continued to provide funds to the City of Las Vegas, the city of North Las Vegas, the City of Henderson, Esmeralda County, the Western Shoshone National Council and the Moapa Band of Paiutes to assist these entities in participating in State and federal HLW programs and to enable them to evaluate potential repository-related socioeconomic and transportation impacts. In addition, the SLPG includes other local governments which have expressed interest in the repository program-particularly those which could be impacted by highway or rail transportation of waste to a repository at Yucca Mountain. These entities include the City of Reno, the City of Sparks, Washoe County, Mineral County, Churchill County, Elko County, and Humboldt County. Due to funding constraints, involvement of these local jurisdiction to date has been limited to the provision of information and informal consultation.

As a result of DOE's preliminary rail spur analyses and the Nevada Department of Transportation's highway routing efforts, local governments located along potential HLW shipping corridors will become increasingly affected by and involved in the federal HLW disposal program in the future.

In May, 1991, DOE awarded "affected" status to Esmeralda, Inyo (CA), and White Pine counties. It also advised Mineral, Lander, Eureka and Churchill counties that they would also be designated as "affected" upon request. This action was in response to the ruling by the 9th U.S. Circuit Court of Appeals in February, 1991, that DOE had acted improperly in denying Esmeralda and Inyo counties "affected" status. The Court found that these counties were affected and instructed DOE to reconsider the decision.

The NWPO continued to work cooperatively with the University of Nevada Las Vegas, the University of Nevada, Reno, the State Department of Transportation and other agencies in implementing State/local transportation analyses. In addition, the NWPO continued its cooperative efforts with the State Department of Conservation and Natural Resources, the State Division of Health, the Division of Emergency Management and other State agencies with regard to environmental, health and safety, and other activities being undertaken as part of the State's oversight responsibilities.

OBJECTIVE 5

Monitor and evaluate federal planning and activities regarding high-level radioactive waste disposal. Plan and conduct independent State studies regarding the proposed repository.

Status

Work was carried out in four major areas during the reporting period. These were technical planning and evaluation, socioeconomic impact assessment, transportation planning and assessment and public information.

1. Technical Programs

The Office submitted comments on its review of DOE Study Plans for "Characterization of the Yucca Mountain Quaternary Regional Hydrology" (Study Plan 8.3.1.5.2.1) and "Characterization of the Yucca Mountain Regional Surface - Water Runoff and Streamflow" (Study Plan 8.3.1.2.1.2). Reviews of Study Plans on "Historical and Current Seismicity"; "Probability of Magmatic Disruption of the Repository"; "Characterization of the Saturated-Zone Ground-Water Flow System"; "Characterization of the Unsaturated Zone Infiltration"; "Quaternary Faulting

Within the Site Area"; "Geodetic Leveling"; and "Characterization of the Yucca Mountain Regional Ground-Water Flow System" continued during the reporting period.

Activities of the Center for Neotectonic Studies, University of Nevada, Reno focused on faulting, tectonics, seismology, and natural resources evaluations.

The UNR seismological laboratory continued to operate and record data from three broad band downhole digital seismograph stations in southern Nevada. Work was initiated on estimating magnitudes from micro-earthquake data collected in late 1990 from Yucca Mountain. A review was initiated on a draft report on strain patterns in southern Nevada by the U.S. Geological Survey.

On the Quaternary Tectonics Task, J. Bell and F. Peterson prepared a paper titled "Late Quaternary Geomorphology in Crater Flat, Yucca Mountain, Nevada" for submission to the Journal Quaternary Research. A. Ramelli completed a draft manuscript on Quaternary faulting at Yucca Mountain for submittal to Geology.

Relative to the mineral resources project, D. Noble presented an invited lecture to a U.S. Geological Survey Yucca Mountain colloquium in Denver, entitled "New Observations on the Volcanic, Tectonic, and Hydrothermal Evolution of the Southwestern Nevada Volcanic Field and Areas to the West." S. Weiss and S. Castor initiated preparation of a manuscript titled "Contrasts in the Style and Geochemistry of Epithermal Mineralization, Southwestern Nevada Volcanic Field" for submission to the Journal of Geochemical Exploration. Field work continued on detailed stratigraphic mapping and sampling of the volcanic tuff section along the west side of the Timer Mountain Caldera and in the Bullfrog Hills. New Ar_{39} age dates corroborate previous K-Ar age determinations and suggest that alteration/mineralization at Original Bullfrog appears to be slightly younger than that at Bond Gold Bullfrog Mine and Montgomery-Shoshone Mine. These ages clearly show that productive, gold-bearing hydrothermal activity took place as far north as the Mayflower Mine during or very shortly after the time of deposition of the Tuffs and Lavas of the Bullfrog Hills, which were erupted by about 10 Ma. The ages of the Yellow Jacket Mine and "Bullfrog Hills" samples provide direct evidence for one or more older hydrothermal event(s) in the northern Bullfrog Hills.

The hydrocarbon resources project participated in a field review of the Eleana Formation on the Nevada Test Site with Geologists from the U.S. Geological Survey.

Consensus was reached that the Eleana Formation can be separated into two units - a "western Eleana" composed of argillites and bioclastic turbidites, and an "eastern Eleana" composed of mudstones and quartzites. A fault separates the two units at Gap Wash and in the southern Eleana Range. Additional mapping in the Bare Mountains confirms the presence of "western Eleana" formation west of Yucca Mountain.

J. Caskey and R. Schweickert completed a manuscript entitled "Mesozoic deformation in the Nevada Test Site and Vicinity - A New Perspective for the CP Hills, Nye County, Nevada" for submission to Tectonics. D. Donovan completed her M.S. Thesis on Neotectonics of the southern Amargosa Desert with Office sponsorship. J. Hoffaro also completed her M.S. Thesis on Quaternary faulting in Pahrump and Stewart Valleys, also with State Office support. R. Schweickert presented an invited lecture on "Some Aspects of the Structural Evolution of the NTS Region, Southern Nevada" at Lawrence Livermore National Laboratory. Field work involved collecting samples for paleo magnetic analysis in the Bullfrog Hills, Bare Mountain, Muddy Mountains, and along the Las Vegas Valley Shear Zone. Analysis of the samples was initiated.

Activities of Mifflin and Associates focused on geochemistry and climate change. M. Mifflin and R. Morrison attended the Friends of the Pleistocene field trip to Fish Lake Valley. Special emphasis of the trip was on tephra chronology and paleohydrology studies which suggest the presence of a middle Pleistocene lake in Fish Lake Valley. A literature review was initiated to identify environmental effects on glass hydration rates. Research to date suggests that various environmentally-derived gases may have adverse impacts of glass stability especially under high thermal conditions. C. Schlenger, D. Veblen, and J. Rosenbaum published a paper on their research titled "Magnetism and Magnetic Mineralogy of Ash Flow Tuffs from Yucca Mountain, Nevada" in the April issue of Journal of Geophysical Research.

Relative to the University of Nevada, Las Vegas volcanism studies, three abstracts were prepared and submitted to the Geological Society of America meeting in San Diego in October 1991. The abstracts were prepared for the theme session entitled "Geology, Hydrogeology, and Tectonics of southern Nevada in relation to the potential storage of high-level nuclear waste."

The abstracts are titled:

New Insights on Structural Controls and Emplacement
Mechanisms of Pliocene/Quaternary Basaltic Dikes,
Southern Nevada and Northwestern Arizona

James E. Faults
Department of Geology
University of Iowa, Iowa City, IA 52242;

Daniel L. Feuerbach and Eugene I. Smith
Department of Geoscience
University of Nevada, Las Vegas, NV 89154

Intermediate and Mafic Volcanic Rocks of the
Northern White Hills, Arizona: Implications for
the Production of Intermediate Composition Volcanic
Rocks During Regional Extension

Cascadden, T.E.
Department of Geology
University of New Mexico, Albuquerque, NM 87131

Smith, E.I.
Department of Geoscience
University of Nevada, Las Vegas, NV 89154

Hornblende Geobarometry from Mid-Miocene Plutons:
Implications Regarding Uplift and Block Rotation
During Basin and Range Extension

Metcalf, Rodney V. and Smith, Eugene I.
Department of Geoscience
University of Nevada, Las Vegas, NV 89154

A manuscript titled "Eruptive probability
calculation for the Yucca Mountain Site, U.S.N.:
Statistical Estimation of Recurrence Rates" by C-H.
Ho, E. Smith, D. Feuerbach, and T. Naumann was
completed and accepted by the Bulletin of
Volcanology. C-H. Ho had two additional papers
published during this reporting period:

"Time Trend Analysis of Basaltic Volcanism for
the Yucca Mountain Site" in Journal of
Volcanology and Geothermal Research; and

"Predictions of Volcanic Eruptions at Mt.
Vesuvius, Italy" in Journal of Geodynamics.

2. Socioeconomic Impact Assessment

State socioeconomic studies continued to be implemented during the period. Studies were actively coordinated with affected local government programs through the State/Local Government Planning Group which serves as a steering committee for the State effort. Nye County, Clark County and Lincoln County (the three officially designated "affected" jurisdictions) are members of the Planning Group as are Esmeralda County, the City of Las Vegas, the City of North Las Vegas, the City of Henderson, the Western Shoshone National Council and the Moapa Band of Paiutes. In addition, NWPO representatives participated in meetings of the Clark County Nuclear Waste Steering Committee, which oversees the Clark County socioeconomic effort.

State socioeconomic activities were underway during the period in the following areas:

Project Description. Development of a Project Description Development System, including a computerized database and program for developing scenarios. Work is being done by Planning Information Corporation of Denver.

Economic Modeling. Continued refinement of the REMI model and the installation and maintenance of the model at the State Department of Employment Security Research Division, the entity selected to house the model for the NWPO. Work is being done jointly by the State ESD and Coopers and Lybrand of Las Vegas and Phoenix.

Social-Cultural Studies. Commencement of a project to analyze and explain certain anomalies in data collected on rural and urban populations, especially variable that might help explain differential risk perceptions. Also, a initial project to examine how trust operates to influence people's responses to risk and to the repository was begun. Work is being carried out by Arizona State University, Utah State University and the University of Nevada Las Vegas.

Native American Studies. Continuation of the analysis of data on Native American communities in Nevada affected by the repository project and the collection of community profile data on the Moapa Band of Paiutes and the Las Vegas Indian Colony. Work is done by the University of Nevada Reno.

Risk Assessment, Risk Perception/Behavior Studies. Work continued on studies of risk effects, including the analysis of data from prior survey research on tourism,

migration, and convention attendance. A series of summary reports were in process. Work is being done by Decision Research of Eugene, Oregon, The Wharton School, University of Pennsylvania, Clark University and Coopers and Lybrand.

Database Development and Maintenance. The Monitoring Reference Data Base (MRDB) was maintained and updated to incorporate all new study products. Plans were begun to move the MRDB from Coopers and Lybrand to the NWPO. Work is done by Decision Research and Coopers and Lybrand.

Plans were made during the period for the Technical Review Committee to review socioeconomic study activities, products and findings and make recommendation for future work at the TRC meeting scheduled for September, 1991. Funding shortages continue to hamper the State's socioeconomic efforts and have resulted in the truncating and revising of many research activities originally planned as part of the State efforts.

3. Transportation Planning and Assessment

State transportation work during continued to focus on expanding the route characterization and risk analysis database development and evaluation being implemented by the UNLV Transportation Research Center under contract to the NWPO. In addition, NWPO staff and researchers continued to evaluate DOE's cask design activities and analyze the effects of HMTUSA and related changes in federal regulations on State and local governments with respect to nuclear waste transportation.

Work begun during the period includes the following tasks:

- Preparation of a report on full-scale shipping cask crash and fire tests;
- Preparation of a report on the status of commercially available dry storage systems for spent fuel, with special attention to the certification of dual purpose (storage/transport) casks;
- Analysis of severe highway/rail accidents which may expose casks to conditions exceeding those specified in NRC's cask performance standards;
- Evaluation of DOE's responses to comments on the GA 4/9 and BR 100 shipping cask preliminary design reports; and

- Review of the Hazardous Materials Transportation Uniform Safety Act and the implications for HLW risk management.

In addition to the specific work/research activities, meetings were held between NWPO staff, transportation advisors, contractors, State agencies and local governments to review and oversee work plans.

Negotiations continued during the period with the University of Nevada, Reno College of Engineering regarding the scope of work and work plans for the Center for Infrastructure Studies' transportation-related activities to be funded through the NWPO, as specified in the FY 1991 congressional appropriations measure.

4. Public Information

Public Information activities during the period continued to involve all phases of a program to develop and provide information on the Department of Energy's Yucca Mountain project and the State of Nevada's oversight role in it. NWPO staff continued to prepare and disseminate information to the public and the media and assisted the Nevada Nuclear Waste Task Force, the principal NWPO public information contractor, in the preparation of public information newsletters. The staff also coordinated the release of information regarding the repository program with the Governor's Office, the Nevada Commission on Nuclear Projects, and the Task Force.

The staff continued to develop and maintain print and electronic files of media coverage of the repository program and nuclear waste, and monitored public hearings, forums, and other meetings.

The staff assisted media organizations in arranging interviews and gathering background information about the project, as well as assisting in public presentations by NWPO officials, members of the Commission, and the Task Force.

Daily the staff fielded phone solicitations for information and other requests for NWPO-produced materials, such as newsletters, maps, fact sheets, overviews, videotapes, and various technical, socioeconomic, and transportation documents. The staff also continued to manage and evaluate the performance and accomplishments of contractors in the public information field.

B. OFFICE ORGANIZATION TO MEET OBJECTIVES

The NWPO continued to operate with a central office staff, supplemented by contractual services for needed technical and specialized expertise, in order to provide high-quality oversight and monitoring of federal HLW activities and to plan and conduct independent State studies. At the close of the report period, NWPO staff consisted of the following:

Executive Director

Accountant

Accounting Clerk III

Management Assistant III

Management Assistant II

Management Assistant I

Administrative Aide II (clerical)

- currently vacant due to congressional budget cuts

Micro-Computer Specialist III

Quality Assurance Manager

Administrator of Technical Programs

Technical Coordinator

- currently vacant due to congressional budget cuts

Environmental Scientist (contract employee)

Radiation Physicist (contract employee)

Repository Engineer (contract employee)

- currently vacant due to congressional budget cuts

Technical Policy Coordinator (contract employee)

Administrator of Planning

Planner/Research Analyst

Transportation Advisor (contract employee)

Public Affairs Manager

Deputy Attorney General

Senior Legal Secretary II (clerical)

C. PLANS FOR THE BALANCE OF THE GRANT PERIOD

During the remainder of the current grant period, and into the next, the NWPO will be engaged in the following activities in order to meet established objectives:

1. Monitoring all DOE activities relative to the federal high-level nuclear waste repository proposed for Nevada;
2. Coordinating State and local responses and reviews of DOE technical and planning documents and proposals, and assuring that all affected State, local and tribal governmental agencies are appropriately involved in all phases of federal repository activities;
3. Coordinating review of hydrological, geological, engineering and other technical aspects of the proposed federal repository activities;
4. Conducting studies in areas of socioeconomic, transportation, and others as needed;
5. Consulting and coordinating with other appropriate State agencies for input and guidance regarding the design of the State program, for review and comment relative to federal document, and for identifying potential impacts of the federal program and formulating mitigation strategies;
6. Identifying health, safety and environmental issues which are of concern to the State and developing State responses and strategies for addressing these issues;
7. Providing timely and accurate information to the Governor, the Commission on Nuclear Projects, the State Legislature, local governments, and the public on all aspects of the federal program;
8. Identifying major legal issues arising out of the proposed repository project and developing strategies for effectively addressing such issues to the benefit of the State and affected local communities; and
9. Representing Nevada's interests at the national and regional level, including participation in Nuclear Regulatory Commission deliberations and rulemaking activities concerning licensing of a waste repository; coordination of Nevada's activities with those of other

affected states; participation in task forces created by the National Governor's Association, the National Conference of State Legislatures, and the National Association of Attorneys General for reviewing federal nuclear waste storage activities; and cooperation in evaluations and assessments of impacts and associated consequences of repository siting, construction, operation, and closure.

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