PART TWO
GENERAL COMMENTS

Deficiencies with Respect to National Environmental Policy Act Requirements

The Draft EIS treats the proposed Yucca Mountain repository as just another federal program, with no attention paid to the one-of-a-kind, controversial, extremely long duration, and extraordinarily complex program that is characterized by irreducible uncertainties in almost every aspect of its design and implementation. The overly general, almost off-the-shelf impact assessment contained in the document is entirely inadequate and inappropriate for a program of the type and complexity presented by the Proposed Action. Nevada continues to believe, as stated in the State’s Scoping Comments on DOE’s 1995 Notice of Intent, that DOE should have prepared a programmatic EIS for the repository project and then tiered separate EISs to it for the Yucca Mountain repository facilities, the rail spur corridor selection, the selection of Nevada and national highway and rail routes, and the intermodal transfer facility. Such an approach would more accurately reflect the complex and interconnected nature of the various elements of the program and allowed DOE to better assess and address environmental impacts program wide. It would also have enabled DOE to deal more directly and effectively with the wide range of uncertainty presented by each aspect of the program.

Council on Environmental Quality (CEQ) regulations require federal agencies to assess the effects of major federal actions on the human and natural environment. Where such actions involve a broad program that contains groups of concerted actions clearly and systematically connected, federal agencies are required to follow National Environmental Policy Act (NEPA) “tiering” requirements.

Tiering refers to NEPA analysis presented through preparation of Programmatic Environmental Impact Statements - otherwise known as PEIS documents. The PEIS allows federal agencies to address broad program or policy decisions that are subsequently followed by narrower EIS statements that address site-specific decisions.

Over the past fifteen years, DOE has used the PEIS process extensively. The process has been employed to examine many issues such as the disposition of surplus plutonium, managing the nuclear weapons stockpile, and selecting regional disposal sites for DOE low-level and mixed low-level waste.

Tiering is used to make a broad program decision that will later be supported by specific EIS analyses of lesser scope. In other words, tiering is appropriate when it helps the lead agency
(in this case, DOE) to focus on the issues that are ripe for decision and exclude from consideration issues that are not yet ripe for decision.

In the case of the Yucca Mountain Draft EIS, DOE has corrupted the tiering process, as defined under CEQ regulations Sec.1502.20 and 1508.28, in that the Draft EIS does not purport to be a programmatic document, yet it, nevertheless, attempts to serve as the basis for both programmatic and project-specific decisions. The Draft EIS “programmatically” identifies alternative transportation modes and routes within Nevada, while seeking to support “comparative decisions” on one or more of these alternatives as part of the EIS decision process. It also expressly states that a site-specific assessment of Nevada transportation modes and routes will follow, once the mode and route comparative siting decisions are made. This is precisely the role tiering is intended to have through the PEIS process. Yet the Yucca Mountain EIS is not a Programmatic EIS document.

The Draft EIS also fails to identify the cross-country rail and truck routes used in DOE's own transportation impact analysis. So, where programmatic decisions at the national level are clearly warranted, DOE has chosen to avoid the identification of transportation modes and routes.

Overall, this means that communities outside Nevada share the same fate as communities inside Nevada; that is, no one is availed of any reliable information about who will be affected by the transportation of nuclear waste across the country to a repository in Nevada. Accordingly, while the EIS attempts to serve as the basis for both programmatic and project-specific decisions, it unequivocally fails on both accounts.

The NEPA analysis in the document is segmented, which can only lead to fragmented decision making. In the State’s view, DOE has corrupted the NEPA process by leaving some of the most significant issues and impacts un-assessed. DOE has either refused to assess or purposely postponed key decisions concerning national and local transportation modes and routing alternatives. These actions have conveniently avoided compliance with NEPA tiering requirements. DOE has also avoided mandatory requirements that specify involvement of other federal agencies in the NEPA process. Again, this is unacceptable, given the clear jurisdictional control these other agencies have over proposed actions defined in the Draft EIS.

CEQ regulation 1502.9 require draft Environmental Impact Statements to fulfill and satisfy the requirements established for final statements in section 102(2)(C) of the National Environmental Policy Act. This means that if a draft statement is deemed inadequate as to preclude meaningful analysis, the agency must prepare and circulate a revised Draft EIS. Given inadequacies of the Yucca Mountain Draft EIS (e.g., it is neither a project-specific document nor a programmatic document), we contend that DOE is now obligated to prepare and circulate a revised Draft EIS for the repository program.
Conflict with Provisions of the Nuclear Waste Policy Act of 1982, as Amended

The Draft EIS that DOE has released for public comment does not reflect the fundamental concept of geologic isolation as required by the Nuclear Waste Policy Act of 1982. This Act calls for the isolation of spent fuel and high-level radioactive waste through the mechanism of deep geologic disposal. Instead, the “evolving” facility design described in the Draft EIS relies almost exclusively on engineered barriers to compensate for the inadequacies of the site and to make the facility work. The Draft EIS implicitly acknowledges that Yucca Mountain, as a geologic formation, is incapable of isolating highly radioactive and long-lived wastes from the environment.

The nearly complete reliance of the Yucca Mountain project on the waste package (and other possible engineered barrier contributors) is also a contradiction of the geologic disposal concept as described in DOE’s 1980 Final Environmental Impact Statement (EIS) Management of Commercially Generated Radioactive Waste. The 1980 EIS states, "Geologic barriers are expected to provide isolation of the waste for at least 10,000 years after the waste is emplaced in a repository and probably will provide isolation for millennia thereafter. Engineered barriers are those designed to assure total containment of the waste within the disposal package during the initial period during which most of the intermediate-lived fission products decay. This time period might be as long as 1,000 years..." The Yucca Mountain Draft EIS describes a project that does not conform to the intent or the requirements of the Nuclear Waste Policy Act. This project, as it is currently described, targets future generations to be contaminated by nuclear waste, instead of protecting them.

The Draft EIS should acknowledge and describe the two factors that have served to eliminate a whole suite of potential repository designs and have driven the current general design concept. The two factors are: 1) the discovery of rapid infiltration and flow of water in fractures in the unsaturated zone (contrary to the original conceptual model of very slow matrix flow downward through Yucca Mountain); and 2) the incorporation of large, horizontally emplaced waste packages in drifts, driven by the now-defunct development of the Multi-Purpose Container concept (replacing the concept of thin-walled stainless steel, vertically emplaced waste packages). These factors together reflect the finding that a Yucca Mountain repository system must rely on a robust engineered barrier system because the natural barriers of the site are not capable of providing significant waste isolation alone. The key design requirement that is central to Yucca Mountain repository performance is a waste package that has a projected long life relative to the regulatory compliance period.

Inadequate and Misleading Notices of Public Hearings
Although the U.S. Department of Energy (DOE) has conducted public hearings on its Draft Environmental Impact Statement (EIS) for a High-Level Radioactive Waste Repository at Yucca Mountain, Nevada in various cities around the country, DOE has gone to considerable lengths to conceal information about nuclear waste transportation routes, shipment numbers, and risks to specific states and communities located on or near transportation corridors to a Nevada repository.

The notices for these public hearings, for example, refer only to a Draft EIS for a radioactive waste repository in Nevada. They do NOT indicate that people in hundreds of cities and communities across the country stand to be impacted in major ways by thousands of radioactive waste shipments as a direct result of the Yucca Mountain project. DOE has made no effort to inform citizens of potentially impacted communities of the spent nuclear fuel and high-level radioactive waste transportation aspects of the Proposed Action and the potential for such transportation to result in impacts to specific communities along shipping routes.

Furthermore, the Draft EIS itself contains no analyses of possible spent fuel and HLW transportation impacts on states, cities, and communities along potential shipping routes, despite the fact that, in responding to public comments on the 1985 draft Environmental Assessment (EA) for the Yucca Mountain site, DOE committed to just such an assessment as part of the Yucca Mountain EIS:

“The DOE believes that the general methods and national average data used [in the EA] are adequate for this stage of the repository-siting process [i.e., the pre-site characterization stage]. Route-specific analyses and an evaluation of the impacts on host States and States along transportation corridors will be included in the environmental impact statement” (emphasis added).1

The irony of the situation is that DOE has, in fact, done the analyses needed to reveal specific highway and rail routes that would be used for waste shipments and to conduct required impact assessments along those routes. That information, however, is buried in data used to run computer models and is never made explicit in the Draft EIS. The Draft EIS contains no maps or other information showing which cities and communities along transportation corridors will be affected by this massive and unprecedented radioactive waste shipping campaign. One can only conclude that such an oversight is intentional and designed to suppress public interest in the project and participation in these public hearings.

Nevada believes that DOE has violated the National Environmental Policy Act by concealing crucial information used to support conclusions in the Draft EIS. Absent this information, persons affected by the transportation impacts of the Proposed Action have no way of determining the substantive and legal sufficiency of DOE’s analysis. Such concealment of information can only diminish public confidence in DOE’s ability to safely transport these highly radioactive materials.

**Unreasonable No-Action Alternative**

The National Environmental Policy Act requires that federal agencies, in preparing environmental impact statements supporting major federal decisions and projects, consider alternatives to the action being proposed, including the alternative of taking no action. In the Draft EIS for the proposed Yucca Mountain high-level nuclear waste repository, DOE has chosen two No-Action Alternative scenarios that are unrealistic, unreasonable, and legally deficient.

The Draft EIS postulates a situation where, in place of a repository at Yucca Mountain, spent nuclear fuel and high-level radioactive wastes are assumed to be stored on-site at reactor and generator locations for a period of 10,000 years. In the first No-Action Alternative scenario, DOE assumes that active institutional control is maintained for the entire time, while under the second scenario, institutional control ceases after the first 100 years.

Both scenarios are wholly inappropriate, even absurd. The Council on Environmental Quality interprets the No-Action Alternative as “the federal agency not acting at all” (i.e., not constructing and operating a repository at Yucca Mountain). In the absence of a repository, it is unacceptable to assume that spent fuel and HLW would simply be left at reactor sites forever. The most plausible No-Action Alternative scenario is one where there would be some period (50 to 100 years) of at-reactor storage (most likely in dry storage configurations), combined with the application of waste reduction technologies, and followed by some form of revised (and, hopefully, dramatically improved) process to site and construct storage and/or disposal facilities.

DOE’s No-Action Alternative scenarios cannot be defended on the basis of reasonably foreseeable courses of action in the absence of a decision to move ahead with the development of a repository. Instead, what DOE appears to have done is select scenarios designed to generate the greatest public alarm and political pressure in favor of its Proposed Action. In so doing, DOE has violated the clear intent of NEPA that a realistic and reasonable No-Action Alternative be evaluated and compared to the Proposed Action.

The No-Action Alternative is prescribed in the Nuclear Waste Policy Act. Under Section 113 (c)(3), if the Yucca Mountain site is unsuitable, the Secretary of Energy is to inform Congress, make recommendations for future action, and wait for further direction, which
assuredly would not be leaving irradiated nuclear fuel on site with little or no control for 10,000 years.

Inaccurate Project Description

The Draft EIS fails to reliably define a proposed repository design and holds open a range of design options that, in various combinations, would require extensive additional environmental impact analysis. This condition exists in the Draft EIS despite the fact that the Final EIS, mandated by the NWPA to be included in the Secretary's Site Recommendation Report, must also include "a description of the proposed repository, including preliminary engineering specifications for the facility" (Sec. 114(a)).

The Draft EIS does not describe the proposed repository project in a manner that allows an analysis of its impacts. Asserting that the design for the facility is still “evolving,” DOE describes a number of design alternatives and options in the Draft EIS with the expectation that whatever design is finally selected, its impacts will have been bounded by the analysis of the alternatives and options. The range of possible impacts is wide, and they all lead to releases of radionuclides from the repository that will contaminate a groundwater source currently used for drinking water and agricultural purposes. What cannot be known from this Draft EIS is how much radiation is released, how fast it is released, and how soon it is released. In simple terms, because of the inadequate project description, this Draft EIS does not tell us what the future risks of the proposed repository are to people and the environment.

Incomplete Site Characterization Data

Performance confirmation activities are nothing more than continuing site characterization activities. The name was changed so that DOE could meet its self-imposed schedule. What it really means is that DOE has not completed site characterization in sufficient detail to conduct an adequate environmental impact assessment or make an adequate site recommendation to the Secretary. The site, according to this Draft EIS, will not be determined suitable or unsuitable until closure. This is contrary to the intent of the NWPA and means that the Draft EIS is and final EIS will be based on flawed and seriously incomplete data.

For the low thermal load repository, the Draft EIS would include Area 5, in order to provide sufficient underground emplacement area. Area 5 has not been the object of site characterization and, therefore, should not be included in the Draft EIS or repository planning until it has been characterized. The Secretary's site recommendation is to be made at the completion of site characterization according to the NWPA. In the case of the low thermal load alternative design, site characterization has not been completed in a portion of the area included
in the Proposed Action. If the low thermal load alternative is to be considered a reasonable alternative, which it must if it is included in the Draft EIS, this Draft EIS should be deferred until after characterization of Area 5 is satisfactorily completed.

**Reliance on Incomplete and Obsolete Performance Assessment Information**

Performance assessment results used in this Draft EIS are based on a Total System Performance Assessment (TSPA) code and supporting analyses that were developed prior to those currently being used in DOE’s site suitability evaluation for site recommendation. The Draft EIS must include a description of the current TSPA and include its results and analyses, rather than relying on an acknowledged incomplete and obsolete TSPA. In order to meet the need for a complete and accurate evaluation of the long-term impacts of the Proposed Action, DOE should issue a new Draft EIS for public review and comment that includes information and analyses consistent with the Site Recommendation Report.

The output of the TSPA model for the Draft EIS is highly dependent on seepage rates into the drifts. However, the results of critical studies on the movement and chemistry of water after the thermal pulse are not yet available. It should be stated clearly in this Draft EIS that the repository performance projections are tentative, at best, and are subject to large adjustments, pending further information on crucial aspects of heat effects on the assumed characteristics of the natural barrier system and its interaction with the engineered barrier system. This uncertainty alone is sufficient to declare the projected performance of the repository in this Draft EIS premature and lacking in credibility.

It should be made clear that the waste package degradation models described in the Draft EIS are essentially unsupported by reliable long-term data and are based largely on extrapolation and assumptions of expected behavior. In addition, the waste package design analyzed in this Draft EIS is not the design currently under consideration. Therefore, the TSPA products in this Draft EIS are invalid.

**Inadequate Assessment of Cumulative Impacts**

The Draft EIS fails to adequately assess cumulative impacts from past, current, and future activities at the Nevada Test Site (NTS). Estimates of the NTS contribution to off-site radiation exposures and projections of future cumulative exposures are based on woefully inadequate and incomplete data. Known and suspected contaminated sites in the proposed withdrawal area are not acknowledged, and their remediation status is not described.

DOE’s own estimates place the combined source term for all tests conducted at the NTS at 300 million curies. The geographic scope of existing groundwater contamination in the region
may exceed 300 square miles and extend to depths ranging from 500 to 5,000 feet. Yet the Draft EIS concludes that the maximum potential dose from the underground testing inventory is calculated to be 0.2 millirem per year and that the cumulative annual dose from both NTS and Yucca Mountain sources would 0.42 millirem per year.

In fact, DOE does not have the data required to calculate a base case scenario for determining groundwater travel time in the region, let alone to make an estimate of radionuclide movement in the groundwater. Estimates of hydraulic conductivity contained in the Draft EIS (e.g., movement of contaminants through the groundwater) rely on only one data set obtained from a single well for a period of fifty years. This limited data is then extrapolated over a 10,000 year period to produce the estimated 0.2 millirem per year dose figure (as the contribution to cumulative groundwater impacts caused by nuclear testing). As a result, it is not possible, with any reasonable level of confidence, to estimate the amount of radionuclides released through the groundwater to the biosphere in the region of influence beneath the NTS and offsite locations. Both the State of Nevada and DOE’s own independent peer review group2 have documented these facts as part of ongoing technical and regulatory reviews of DOE’s Underground Test Area program for the NTS.

Developing believable and reasonable estimates of the potential cumulative impacts to groundwater from existing contamination beneath the NTS and future contamination from a proposed repository at Yucca Mountain is mandatory for assessing the degree to which the Proposed Action would affect public health and safety. The Draft EIS fails to make this fundamental assessment and is, therefore, deficient. The Draft EIS fails to meet the basic requirement of NEPA as defined by the Council of Environmental Quality implementing regulations, Sec. 1500.1(b).

The Draft EIS also fails to adequately assess impacts from contaminated sites known to be located within the proposed repository withdrawal area. For example, it is known that there are high-level waste residues from the nuclear rocket program buried at an unknown location in Area 25 of NTS. The Draft EIS must contain affirmative information regarding the location of this material and assure that, if it is in the proposed withdrawal area, it will be recovered and managed according to applicable laws, regulations, and orders. In addition, there are reportedly at least 20 other known contaminated sites within the portion of the NTS that is included in the proposed withdrawal area. These areas must be fully rehabilitated under the jurisdiction of NTS so they are not passed on to OCRWM, where they would remain a continuing hazard. The impacts associated with required clean-up activities should have been addressed in the Draft EIS.

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Maximally Exposed Individual

The maximally exposed individual for this Draft EIS should be a subsistence farmer located at the boundary of the repository operations area. This would be equivalent to a maximally exposed individual adjacent to an operating nuclear reactor. There is no rationale provided to locate the maximally exposed individual 20 km from the operating repository surface facility.

Uncertainty

As presented in this Draft EIS, the uncertainties from all sources, both in repository performance and system design, and thus environmental impacts are of such range and magnitude that a decision to select the preferred alternative can not be supported by this document. The definition and analyses of uncertainties should recognize that the program is a major national effort, unique and unprecedented as an engineering project, with extremely long time horizons, an uncertain political and financial base from which to work, and a long list of important physical site characteristics that are extremely difficult to define and measure.

Compliance with Existing Regulations

This Draft EIS is written to comply with regulations that currently do not exist, i.e., the NRC’s proposed revised licensing regulations (10 CFR 63) and DOE’s proposed revisions to the guidelines for recommending repository sites (10 CFR 963). These proposed regulations greatly reduce the requirements that DOE must meet in order to determine that the Yucca Mountain site is suitable and to apply for a NRC license. Neither of these proposed regulations has been approved as of the date of the Draft EIS or these comments. The Draft EIS should have been written to comply with the regulations that are currently in place, i.e., 10 CFR 60 and 10 CFR 960.

Reliance on Incomplete and Inadequate Modeling of Groundwater

The Draft Environmental Impact Statement (Draft EIS) for the Yucca Mountain high-level waste project includes an evaluation of environmental consequences (in terms of dose) of alternative repository design concepts and alternatives. The conclusion drawn from the results of these evaluations is that compliance is achieved.

There is, however, strong evidence that casts doubt on the validity of the conclusions and these compliance assessments in light of NWPA and NEPA requirements. This evidence is related to the choice of groundwater pathways selected for the analyses.
At Yucca Mountain, the primary human exposure pathway is through ingestion of groundwater. In conducting a performance assessment for Yucca Mountain, an accurate view of the groundwater flow field is essential. The velocity of the groundwater is one of the most sensitive parameters in the transport equation and, therefore, strongly influences dose calculations. The direction of the groundwater pathway is important as it dictates the hydrologic and geochemical character of the rock encountered along the pathway. Direction, along with velocity, strongly influence sorption and other important variables such as dilution and effective porosity in the saturated zone.

There has been considerable debate over the actual flow paths that would be followed by radionuclides released from the repository. Modeling results performed by the State of Nevada (Lehman and Brown, 1994, Lehman and Brown, 1995) indicate major differences may exist in flow path direction, velocity, and sorptive capability compared to that used in the latest assessments by DOE, including the Draft EIS, if all available data sets are utilized.

By failing to evaluate credible alternative models or opposing views of the saturated zone, DOE is not in compliance with NEPA. Being out of compliance with NEPA means automatic noncompliance with the NWPA. DOE is specifically out of compliance with NEPA Section 1502 for not summarizing, discussing or using important data sets; failure to evaluate credible opposing viewpoints; and not proposing testing to reduce uncertainty in the choice between alternative conceptual flow paths.

The Nuclear Waste Policy Act requires that an EIS, consistent with the National Environmental Policy Act, be prepared and accompany a recommendation for site approval. The amended NWPA (1987) still requires consistency with NEPA, but does not require the DOE to consider:

1. The need for the repository
2. Alternative sites to Yucca Mountain, or
3. Non-geological alternatives

NWPA Section 114(f) specifically states that all other provisions of NEPA apply. NEPA Section 1502.22 relates to incomplete or unavailable information. NEPA regulations require that, if information is available that would aid in evaluating uncertain effects, it must be obtained and analyzed unless it is too expensive to do so. If costs are prohibitive, then it must be disclosed as incomplete or unavailable information. Specifically, regulations require that if information cannot be obtained, the EIS must include:

1. A statement that such information is incomplete or unavailable.
2. A statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment.

3. A summary of existing credible scientific evidence that is relevant to evaluating reasonably foreseeable significant adverse impacts on the human environment.

4. The agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.

The Yucca Mountain Draft EIS is not in compliance with numbers 2, 3, or 4 above. While DOE has stated that information used in determining the groundwater flow model is incomplete or unavailable, the existing credible scientific evidence relevant to evaluating reasonably foreseeable significant adverse impacts has not been summarized nor has it all been utilized in developing flowpaths.

To be in compliance with NEPA, DOE is required to consider effects of credible alternative models in the Draft EIS. While the Draft EIS recognizes differing viewpoints regarding groundwater flow and references the State of Nevada-funded studies of Lehman and Brown, 1995, there has been no evaluation of the impacts. (See Attachment U to these comments for an expanded discussion of this topic.)

Lack of an Integrated Approach to Environmental Impact Assessment (EIA)

NEPA establishes national environmental policy and is meant to coordinate responses to environmental issues by bringing together other environmental legislation and policy for all environmental media regarding an individual major action. The YMP Draft EIS falls short in regard to joint regional land use planning with other agencies, citizens, and private stakeholders. Additionally, there has been no effort on DOE’s part to integrate NEPA documentation for the Yucca Mountain project with other ongoing and anticipated federal activities.

The task of addressing the overall environment in an integrated sense is not achieved in the Draft EIS because environmental components are addressed in a piecemeal and incomplete fashion. For example, only biota and soils were addressed in the Draft EIS, the former only at the population and community levels. Ecosystems were avoided as was their role in the regional landscape. Consequently, impact analysis was not performed in the context of regional plans to assess the carrying capacity of the region’s resources and the cumulative effects that could occur.

The range of uncertain adverse impacts on the Yucca Mountain region that are meaningful in the context of future generations is missing from the Draft EIS. This applies in particular to the interactions between climate change and future releases of radionuclides into the
regional environment. NEPA infers also that a goal of national environmental policy is to work toward sustainable resources and economies through ecosystem management. Such an approach has been taken by DOE at the Nevada Test Site, but the Yucca Mountain project has steadfastly refused to adopt a comparable approach. Consequently, policy-relevant EIA and decision making in the context of holistic environmental and human dimensions was impossible for the Yucca Mountain project. This failure is at the root of one of the Draft EIS’s fundamental insufficiencies.

The precedential nature of the Proposed Action in terms of contamination far into the future will endanger the environment and render future natural resources unusable. A comprehensive and integrated holistic approach to EIA that considers humans within the natural environment should be applied to the Yucca Mountain natural region. A particular loser in the NEPA process for the Yucca Mountain project has been long-term quality of the human environment regarding future generations. The Draft EIS condones sacrificing the Yucca Mountain region for the future. For additional comments in this regard, see Appendix III of these comments.

**Inadequate Consultation on Historic Preservation Issues**

The State Historic Preservation Office has reviewed the Draft EIS for Yucca Mountain. The National Historic Preservation Act charges the Department of Energy (DOE) to consider the effects of this undertaking on historic properties eligible for inclusion in the National Register of Historic Places. DOE has already identified archaeological sites potentially eligible for inclusion in the National Register. Additionally, the Consolidated Group of Tribes and Organizations has also indicated an interest in properties around Yucca Mountain, but it is difficult to discern from the Draft EIS whether or not these properties are located within the area of potential effect.

As outlined in 36 CFR 800, Advisory Council regulations, DOE must consult with the State Historic Preservation Office (SHPO) to identify consulting parties that include the Advisory Council, local governments, tribes, and any other party interested in historic properties that occur within the area of potential effect. Second, DOE must consult with the SHPO to define the area of potential effect. Although a programmatic agreement (PA) between the Council and DOE specified how consultation was to proceed during site characterization activities, this document is over ten years old and does not address transportation systems or intermodal transfer stations. We request that it be replaced by a new PA that reflects amendments to the National Historic Preservation Act in 1992 and the revised 36 CFR Part 800 regulations that went into effect in June 1999. The Nevada State Historic Preservation Office requests DOE consult with this agency to craft a new agreement document.

In conclusion, the Draft EIS does not disclose sufficient information to determine effects to properties that might be found eligible for inclusion in the National Register of Historic
Places. DOE is urged to enter into consultation with the State Historic Preservation Office as soon as possible to establish a process for meeting its obligations under the National Historic Preservation Act. DOE would have to make commitments in an executed agreement prior to the issuance of a Final EIS.

**Incomplete and Inadequate Assessment of Impacts to Native Americans**

The treatment of Native American issues and impacts in the Draft EIS is entirely inadequate. The Draft EIS ignores potential impacts to Native communities from the transportation of spent fuel and HLW, both in Nevada and nationally. For Native American interests in Nevada, it presents a sanitized section on “Native American Views of the Affected Environment,” but fails to reflect the strong and ubiquitous opposition to the Yucca Mountain project on the part of Native peoples in Nevada and California.

Nationally, there is absolutely no attempt to identify Native lands and communities located along radioactive waste shipping routes. The Draft EIS should have identified Native American lands that are traversed by or are located in proximity to highway and rail routes. Numerous Indian lands/communities outside Nevada will be impacted by spent fuel and HLW shipments including: Gila Bend, Navajo, San Xavier, and Salt River in Arizona; Umatilla and Cow Creek in Oregon; Miccosukee in Florida; Fort Hall in Idaho; Winnebago in Nebraska; Cattaraugus in New York; Quapau, Ottawa, Modoc, Sac Fox in Oklahoma; and others. The failure to identify Native lands and communities along transportation routes and to assess impacts of the Proposed Action on those entities is another indication of the inadequate and superficial treatment of transportation impacts in the Draft EIS.

The Draft EIS also fails to reveal in its discussion of the affected environment that Native American tribes in the immediate vicinity of the Yucca Mountain project area and along potential transportation routes are, for the most part, economically disadvantaged. Reservations and communities in Nye, Lincoln, and Inyo counties are rural and isolated, and either lack a land base or have land bases too small to support their populations by ranching or other locally common means. A large number of people are unemployed, underemployed, and/or living below the poverty level. Any negative statewide economic impacts associated with or caused by the repository or repository-related nuclear waste transportation will have a disproportionate impact on such communities because of these depressed baseline conditions.

The 1986 Environmental Assessment for Yucca Mountain stipulated that, "[i]f the Yucca Mountain site is approved for site characterization, [Native American impacts] will receive appropriately detailed treatment in research to be performed during the Environmental Impact
The EA also made special note of the "potential for impacts on Native American cultures from [SNF and HLW] transportation activities" and stated that "[i]t is this aspect will receive appropriately detailed treatment ... if Yucca Mountain is approved for site characterization." This Draft EIS contains no such “detailed treatment” of Native American impacts.

The State of Nevada’s research has shown that Native American tribes in the area around Yucca Mountain and along transportation routes have unique governments. As independent federally recognized entities, tribal governments have a role equivalent to states in most federal undertakings. They also have a special status according to various environmental and cultural protection acts and in the Nuclear Waste Policy Act of 1982. To date, none of the tribes in the study area has been granted "affected Indian Tribe” status under the NWPA, although several have applied. The repository project has also spilled over into the campaign by the Western Shoshone National Council, a political entity made up of representatives from many Western Shoshone tribes, to reclaim lands under the Treaty of Ruby Valley of 1863. This has brought the Western Shoshone and other tribal governmental entities into conflict with DOE, as well as other federal and state agencies. Because of the unique governmental position of tribes, their interests are not likely to be well protected or even properly represented in deliberations over the repository. They may also come into conflict with neighboring local governments over differences in positions regarding the repository, thus increasing their isolation from intergovernmental interaction. None of these issues are addressed in the Draft EIS.

**Legally and Substantively Deficient Analysis of Socioeconomic Impacts**

The Draft EIS fails to adequately describe the socioeconomic environment at risk of significant impacts from the Proposed Action. The Draft fails to describe the environment with respect to Nevada’s major economic sector and discuss why the State’s tourism-based economy is especially vulnerable to impacts associated with the proposed Yucca Mountain facility and related transportation of spent fuel and HLW. As noted in specific comments relative to Sections 4 and 5 of the Draft EIS, the State of Nevada, affected local governments in the State, the Nevada University System, and DOE’s own contractors have identified potential areas related to tourism, economic development, business in-migration, and related areas potentially vulnerable to the extraordinarily negative and stigmatizing characteristic of high-level nuclear waste facilities and activities. The Draft EIS is deficient in not including these areas in its definition of the socioeconomic environment and comprehensively addressing potential impacts in subsequent sections of the document.

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A considerable body of research has been compiled by the State of Nevada between 1986 and 1998 and was available to DOE for use in preparing the Draft EIS. The State’s comments on DOE’s 1995 Notice of Intent to prepare an environmental impact statement for the Yucca Mountain program set forth a comprehensive description of the available research, data, and findings. The Draft EIS completely ignores this work and completely fails to address the most significant and far-reaching area of likely socioeconomic impacts, the tourism/gaming sector.

A complete and in-depth treatment of the State’s impact studies and their findings can be found in the three major summary reports on the Nevada socioeconomic studies published in 1989, 1993, and 1995, respectively. In addition, two major books dealing with the policy implications of the findings of Nevada’s socioeconomic research have been published by the State of Nevada’s study team. The State’s Technical Review Committee has also issued two reports of its findings with respect to the studies, and a summary of the Nevada research was published in the Proceedings of the National Academy of Sciences.

The Draft EIS inappropriately restricts the socioeconomic “region of influence” to three Nevada counties (Clark, Nye, and Lincoln). The region of influence must also include counties and areas affected by rail spur development and operation; intermodal facility siting, construction, and operations; heavy-haul truck transportation; and highway transport of spent fuel and HLW waste. In addition, the State of Nevada as a whole will be affected by repository activities in terms of impacts on the State’s major industries; impacts to the State revenue base; and impacts to State agencies that have responsibilities for repository activities (highway regulation/maintenance, law enforcement, emergency management/response, etc.).

Since the Proposed Action encompasses a national radiological waste shipping campaign of unprecedented proportions, duration, geographic scope, and potential impacts, the socioeconomic environment region of influence should also include cities and communities located along all of the specific transportation routes nationwide. Attempting to confine the

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region of influence for the Proposed Action is inappropriate and renders the Draft EIS deficient in its scope and approach to impact identification and assessment.

The analyses of socioeconomic impacts is limited only to the areas of employment, population, economic measures (personal income, gross regional product, and government expenditures), housing, and public services. There is no attempt to evaluate the effects of the Proposed Action on the State’s major economic sector - the tourism industry - or to examine impacts of the project on property values, economic development, State and local government revenues, State agencies, intergovernmental issues, and other important areas.

Perhaps the most important deficiency in the Draft EIS treatment of socioeconomic impacts is its failure to analyze in any way the impacts of the Proposed Action on Nevada’s most significant economic sector. The Draft EIS contains no explanation of why such an analysis was not undertaken, and it ignores extensive comments and information on this matter provided by the State of Nevada and affected local governments in response to the 1995 scoping process Notice of Intent. The failure to address this crucial area of likely and significant impact is, of itself, grounds for finding the Draft EIS legally and substantively deficient.

The State of Nevada formally initiated a comprehensive study of the socioeconomic impacts of a proposed high-level nuclear waste repository at Yucca Mountain in 1986 after the Nevada site had been chosen as a potential waste disposal site. Between 1987 and 1995, the State's study has produced over 250 reports and work products, plus numerous publications in scientific and academic literature. Summaries of research reports produced under the State’s studies are attached as Appendix I of these comments.

The State’s research has demonstrated that a major potential source of impacts from the Proposed Action stems from intense negative perceptions and avoidance behaviors by the public in response to a high-level radioactive waste repository, which, combined with the vulnerability of the Nevada economy to changes in its public image, could produce large negative impacts. These are not “psychological” impacts. These are real, measurable economic effects that derive directly from the Proposed Action and are substantiated by a considerable body of scientific research and evidence.

The great public and media interest in the radioactive waste program makes it almost certain that any association with these negative perceptions will adversely affect Nevada’s attempts to attract tourists, conventions, in-migrants, and new business investments. This would

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be especially damaging in the event of a nuclear waste accident associated with Las Vegas, which is one of the world’s major tourist destinations and a dominant contributor to Nevada’s economy. The conclusion of the Nevada researchers and the State’s Technical Review Committee is that stigma impacts could be very negative and very large.

The existing research on stigma effects and potential impacts provides a viable theoretical and methodological base that DOE should have used to undertake a detailed assessment of these types of impacts on Nevada’s economy, public revenues, public services, and community quality of life. These assessments should have taken into account the increasingly competitive gaming and tourist marketplaces and the important role that any negative perceptions and stigma could have in affecting an economy uniquely reliant on tourism revenues. It is very possible that, through the social amplification of risk process, even relatively minor events or accidents could have serious economic consequences. Such impacts would dwarf any projected benefits to be derived from project employment and spending.

While Nevada may be especially vulnerable to stigma impacts, given its economic base, the Draft EIS should also have addressed stigma effects for program facilities and transportation routes wherever they might be located in the nationwide system that the Proposed Action postulates.

The analyses of so-called “standard” socioeconomic impacts contained in the Draft EIS are also inadequate and incomplete. The analyses ignore impacts to State and local government revenues, public services such as those related to emergency management and response, intergovernmental systems and relationships, and the unique tax and revenue redistribution systems that characterize Nevada’s fiscal environment.

A comprehensive and integrated discussion of the need for an adequate assessment of economic impacts of the Proposed Action is contained in Appendix I of these comments.

A summary of State of Nevada research findings covering each major area of socioeconomic impact assessment is contained in Appendix II of these comment.

The fact that DOE has chosen not to analyze impacts of the Yucca Mountain project on Nevada’s principal economic sector and on other areas of the Nevada socioeconomic environment vulnerable to stigma effects of the Proposed Action (i.e., property values, economic development/business location decisions, in-migration, etc.) is disturbing, given DOE’s past assessments of the relevance of such impacts to the repository program. As early as 1986, DOE’s final EA for the Yucca Mountain site acknowledged the potential for impacts to Nevada’s tourism-dependent economy and the need for additional research. In an uncharacteristically insightful pronouncement that actually presages the State of Nevada’s later research on the subject, the final EA states:
... the potential for adverse public perception of a repository and its associated waste transportation could adversely affect the tourism industry. The importance of public perception lies in the attractiveness of the image of Las Vegas to potential visitors. Concerns have been expressed that this image could be affected by the visibility of the repository and waste shipments and by safety concerns regarding the high-level radioactive waste-disposal system, particularly when accompanied by extensive media attention. Preliminary research to date concerning the potential effect of a repository on tourism is inconclusive; therefore further studies will be conducted” (emphasis added).9

Additional commitments to address tourism and so-called risk perception impacts are contained throughout the final EA.10 No subsequent work on this crucial impact assessment area was ever carried out by the DOE Yucca Mountain Project.

The Nuclear Waste Policy Amendments Act of 1987 directed DOE to report to Congress on potential socioeconomic impacts that could occur as a result of locating a repository at the Yucca Mountain site. DOE was directed to report on fourteen (14) specific areas of potential impacts covering the gamut from education to public health to public lands, emergency response, transportation, and the like. Specifically singled out by Congress was the directive (number 13) that DOE report on potential impacts to “tourism and economic development, including the potential loss of revenue and future economic growth.”11

The “Section 175 Report” was released in December 1988. While the treatment of tourism and economic development impacts in the document was cursory, at best, the report did conclude that a repository at Yucca Mountain could have negative effects on these important economic areas. With respect to economic development, the report found that, “[b]ecause the repository may be defined by some as a hazardous activity, some limitations on the prospects for economic development in Nevada may result.”12

In evaluating the potential for impacts on tourism and economic development later in the report, DOE concluded, “Possible changes in economic development patterns, generally, and in

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10 Ibid., p. 5-111, p. 6-87, p. C.7-6.

11 Public Law 97-425 [42 U.S.C. 10174(a)]

the tourism industry specifically, in southern Nevada may result from the repository program."\(^{13}\) By implication (and intent of Congress), such impacts were to be identified and quantified in subsequent impact assessments.

Following the publication of the Section 175 Report, a policy directive was issued by DOE headquarters to OCRWM Associate Directors and Office Directors stipulating that “... perception-based impacts [i.e., stigma impacts] are of potential concern to affected governments, interested parties and the public and should be appropriately addressed by OCRWM.”\(^{14}\) The memorandum was in response to an earlier memo that sought to limit research in this area. The new directive superceded the prior guidance and specifically noted that “[the previous memorandum] is not viewed as limiting OCRWM-supported research in this area [i.e., stigma and perception impacts on tourism and economic development].”

The June 1992 memorandum was followed in July 1992 with a “Socioeconomic Policy Management Directive” from OCRWM. This directive was intended to serve as “... the program-level policy document that will guide the conduct of all OCRWM socioeconomic activities. Project-level socioeconomic plans for all OCRWM components will be prepared in accordance with the guidance provided in this document, and will serve as the primary source of information about each project’s socioeconomic activities.” (page 1)

To guide the OCRWM socioeconomic program, the Policy Directive set forth a list of specific objectives “designed to help OCRWM realize its mission.” Two of these objectives are especially relevant to the Draft EIS:

- Address “standard” impacts arising primarily from program-related employment and population growth as well as expenditures for materials, equipment, and services.
- Address developments, as necessary, in the area of “special” impact assessment arising primarily from the various components of the high-level radioactive waste program.”(page 2)\(^{15}\)

\(^{13}\) Ibid, page 64.

\(^{14}\) Memorandum from Jerome Saltzman, Director, OCRWM Office of External Relations, dated June 3, 1992.

\(^{15}\) The terms “standard” impacts and “special” impacts are terms of art in socioeconomic assessment. The former refers to the impacts of the range of specific economic indicators used routinely in such assessments. The later refers specifically to those impacts that occur as a direct result of the nuclear or hazardous nature of the project and are synonymous with “stigma” impacts.
The Draft Yucca Mountain EIS addresses only “standard” impacts associated with the Proposed Action (and that only partially). It completely ignores the “special” impact assessment directive.

In addition to DOE’s policy pronouncements regarding the need to assess “special” impacts, there is evidence that DOE considered the State of Nevada’s extensive work in identifying potential stigma impacts associated with the high-level radioactive waste program to be credible and appropriate. In 1993, DOE commissioned Argonne National Laboratory to evaluate research on risk perception and stigma impacts carried out by the State of Nevada. Since much of the State’s work involved survey research, Argonne contracted with the National Opinion Research Center (NORC) at the University of Chicago to undertake a technical evaluation of the methodologies used in the State’s “special” impact assessment activities. The NORC report is instructive as to the high quality and appropriateness of the Nevada stigma research. The report concluded:

“... the [State of Nevada] surveys could provide valuable data about risk perceptions and potential behavioral responses. NORC identified a few minor problems with a number of questions and calculated response rates but claimed these problems would probably not have any major biasing effects.”

The report went on to praise the creativity and robustness of the survey research, noting that the State surveys “exhibit some considerable creativity in approaching a difficult measurement problem.” The report expressed “confidence that the conclusions [of the State’s stigma research] are not highly dependent on the measurement technique, that is they are robust across measurement methods,” noting that “... such robustness is a very important attribute in assessing the validity of the surveys.”

DOE has, in fact, sponsored its own “stigma” research that is not included in the socioeconomic analyses contained in the Draft EIS. An excellent example of this research is the work done by the University of New Mexico under contract with DOE. Of particular interest is a study by Drs. Gawande and Jenkins-Smith on the effects of stigma on property values along routes in South Carolina that were used to transport spent nuclear fuel from foreign research reactors. The Gawande and Jenkins-Smith findings are extraordinarily important and relevant to the potential for stigma effects stemming from the Yucca Mountain project and related nuclear waste transportation. Specifically, the researchers found that the hazardous, nuclear nature of these shipments and people’s responses to them directly caused property values in urban Charleston to be “lowered in a substantive manner”:


DRAFT ENVIRONMENTAL IMPACT STATEMENT COMMENTS

State of Nevada

February 28, 2000
“... we are convinced by the results for Charleston County [South Carolina] that real price effects can occur when shipments like those involved in the [foreign spent nuclear fuel] FSNF return program take place. Despite systematic and extensive search for alternative explanations, the onset of the shipments appears to be the best explanation for the drop in housing values close to the route. Moreover, the results are consistent with research regarding the effects of other disamenities (e.g., polluted water, air and Superfund sites), with the self-reports of perceived risk of spent nuclear fuel shipments obtained in public opinion surveys, and with surveys of expected effects of nuclear waste shipments on housing values (Flynn et al, 1997).”

It is clear from the historical record that DOE, as early as 1988, recognized the potential for “special” or stigma effects of the Yucca Mountain program to result in significant impacts to Nevada. DOE took steps to evaluate the extensive body of research on this matter produced by the State of Nevada and found that work to be sound. Finally, DOE undertook its own research on stigma impacts associated with the transportation of spent nuclear fuel and obtained confirmation that such impacts can and do occur and are potentially significant.

The fact that no assessment of “special” impacts to Nevada’s uniquely vulnerable tourism-dependent economy was conducted in the Draft EIS, despite DOE’s prior knowledge of the potential for and legitimacy of such impacts, renders the socioeconomic impacts assessment in the Draft EIS both legally and substantively deficient.

**Inappropriate Transportation Scenarios**

The transportation scenarios analyzed in the Draft EIS are inappropriate and non-reflective of reasonable transportation scenarios for the project. The all truck and all rail scenarios do not reflect a reasonable and readily identifiable expectation of how waste shipments would occur.

Information is readily available to DOE to estimate, with a high degree of certainty, which reactor/generator sites would ship spent fuel or HLW by rail, which would ship by truck, and which would ship by some form of barge-rail combination. The State of Nevada conducted such an evaluation in 1996 using available information. The results of that study are contained in Attachment V to these comments.

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18 “The Transportation of Spent Nuclear Fuel and High-Level Waste: A Systematic Basis for Planning and Management at National, Regional, and Community Levels,” by Planning Information Corporation (September, 1996).
The State of Nevada also believes that the use of bounding scenarios for evaluating potential transportation impacts is inappropriate when information clearly exists that would have allowed a more accurate and realistic assessment. DOE appears to have chosen not to undertake a site-specific, point-to-point evaluation in order to keep the transportation analysis (and its results) general in nature and less likely to provoke the public response and involvement that would accompany a more detailed and realistic transportation impact assessment.

The use of the all train scenario is especially problematic because, given the lack of rail access to Yucca Mountain, there is no justification for it. The Draft EIS, as discussed elsewhere in these comments, does not demonstrate that rail or intermodal (rail to heavy-haul truck) access to Yucca Mountain is feasible. Therefore, assuming that all spent fuel and HLW can be shipped to the site via rail is inappropriate.

The transportation scenarios used as the basis for assessing transportation impacts in the Draft EIS are legally and substantively deficient. The evaluation of transportation risks and impact must be redone using realistic and reasonable transportation scenarios.

**Failure to Disclose Transportation Routes**

The Draft EIS fails to identify the specific transportation routes for spent fuel and HLW shipments from specific reactor and generator locations to Yucca Mountain, despite the fact that these routes were identified as part of the analyses contained in the transportation appendix. DOE, in effect, has chosen to hide the routes and simply report the results of the analyses in a generic fashion. The half-hearted and inadequate attempt to publish a set of route maps three week before the end of an extended comment period (and after 18 of 21 public hearings had already been conducted without any notice to the public about likely routes and potentially impacted communities) in no way mitigates this extraordinary and fundamental deficiency in the Draft EIS. The maps themselves fail to contain information about shipment numbers, modal mix, and specific communities impacted.

One can only conclude that the failure to disclose specific nuclear waste shipping routes in the Draft EIS is intentional and designed to serve a political objective of suppressing public interest in the project and participation in the public hearings, especially those in states other than Nevada. Nevada believes that DOE has violated the National Environmental Policy Act by concealing crucial information used in the Draft EIS. Absent this information, persons affected by the transportation impacts of the Proposed Action have no way of determining the substantive and legal sufficiency of DOE’s analysis. Such concealment of information can only diminish public confidence in DOE’s ability to safely transport these highly radioactive materials and, of itself, renders the Draft EIS fundamentally deficient.
Inadequate Analysis of Rail Corridors in Nevada

The analysis of potential rail corridors in Nevada is inadequate, incomplete, and arbitrary. Different corridors are evaluated at different levels of detail; specific alignments are not identified precisely enough to adequately assess impacts; and no preferred alternative is identified. That decision is left to some “future” decision point, but DOE states that the information in the Draft EIS “could” be used to make the decision at that time.

The analysis of potential rail corridors and the identification of a preferred alternative is essential to assessment of transportation risks and impacts associated with the Proposed Action in the Draft EIS. There is no justification for deferring such analyses to an unspecified future time and unspecified “environmental reviews.” The Draft EIS should have contained detailed and specific evaluations of each potential corridor, with the same level of information and analysis for each. The Draft EIS should then have compared the available alternatives and identified the one that minimizes risk and maximizes safety. Absent such an evaluation, the Draft EIS is deficient.

Inadequate Analysis of Highway Routes in Nevada

The evaluation of alternative highway routes is inadequate, incomplete, and relies on numerous questionable assumptions. The most likely alternative highway route (the NDOT ‘B’ route from I-80 to US 93 to US 6 to US 95) is not analyzed at all; the primary route (I-15 to US 95) assumes infrastructure that is not in existence (the yet-to-be-built Las Vegas beltway section); and the Draft EIS ignores the route that would be used under existing U.S. Department of Transportation regulations (I-15 connecting directly with US 95 in Las Vegas).

The Draft EIS should have evaluated all potential highway routes in Nevada for waste shipments to Yucca Mountain, with the same level of information and analysis for each. The Draft EIS should have contained a detailed comparison among the available alternatives, and a preferred alternative should have been identified. Deferring such analyses and decisions to some unspecified future time is inappropriate and renders the assessment of transportation risks and impacts in the Draft EIS inadequate and deficient.

Inadequate Treatment of Heavy-Haul Truck Transport in Nevada

The Draft EIS fails to demonstrate the feasibility of the unprecedented large-scale, long duration heavy-haul transport of SNF and HLW on public highways. It misrepresents the operational complexity of such shipments; grossly underestimates the amount and cost of infrastructure improvement required along Nevada highways; and contains an incomplete and inadequate analysis of potential heavy-haul truck (HHT) routes.
Nevada believes that the use of heavy-haul trucks for thousands of shipments of spent nuclear fuel from any of the proposed intermodal transfer facility sites to Yucca Mountain is infeasible and dangerous. The costs associated with highway construction and improvements would be prohibitive, if the necessary infrastructure modifications could be made at all. The disruption to traffic flows and the accident risks posed by these massive, slow-moving, multiple unit vehicles and their escorts would pose unacceptable and unmitigable problems for Nevada’s highways. In addition, the frequency of heavy-haul trips required to deliver waste and return the empty vehicle to the intermodal facility would place an unprecedented and unacceptable burden on Nevada’s highway transportation infrastructure.

The Draft EIS should have evaluated heavy-haul transport in Nevada against the other alternatives for delivering spent fuel and HLW to Yucca Mountain, and DOE should have determined that such shipments are costly and impractical at best, dangerous and irresponsible at worst. Simply examining the heavy-haul option as a stand-alone alternative, as the Draft EIS does, is inadequate.

Inadequate and Inaccurate Analysis of Spent Fuel Radiological Characteristics

The Draft EIS misrepresents the radiological characteristics of the spent fuel that would be transported, using reference fuel that is older, less radioactive, and less thermally hot. The EIS considers a “typical” Pressurized Water Reactor (PWR) assembly as one that has cooled for 25.9 years (page H-17). The State believes this an inaccurate assumption. However, even if one accepts this average age of 25.9 years, it is quite likely that fuels cooled both less than and more than 25 years would be transported to the proposed repository. Therefore, the accident consequences would be greater than estimated by DOE simply because radionuclides decay exponentially.

Contrary to DOE’s view that oldest fuel will be shipped first, it is more likely, due to cost and operational considerations, that older fuel would first be shipped to the proposed Private Fuels Storage facility in Utah, and newer fuel would be shipped first to the proposed repository, followed at a later time by very old spent fuel. The average age of fuel shipped might be 25.9 years, but in terms of accident impacts, it is inappropriate to use the average age of fuel, since it is not a linear, but exponential, decay. Using only the “average” fuel characteristics results in a gross underestimate of impacts of potential releases from shipping containers.

Faulty Assessment of Routine Radiation Exposures Due to Transportation

The Draft EIS grossly underestimates the routine radiation exposures along highways and rail lines. The generic analyses contained in the Draft EIS do not account for the potentially long stop-times, slow speeds, unique highway characteristics, and the interface between highway infrastructure and community characteristics along potential Nevada heavy-haul routes.
Repeated transit of spent fuel and HLW shipments (thousands of trucks over a sustained period of almost four decades) would result in routine exposures greater than estimated in the Draft EIS, especially in areas like Las Vegas (I-15, Spaghetti Bowl, Beltway), Caliente, Tonopah, Goldfield, Beatty, and Pahrump, depending on the location of the intermodal transfer facility.

**Inadequate Treatment of Accidents and Terrorism/Sabotage Impacts**

The Draft underestimates the consequences of severe accidents and terrorism/sabotage incidents, especially with respect to heavy-haul transportation. The Draft EIS fails to appropriately recognize human initiated events as risk factors associated with the loading, transportation, and unloading of radioactive waste shipments. The Draft reflects an overriding “denial” philosophy that is evidenced in the lack of critical or even anecdotal discussion of sabotage and terrorism within Section 6 and Appendix J of the Draft EIS.

The Draft EIS must acknowledge the existence of credible and realistic risks from sabotage and terrorism. The symbolic value of repository shipments as targets and the regularity, frequency, and duration of shipments substantially increase the risks of human initiated events.

Spent fuel loading, transfer, and unloading activities should have been recognized as vulnerable to sabotage and terrorism attacks. These risks should have been addressed in the Draft EIS together with the implications of new regulations needed to limit the effects of human initiated events on the overall repository shipment program.

The complete point-to-point shipment process needs to be re-analyzed using updated assumptions about terrorist/sabotage technology and more realistic expectations of the potential for sabotage and terrorism attacks. The State of Nevada has begun this process by publishing several relevant documents on target types and risks associated with potential adversaries. Recognition of these concerns and an adequate analysis of the risks associated with potential terrorism/sabotage must be incorporated within the final EIS.