



Comments on Draft Environmental Impact Statement (DEIS) for Yucca Mountain

February 25, 2000

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RE: Comments on the Draft Environmental Impact Statement for a Geologic Repository for Nuclear Waste at Yucca Mountain, Nevada

Please accept these comments on the DEIS for a nuclear waste repository at Yucca Mountain and consider them as follow-up to testimony I delivered in January at the Las Vegas hearing.

Public Citizen is a non-profit research, lobbying, and litigation organization founded by Ralph Nader in 1971. Public Citizen advocates for consumer protection and for government and corporate accountability, and is supported by over 150,000 members throughout the United States.

Summary

The DEIS is an incomplete assessment of the environmental impacts associated with a nuclear waste repository at Yucca Mountain, Nevada, and as such, the DEIS should be withdrawn and completely rewritten.

The DEIS glossary defines *environment* as "(1) Includes water, air, and land and all plants and humans and other animals living therein, and the interrelationship existing among these. (2) The sum of all external conditions affecting the life, development, and survival of an *organism*." The DEIS, which is supposedly an **environmental** impact statement, does not address the impacts to the environment as the DEIS defines it, and the DEIS especially fails to address the impacts a nuclear waste repository at Yucca Mountain will have on the interrelationship among the water, air, land, humans, plants, and animals in Nevada and across the nation.

The DEIS fails in this regard in several ways. First of all, the DEIS is difficult to read, and it has not been adequately publicized. Also, the hearing process for the DEIS was insufficient.

Next, the DEIS is supposed to be a summary of impacts associated with a proposed action, yet that proposed action includes a repository that has not yet been designed and a transportation mode that has not yet been determined. Until the Department of Energy approves a final plan for the repository (e.g., high or low thermal load) and identifies a preferred transportation mode (rail or truck) and preferred transportation routes, the DEIS will be incomplete and inadequate in its assessment of the potential impacts of the proposed action.

The DEIS also fails to responsibly address the fact that this document is the only way for the public to assess how the proposed action will affect them in their communities. The DEIS is inaccessible and difficult to read, it fails to adequately address the impacts associated with the nuclear waste shipping campaign that will be necessary if the repository is approved, it fails to honestly and accurately assess socioeconomic and environmental justice issues, and it fails to address the question of total risk. Further, the No-Action Alternative is unrealistic and fails to provide a baseline for comparison to the proposed action. The No-Action Alternative is simply a scare tactic included in the DEIS to present the proposed action in a more attractive light.

In addition to failing to address the impacts associated with the interrelationship between humans and the natural environment, the DEIS fails to adequately address the impacts on the land, water, and non-human species from the proposed action.

Finally, the DEIS is incomplete in its assessment of the cumulative impacts that will result if a nuclear waste repository is approved at the Yucca Mountain site. The DEIS must more thoroughly consider what the cumulative impacts of adding another radioactive materials site to the already overburdened area of southwestern Nevada will be.

Preventing Meaningful Public Participation

The incomprehensibility of the DEIS deters all but the most determined citizens from participating in this important decision-making process. The DEIS constantly buries the reader in a jumble of confusing cross-references and redundancies. This obfuscation makes it difficult if not impossible for interested parties to navigate the three-volume report and to provide specific and clear comments to the DOE regarding the improvement of the DEIS. The lack of clarity in the DEIS also makes it difficult for policy makers to make informed choices about the nuclear waste policy of the United States because it is nearly impossible to form a clear picture of the risk involved with a nuclear waste repository.

Further, the difficulty of reading such a document, combined with the great likelihood that a citizen's first exposure to the document most likely would be at one of the 21

hearings held on the DEIS, makes the February 28th deadline for comments an almost impossible deadline, especially for those people living in Chicago, Cleveland, Lincoln, and San Bernardino, whose hearings were announced late in the comment period, and held only weeks (and in the case of San Bernardino, days) before the comment period expired.

Further, the DOE has failed to hold hearings in key areas such as Hartford, Indianapolis, Los Angeles, Phoenix, and other major cities that are likely to lie along those transportation routes, thereby ignoring the goals set forth in the Environmental Justice Strategy. The DOE's excuse for not holding hearings in these communities seems to be that the DOE suffers from a lack of resources. If the DOE cannot even afford to hold hearings to allow the public an opportunity to express its opinion on a future action, how can the DOE afford to guarantee the safety of the 50 million Americans affected by this potential transportation campaign?

Working without a Plan

Because the Department of Energy has not yet chosen a preferred design alternative, the DEIS cannot adequately assess the potential environmental impacts of a nuclear waste repository at Yucca Mountain. How can the DOE describe what the impacts will be when it does not even know what the design of the repository will be? How can the President and Congress and the Nuclear Regulatory Commission make informed decisions about whether or not to recommend and license Yucca Mountain as the site for a nuclear waste dump if it is not clear what that dump will look like and how "hot" it will be? The Department of Energy has a responsibility to choose a design alternative and describe what the impacts of that chosen design will be on the environment and on public health and safety. Since the DEIS was published, the DOE has explored design alternatives that are not even described in the DEIS. The DOE should choose its design for Yucca Mountain, clearly describe it and accurately assess the impacts in the DEIS.

Not Painting the Whole Picture

Transportation. The 50 million Americans that will be affected by this unprecedented transportation campaign have a right to be informed about the risks they will face if Yucca Mountain is approved as a repository for nuclear waste. The DOE has a responsibility to the people of America to honestly, clearly, and accurately characterize the human health risks involved with nuclear waste transportation. Yet, the DEIS fails to provide this information.

The DEIS does not adequately consider the impacts of transporting the waste materials to Yucca Mountain. The DEIS does not identify the preferred mode of transportation (rail or truck) and does not identify specific routes for the shipping campaign that would be initiated if Yucca Mountain is approved. Further, the impacts outlined in the DEIS are based on an outdated study, which is being updated by the Nuclear Regulatory Commission, through a contract with Sandia National Labs. The DEIS should include the most up-to-date information available.

Also, the DEIS does not thoroughly assess the impacts of a nuclear waste transportation accident. The DEIS should take an accident scenario and model what all of the impacts would be to human health, the water, land, and animals, and socioeconomics of the area around the accident. In addition, the DEIS fails to assess the ability of communities along the transportation routes to respond to a nuclear waste transportation accident. Citizens along these routes need to know both the risks they will face if this shipping campaign is launched and the steps they need to take in order to be adequately prepared (if that is even possible) for a radioactive accident. Doctors, nurses, and emergency responders have a right to know what dangers their communities will be exposed to if this campaign is allowed to happen. The DEIS should include this information.

Transportation Routes. In Chapter 3, "Affected Environment," the DEIS notes that the region of influence for public health and safety along existing transportation routes is 800 meters (.5 mile) from the center line of transportation rights-of-way for non-accident conditions, and 80 kilometers (50 miles) for accident conditions.

However, the DEIS neither shows specific routes outside of Nevada to be used to transport waste materials, nor addresses the baseline conditions along those routes. The DEIS also fails to identify which mode of transportation the DOE prefers rail or truck. In order to do a complete impact analysis, the DEIS should identify a preferred mode, map specific routes and establish their baseline conditions, and clearly and honestly identify potential impacts along the routes. Further, it should include site-specific data to show the effects of accidents in highly populated areas or areas where it would be difficult to retrieve a leaking cask (such as ravines and rivers) or where accidents might be more likely because of extreme weather, steep inclines, or sharp curves.

The DOE has posted the routes it used to complete the DEIS on its web site. This is a good start, but this information must be included in the DEIS. The DEIS should include both maps and tables showing the routes and number of shipments expected on each route, as well as where the waste shipped on each route will originate, and how many casks will be involved. These maps and tables should be included as an Appendix to the DEIS.

Further, the form used on the web site is difficult to decipher and is unacceptable. The maps should not simply "zoom in" on states from the national map. The DOE should prepare a map for each state, clearly marking the routes used and the cities and towns the routes pass through. These maps should be drawn to scale, and ideally should be topographical. The DOE's argument that the routes might change or that states may designate alternate routes is not an acceptable justification for refusing to include the specific routes used to analyze potential impacts in the DEIS. How can states decide if they need alternate routes if they cannot see the routes being considered? How can citizens determine whether they will be affected by nuclear waste transportation to Yucca Mountain if they cannot decipher the information offered by the DOE?

Outdated Data. The DEIS bases its conclusions about the impacts of nuclear waste transportation on an outdated and incomplete study (the Modal Study) done in 1987 by

Lawrence Livermore Labs for the Nuclear Regulatory Commission (NRC). The NRC itself has recognized the need to update and expand the Modal Study, and has thus contracted with Sandia National Labs to revise the 1987 study. However, this revision ("Modal II") will not be completed until 2003 two years after a final decision will be made about Yucca Mountain. The DOE should work with Sandia labs and include in the DEIS a discussion of what will be studied in Modal II and how the information obtained in that study could affect the information in the DEIS (see <http://ttd.sandia.gov/nrc/modal.htm> for a start). Sandia has indicated that they expect to have a proposal for the study completed in the spring of 2000, and a final proposal by late summer. Thus, the DOE could easily include this information in the EIS, and note that a follow-up document should be completed after Modal II is finished.

Impacts from Nuclear Waste Transportation Impacts. The DEIS does not examine what the specific impacts of a transportation accident would be. Using the Department of Energy's own data, it can be estimated that between 70 and 310 accidents and over 1000 incidents would occur during the nuclear waste shipping campaign if trucks are used as the preferred mode, and between 50 and 260 accidents and over 250 incidents if trains are used as the preferred mode. The Department of Energy also estimates that a severe accident would contaminate 42 square miles for well over one year. What does it mean for a community to experience this type of accident? If people are evacuated, how long will they have to stay away? Will it ever be safe to come back? What kinds of loss would be involved? Besides the immediate threat of death and the long term threat of cancer, what kinds of health impacts would be seen?

Also, homeowners insurance and health insurance almost always excludes radioactive accidents from coverage. What does this mean socioeconomically for a community that has experienced a radioactive waste transportation accident? If roads are closed and businesses shut down, what kinds of socioeconomic impacts will that entail?

Emergency Response Preparedness. The DEIS fails to identify what emergency response personnel training and equipment would be needed in all of the communities along the transportation routes. Many communities emergency responders lack the special equipment and training necessary to respond to a radiological accident. Further, many hospitals do not have isolation rooms for radioactively contaminated victims. This analysis should at the very least be done for the major population centers along the transportation routes (populations of 100,000 or more). The DEIS should indicate what emergency response equipment, facilities, and trained personnel are available in these communities, and what the effects of a transportation accident could be based on what is currently available. For instance, if an accident occurs, and the driver of a nuclear waste truck is radiated, and there is no isolation room in the hospital, what are the impacts?

Socioeconomics. The DEIS fails to consider impacts on property values both near the Yucca Mountain site and along the transportation routes upon which nuclear waste would be transported to the Yucca Mountain site.

The DEIS should include a section that discusses potential impacts to property values, both in Nevada near the Yucca Mountain site and throughout the nation along the transportation routes to Yucca Mountain. This analysis should include a baseline assessment of property values as well as an estimate of impacts to property values. This information is crucial because costs to taxpayers could be significant if the Department of Energy is sued by property owners for property value decreases. Further, local economies could be devastated if property values decrease significantly because of nuclear waste transportation. This analysis should also include a discussion of environmental justice issues associated with a decline in property values along transportation routes. Below are several examples that show that property values can be negatively effected even if no accident occurs along nuclear waste transportation routes.

Komis Case. In *The City of Santa Fe vs. John and LEMONIA KOMIS*, the Komises were awarded \$337,915 for property value loss due to perceived risk because of nuclear waste transportation long the WIPP routes. The Supreme Court of the State of New Mexico found that compensation can be awarded for loss of property value " even if the loss is based on fears not founded on objective standards." The court decision goes on to say that "if people will not purchase property because they fear living or working on or near a WIPP route, or if a buyer can be found, but only at a reduced price, a loss of value exists." The Supreme Court decision notes that "damages should not be denied because they are difficult to prove," and concludes, "Whether the transportation of hazardous nuclear materials actually is or is not safe is irrelevant; the issue is whether the public perception of those dangers has a depressing effect on the value of the property& ."

The Supreme Court decision refers to a survey conducted by Zia Research Associates, Inc., which found that 71% of Santa Fe County residents polled felt that residential property near the WIPP route would sell for less money because of its location. This poll also showed that 93% of residents polled were familiar with the property in question and 89% were familiar with the bypass that was to be built in order to transport waste to the WIPP site.

Other Lawsuits. Other lawsuits similar to the *Komis* case include a class action lawsuit by 50,000 Coloradans against Rockwell International for \$550 million in reduced property values, and law suits by neighbors of the Oak Ridge plant in Tennessee, the Hanford plant in Washington, and the Mound plant in Ohio. In 1990, the community around the Fernald plant in Ohio received \$78 million from the government.

Property Value Impact Map. A map prepared by Clark County, Nevada, indicates a preliminary estimate for urban areas of land value impact from nuclear waste transportation through Clark County to the Yucca Mountain site (copy attached). This map predicts a \$33 million decrease in property values within 100 feet of the transportation route along US Route 15 and Nevada Route 95. This estimate is based on the *Komis* decision, wherein the State Court awarded *Komis* 5% of his property s assessed value.

Local Proclamations. Communities across the country have adopted resolutions opposing radioactive waste shipments through their areas, and many note the likelihood of decreased property values as a reason for the resolutions. Just one example occurs in Anson County, North Carolina, where the County went on record as "opposing HR 1020 and all similar legislation which would require high-level radioactive waste transportation near or through this jurisdiction" because, among other reasons, "property values are likely to fall, attraction of new business is likely to fail, and improvement of the community may become difficult or impossible should high-level radioactive waste be transported through Anson County."

WIPP Study. A study conducted in New Mexico by Ganderton, McGuckin, Cummings, and Harrison, looked at whether New Mexico residents were willing to accept compensation for nuclear waste shipments or whether they would pay to avoid such routes to the WIPP site. Interestingly, the study found that a large percentage of people would not only reject the routing of such shipments, but would also require extreme compensation. Further, the closer people lived to proposed routes, the more willing they are to actually pay to avoid nuclear waste shipments, especially if household members are perceived to be at high risk from radiation exposure.

Argonne National Labs Paper. A paper by Leslie A. Nieves of Argonne National Laboratories, *Economic Impacts of Noxious Facilities: Incorporating the Effects of Risk Aversion* done for the Office of Civilian Radioactive Waste Management, (copy attached), claims:

Historically, facility impact assessments have focused on the effects of changes in population, employment, and economic activity associated with construction and operation. Because of this scope limitation, such negative public reaction to some types and locations of facilities seem unreasonable. Also, the long-run effect of public perceptions of both facility risk and nuisance characteristics on the area's economy has not been included. Recent developments in psychological and economic techniques have made it possible to correct this by incorporating public perceptions into projection of direct and indirect economic impacts from noxious facilities.

Nieves refers to studies that show that nuclear plants and nuclear wastes "have consistently received among the highest rankings in regard to perceived risks." Nieves also refers to a study by Bajgier and Moskowitz that found that people are "willing to pay the most to avoid risks from radioactive contaminants."

Nieves describes the hedonic model approach as estimating the "net value of the presence of a disamenity including its effect on employment, local income, traffic, noise, perceived risks, etc. in the long-run (after local markets have adjusted to the siting of the facility)." Nieves goes on to conclude that "the finding of a negative implicit price for a noxious facility implies that the value of the associated nuisance effects and perceived risk effects is greater than the value of stimulating effects of the facility on the local economy." This means that even though jobs might be created by a facility or campaign and wages might

increase, the long-term negative effects to the economy or property values outweigh those short-term benefits.

Nieves concludes:

The finding of negative impacts in the hedonic valuation of facility sites confirms that public perceptions of risk and nuisance effects have a measurable economic consequence. Determining the magnitude of this impact in addition to the economic stimulus component requires incorporating information regarding public aversion to facilities into economic analyses of facility impacts in such a way that the components can be delineated.

Environmental Justice. The history of this country shows that minorities, low-income families, and native peoples have consistently and constantly been ignored or worse forced to endure exposure to toxic substances that those in power did not want in their own "backyards." With the President's Executive Order 12898 (copy attached), and the DOE's own Environmental Justice Strategy (copy attached), the journey to stop these unfair policies was begun. The DOE, through documents like the DEIS, should ensure that this journey is continued and the disempowered are treated fairly. The DEIS for Yucca Mountain fails miserably in this regard.

For many years, decisions about where to locate environmental hazards were based on where the people would have the least amount of power to fight against those hazards. In only the recent past, the United States has admitted to this shameful practice and made a commitment to uphold the principles of Environmental Justice through the president's Executive Order 12898 and the Environmental Protection Agency's Environmental Justice Strategy (copy attached). The DOE should not be allowed to revert to past practices in order to push through a decision on Yucca Mountain that could disproportionately threaten the health and well-being of our poorest and least powerful communities. The nuclear industry has been allowed to push its problems on America's citizens for too long. The DEIS should be rewritten, and it should accurately classify the impacts to minority and low-income communities.

DOE's Environmental Justice Strategy. In April 1995, the Department of Energy (DOE) developed its Environmental Justice Strategy, in accordance with Executive Order 12898. This document outlines the key goals and components of a thorough and fair assessment of departmental actions with regard to how minority or low-income communities will be affected as a result of those actions. The DEIS fails to follow the guidelines in the Environmental Justice Strategy.

The Strategy supposedly "emphasizes community participation and empowerment of [the DOE's] stakeholders and communities, refocused research agendas to reflect a new recognition of various health issues& [and] embraces interagency coordination to ensure environmental justice" (p. 2). Yet, the DEIS does not consider that minority or low-income communities along the transportation routes may have special health or environmental concerns. Instead, the DEIS approached its environmental justice analysis

by first reviewing the proposed action to see if it would likely result in high and adverse human health or environmental impacts to the general population, and then supposedly checking to see if any identified impacts would disproportionately affect specific minority or low-income communities. With this method, the DEIS failed to identify any environmental justice issues.

In order to achieve true environmental justice, the DEIS would need to identify all of the minority and low-income communities that could potentially be affected and then check to see if there would be any negative impacts to these communities that would be disproportionate to other communities. Many communities already have completed maps that show the presence of low-income or minority communities in relation to roadways and railways. These maps should be obtained and analyzed for disproportionate risk not only for health effects, but also for socioeconomic effects, such as lowered property values, stigmatism, and potential economic impacts of an accident.

The DOE's Environmental Justice Strategy lists among its goals to "Identify minority and low-income populations and communities which could be impacted by potential increases in environmental impacts attributable to Departmental operations" (p. 6) and "Address demographics and socioeconomic factors unique to health-related issues, multiple contamination sources, multiple exposure possibilities, unique risk scenarios & as appropriate, in the impact analyses" (p. 8). It is well known that low-income and minority communities are often located along rail roads and highways. Federal regulations allow transportation casks to emit 10 millirem/hour at 2 meters from the cask surface, which is equivalent to one chest x-ray per hour. If nuclear waste transportation casks are to travel repeatedly through certain minority or low-income neighborhoods, where children are playing in playgrounds close to the street or where people are sitting in traffic jams next to the casks, these communities will be at greater risk than the general population.

In addition, because unwanted environmental and health threats have also been historically located in minority or low-income neighborhoods, these citizens may face an increased possibility of threat from cumulative effects. Without looking at these communities and doing a baseline analysis of the threats already there, how can DOE expect to determine whether the impacts from nuclear waste transportation would disproportionately threaten these citizens?

The DOE's Environmental Justice Vision Statement claims that the DOE will function in a leadership role by "focusing on a Partnership in Participation Approach with our stakeholders including the general public, affected communities, Federal, Tribal, State, and local governments in the early stages of planning and implementing environmental justice procedures" (p.4). The Strategy lists as a goal, "Where appropriate, structure programs to encourage local community groups to participate in Departmental decisions which may affect their communities" (p. 9). It is possible that the decision to haul the nation's nuclear waste across the country may affect more neighborhoods than any other decision by the Department of Energy indeed it will affect over 100 communities with populations of more than 100,000 people. Yet, the DEIS fails to name the mode of

transportation (rail or truck) or the routes that it will use to transport 77,000 metric tons of nuclear waste across the country.

The Western Shoshone tribe claims that it owns a large parcel of land that spans Nevada, Utah Idaho, and California, including the area where Yucca Mountain is located. The Western Shoshones claim that this land is theirs based on the Treaty of Ruby Valley, signed in 1863, ratified by Congress and proclaimed by Ulysses S. Grant. Although the land was taken away from them by the federal government, the Western Shoshones have not agreed to this breach of the Treaty, and have never accepted monetary payment for the lands that are theirs. The Western Shoshones believe that Yucca Mountain is a sacred site and have historically used the plants and springs around the mountain as medicine and healing places. Taking even more of this land away from the Western Shoshones (much land has already been stolen, including the Nevada Test Site land) and intruding upon their lifestyles and healing rituals by creating more noise and other aesthetic offenses disproportionately affects them as a people. The DEIS should not dismiss the Western Shoshone s claims and concerns as illegitimate. Instead, the DEIS should thoroughly characterize the impacts on these people and recognize that these impacts are disproportionate and cumulative.

Total Risk. A major flaw of the DEIS is that readers cannot determine their total risk in regard to the Yucca Mountain Project. The DEIS s lack of clarity and disjointedness make it difficult if not impossible to see how more than one risk factor could combine in order to get a picture of the total risk. The DEIS should provide some way for readers to determine "personal cumulative risk."

Using Scare Tactics to Promote Action

The "No-Action Alternative" is unrealistic and does not provide a baseline to which the proposed action can be compared. This section should either be entirely deleted from the DEIS, or a real no-action alternative should be described.

The "No-Action" alternative presented is not truly a no-action scenario. It would require action by the federal government to take control of the nuclear waste on the reactor sites and monitor it for at least one hundred years. The true no-action alternative would be to require the utilities to be responsible for safe storage of the waste on the reactor sites until an alternate sound solution is discovered. Although this scenario would raise some safety and environment concerns, it would be a truly "no-action" alternative, and would provide a better comparison model than the scenarios currently described in the DEIS.

Further, it would be possible for the DOE to propose other alternatives that would not be "no-action" alternatives (i.e., other actions). It is clear that the DOE is legally prohibited from looking at other repository sites, but it is not prohibited from looking at alternatives to repository sites. Although Public Citizen does not currently endorse any proposals currently in circulation, we do support continued research in this area and focused efforts to find a true solution.

Failing to Describe Threats to Land, Animals, and Water

Land Impacts. The DEIS is nonchalant about the potential impacts on the desert environment from the Yucca Mountain Project, and the DEIS by scattering and obfuscating information throughout the report makes it difficult for those who care about this environment to form a clear picture of the overall impacts to desert lands and species.

Because they are poised in such harsh extremes of heat and aridity, deserts are among the most fragile ecosystems on the planet. Even subtle changes or disturbances can greatly affect desert plants and animals and the delicate balance of the ecosystem. The Yucca Mountain region is a desert environment and is home to the desert tortoise, a threatened species. Threatened species are defined as plants and animals whose numbers are very low or decreasing rapidly, so it is imperative to the tortoise's survival that it be protected in all proposals concerning Yucca Mountain.

The DEIS notes that from 1989 to 1998, five (5) desert tortoises were killed by vehicles on roads in the Yucca Mountain region as a result of site characterization activities. However, the DEIS makes light of the fact that several thousand trucks could potentially be travelling on current and new roads in the Yucca Mountain region if the repository is built. If five tortoises were killed in a period of relatively light activity, how many more tortoises will be killed if Yucca Mountain is licensed as a repository, and there are more roads, cars, and trucks? The DEIS has failed to adequately address environmental impacts.

The DOE also admits that not much is known about the thermal properties of the soil at Yucca Mountain, particularly thermal conductivity, and so that there is considerable uncertainty in the estimates of soil temperature changes from the repository. The possibility that the repository could cause an unforeseen effect of heating up the desert soil to a dangerous level coupled with the increased risk of death from vehicles could lead to severe consequences for the desert tortoise. Yet, the DEIS does not characterize these potential effects clearly or take them seriously.

The desert tortoise and other plants and animals could also be affected by an increase in soil temperature. Desert tortoises burrow into the soil in order to escape the great heat of the desert. If the temperature of the soil increases (because of the heat generated by the nuclear waste), the tortoise's ability to survive may be compromised. The DEIS also notes that nest temperature determines whether desert tortoise hatchlings will be male or female. If the temperature of the soil around the repository increases, the sex ratio of the species could be affected, thus compromising the ability of the species to thrive and survive. The DOE admits, "little is known about the effects that minor alterations in habitat would have on desert tortoise population dynamics (p. 5-48)." More research needs to be done in order to accurately predict the potential impacts on this threatened species.

Water Impacts. Groundwater contamination is a major human health concern with regard to a potential nuclear waste repository at Yucca Mountain. The DOE has a

responsibility and an obligation to the American people to honestly characterize the risk associated with storing 77,000 metric tons of radioactive waste at this site. It is unacceptable for the DOE to simply say, "the groundwater probably won't be contaminated," or "populations probably won't increase," and ignore the potential for severe health related consequences in order to continue the nuclear industry's lie that nuclear power and the waste it produces is not dangerous.

Population increases, groundwater contamination, and earthquakes are three issues not adequately discussed in the DEIS. Also, the maximally exposed individual is not acceptably identified.

Population Increases. The DEIS notes that if populations were to move closer to or increase in size in the Yucca Mountain groundwater hydrology region of influence, the radiation dose and resultant impacts could increase (p. 5-17). Clark County, Nevada, is one of the fastest growing areas in the United States and the 10th largest school district in the country. Population in this area continues to increase dramatically. This county is right next door to Nye County, where Yucca Mountain is located. It seems likely that increased expansion of the Clark County and Las Vegas areas will lead to an outward growth pattern that will result in a significant number of people living closer to Yucca Mountain and in the region of influence. Yet, the DEIS assumes that the population will remain the same for thousands of years. This assumption is absurd. The DEIS should at least use current growth patterns to predict an increase in population in the area and project the dose levels according to these predictions.

Maximally Exposed Individual. It is vital that the DEIS honestly characterize the potential impacts of groundwater contamination. The residents of the Amargosa Valley rely on the groundwater that runs beneath Yucca Mountain for drinking, washing, and irrigation. The cumulative effect of contaminated groundwater on these residents will be great. The DEIS fails to adequately identify those who would be most severely affected by radiological contamination of groundwater. The DEIS identifies the "critical group reference person" as an adult who lives year round in Amargosa Valley, uses a well as a primary water source, and lives in a manner similar to a typical inhabitant of Amargosa Valley (p. 5-14). The DEIS should instead identify the maximally exposed individual (MEI) person as a fetus in the womb of a subsistence farmer in the Amargosa Valley region because this fetus would more accurately represent the individual whose health will be most at risk from groundwater contamination.

Groundwater Contamination and Earthquakes. The DEIS notes an opposing viewpoint, stating that "Several investigators have suggested that the water table in the vicinity of Yucca Mountain has risen dramatically higher than 100 meters (330 feet) above the current level, even reaching the land surface in the past (Szymanski, 1989, all). If such an event occurred, it would affect the performance of the proposed repository" (p. 3-49). DOE even admits, "if such an event occurred, the long term impacts would probably increase greatly" (p. 5-15). Yet, the DEIS dismisses this possibility and does not address the potential impacts of such an event.

The DEIS notes another opposing viewpoint by Davies and Archambeau which suggests that a moderate earthquake at the site could result in a water table rise of about 150 meters (490 feet) and a severe earthquake could cause a rise of about 240 meters (790 feet) in the water table, which would flood the repository. Nevada ranks third in the nation for current seismic activity. Since 1976, there have been over 600 seismic events of a magnitude greater than 2.5 within a 50-mile radius of Yucca Mountain (see attached document). The DEIS states that "earthquakes have occurred in the Yucca Mountain geologic region of influence and are likely to occur in the future" (p. 5-16). Yet, the DOE has repeatedly ignored the potential impacts of future earthquakes at the Yucca Mountain site and refuses to examine how an earthquake might affect the region's groundwater supply.

Surface Water Contamination. The DEIS also notes that the DOE will use controls to limit surface water contamination, but the DEIS does not outline the impacts that could occur if DOE's controls fail. It is unacceptable to state categorically that there will be no impacts because controls are in place. If that were true, the word "accident" would not be in our vocabulary.

Masking the Total Effect

The DEIS does not adequately address the cumulative impacts associated with a nuclear waste repository at Yucca Mountain combined with the past, present, and future activities in the region, such as the Nevada Test Site, Nellis Air Force Range, and Beatty Low Level Waste Dump.

For example, the groundwater is already contaminated at the Nevada Test Site, and the aquifer that flows beneath the NTS is the same aquifer that is beneath Yucca Mountain. Therefore, contamination from Yucca Mountain would add to an already existing problem and make matters worse for the environment and the people who are dependent upon that aquifer for drinking, farming, and washing. Further, if current trends continue, a significantly higher number of people will be dependent upon that aquifer for water in the future. This increased population coupled with the cumulative effects of radioactive contamination would lead to higher doses and more cancer for the people in the Yucca Mountain and Amargosa Valley area.

Also, the above named sites also have effects on the desert environment, and these impacts must be considered in conjunction with the impacts that a nuclear dump at Yucca Mountain would add.

Finally, as the Nuclear Regulatory Commission has noted, the cumulative effects of water usage, land use, and biological resources. We request that the DOE calculate these cumulative effects and factor them into the DEIS. In order to ensure that all of these considerations are included, the DOE should rewrite the Cumulative Impacts section to more clearly and accurately characterize the total impacts from all of the environmental disaster areas in the Yucca Mountain regional area.

I look forward to your responses to my comments. If you need further information or have questions, please do not hesitate to contact me.

Sincerely,

Amy Shollenberger
Senior Policy Analyst

Encl: Executive Order 12898
Environmental Protection Agency Environmental Justice Strategy
Department of Energy Environmental Justice Strategy
"Earthquakes in the Vicinity of Yucca Mountain"
Economic Impacts of Noxious Facilities: Incorporating the Effects of Risk Aversion
"Clark County Land Value Impact" Map