

Statement for the Record

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Chairman Bishop and Ranking Member Grijalva, thank you for the opportunity to testify today. My name is Richard Myers. I am Vice President for Policy Development, Planning and Supplier Programs for the Nuclear Energy Institute (NEI). NEI is responsible for establishing nuclear industry policy on matters affecting the nuclear energy industry, including regulatory, financial, technical and legislative issues. NEI's 375 members include all companies licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, suppliers of fuel, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

America's 104 nuclear power plants represent approximately 10 percent of our electricity generating capacity. However, because they operate at such high levels of reliability, safety and efficiency – they provide 20 percent of this country's electricity supply and nearly three-quarters of our emission-free generation. When ranked by performance over the last three years, the U.S. has the top three best-performing nuclear reactors in the world, seven of the top 10 and 16 of the top 20.

Nuclear power plants operate in 31 states and produce substantial economic value in revenues from electricity sales – \$40 billion to \$50 billion each year – and employ over 100,000 workers. Nuclear energy companies buy over \$14 billion each year in materials, fuel and services from domestic suppliers in all 50 states.

Worldwide, more than 150 new nuclear plant projects are in the licensing and advanced planning stage, with 65 reactors currently under construction. In addition, the U.S. Department of Energy projects that U.S. electricity demand will rise 24 percent by 2035, about one percent each year. That means our nation will need hundreds of new power plants to provide electricity to meet rising demand and replace aging infrastructure. Nuclear energy is the only proven technology that can provide emission-free, affordable baseload electricity.

As a result, our industry will see sustained growth in demand for materials, components, services and fuel. The World Nuclear Association's 2011 Market Report¹ shows that world uranium production in the reference scenario must rise by at least two-thirds by 2030 from the current level and, under some circumstances, uranium supply must double. Bringing new uranium mines into production requires careful, time-consuming planning and permitting well in advance of exploration and production of uranium, and we cannot afford to remove high-quality reserves from consideration without good cause.

NEI's primary goal is to ensure a diverse, competitive and reliable supply of uranium to bolster America's energy security. Given that uranium supply is a strategic priority, NEI fully supports H.R.

¹ *The Global Nuclear Fuel Market: Supply and Demand 2011-2030*, World Nuclear Association, September 2011.

3155, The Northern Arizona Mining Continuity Act of 2011, and S. 1690, the companion legislation in the Senate. The Administration has proposed that approximately one million acres of federal land in the Arizona Strip be withdrawn and unavailable for uranium mining for 20 years, and this legislation would block that withdrawal.

My testimony today will cover two major areas:

- NEI's perspective on world uranium supply and demand, and the importance of U.S. uranium supply, including potential future supply from northern Arizona.
- NEI's preliminary assessment of the final environmental impact statement (EIS) on the northern Arizona land withdrawal, which was published last week by the Interior Department's Bureau of Land Management. We are unable to find any impacts identified in the final EIS that would justify the proposed withdrawal.

Uranium Supply and Demand

The uranium resources in the Arizona Strip represent some of the highest-grade ores located in the United States. In fact, according to the Interior Department's final EIS, these uranium resources are higher grade than 85 percent of the world's uranium resources. These resources could represent as much as 375 million pounds of uranium, approximately 40 percent of U.S. reserves, twice current world demand and more than seven times current U.S. annual demand.

A recent analysis by Tetra Tech, Inc., an environmental consulting firm, found that development of northern Arizona's uranium resources would have a significant economic benefit. Tetra Tech's analysis showed a direct and indirect economic benefit of \$29.4 billion², or an average annual impact of \$700 million during the period in which mines would be in operation. Federal, state and local governments would receive tax revenues from the mining companies, including \$2 billion in federal and state corporate income taxes, and \$168 million in severance taxes to the state. Since the ore from northern Arizona mines would likely be taken to the White Mesa Mill in Blanding, Utah, for processing, trucking companies could expect revenues of approximately \$1.6 billion during operation of the mines.

The uranium market is an international market, and will continue to be so, with commercial uranium mining on six continents. History and recent events make it clear, however, that maintaining U.S. capability in uranium production must be a strategic part of our domestic energy supply strategy.

The world's nuclear power plants currently consume more uranium than is produced. Current worldwide uranium demand is approximately 180 million pounds per year. Worldwide production is approximately 140 million pounds per year, with the balance coming from secondary sources of supply, including inventories held by the U.S. and Russian governments. U.S. uranium production in 2010 was approximately four million pounds.

U.S. nuclear power plants consume approximately 50 million pounds of uranium per year. More than 90 percent of that comes from foreign sources. In 2010 nearly a quarter of U.S. uranium requirements were met by downblended Russian high-enriched uranium extracted from nuclear weapons. This weapons-grade material is converted into low-enriched uranium fuel in what is popularly called the "megatons to megawatts" program. This arrangement expires in 2013, however, and will leave a gap in U.S. demand that must be filled from other supply sources. In that context, even relatively small additions to U.S.

² *Economic Impact of Uranium Mining on Cocino and Mohave Counties, Arizona*, Tetra Tech Inc., September 2009. The \$29.4 billion economic impact consists of \$18.9 billion in direct sales and \$10.5 billion in indirect impact. The analysis assumed a conservative uranium price of \$50 per pound.

uranium supply – such as might be achieved by producing the breccia pipe uranium deposits in northern Arizona – are strategically important.

In addition, approximately 55 percent of world uranium supply comes from the 10 largest mines: Four in Kazakhstan, two in Africa, two in Australia, and one each in Russia and Canada. This heavy dependence on uranium production from a relatively small number of large mines represents a supply vulnerability: Any interruptions in production can cause disruption in the market. These interruptions do occur: From fires (at Olympic Dam in Australia in 2001); from mine flooding (as at the Rabbit Lake, Cigar Lake and McArthur River mines in Canada in the 2003-2008 period); from floods caused by cyclones (as at the Ranger open pit mine in Australia in 2006, 2007 and 2011); from in situ leaching supply shortages (as at the Beverley mine in Australia in 2010); and from leaching acid supply shortages (as in Kazakhstan in 2007).

U.S. nuclear energy companies manage this potential vulnerability by diversifying their sources of supply. Additional U.S. uranium supply, including future supply from the high-grade deposits in northern Arizona, is an important part of a diversified supply portfolio.

The Northern Arizona Land Withdrawal

There is no current or proposed uranium mining inside the Grand Canyon National Park, which encompasses 1.2 million acres and includes a buffer zone to protect the Grand Canyon. The one million acres proposed for withdrawal lie outside the park boundaries.

Withdrawing one million acres from future mining would upset a longstanding and carefully crafted compromise developed in 1984 between the mining industry and the environmental community, and supported by the Arizona congressional delegation led by former House Interior Committee Chairman Mo Udall, Sen. Barry Goldwater, and then-Congressman John McCain. In the early 1980s, legislation was crafted that designated approximately 300,000 acres of Bureau of Land Management land and approximately 100,000 acres of National Forest Service lands as wilderness. The Act added over one million acres of land to the National Wilderness Preservation System, and provided that mining and grazing be allowed in those areas not designated as wilderness, if conducted in an environmentally responsible and sustainable manner. The Act also specifically directed nearly half-a-million acres of Bureau of Land Management lands and 50,000 acres of Forest Service lands be released from wilderness study with the understanding and intention that this would allow uranium mining on the Arizona Strip and Kaibab National Forest. Since the passage of the Arizona Wilderness Act of 1984 (P.L. 98-406), there is no evidence that uranium mining and reclamation have impacted the Grand Canyon.

During the 1980s, seven mines in the Arizona Strip produced approximately 19 million pounds of uranium, with a temporary surface disturbance of approximately 20 acres per mine – about the size of a Wal-Mart parking lot. A statement by the Arizona State Legislature notes that “in the 1980s, uranium mining operations existed that have now been so well reclaimed that it is difficult to discern where these mines existed.”

The Draft Environmental Impact Statement. The Draft EIS (DEIS) on the northern Arizona land withdrawal was published for public comment in February. The DEIS considered potential impacts on air emissions, water resources, soil resources, vegetation, fish and wildlife, wilderness resources, and recreation and tourism. In general, the DEIS found either no impact or minor, temporary impacts that could be readily mitigated. This conclusion was validated by the Arizona state agencies responsible for environmental protection and management of state lands.

The high-grade uranium resources in northern Arizona are found in “breccia pipe” formations. These are compact formations that can be developed with minimal environmental impact. In its comments on the Interior Department’s draft EIS, the Arizona Land Department said: “[T]he DEIS reveals nothing in the recent history of mining the breccia pipes in northern Arizona ... that would appear to justify any withdrawal. Going back to the start of the Hack Mine complex in 1981, there has been no incident or event during this 30-year period that would ... warrant a withdrawal.”

In its comments³ on the draft EIS, the Arizona Department of Environmental Quality (ADEQ) noted that the draft EIS ignored state and federal programs designed to protect the environment, and saw no basis for a blanket withdrawal. “As the lead regulatory agency responsible for the protection of Arizona’s environment, ADEQ closely regulates uranium mining activities in northern Arizona. The **environmental risks posed by mining in Arizona have been successfully managed by both state and federal environmental requirements** currently in place. The State of Arizona has adopted the Aquifer Protection Permit program specifically designed to protect its precious groundwater resources. This State program provides added protection to the federal environmental laws. It is important that the BLM consider not only the federal programs, but also Arizona’s unique environmental requirements when making its decision.” (*Emphasis added.*)

ADEQ continued: “The DEIS does not give full consideration to modern uranium mining technology or ADEQ-issued permits that require environmental controls, financial assurance, and reclamation. These **modern technologies and permits ensure that new and reactivated mining claims can be safely worked with minimal environmental impact.** A broad withdrawal of federal lands in response to concerns that new mining operations will pose unacceptable environmental risk is unwarranted. Rather than a blanket prohibition of new claims, proposed **new mining facilities should continue to be evaluated on a case-by-case basis under existing federal and state environmental permitting programs.**” (*Emphasis added.*)

The Arizona Geological Survey conducted an analysis of possible contamination of water resources as a result of uranium mining and found no cause for concern. In an April 28, 2011, letter to Governor Janice Brewer, the state geological survey stated: “We conclude that even the most implausible accident would increase the amount of uranium in the Colorado River by an amount that is undetectable over amounts of uranium that are normally carried by the river from erosion of geologic deposits. Even if the entire annual uranium production from an operating mine were somehow implausibly dumped into the river, the resulting increase in uranium concentration in river water would increase from 4.0 to 12.8 parts per billion (ppb) for one year, which is still far below the 30 ppb EPA Maximum Contaminant Level.”

The Arizona Geological Survey told the governor that “we believe the fears of uranium contamination of the Colorado River from mining accidents are minor and transitory compared to the amounts of uranium that are naturally and continually eroded into the river Uranium has been eroding out of these deposits into the Colorado River and other streams and creeks for millions of years and will continue to do so for millions more.”

The Final Environmental Impact Statement. In its preliminary analysis of the Interior Department’s final EIS, published on October 26, NEI has found nothing that would appear to justify an extreme action like the proposed withdrawal of one million acres.

The EIS identifies four alternative courses of action, but only two alternatives are of significant interest. Alternative A is the so-called “no action” alternative, under which continued uranium mining would be

³ Arizona Department of Environmental Quality, comment letter to BLM, May 4, 2011

allowed, subject to the safeguards and requirements of federal and state laws and regulations. Alternative B is the proposed one-million-acre land withdrawal. It is commonly assumed that there would be no mining under Alternative B, but that is not the case. Uranium mining would occur under both alternatives, because a number of mines are already operating or permitted as valid existing claims in the proposed withdrawal area and would, therefore, not be subject to the land withdrawal proposed.

Under Alternative B (the withdrawal scenario) the final EIS estimates 11 uranium mines would operate in the withdrawal area over the 20-year period. Under Alternative A, the number of mines increases to 30, an increase of 19 mining projects above Alternative B. The true measure of environmental impact, therefore, is the difference between 11 and 30 mining projects.

It is instructive to compare the differences between Alternative A and Alternative B from various perspectives. For example, under Alternative A, the total acres disturbed for exploration and development over 20 years would be 1,364 acres; under Alternative B, 164 acres – a difference of 1,200 acres over 20 years or 60 acres per year.⁴ Sixty acres per year in a one-million-acre tract of land is a relatively trivial difference – certainly not large enough to justify a draconian step like a 20-year, one-million-acre land withdrawal.

In terms of water usage, according to the final EIS, Alternative A would consume 316 million gallons; Alternative B, 116 million gallons. The difference is 200 million gallons over 20 years or 10 million gallons per year. This seems relatively insignificant in a nation where residential water consumption is 26 billion gallons per day, and water for consumed for irrigation was 134 billion gallons per day.

Land Disturbance. The Administration proposes to withdraw 1,006,545 acres, divided among three parcels: the North Parcel with 549,995 acres (the area likely to see the highest level of development); the South Parcel (134,454 acres) and the East Parcel (322,096 acres).

Because breccia pipe deposits of uranium are so compact, the amount of land disturbed temporarily by mining is relatively small – less than 0.2 percent of the one million acres proposed to be withdrawn.⁵ The final EIS states: “Even if the entire anticipated disturbance occurred in one sub-basin or area, which is not likely based on locations of past uranium mines, the **impact to overall soil productivity and watershed function would be small because the level of disturbance represents a very small fraction of the respective parcel areas.** In addition, the magnitude of the direct impact would be somewhat less than the total anticipated disturbed area because not all the disturbance would occur at once: some areas would be reclaimed prior to disturbance related to other sites. Thus, **disturbance impacts would be minor because of the small amount of relative disturbance and would generally be of short duration, about 5 years, which is the average lifespan of a mine from development through reclamation activities.**”⁶ (*Emphasis added.*)

Water Resources. The final EIS provides an exhaustive body of data on potential impacts on water resources. None of it seems to justify the proposed land withdrawal.

On the impact on Colorado River water quantity and quality, the final EIS asserts that “water quantity impacts could vary between 0% and 0.002% of the average minimum flow in the Colorado River Water quality impacts could vary from no mine to at least one mine which might contribute impacted

⁴ U.S. Interior Department Bureau of Land Management, Final Environmental Impact Statement on the Northern Arizona Land Withdrawal, October 2011, 2:35.

⁵ About 945 acres out of about 550,000 acres for the North Parcel, 107 acres out of about 134,000 acres for the East Parcel, and 312 acres out of about 322,000 acres for the South Parcel

⁶ Ibid, 4:111.

water to the R-aquifer. If any impact would occur, **the resultant concentration of uranium or arsenic would not be expected to exceed estimated ambient levels.**⁷ (*Emphasis added.*)

On the water quality in deep aquifer springs, the FEIS finds nothing that would threaten drinking water standards:

“North Parcel: From no to 11 mines might contribute impacted water to the R-aquifer. If any impact would occur, the resultant concentration of uranium or arsenic might exceed ambient levels (4.9 mg/L uranium and 2 mg/L arsenic), but not drinking water standards (30 µg/L uranium or 10 µg/L arsenic) at the Kanab and Showerbath spring complex. If as many as 11 mines contribute impacted water to the R-aquifer, the projected maximum resultant concentration is 14 µg/L for uranium and 4 µg/L for arsenic.

“East Parcel: From no to 1 mine might contribute impacted water to the R-aquifer. If any impact would occur, the resultant concentration of uranium or arsenic might exceed ambient levels (1.7 µg/L uranium and 10 µg/L arsenic), but not drinking water standards (30 µg/L uranium or 10 µg/L arsenic) at the Fence Fault spring complex. If as many as 1 mine contributes impacted water to the R-aquifer, the projected maximum resultant uranium concentration is 1.8 µg/L; resultant maximum arsenic concentration would not be expected to exceed ambient levels.”⁸

In part, the lack of impact on water resources reflects the local geology. As the final EIS notes,⁹ the “modern (post-1980) breccia pipe uranium mine sites in the study area are ... characterized by well-cemented, very low permeability breccias and adjacent formation rocks In each case, these ore deposits are on the order of 1,000 feet or more above the R-aquifer system and are underlain by the poorly permeable breccias and siltstones/mudstones of the Hermit Formation and Supai Group. Therefore, **conditions are not favorable for downward migration of leached minerals and constituents (such as uranium and arsenic) from the ore deposits to the R-aquifer.**” (*Emphasis added.*)

Air Quality Impacts. The final EIS finds¹⁰ that “[n]one of the proposed mines would have potential emissions in quantities large enough to trigger a PSD [prevention of significant deterioration] review Therefore, each mine would be considered a minor source relative to the PSD permitting process and would only require a State of Arizona Class II Non-Title V air quality permit. Compliance with the permit and the applicable state regulations would minimize the air quality impacts of mine operation

“Mining operations related to all of the alternatives would be expected to result in increases in ambient air pollutant concentrations. Use of the unpaved and paved roads by the ore haul trucks would result in potential increases in fugitive dust and vehicle exhaust emissions. However, **these impacts would be localized and temporary** when they did occur and would be minimized by speed limit restrictions on unpaved roads. However, exceptional wind events have the potential for fugitive dust to be transported beyond several kilometers. The extent of the impact is dependent on the proximity of the mining activity to the Grand Canyon National Park boundary. Areas of the Park that are closer to mining operations could be impacted greater than areas that are farther away.” (*Emphasis added.*)

⁷ U.S. Interior Department Bureau of Land Management, Final Environmental Impact Statement on the Northern Arizona Land Withdrawal, October 2011, 2-40.

⁸ Ibid, 2:37.

⁹ Ibid, 3:62-63.

¹⁰ Ibid, 4:17-18.

When considering the relative impacts of various industrial activities, it is instructive to compare emissions. For example, the Salt River Project's Navajo Generating Station in Page, AZ, produces these pollutants (in tons per year):¹¹

CO – 2,010
NO_x – 33,221
PM₁₀ – 3,943
PM_{2.5} – 2,817
SO₂ – 3,944
CO₂ – 20.1 million

By comparison, Denison Mines' Arizona 1 Mine in the North Parcel has the potential to emit these pollutants (in tons per year):¹²

CO – 0.28
NO_x – 1.3
PM₁₀ – 324
PM_{2.5} – 5.7
SO₂ – 0.08

Even multiplying the emissions from operation of the Arizona 1 Mine by 30 times (the number of potential mines in the withdrawal area), total emissions from uranium mining in northern Arizona are trivial and incidental compared to emissions – which are judged acceptable under air quality control regulations – from a large coal-fired power plant in the same region. (The sole exception would be PM₁₀, and only if all 30 mines were operating at the same time and that, of course, would not occur.)

The Uranium Legacy. NEI concludes that the proposed land withdrawal is not justified by any information in the Interior Department's environmental assessment. The proposed land withdrawal is designed to protect against situations and circumstances that no longer exist – specifically, the uranium mining practices of the 1950s and 1960s, when uranium was mined at the federal government's behest and on the federal government's account, principally for nuclear weapons purposes. Uranium mining in those days was conducted in ways that would not be acceptable today – without National Environmental Policy Act reviews, without air quality and water quality permits, absent any requirement for reclamation and financial bonds to ensure that reclamation occurs, with none of the multiple protections required today to protect public and worker health and safety and the environment.

It is a grievous mistake to judge today's uranium mining activities by practices and standards from 50 to 60 years ago. Yet that, apparently, is what the Interior Department has done in its final EIS. The final EIS' preoccupation with the past appears early in the document¹³: “There is a history of hardrock mining activities in the Grand Canyon watershed dating back to the 1860s. In some cases, these mining activities have left lasting impacts within the watershed, primarily associated with older copper and uranium mines These historical impacts and the recent increase in the number and extent of mining claims located in the area have raised concerns that future hardrock mining activities in the Grand Canyon watershed, particularly for uranium, **could** result in adverse effects on resources ...” (*Emphasis added.*)

¹¹ U.S. Interior Department Bureau of Land Management, Final Environmental Impact Statement on the Northern Arizona Land Withdrawal, October 2011, 3:23.

¹² *Ibid*, 3:29

¹³ *Ibid*, 1:5.

“Could result in adverse impacts” is a long distance – and many decades – from “will result in adverse impacts.”

Arizona Gov. Brewer raised this issue in an October 30, 2009, letter to Interior Secretary Ken Salazar, in which she objected to the proposed land withdrawal. “Most environmental concerns raised by the legacy of uranium mining in Arizona and the southwest United States are the result of activities that occurred prior to the existence of modern environmental laws and generally resulted from detonation, disposal, ore-processing (milling) and weapons manufacturing sites – activities not associated with modern uranium extraction,” she said. “In the Colorado Plateau region of northern Arizona that includes the proposed withdrawal area, ore extraction and production at existing uranium mines has minimal environmental impact on the surrounding land, water, and wildlife because of modern environmental laws.”

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